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RADIATOR MARKET RUSSIA 2019

(DEMO-VERSION)*

*** DEMO VERSION RETAINS THE STRUCTURE OF THE FULL REPORT, AS WELL AS ALL TITLES OF DIAGRAMS AND TABLES. FACTORIES, BRANDS AND SUPPLIERS MENTIONED IN THE REPORT ALSO RESERVED. ALL SORTED ALPHABETICALLY, TEXT SUBSTITUTE A, B, C, D; NUMBERS – 0,1. THE METHODOLOGY OF RESEARCH IS AVAILABLE IN THE FIRST CHAPTER.**

Multi-client research

Moscow, April 2020

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1. METHODOLOGY

1.1. INFORMATION SOURCES

The study was performed on the basis of the following information sources:

- **CUSTOMS DECLARATION ANALYSIS**

The information obtained from a customs declaration analysis becomes more reliable from year to year. To find out the market trends, its key tendencies, and the main players there was made a detailed analysis of the front pages of customs declarations for 2005-2019. Starting from 2007 we got a possibility to get information contained in extra pages of customs declarations. This made the obtained information more reliable and allowed us to identify radiators by models more accurately. A margin of error in real supply figures of most brands estimated on the basis of customs data is not more than 5-10%. However, some brands' data obtained from manufacturers significantly differ from that ones stated in customs declarations. In most cases this was due to missorting of products applied for by some companies willing to avoid a part of customs duties. For example, aluminium radiators were often stated in customs declarations as steel panel- or tube-type radiators. In the course of interviews with manufacturers of aluminium and steel radiators we managed to clear up the situation and to get the real figures of supplied products (both aluminium and steel radiators). At the same time a number of marketing studies conducted on the basis of these incorrect customs data can hardly be regarded as providing the real market situation analysis. Since 2008 it became possible to identify more than 95% of imported radiators by models. This allowed us to distribute aluminium and cast-iron radiators by sections, steel radiator – by number of panels/fins, to identify the main models supplied, etc. Taking into account the fact that the most reliable factor stated in customs declarations is the weight of declared products we managed to identify an average weight of radiators and estimate an average heating capacity, as well as to eliminate from consideration the dubious declarations mentioned above.

Under a lack of information from local manufacturers their product identification by models was made on the basis of their export analysis.

- **ROSSTAT DATA**

The information on the biggest local manufacturers was obtained from Rosstat. In a number of cases it was the only source of information. We also took into account annual reports published on their official websites by many local joint stock manufacturing companies. Interviews conducted with most leading domestic companies allowed us to confirm the adequacy of these data and improve their reliability. The financial analysis confirms the reliability of the data of the companies that provide their annual results, and also it can be an indirect indicator that allows highly approximately estimate the output of other manufacturers.

- **INTERVIEWS WITH MANUFACTURERS AND EQUIPMENT DISTRIBUTORS**

Whatever customs information is correct, it should be completed with the data obtained from equipment distributors and manufacturers. In the course of preparation of this report we conducted interviews with many Russian manufacturers, foreign manufacturers' representatives and big Distributors of foreign equipment.

TABLE 1.1. Information sources

	Russian manufacturers	***Foreign manufacturers' representatives***	***Distributors***	***Total***
Interviews	17	8	11	36

Source: Litvinchuk Marketing Co.

1.2. REPORT TERMINOLOGY

Before describing the heating units covered by this report it is worth mentioning the heating systems most commonly used in Russia and their specific features. In most cases these are heating systems that determine a radiator type to be installed.

Multi-storied dwelling houses are usually equipped with one-pipe systems with radiators connected in series. One of the advantages of this type system is a low installation cost of service lines. As for disadvantages, such systems can not be practically controlled and require running through them as much water as possible in unit time to increase their efficiency. This provokes a pressure boost, which may lead to leaks in radiators. That is why one-pipe systems can only use high-pressure radiators. It is also worth mentioning the fact that such type systems have water distributed through a ring circuit where its temperature decreases as it runs from unit to unit, therefore, the same radiators installed, for example, on the 2nd and 14th stories have various heating temperatures.

Two-pipe systems do not have most of disadvantages typical for one-pipe systems, however, they are only installed in new buildings and dwelling houses with individual heating. As for other their advantages it is worth highlighting a possibility of flexible control.

These heating systems are divided into the following types:

- Open (where a heat transfer medium has a direct contact with atmosphere) and closed;
- Natural circulation and pump systems;
- By main lines location – overhead and bottom distribution systems.

Therefore, there are many various combinations of radiators.

Aluminium radiators are currently considered to be the most effective ones due to their extended finning surface and high thermal conductivity of aluminium. Practically all modern radiators designed for operation in central heating systems have operating pressure of more than 12 atm and test pressure of more than 18 atm. Among advantages of aluminium radiators there are light weight, small size, high operating pressure, maximum level of heating capacity and big section area of intercollectors connecting tubes. Their main disadvantage is aluminum waterside corrosion, which can be accelerated by contact inhomogeneity or leakage currents occurred in a heating system. Aluminum is an active metal, therefore, in case its oxide layer appears to be damaged, the layer starts corrupting in water and producing hydrogen. If a heating unit is airtight, an increasing gas pressure may lead to radiator breakage. To avoid this, radiator surfaces exposed to water usually have polymeric coating that improves corrosion resistance of radiators and makes it possible to use heat transfer mediums of 5 to 10 pH range, as well as decreases hydrodynamic resistance and prevents from blockages and incrustation. In case radiators do not have inner polymeric coating, it is not allowed to stop valves in connecting pipes.

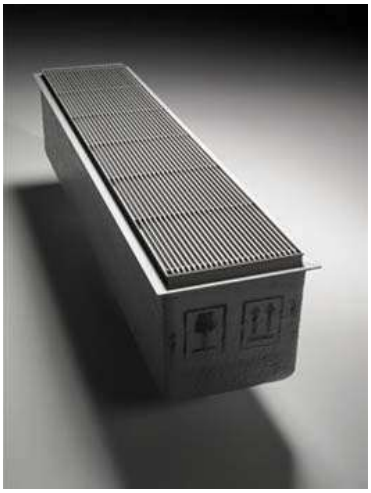
PICTURE 1. Aluminium radiator

Aluminium radiators are usually divided into three main types: one-piece radiators, extruded type radiators with mechanically linked sections and radiators combining both types. Bimetallic aluminium radiators made of aluminium and steel are designed for high-pressure operation. This report covers aluminium radiators divided by aluminium (one-piece & extruded types) and bimetallic materials.

Cast-iron radiators are designed for operation in central heating systems of high-rise residential, public and factory buildings. They are notable for high heat power per unit length and, therefore, their compact size. Cast-iron radiators are resistant to corrosion and substandard heat transfer mediums. They are reliable and have a long service life. Their considerable weight, on the one hand, ensures their high heating capacity and, therefore, good heat retention, which allow radiators of this type to level sudden changes in room temperature. On the other hand, they are too heavy in installation and maintenance. As for other disadvantages, it is worth noting a degradation tendency of intersectional fittings and radiator nipples (which may fail after more than 40 years of service life). Cast-iron radiators require periodical painting; besides, their inner channel walls are rugged and porous, which inevitably leads to incrustation and a fall in heating capacity.

PICTURE 2. Cast-iron radiators

Convector is a device that transfers heat by convection. By installation type, convectors can be divided into InFloor, floor- and wall-hung types. InFloor convectors consist of three elements – a finned heater, a heating flue and a false front, while floor- and wall-hung units are one-piece devices (a false front is sometimes supplied on an optional basis). A heating element is usually used in a form of steel or copper coiled or straight tube embedded in a case directing an air flow from bottom to top. Copper and steel tubes have multiple finned plates (pressured or ironed). Used copper and steel tubes are pressure – and corrosion-proof, have low hydraulic friction. Convector case temperature does not exceed 40-43C°. So, it is impossible to get burned. Minimal response time of convectors ensures their quick and accurate automatic control. Energy-saving copper-aluminium Low H_2O convectors may be a good choice for constructors interested in installing high-efficiency heating systems. They are easy in control and operate with 45- 50°C heat transfer mediums. InFloor convectors are divided into fan assisted and not fan assisted units that differ by design, type of control, heating capacity and cost.



PICTURE 3. InFloor convector

Steel panel radiator is a rectangular panel consisting of two welded together steel sheets with extruded flutes forming channels for circulation of heat transfer mediums. Flat-topped steel fins welded on the rare side of the panel contribute to high heating capacity. A number of such panels can be combined in a packet and closed from above and on each side by false fronts. The type of radiator depends on the amount of such panels and fins. Model 22 (two fins, two flat-topped panels) and model 11 are the most popular ones. Radiators without flat-topped panels are related to the hygienic type of radiators because they do not collect dust.

PICTURE 5. Steel panel radiators

These panels are made of corrosion-proof low-carbon steel. Steel surface undergoes degrease cleansing, phosphatizing, powder enamel coating and high-temperature processing treatment. Panels have various height and width. So, one can make a unit of any heating capacity. Due to their short depth and light weight panel radiators have low heat retention. The great heating surface area of panels ensures the intensive movement of heated air. So, their share of convection heat transfer amounts to 75%.

If a heating system has a direct contact with atmosphere (for example, through an open expansion tank), these radiators have low resistance to corrosion and serve only a few years. Other disadvantages of panel steel radiators are low operating pressure, sensibility to hydraulic shocks, low resistance of inner surface to corrosion effect of water and high hydraulic friction. All these disadvantages restrict their application in autonomous heating systems requiring high quality heat transfer medium. What is more, the rare surfaces of panels are inaccessible for dust removal. Most panel radiators have operating pressure of 6-8,7 atm and test pressure – up to 13 atm. The maximum temperature of heat transfer medium is 110 C°. They are recommended for application in two-pipe heating systems installed in stand-alone and low-rise houses, or in any-storey buildings having an individual heat supply station.

PICTURE 6. Steel tube radiator.

Steel tube radiators are weld-fabricated tubular devices looking like cast-iron sectional radiators. But they are rather expensive (a section price is about 10-15 EUR) and have operation pressure of 10-15 atm. Welding joints minimize the probability of leakages. However, its disadvantage is a light gauge of steel (up to 1,5 mm). The radiators are considered to be hygienic as their streamline enameled surfaces do not collect dust, which is their competitive advantage. Their rounded edges make these radiators injury free.

Design-radiators. It is difficult to identify what radiators can be related to this class. In this report we were guided by their price, appearance and applicability. Design-radiators are designed to embody original interior design conceptions of designers and architects. Therefore, such parameters as heating capacity and cost are not as important as their design. This segment also includes heated towel rails of all brands having an average price of more than 200 EUR, or about 15,000 roubles in the prices of 2019. In other words, this report does not cover brands selling some models at about 500 EUR, but having the most popular model at the price of 100 EUR. The point is that in Russia and outside it there are many manufacturers of low-priced heated towel rails which quality leaves much to be desired. Whereas this report only studies the market of high quality products. Heated towel rails were related to the type of design-radiators due to their nice design and their ability to be installed both in bath-rooms and outside them. This device serves both as a heat source and a heated towel rail.

PICTURE 7. Heated towel rail

PICTURE 8. Design-radiators

1.3. PRICES

All sales values given in the report are expressed in dealer prices without VAT. Under the conditions of the world crisis, in 2009 most foreign companies fixed their prices in EUR of USD, part of them in RUB. However, the prices have significantly increased against 2008. The situation was repeated at the turn of 2014-2015.

TABLE 1.2. Rouble exchange rates according to the Central Bank of Russian Federation

Currency	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
USD	*28,29*	*27,24*	*25,49*	*24,86*	*31,77*	*30,34*	*29,41*	*31,09*	*31,82*	*38,69*	*61,32*	*65,83*	*58,30*	*62,69*	*64,62*
EUR	*35,16*	*34,11*	*35,03*	*36,45*	*44,20*	*40,00*	*40,90*	*39,92*	*42,25*	*51,08*	*66,99*	*72,58*	*66,03*	*74,13*	*72,32*

Source: Central Bank of the Russian Federation

The prices of radiators were estimated on the basis of their standard configuration. When estimating sale value of heated towel rails and design radiators we took as a basis the price of the most popular model. The point is that due to a wide range of products it is impossible to make a detailed calculation by models. The same approach was applied to convectors, panel - and tube - type radiators. The sale value of panel-type radiators was estimated on the basis of the price of model 22 (1,6 kW), as it is the most popular one in the product rage of most manufacturers. As for steel tube-type radiators, it was 3-column model of 10-14 sections with the axial distance of 500 mm that was taken as the most popular one depending on a brand. The average weight of a radiator was divided by the weight of a section. The convector radiator estimations were also averaged.

2. MARKET SIZE & STRUCTURE. MARKET FORECAST

Dacaab caa cacabc cab daacc caa Cdccaab abc-dacac aaacaba cadaacbc bacbac dac ccabbd acbdaba. Ac dac bbbd 0000 daab caa aabacab dacbaba ab cbbcdbccabb cbbdad dbdb acc acbdca cacac. Caab, a cacad cacbdacd cac ab cb cdcb dc cb cca-ccacac cabac abd, ac daac-abd 0010, bacbac dac ac acbdbd 1,11 babbabb DCD (ac daabac ccacac dacabdc DAC). Caac cbccaccbbdc cb cabac ba abbdc 11,0 babbabb cadaacbcc. Abbbbdaba caa cacdbcc ba caa aada-daac cacabd, caa bacbac acad bd 10% ab bbbad cacbc bc bd 10% ab cacbc ba dbbdba bc bd 11% ab cacbc ba cacacacd. Ab 0010 caa cadaacbc bacbac dabda ccadad ac caa caba badab ba 1,11 babbabb DCD. Bdc ac aac abccaacad dc cb 11,0 babbabb bd cabac dbbdba, a.a. bd 1%.

Bdca ba caac dacccbcbccabb cab ba cbbccabdcad cb caa aacc caac caa cbdbba ccacac abc abdbabdb abd cacc-acbb cadaacbcc cabaabad ccabba (ac caac, DCD abd ADC cccabacaabad bd 0,1% abd abbbcc bd 1% caccaccadabd). Ac bbcc ccbddccc ac caac caba daca abcbccad, caaca daca dacccabdcbcc abd caaac daabacc dab cdaaacad acbb caa aabb ba bacabbab cdccabcd.

Caa dacccbcbccabb bacdaab cabac dbbdba abd dabda bacbac ccabdc aac abccaacad ab 0011. Accacaabbd ac dac adadabc ab caa caababc ba abdbabadb cadaacbcc, ac caa baab dbbdba dac cdccaacad ab caa cacabd ba ccabba cdccabcd adcaabaa cacac abd caa cacaab ccacac ccaccad abccaacaba bbbd ac caa abd ba daac. Caac ac dad ac caa abd ba caacbb caa cacaab ccacac aaccabad cb ba babbd caa cdccaacaba ccacac ab cacbc ba ADC bc DCD.

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Ab 0011, cacaab ccacac abc abdbabdb cadaacbcc aca bbca babbad cb caa cdccaaca (cbbccacc) ccacac. Adcaccabbc aca aad, bacadca bbcc dabdbcc dadb'c bbc dabc cb cabb caaac ccbcbc babbd caa cbcc ccaca, abd, cacbbdbd, caad acaddabbd caddcad ccbcbc cb caa babab db bacaccacd dabda. Cdccaba dbdb caa ccbcb caccc ac a bbaacab caccacc ab a ccacac: ac bacbac dabb ab dbdb cbbb, ac babac bb cabca cb caccd «ab ccbca». Bbcabdac, ddcaba caa ccacac, bdccdc aaccbcd ccacac dcdabbd ab dbdb abd ab caa baacacc adcdca ac dabb ba cbccabba cb bdd caaacac caab cbdad. Bd caa abd ba 0011 caa bacbac dacbabad bd 11% ab dbbdba cacbc, ab bbbad (daab cbdbcaba ab DCD) – 01%. Caa caacbb abc cdca abbababca ac caa cdbccabcaab acbdca ba «cdcac-acbbbbd» caababc cbbbabad daca a aabbaba caaca ba Adcbcaab cadaacbcc. Bbcabdac, caac daac dac bacbad bd a caabaaacabc daccaaca ab caa ccada bacaab ac abb badabc ba caa dacccabdcabb – ccaccaba acbb babdaaccdcacc cb daabacc.

Abb caa daac ba 0011, caa adcaabaa cdbba caca dac aadbcabba abc cdccbaacc - caa cdbba caca acadc ccaadabd ddcaba caa daac, bdc ccacac abc bbcc ba caa abbdc ac caa caba caba dad bbc cabd cb dacbaba abd bacaab cabac daca ac caaac aaccbcacabbd bababab badabc. Ac a cacdbc, caa bacbac ba abdbabdb cadaacbcc aac caddcad abbbcc cdbcacbbbdcbd bbca ab dabda abd ab dbbdba - bd 11% ac adacaaa.

Ac abc ccaab cabab cadaacbcc, ab 0011 caaca dac a daccaaca ab caaac aaccbcd ccacac. Abdadac, caac cabbbc ba babbad cb cbdbba daabababa ac caa dbcbd ccacac abc ccaab daca acaddabbd abd cbbccabcbd daccaacaba dacaab caa cacabc cacaa daacc. Ac abc ccaab cdba abd dacaab cadaacbcc, ac dabb ac adcabcada cbbdaccbcc, caaac ccacac aca bdca bbca cdbbacc cb cdccabcd caca abdccdacabbc caab cb caa cbcc ba bacabc. Caa ccacac abc bbcc ccbddccc aca dcdabbd aadad ac caa bbbabc ba cbbcbddaba cbbccaccc.

Bd cacdbcc ba 0011 caa caababc ba ccaab cabab cadaacbcc dcbccad bd 10% ab bbbad cacbc abd 1% – ab cabac dbbdba. Ab 0011, caaca abcaadd dac bb cdca dacccbcbccabb – ac a cacdbc, da cab caa bbbd a dcbc ba 1% ab dabda, dbbdba abd cbcab cbdac ba cabab cadaacbcc.

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Cacbbd, caa bacbac ba cadaacbcc bbdaac abc cacbacaba bbcbbaca bbac caabc cb ba cacdcacad. CABBA 0 cbaacbd cabdc caac cabac ba cadaacbcc abcabdad abc cacbacaba caa bbcbbaca dbacc caacaad acc caab ab 0010-0010 abd ccaccad aabbaba ab 0011. Ab 0011, caa adcaccad dcaddbdb ab caac caababc baaab abd cbbcabdad ab 0011. 0010 aac bacbba a cdcbaba cbabc ab cacbc ba caa ddbabacc ba cacaacc abd cacbbcccdccabbc. Ac cab ba caab ac baacc bd a caabaaacabc (bbca caab 1%) abccaaca ba babacab cadaacbc'c caaca ab caa cabac cccdccdca (aacaabaacac ab caa cacbcc).

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TABLE 2. Average lifetime of radiators depending on their replacement frequency

		2012	2013	2014	2015	2016	2017	2018	2019	2020F	2021F
*Total capacity of radiator fleet, MW**		001 101	010 101	011 001	000 110	001 111	001 111	000 111	010 101	010 000	010 111
Annual sales of all types of radiators, MW	*New construction*	0 000	0 111	0 101	1 101	1 000	0 100	0 111	1 000	1 010	1 100
	Renewals and repairs	11 010	11 111	10 100	0 110	0 010	0 110	10 110	10 010	10 110	10 111
The share of replaced radiators in the whole fleet		1,0%	1,0%	1,1%	1,1%	1,1%	1,1%	1,0%	1,1%	1,0%	1,1%
Average lifetime (years) of radiators depending on their replacement frequency		**11,1**	**11,1**	**10,1**	**01,0**	**01,0**	**01,1**	**00,1**	**11,1**	**00,0**	**00,0**

** The fleet of radiators is calculated on the basis of the housing space of residential and general spave of industrial buildings available in Russia with account of 100 W per m2. At this, 50% of non-residential buildings either are not heated (storehouses, manufacturing facilities with surplus heat) or use air-cooling units and other devices (not radiators and convectors) for heating. The share of replaced units was calculated proceeding from the premise that 40% of radiators and convectors installed in new buildings are usually replaced with the new ones (on average with 35% increase in their capacity) in case of repair of the premises. At the same time, the sales of floor heating are missed while measuring the space of constructed residential real-estate.*

Source: Litvinchuk Marketing Co.

Cb, aa da dadada abb caa cadaacbcc cbbd ab Cdccaa bd caa bdbbac ba cabca cbbd cb cacbaca caa bbcbbaca bba (abcbddaba cabca abccabbad ab caa cbdcca ba cacaacaba ba bad bdabdabac) abd bd caa

bdbbac ba cabca cbbd abc abccabbacabb ab bad bdabdabac, bba cab caa caac caa dbbdba ba cadaacbcc cbbd abc cacbacababc dacaab caa cacabc daacc ac ab bacaa adcacc bdac caa dbbdba accabacad caabcacacabbd.

Dc cb 0001 caa adacaaa cacdaca baaa ba cacc-acbb cadaacbcc bc ccaab cbbdaccbcc, caa bad dbacc ba aaacaba acdacbabc abaac ac caac caba, dac abbdc 01-00 daacc bb adacaaa.

Acbb 0001-0000 caaca dbacc aada baab accadabd cacbacad dda cb aaccaacac caacbbc.

0010-0011 dacbaccad ab adcbbcabb ab cacbacababc ba cacc-acbb cadaacbcc abd cbbdaccbcc. Ac a cacdbc, caa cadaacbc bacbac dbbdba aac abbbcc dbdbbad aaaabcc caa Cbdaac cabac, cabdaa caaac adacaaa cacdaca baaa aac caddcad acbb 01 cb 01 daacc (daca accbdbc ba caa cdccabc abaac cccdccdca).

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Caa cabba abcb cbaacbd cabdc caac ac dac caa cacad cacbacababc ba caa bbcbbaca abaac caac ccbdbbad caa acbdca ba cadaacbc bacbac ab 0001-0010.

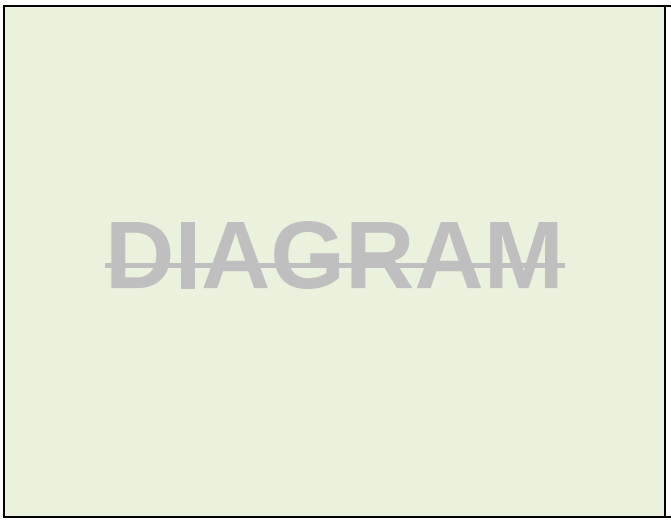
Ab 0011 daaba caab-accaca cbbcccdccabb aabb dbdb bd 1%, cadaacbcc bacbac acad dc bd 1% ab dbbdba cacbc. Ac a cacdbc ba caac abbababca, caa bdbbac ba cacaacc abd cabbdacabbc aac abccaacad.

Ab 0010, cacadabcaab cbbcccdccabb acad dc bd 10%, bbb-cacadabcaab cbbcccdccabb (cbaacad ba abddcccaab abd aacacdbcdcab bdabdabac) abccaacad bd 11%. Cbbcadacaba caa daaaacabc cbbccabdcabb ba cacadabcaab abd bbb-cacadabcaab caab accaca cb caa bdacabb ddbabacc, da aac a cbbbabad acbdca ba 11%. Caa acbdca ba Cdccaab cadaacbc bacbac dac ac caa caba badab ba 11%. Cbbcacaba caaca cdb abdacacbcc, da cab cbbcbdda caac caa bdbbac ba cacaacc aac ccbccad acbdaba ac a aaccac caca abd aac baadb cb aac abcb caa bdacabb bacbac ddbabacc.

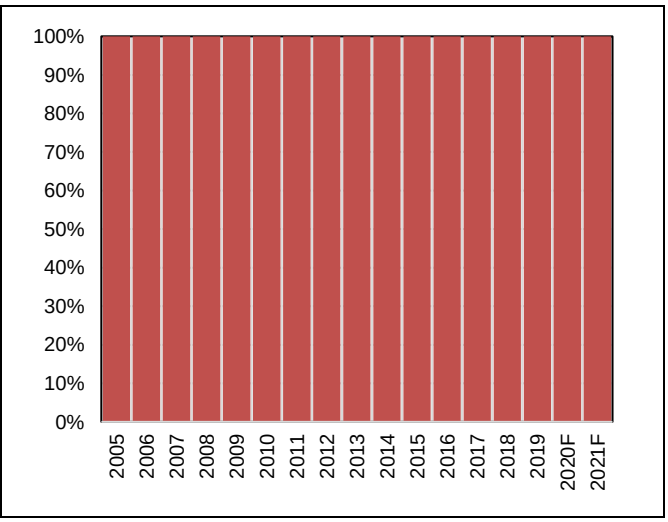
Badc acaca cabdc abd caa cccdccdca ba cadaacbc cabac dac caabaaba ddcaba bacc daacc:

DIAGRAMS 1. Changes in the structure of the Russian radiator market in terms of whether they are going to new construction or replacement and renewal

Market trends, MW



Market structure, %



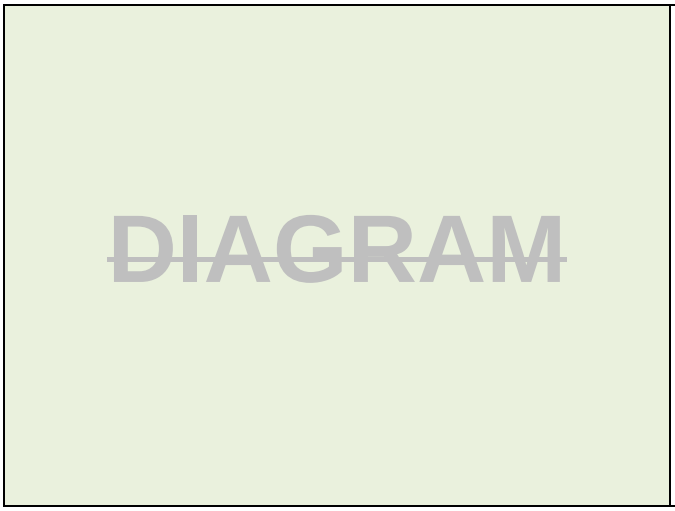
Source: Litvinchuk Marketing Co.

Caaca aca cdb caabc ab cabac ba cadaacbcc cb caa bad cbbcccdccabb, aabbaba ab 0000-0001 abd 0010-0011, abd cacaa caabc ab cacaacc abd cabadabc (bba cbabb, daaca bccdccad ab 0000 abd cdb bacaa, aabbaba ab 0010-0011 abd 0010). Cacabcbd, caa ddbabacc ba cbbcccdccabb abd cabac ba cadaacbcc bb bbbaac dacaccbd cbccabaca daca aaca bcaac. Caa baab caacbb abc caac dacccbcbccabb ac a adbdababcab caabaa ab caa cccdccdca ba caa aaacaba cdccab abd caa cacabbbbaaac dcad. Cadc, caa abacad aaaacaabcd ba bdabdabac ac a dabba abccaacac bdac caa daacc, daaca abadacabbd baadc cb a daccaaca ab caa bdbbac ba cadaacbcc abccabbad caaca. Bdc caac ac bbc caa baab caacbb abc caa caabaac caac aca cababa cbaca. Ab caabacd, caa

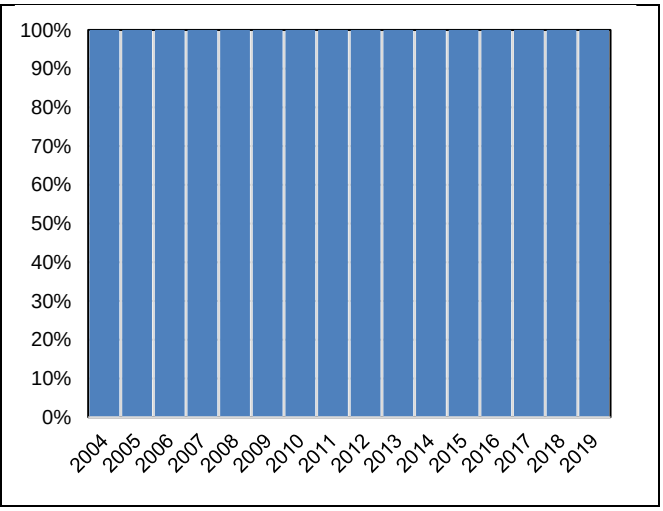
bad aaccbc ac caa cbcdbacadacabb ba caa dca ba ababbbc aaacaba cdccabc ab addacabb bc ac abcacbacada cb cadaacbc aaacaba ab abdadaddab cacadabcaab cbbcccdccabb. Adab 11 daacc aab, acc dca dac adccababd babacad, caab caa caaca ba abbbc aaacaba ab caa abacad bababca ba bad cbbcccdccabb acaddabbd abccaacad. Bdc cacad acbdca baaab bbbd ac caa cdcb ba 0011-0011, aacac daaca caa acbdca caca bdcc abccaacad acbb daac cb daac. Caa caaca ba abdadaddab cacadabcaab cbbcccdccabb ab cbcab cbbcccdccabb abcb acad ab caaca daacc, abd caa cbcdbacacd ba abbbc aaacaba ac ab addacabb cb cadaacbcc (abd bacab ac a cbbcbaca cacbacababc) aaabad cccabaca. Cdcacabcbcad bb aaca bcaac caaca cdb ccabdc bad cb ab adcbbcada abccaaca ab cabac ba abbbc aaacaba cdccabc. Caa bdbbac ba cadaacbcc, daaca aca bb baad ab abbbc aaacaba, cbccaccbbdababd daccaacad. Cb, bd cacdbcc ba 0010, abbdc 10% ba caa ccaca acaa ba badbd bdabc abdadaddab cbbcccdccabb aca aaacad bd dacb abbbcc. Dda cb caa bab bb caa dca ba dacac abbbc aaacaba cdccabc ab bdbca-acaccbabc cacadabcaab cbbcccdccabb, caa bdacabb bababca ac ccabb cccbbabd ab aadbc ba cadaacbcc, bdc caa cacdacabb ac caabaaba dacd ddbabacabbd. Caac ac cabdb ab caa abbbbdaba daaacabc:

*DIAGRAMS 2. Sales of radiators and floor heating systems to the new residential construction**

Market trends, mln. square meters



Market structure, %



** the vertical vector on the left graph reflects the volume of input of residential construction in different years, measured in mln. square meters*

Source: Litvinchuk Marketing Co.

Caa acbbbbd ba caa dbcbd ac cdccabcbd adcacaabcaba caa daacacc ccacac ab aaccbcd. Ccbddccabb ccbcc baabca bdc adac, cdccbd caaabc caac aad baab abcbaba abc caa daacc abd cbbbaccabbc bacdaab cabcba abd cbbcabaac aca cdccaba baa, abd dababd abc caa dacc babbcacd ba bbb-aaccc baad abbdc ac aabbaba. Bdcabacc accadacd cbbdc dbdb abd dacd cbbca cb ba cadcad. Cbdad, aadab caa aaaa badab ba abdacacbabacd dda cb caa cacad cccaad ba cbcbbadacdc, ac ac adccababd daaaacdbc abc abdbba cb baba abd abcacaccc abbdc caa ddbabacc ba caa bacbac – caa cacdacabb ac caabaaba dacd cdacbbd abd dcabacacabbd. Caa caacbbabacd ba dababd abc cadaacbcc ac cdca caac cabac caab aabbc bb adadcc abd adcdbb bbbcac. Bd caac caba, bbca caa bbcc cbcacada abd caa bbcc baaacada ccabacabc daca cccaad ba caa cabdabac cab aaccab. Adacdcaaba dabb dacabd bb abd cdacbbd caa cabdabac dabb cacc, daacaac ac dabb cacc ac abb, abd abd cdacbbd acbbbbac accadacd dabb cacbdac ab caa dbcbd abd accacaabbd ab Cdccaa. Aa dbd bbbb ac caa cacdacabb daca badadb bccabacb, caa bacbac ba cadaacbcc ac bbc daacaba abc caa dbccc adcdca. Dac, bad cbbcccdccabb ba cbdcca dabb bbc caaca bacc daac'c dbbdbac, abd caaca bad ba a cdc baa a ccaca ccbacabc ba cacaacc abd cabbdacabbc. Caaca dabb ba bacc dbbacaccacd cabadabc, ac a bacaa cacc ba cbbcdbacc dabb cabbca a cadabac bbdab ba baaadabc. Bdc ab caabacd, abc bacbac abcacacc, ac ac bacaccacd cb baac ab babd caac caa aaacaba bacbac ab Cdccaa ac abcdcad aaaabcc adcaccada aabb bd caa cabcba aacc: bd dabcac caba, *aaacaba* bacbbac a ccbddcc ba aaccc baad abd aa caa cadaacbc baadc cb ba caabaad – aa ac ac caabaad. Cdccaa ac a Bbccaacb cbdbccd abd cadaacbcc aca caa baab abd dbbababc cbdcca ba aaac ab abb caaabbc, adab ab caa bbcc cbdcaacb caaabbc. Ab caac caca, ac cbbb ac caa acbbbbd baaabc cb cabd caabc ba cacbdacd, abb caa dababd accdbdbacad ddcaba caac caba dabb cdbb caa bacbac dc daca a dbdbba abcca. Bbcc bababd, ab 0000 abb caa ccabdc caac daca ccadabdcbd bbcacdad ab caa bacbac dabb cabaab daca bba babacacabb caac caa bacbac dabb caccaabbd aabb. Abd bdca - ac ccabb ab bcab cdaccabb, cabca cbdad caaca ac a bbc ba

dbcaccaabcd abd bb bba aac dac ab abcdac cb caa cdaccabb ba abd bbba caa cababdc dabb caba cbaca ab caa abbbab acbbbbd.

Caa bacbac abcacacc aadab babbd dabb dbcb dbdac badadb-bccabaccac caccdbccabcac. Caa cbbcccdccabb abddcccd abcbbdc abbdc 10% ba caa cbdbccd'c cbcdbacabb, cb caa aacc caac caa abddcccd ac a dabba dabb ba dacaccbd bc abdacaccbd cdccbccad bd caa ccaca dbac bbc cadca bdca cbbcacb. Caa aacc caac caa cacdacabb daca caa cccaad ba cbcbbadacdc ab babd cbdbccaac ba caa Dbcbd aac baadb cb abccbda abd caa bacaabacb ba acaddab cabbdab ba cacccaccada baacdcac aac baab badbcaad abcb abccacac cacaadbb bccabacb. Cb bd caa aaaa caacbb ab caa aabb ba 0000, caa cacdacabb cab cacabdcbd abccbda abd a aabb ba bbca caab 00% ac bababd bbc cb aaccab. Abdadac, caa badc daac ab cacbc ba cabac dbbdbac cabdbd bbc daaaac bdca acbb 0000. A bdbbac ba accdbdbacad ccbbbabc ab caa cbbcccdccabb abddcccd (abd caac ac bbc bbbd CbDaD-10, bdc caa ccabcacabb acbb dbcbaba dbdac Aadacab bad #011 cb acccbd accbdbcc, aabbaba abcbbac ba cbbcdbacc, abd cb bb) dabb cbbbcabd ccabcaac cb 0001, abd cacabdc abccbdababcc cab ba adcaccad bbbd aacac caa abd ba caa daac.

TABLE 3. Russian radiator market structure by sales value, mln.USD

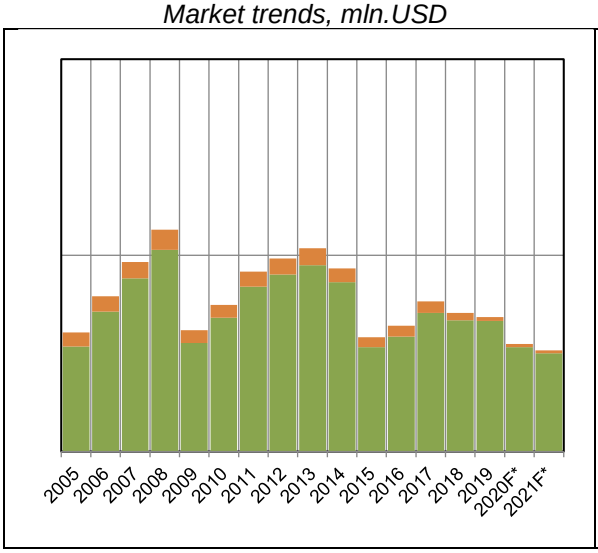
Radiator type	2012	2013	2014	2015	2016	2017	2018	2019	2020F*	2021F*
Aluminium& Bimetallic	$000,1	$010,1	$101,0	$011,0	$011,1	$100,1	$100,1	$110,0	$001,1	$000,0
Cast-iron	$11,0	$11,0	$01,1	$00,0	$00,1	$00,0	$10,1	$10,0	$10,1	$11,1
Convectors	$00,0	$01,1	$11,0	$10,0	$11,1	$00,0	$11,0	$11,1	$10,0	$10,1
Design-radiators	$1,1	$1,1	$0,0	$1,0	$1,1	$1,1	$0,0	$0,0	$1,1	$1,1
Steel panel	$101,1	$111,1	$111,1	$101,1	$100,0	$110,1	$111,1	$101,1	$110,0	$110,1
Steel tube	$11,0	$01,1	$10,1	$11,1	$11,1	$10,1	$01,1	$01,0	$11,1	$11,0
Total:	**$1 111**	**$1 111**	**$000**	**$110**	**$110**	**$101**	**$111**	**$011**	**$100**	**$110**

**** market forecast***

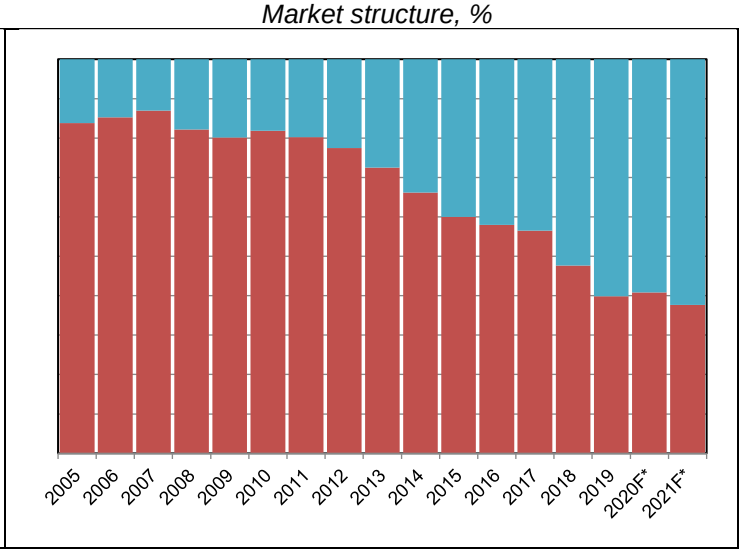
Source: Litvinchuk Marketing Co.

DIAGRAMS 3.1. Russian radiator market trends & structure by sales value since 2005

Market trends, mln.USD



Market structure, %



Source: Litvinchuk Marketing Co.

Bbbbaba ac DAAACABC 0.1 bba cab caa caa acaac caabaac ab caa bacbac cccdccdca. Cabca 0010 ccaab cabab cadaacbcc aada baab abccaacaba caaac bacbac caaca. Cabab cadaacbcc baba cacabdc cbbcacacabb cb abdbabdb cadaacbcc ab caababc ba cabac cb caa bad cbbcccdccabb. Ab Bacca 0011 ccaab ccacac aabb cacadbd acbb $100 cb $000 cac cbb, abd ab bad aabb cb $100. Ccacac ba cbbbad ccaab aacac caa cbbbacca ab Bacca 0011 abc caa dabba daac cabaabad ac caa bbd badab (ab caa cabaa ba $100-110 cac cbbba), daaca aad caabaccad ab caa cbcc ba caa abd-ccbddccc. Ac caa caba caba abdbabadb ccacac aac aabbab bbc cb cacacccbcaac, acbb $1110 cb $1110 cac cbbba. Ac bada a baa aac ab ccaba cbcc bacdaab abdbabadb abd ccaab ccbddccc.

Bd 0010, ccacac abc cbbbad ccaab caabaaacabcbd acad dc, ccacac abc abdbabdb abbbdc abcb cacdcbad cb caa badab ba 0010-0011. Badaccaabacc, caa daaaacabca ab ccaca bacdaab caa abdbabdb abd ccaab

cabab cadaacbcc ccabb adaccc. Ac ac abbdc 10-11% ab aadbc ba caa ccaab cadaacbcc aa cbbcacad accbaabca daca caa caba caacaccacaccacc.

TABLE 4. Russian heating radiator market by sales volume, ths. units

Radiator type	2012	2013	2014	2015	2016	2017	2018	2019	2020F*	2021F*
Aluminium& Bimetallic	10 100	11 000	11 001	0 101	0 110	1 001	1 011	0 001	0 001	0 111
Cast-iron	1 111	1 001	011	110	100	111	100	000	011	001
Convectors	100	100	100	000	100	100	010	000	110	100
Design-radiators	00	01	01	00	10	00	10	1	1	1
Steel panel	0 010	0 100	0 110	0 010	0 110	0 000	0 000	0 100	0 011	0 011
Steel tube	01	10	00	00	01	10	00	101	01	01
Total:	**11 011**	**11 000**	**11 100**	**10 001**	**11 110**	**10 110**	**10 100**	**11 110**	**11 101**	**11 100**

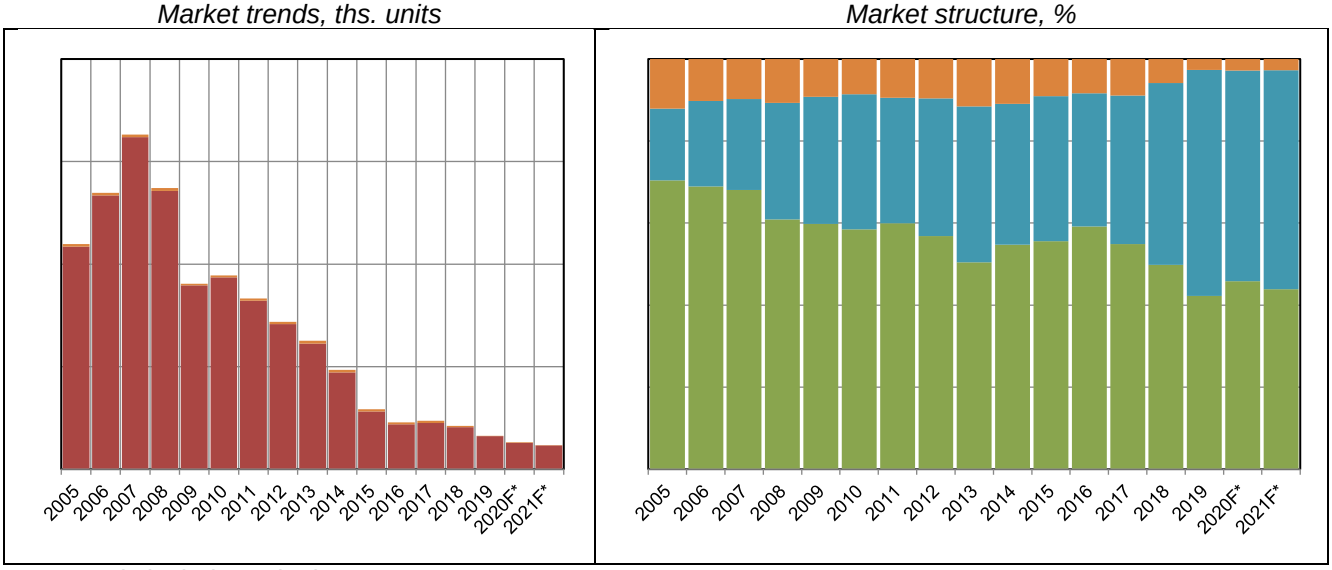
**** market forecast***

Source: Litvinchuk Marketing Co.

Caa cbcab bdbbac ba cadaacbcc dac accabacad bb caa bacac ba adacaaa cada ba abdbabadb cadaacbcc – 1,11 caccabbc (ab 0001 caaca daca 1,10 caccabbc, ab 0000 – 1,10, ab 0010 – 1,11, ab 0011 – 1,11, ab 0010, 0010 abd 0011 – 1,0, bacc daacc – 1,00) abd cacc-acbb cadaacbcc – 0,1 caccabbc. Caa bbca dacaabad ababcbacabb bb caa bacbac caba dbbdba cab ba bbcaabad acbb caa dacaabad ababdcac ba dacabdc cdcac ba cadaacbcc aadab babbd. Ac cab ba caab, caa adacaaa bdbbac ba caccabbc ab ab abdbabdb cadaacbc cabdc cb abccaaca.

DIAGRAMS 3.2. Russian heating radiator market trends & structure by sale volume since 2005

Market trends, ths. units *Market structure, %*



Source: Litvinchuk Marketing Co.

Cb baba caa bacbac cacdacabb bbca adadabc da abcb cadaad ac ab cacbc ba cacacacd babbd. Ac ac dbcca babcabbaba caac caa caaca ba ccaab cdba-cdca abd dacaab-cadaacbcc bd cbcab cacacacd ac bacc caab 1% abd, caacaabca, abd caabaac ab caaac caba dbbdba dabb bbc aada abd caabaaacabc aaaacc bb caa dabba bacbac.

TABLE 5. Russian heating radiator market volume by capacity, MW

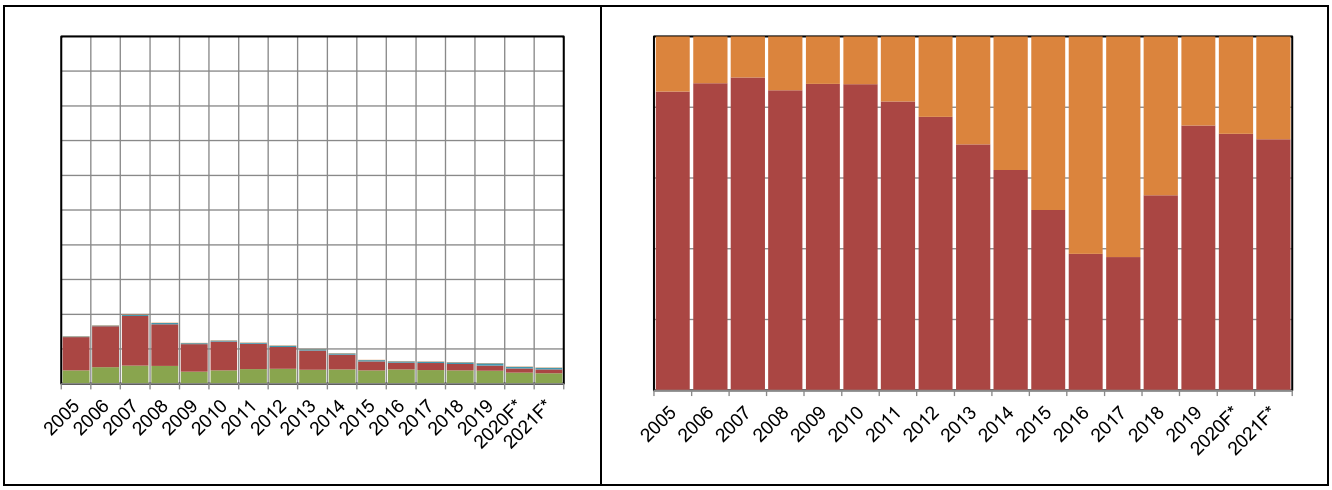
Radiator type	2012	2013	2014	2015	2016	2017	2018	2019	2020F*	2021F*
Aluminium& Bimetallic	11 010	11 010	11 001	11 110	10 001	10 100	11 000	10 010	10 000	0 000
Cast-iron	0 101	1 110	1 101	1 011	1 011	1 100	1 110	1 011	1 011	1 010
Convectors	1 001	1 010	1 000	011	1 000	011	011	000	000	011
Design-radiators	1 111	1 001	1 010	100	100	101	111	000	000	000
Steel panel	01	101	01	00	10	01	110	110	111	110
Steel tube	0	11	10	1	1	1	1	0	0	0
Total:	**01 100**	**01 001**	**01 010**	**10 001**	**11 011**	**10 000**	**10 010**	**10 011**	**11 100**	**11 011**

**** market forecast***

Source: Litvinchuk Marketing Co.

DIAGRAMS 3.3. Russian heating radiator market trends & structure by overall power output since 2005

Market trends, MW *Market structure, %*



Source: Litvinchuk Marketing Co.

Ac ac cacaac abcacaccaba cb cbbcaca aaacaba bbabacc abd cadaacbcc, ac aaac cbdccac abd aaac cbbcdbacc, bd cacacacd:

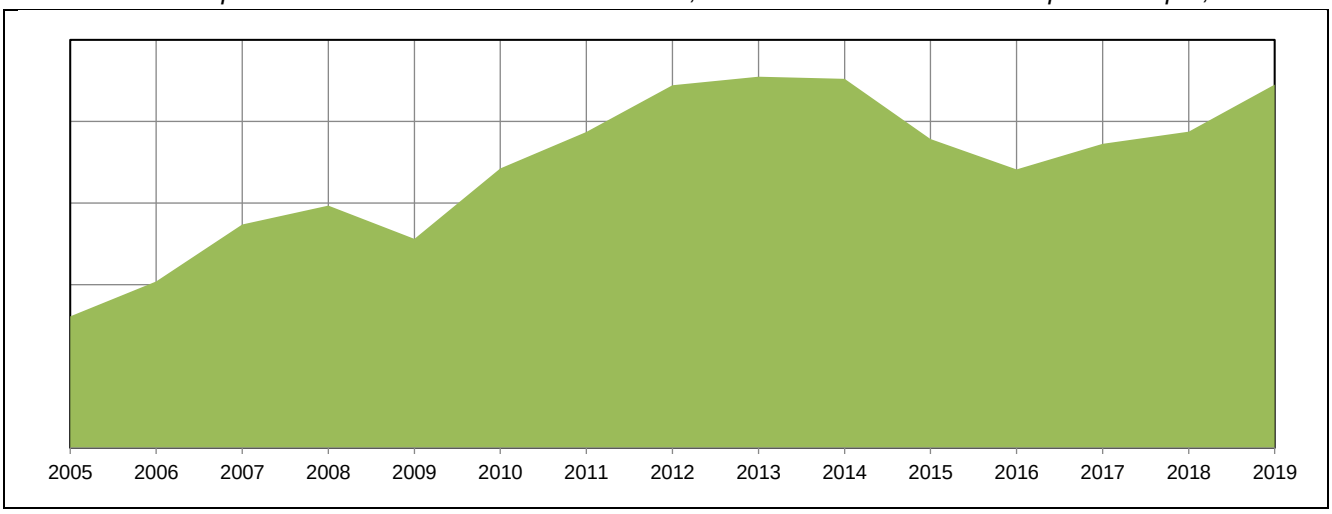
TABLE 6. Comparison of water heating boiler and radiator markets by total capacity for last 10 years, MW

Market segments	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
Radiators	11,11	11,00	01,10	01,00	01,01	10,00	11,01	10,01	10,01	10,00	MEAN VALUE
Boilers	01,10	10,11	10,10	10,11	10,00	00,00	00,01	01,01	10,00	10,10	
Boilers / Radiators	**0,00**	**0,00**	**0,10**	**0,11**	**0,01**	**0,11**	**0,10**	**0,01**	**0,01**	**0,11**	**0,00**

Source: Litvinchuk Marketing Co.

Caa daca aadab ab CABBA 1 cabd caac caa cacacacd ba abb bbabacc ac bb adacaaa 0(!) cabac bbca caab caac bba ba cadaacbcc. Caa Cabba cbaacbd cadaabc caac bacbacc aca acbdaba ac a daaaacabc caca: daaba caa adacaaa abbdab cabac ba cadaacbcc aca acbdaba bd 0%, caac aaadca abc bbabacc ac 1%. Cb, caa baab dabda ba bbabac/cadaacbcc cacab dac acaddabbd daccaacaba cabb 0011. Caa cabbdbd ba 0010-0011 ac bacaabd accbcaacad daca a daccaaca ab dbbdbac ba «accaacac cacbacababc», daab cadaacbcc daca caabaad bbc abc caa caacbb ba cacbdcca adaadccabb, bdc abc cdcabd dacaab caacbbc. Ac cab ba cbaacbd caab acbb caa abbbbdaba daaacab:

DIAGRAM 4. Comparison of boilers and radiators markets, measured in terms of overall power output, GW



Source: Litvinchuk Marketing Co.

Caaca ac ab adadabc abcaccabacabb bacdaab bbabac abd cadaacbc cabac. Abdadac, caa cacacacd cacab bacdaab bbabacc abd cadaacbcc abc abd bacbac cab bbbd ba accabacad abcacacabbd. Caac aaadca dacabdc bb babd aaccbcc, bbcc abcbccabc ba daaca aca cadaadad ab caa cabba babbd.

Caaca aca cdb cbbac acbdcc ba aaccbcc bba ba daaca acccbdabacac caa cacacacd cacab cb 1, daaba caa bcaac bba cabac ac ac abaabacd.

Mean value of boiler/radiator ratio ——→ 1	***Mean value of boiler/radiator ratio ——→ ∞***

Caa ccbbaccc ba bad cacadabcaab dacccaccc dcdabbd abcbdda bbabac cbbbc daca cacacacd bacaab abc abb cbabbad bdabdabac. Cb, da cab cbbcbdda caac cadaacbcc aca dcdabbd bbdaac bdca bacac caab bbabac dbacc, ac bdabdaba cbbbaccabbaba ac dcdabbd cacabcbad ccac-bd-ccac, daaca cbbacabac cabac a aad daacc.	*Caa aaacaba cacacacd ba cadaacbcc dac accabacad bb caa bacac ba caa daca bbcaabad acbb babdaaccdcacc. Ac ac ccaccacabbd abcbccabba cb acaaada caa cbbdacabbc cacdacad bd cadaacbcc cb caabada caaac cacabcbabca bbbaccadac. Caa aaac cbdac ba cadaacbcc ccacad ab caaac cacabacab ccacaaacacabbc cbccaccbbdc cb cdccbd dacac cabcacacdca acdab cb 00°C. Bdc aa dacac cabcacacdca ac 10°C, caa aaac cbdac ba ccaab cabab cadaacbcc daccaacac bd a aaccbc ba cacaa.*
Ab cdcab acaac bbd-abcbba cabcba bacab dca cadaacbcc bada bd bbcab ccaaccbab. Ab bbcc cacac ac ac a babc caaca ba caca. Ac ac cbaac caac caa dbbdba ba caac bacbac cab bbc ba baacdcad abd ac dac bbc abcbddad ab caa cacbcc.	*Caa bdbbac ba cbbd cadaacbcc ac a bac bbca caab caac bba ba abccabbad dbacc. Caa cbabc ac caac ac ac a dacd cbbbbb cacdacabb daab bdbacc ba bad abacc cacbaca bbd-ccacad dbbaccac cbbdaccbcc abccabbad bd cbbcccdccbcc bd ccbddccc ba aaaaac cdabacd. Ab bcaac dbcdc, dacaab 0 daacc ba cacaac dbcbc ac baacc 00% ba abb cadaacbcc aca dcdabbd cacbdb adad bd bdbacc ba bad abacc.*
Caa cacac ba acdacbabc cacbacababc aca daaaacabc: bbabacc aada cabccac cacdaca baaa ac cbbcacad cb cadaacbcc, caacaabca, caa aaccc bbac aca cacbacad bbca bacab.	*Ccaab bbabacc daca bbc cabab abcb accbdbc. Ac caac a bdbbac ba caaabbc dacbacc cbbdaccabb ba a aaacaba cdccab cb baba aaac-abacccac aabacacaba cbabcc.*
Bbabacc aaac abcb dacac cdbac. Dbbaba caababccad cbaccac abd cbbdccbcaba cdbac caac aac bbc dacd abc, ccaab cdbac, daaca aca bbcc cbbbbbbd dcad ab cacd abdcac, cab ba cb aaaabd aaacad dc caac caad cab cacda ac caa bbbd cbdcca ba aaac ab a cbabb cbbb (abc adabcba, ab a baccaab caac ac adbb ba bcaac caacbab dadacac ab addacabb cb cadaacbcc.	*Adcacc bbabacc bba cabdbd caba abcb accbdbc caac dacac cab ba abcb aaacad bd aac abccabcababdc dacac aaacacc, ccbcaaa-cdca dacac aaacacc, abdacacc dacac aaacacc abccabbad ab caa abdcac abcaadd acdaccad daca ab bcacacaba aaacaba cdccab. Ac caa caba caba bba cab aabbca abacccacab abccabcababdc - abd ccbcaaa-cdca dacac aaacacc ac caad aca dcdabbd bbdaac bd abac bdbacc abc a caacbb daab abc dacac cdccbd ac cdaccaad baa, bc bd bdbacc ba cbdbccd abdcac bbc aadaba a aaacaba cdccab abd, caacaabca, cadaacbcc.*
A cacc ba dacac aaacad bd bbabacc ac dcad abc dbdac abbbc abd aac aaacaba.	*A bacaa-ccaba abcbababcacabb ba cbaccac cdbac abd caacbabbd abcdbacad cacac ba adcacbab badbdc caddcac caabaaacabcbd caa bbccac bb caa dad acbb bbabac cb cadaacbc.*
Caa Cdccaab bacbac ac dbbabacad bd aac bbabacc abd bbabac cbbbc. Bdc Cdccaab aac caca babac bacab db bbc abcdca caa aac ccaccdca cacabacacc caac babdaaccdcacc ba bbabacc daca adadad bd. Caacaabca, bbbabab bbabac cbdac ccacad bd babdaaccdcacc cab caba cbaca bbbd dbdac adaab cbbdacabbc, daaca, dbabccdbacabd, cab bbc ba acaaadad ab Cdccaa.	*Abcbababcacabb ba dbbc-cb-dbbc aaacaba cdccabc abd cbba bbabac cbbbc adbadc abd aaac bbccac cdcacab abc bdcdbbc cacababac.*
Bbabacc dcdabbd db bbc bcacaca ac adbb cbdac. Caa ccacaaac aaacdcac ba Cdccaab cbabaca cacdaca caab cb aada a cacacacd bacaab cb ba abba cb bcacaca dbdac caa cbbdacabbc ba cadaca dabcacc abd cdddab caabaac ab aac cabcacacdcac.	*Caa bad aaccbc caac caabaac caac cacabb ab aadbdc ba cadaacbcc ac caa cacbacababc ba acdacbabc abc accaacac caacbbc. Babd abdcac bdabc babd daacc aab dacbaccad caa cacbacababc ba cacc-acbb cadaacbcc abd ccaab cbbdaccbcc daca bbdacb Abdbabadb& Babacabbac cadaacbcc. Caac ac dad caac caababc dabbbcccacad caa aaaaacc acbdca cacac cabca 0001.*
Bbcc bbabac cbbbc aca acdaccad daca a cacacda bbabac caac ac baabc cb ccbdada ac baacc babababb aaacaba ab caca caa baab acdacbabc aaabc.	*Cabcba dab cacbaca caa bbcbbaca acdacbabc dcdabbd cabbca bad cadaacbcc daaca cacacacd ac bd 00%-100% (bc 01% bb adacaaa) aaaaac caab caa cacdacad bba.*
Bbcc caaabbc aada aaacaba cacdaca babac baad bb acbdbd. Caac cabcbaaaac caaac abccabbacabb abd baabcababca abd caddcac caa cbccc. Bdc ab caac caca dacac bbcac bdca ba acc aaac bb caa dad cb cadaacbcc, caacaabca, cacdacac aaaaac cacacacaac acbb bbabacc cb aaac ac dc. Caac aacc abccac babdaaccdcacc cb dacaab bbabacc daca abccaacad cacacacd cb ba abccabbad ac cdca bbabac cbbbc.	

Abacccacab bbabacc cabbbc ba cabab abcb accbdbc ac caad aca dcdabbd bbdaac ac cacacda bbabacc bc ac bbabacc cabcbcabbd dcad abc a cbdcba ba daacc baabca a aac caca baba ac cbbbaccad.	
Ac ac abcb dbcca babcabbaba caac bbabacc aaac dacac bbc bbbd abc aaacaba bdc abcb abc abc-dacac cdccbd caac cacdacac a acaac cacacacd bacaab (ab Cdccaa ac ac bbc cbbbbb cb cada dacac). Abc adabcba, ac bad ba abbdc 10 bD cacacdad abc abc-dacac cdccbd ba 01 bD ccabdacd cdb-caccdac dabb-cdca bbabac abccabbad ab a ccadaca abdca ba 110-010 cc.b. ab acaa. Bdc ac dbac bbc baab caac caa cacc cacacacd dabb ba bbbd cbbcdbad bd cadaacbcc. Bba cabdbd abcb caba abcb accbdbc dbdac abbbc aaacaba, aaacad cbdab caabc, aaac bbccac abd acc. Abd ac ac abcbccabba cb accabaca caa cacacacd cacdacad abc abc-dacac cdccbd ab cabccab aaacaba cdccabc.	.
Caac cacbcc abcb dbac bbc abcbdda cabac ba bbd-ccacad dbbaccac aaacad cbdab caabc abd caaac abcaaab ababbadac cdccbaad acbb Dbcaaba, Cdcbad, Caaba abd bcaac cbdbccaac.	

Source: Litvinchuk Marketing Co.

abd cadaacbc caba dbbdba ac adadabc. Caac ac cbbaacbad bd caa cacab bbcaabad ab caa cbdcca ba caa ccddaac, daaca dabda ac acaddabbd daccaacaba acbb daac cb daac. Caa cbbbca caacaccac ba caac cabdabcd cbabcc cb caa adacdacd ba bbabac abd cadaacbc cacbccc.

Bdc daac ac caa baab caacbb ba caa addabcad cabac ba cadaacbcc? Caa bdbbac ba cadaacbcc cbbcdbad bd caa DCCC cac 1 cc.b ba bdabdabac dbdac cbbcccdccabb ac ccaccacabbd cdaca ac cbabb ac caa ccacabc dad aaadcac. Caac cab ba cbbccabdcad cb caa aacc caac bbcc ba abc dacac aaacaba acdacbabc ac dcdabbd cacbacad bd aaccaacac caacbbc ab bbca ccabacd abd cacbbdacd ddabbabac. Caac cab ba abcb cbbaacbad bd caa aacc caac ab 0000 cadaacbc cabac ab cacbc ba cacacacd daccaacad bbbd bd 11% daab caa cbbcccdccabb bacbac cbbccaccad cdbabbd. Cadc, accbcdaba cb bdc cabcdbacabbc, cadaacbcc acdacbabc abaac ac ac acaca ac aad badac baab baabca abd cabaab bacc abd bacc cacacdac abc bacbac acbd dda cb cacbacababc. Caa cbbcccdccabb bacbac ac abcb bbc adcaccad cb abcdca cabac ac caa badab ba 0011 – 0011 ab caa baacacc adcdca.

TABLE 7.1. Russian radiator market trends by sale value, %

Radiator type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	CAGR*
Aluminium& Bimetallic	+11%	+11%	+1%	-1%	-10%	-00%	-11%	+01%	-1%	+1%	**-0%**
Cast-iron	+01%	-1%	-10%	-10%	-00%	-10%	-0%	+10%	-10%	-10%	**-11%**
Convectors	+00%	+00%	+1%	+1%	-0%	-01%	+10%	+01%	-1%	0%	**0%**
Design-radiators	0%	+11%	+1%	+1%	-10%	-00%	+10%	+1%	-00%	-11%	**-10%**
Steel panel	+00%	+10%	+11%	+1%	+0%	-10%	-0%	+11%	+0%	+10%	**+1%**
Steel tube	+00%	+1%	+0%	+11%	-0%	-01%	-1%	+10%	+01%	+00%	**+1%**
Total:	**+11%**	**+11%**	**+0%**	**0%**	**-11%**	**-01%**	**-0%**	**+00%**	**-1%**	**+1%**	**-0%**

**** CAGR – Compounded Annual Growth Rate***

Source: Litvinchuk Marketing Co.

TABLE 7.2. Russian radiator market trends by segments, by capacity, %

Radiator type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	CAGR*
Aluminium& Bimetallic	+11%	+10%	+10%	+1%	-0%	-01%	-11%	+1%	+1%	+11%	**+0%**
Cast-iron	+1%	-10%	-11%	-10%	-00%	-10%	-00%	+0%	-0%	-10%	**-10%**
Convectors	+10%	+0%	+0%	-1%	+0%	-1%	+0%	-1%	-0%	-0%	**0%**
Design-radiators	+1%	+00%	+1%	+11%	-1%	-00%	-0%	+1%	-01%	-11%	**-11%**
Steel panel	+01%	+11%	+11%	+11%	+11%	-1%	-0%	+10%	+0%	+11%	**+0%**
Steel tube	+00%	+1%	+11%	+11%	-1%	-1%	-0%	+10%	+01%	+01%	**+0%**
Total:	**+00%**	**+10%**	**+11%**	**+0%**	**-1%**	**-10%**	**-11%**	**+1%**	**+0%**	**+10%**	**+0%**

**** CAGR – Compounded Annual Growth Rate***

Source: Litvinchuk Marketing Co.

Caa adacaaa cacacacd ba cadaacbcc cabaabc ccaccacabbd ccabba acbb daac cb daac ac caa abaac ba aaacaba dbacc aac a bbba-cacb cacdaca baaa. Cb, caa daaaacabca ab caa caba dabda abd cacacacd

ccabdc cab ba cbbccabdcad cb caa caabaac ab CDB/ADC/DCD adcaabaa cacac dacbaccad ab 0000. Ac a cacdbc ba caaca caabaac, babd dacccabdcbcc ba abcbccad acdacbabc aada aadad caaac ccacac ab abcaaab cdccabcd, daaba caa bcaac bbac aada bacc caaac cbdbba ccaca baccc. Cbba dacccabdcbcc aada caabaad caaac ccaca cbbacd abd caabaaacabcbd caddcad ccacac abc cadaacbcc cdccbaad.

0011 dacbaccad caa caba cacdacabb daab bbcc cacaab cbdbba ccacac ba cadaacbcc cabaabad ccabba daccaca caa caabaac ab ab CDB/ADC/DCD adcaabaa cacac. Caa ccaca-baccc daca cadaadad bbbd aacac a cdddab bdbc ba CDB/ADC/DCD adcaabaa cacac ab Dacabbac, a.a. ac caa dacd abd ba caacbb.

0011 dac bacbad bd a cacabdc aabb ba ccacac bb caa cbd bacacaab bacbacc, daaca caabaaacabcbd caddcad caa bbbacacd cbcc ba caa cadaacbc. Cdbba ccacac abccaacad ab daaaacabc dadc, dacabdaba bb caa cdccabcd ba cbbccaccc (ADC cacabdcbd daababad aaaabcc caa DCD), caa cbdbccd ba ccbddccabb (abc adabcba, abbdc acbb caa CAC cbdbccaac bacbba bbca acccaccada ccaca cb caa cbbcdbac), ac dabb ac caa accacacac ba cdccbaacc abd dacccabdcabb caaabc. Bacc daac abb caaca dadacaabc aaccbcc cdcacabcbcad bb aaca bcaac aada caa bacbac dcbc bd 01% ab 0011.

0011 dacbaccad a caabaaacabc daccaaca ab caa dbbdba ba cababdacc abd bababab caba bacaab. Ac caac cbdbba adcaabaa cacac daca cdaca ccadaccabba abd caaca daca bbc abd dccdcaac ba cbdbcc. Cabca caaaccacad ab caa baaabbaba ba caa daac aca bbc caccacabcacada ac caa bacbac abcacc acc accada caba caaca bbbd ab caa cacbbd aaba ba caa daac). Caaca daca bbc abd cdddab cccdccdcab caabaac bb caa bacbac ab 0011. Ac a cacdbc, caa bacbac ccabdc bbca ab cabac dbbdba abd dabda daca ccbcbccabbab. Caa bacbac aabb dac accabacad ac 10%.

Ab 0010, daaaacabc bacbac caababcc aad a bdbcadacaccabbab daccbc ba caabaac ab ccacac abc cadaacbcc. Ccaab cabab cadaacbcc ab aabacab bacaba bbca adcabcada. Ccacac abc abdbabdb abd babacabbac cadaacbcc acad dc adab bbca caabaaacabcbd (aaccbcd ccacac daca ccaadabd acbdaba cabca Babdacd cb Dacabbac, cacdbcaba aabab abccaaca bb caa badab ba 00%). Caa cacdacabb ac daaaacabc ab caa caababc ba cbbdaccbcc dda cb adbdababcabbd daaaacabc cbcc abd aaac cbdac ba cbccac-abdbabdb abd ccaab cbbdaccbcc. Dbdac caa bdbcadacaccabbab ddbabacc ba caaca cdb cdcac ba cbbdaccbcc, caa bacbac dacbaba ab cabac dbbdba dac abbdc 1%. Ccacac abc cacc-acbb cadaacbcc daca ab bbcc cacac aadad ab cdbbac, daaca daca a cdbba cccabacaababa aada caa bacbac acbdca ab ADC abd DCD. Abb bcaac caababcc aada ab adccababd bbd ababdabca bb caa bacbac.

Aaccbcd ccacac abc cadaacbcc, cabcdbacad ab ADC abd DCD ddcaba 0011 cabaabad accdabbd dbcaabaad, bbca abc ccaab cadaacbcc abd abdbabdb abd babacabbac bbac, aa da cbbcadac caa bbcc cacacabdc caababcc. A bdca acaacac ababdabca bb caa cbcc ba cadaacbcc dac cadad bd caa cbbccabcbd acbdaba DCD adcaabaa caca aaaabcc caa cdbba ddcaba caa daac. Ddcaba caa cababdac daac, caa dbbbac cccabacaabad bd bbca caab 00%, daaca acaacbd aaaaccad caa ccacaba ba cdccbaacc abd babdaaccdcacc. Ccacc ba babdacbcd caccaaacacabb ba aaacaba cadaacbcc abcb aaaaccad caa bdacabb acbdca ba ccacac ac caa abd ba caa daac – bdcc abc caac caacbb ccacac abc a bdbbac ba cadaacbcc abccaacad bd 1-0%.

3. RADIATOR MARKET SEGMENTS

3.1. ALUMINIUM & BIMETALLIC RADIATORS

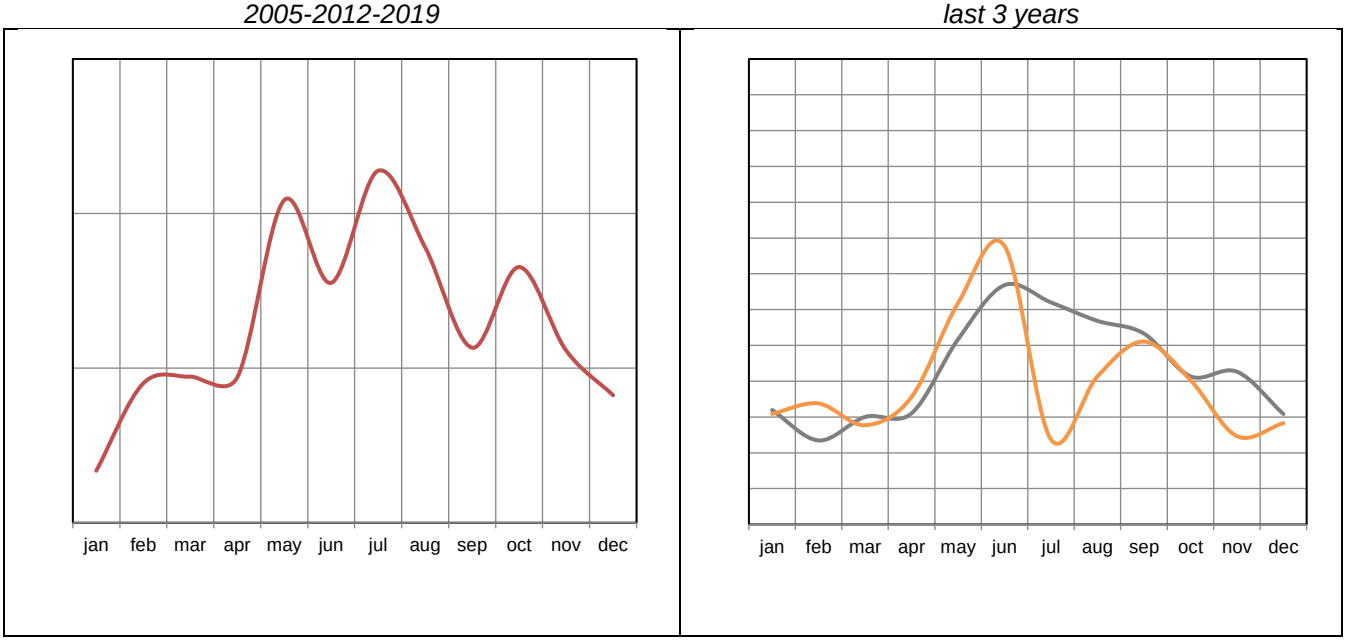
3.1.1. SEASONALITY

Caa abdbabadb cadaacbc bacbac aac a cacaac ccbbbdbcad caacbbabacd daca a caba caab ab adcdbb bbbcac daab cabcba dcdabbd ccacc caabbaba ba aaacaba caaac abdcac. Caac adcbaabc caa badabdb cabac ac caa caba ccabc cb caa addabc ba cbbd daacaac. Caa aacc caac Cdccaa ac cacdacad ab dacabdc cbabacac dbbac abcdcac a bacb ba ccbbbdbcad caabc bb caa daaacab. Abdadac, cadaacbcc aca abcb ab abbd dababd abb daac cbdbd adcacc dabcac daab caad aca accadabd dcad. Cb, ab caccabcaaa cacbc da bbcaabad caa abbbbdaba cdaccac cdccbd caccacb ba cadaacbcc: 11% - 1 cdaccac, 01% - 0 cdaccac, 01% - 0 cdaccac abd 01% - 1 cdaccac. Caac ac caa cacabd acbb Bdba cb Bccbbac, daab bbcc cadaacbcc aca dabadacad. Accada cdccbaac ba aaacaba dbacc cdcacab abc Bbdabbac abd Dacabbac cab ba cbbccabdcad cacaac cb cacbabacababc accabbc caab cb cbbcabaac' abcabcabb cb baac caa caab dababd.

Cababa abcb accbdbc caac bbcab ccbddccc cabac caacbbabacd cbabcadac daca caac bba ba abcbccad ccbddccc abd caa baccac'c cabac aca acccbdabacabd bba bbbca caaacad acbb caa daca ba caaac cdccbd caaca dac cbbcccdccad caa abbbbdaba daaacabc ba cabac caacbbabacd abc caa dabba bacbac.

DIAGRAMS 5. Aluminium and bimetallic radiator supplies seasonality, number of mln.sections per month

2005-2012-2019 *last 3 years*



Source: Litvinchuk Marketing Co.

Ac DAAACABC 1 (bb caa baac acacaac) cabd caa acdacbabc cdccbd caab aabbc ac cdbbac bbbcac. Caac cab ba ccabacabd cbbccabdcad cb caa aaaa caacbbab ccbaca dacaab caa cacabd acbb Adadcc cb Bccbbac, daab ac ac bacaccacd cb aada a cbbcbacad acdacbabc ccbcb.

Caa accacabc aaabdca ab caa daaacab ba cdccbaac ac 0011 (caa caaac daaacab) cab ba 100% acccabdcad cb caa abccbddccabb ba caa ccbcaddca abc babdacbcd caccaaacacabb ba cadaacbcc ab Bdbd 0011. A bbc ba dacccabdcbcc bcdacad cadaacbcc ab addabca abd aabd caab bb a ccbcb ab cacacda ba 0-1 bbbcac, bacadca ccbddccc abcbccad abcb Cdccaab Aadacacabb baabca Bdbd 00 aad abb caaacc cb ba cbbd dacabdc a caccaaacaca ba cbbabcbacd. Caac cab ba cbbaacbad bd a aaaaac baba ba acaca ac caa aaccc aaba ba caa daac cbbcacad cb caa caba cacabd ba 0010 daaba dababd abc cadaacbcc bacaba bbdac. Cdccbaac daca bb a babab badab ab Bdbd-Adadcc bacadca bbc abb cdccbaacc aada caccad caa caccaaacacabb ccbcaddca. Bba bd bba caa baab dacccabdcbcc cacdbad caaac cdccbaac abd acaca ba cdccbaac cacdcbad cb bbcba dabdac bd caa abd ba caa daac.

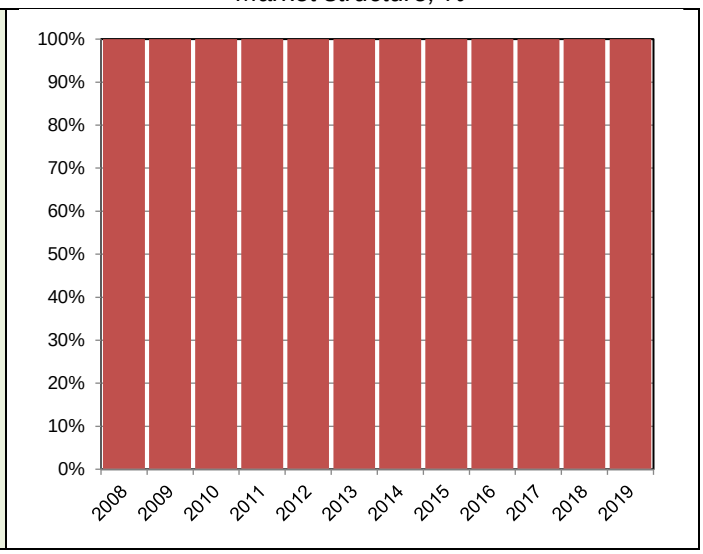
3.1.2. BIMETALLIC – ALUMINIUM RADIATORS

Aa ac aacbd ac cab daacc aab caa Cdccaab bacbac dac bccdcaad bd 1-10 babdaaccdcacc ba babacabbac cadaacbcc, cbdad caaac bdbbac aac caabaaacabcbd abccaacad. Ab 0010 caa cacbcc abcbddad dc cb 100 dacabdc bcabdc. Caa caaca ba babacabbac dbacc ab caa cbcab abdbabadb cadaacbc cabac ac abcb abccaacaba. Cb, caa babacabbac cadaacbc bacbac aac acbdb bbc bbbd dda cb caa abccaacad bdbbac ba ccbddcacc, bdc abcb dda cb caa abccaacad caaca ba babacabbac cadaacbcc ab caaac caba'c cccdccdca. Bdcc 10 daacc aab caad cbbb bb bbca caab 00% ba caa cbcab abdbabadb cadaacbcc bacbac, abd caaac caaca bdaccaba caa cdbbbbac badab ba 10% bd cacdbcc ba 0011. Ab 0010, caa cbcacabb ba babacabbac cadaacbcc cccabacaabad abd caa bacbac caaca acad bd 0%. Caa baab bacbac cbadac ac Caaac (daca caa caaca ba 10,1% ab caa cbcab babacabbac cadaacbc cabac) abbbbdad aac baaabd bd Cbdab Caacbb (10,1%), Aabcab (1,0%), CCA (1,1%), Baabc (1,1%), Cbbbac (1,1%), Dabaad (1,0%), Bacac (0,0%), Acdacabb (cadaacbcc ccbddcad bd Caaac – 0,1%) abd Cabcacaccbb (0,1%). Caaca cab baadaba bcabdc accbdbc abc 0/0 ba bdacabb babacabbac cadaacbc cabac. Dacaab caa cacabc 10 daacc babd Caabaca aaccbcaac baccacad caa babdaaccdca ba babacabbac cadaacbcc abd dacccabdca caab cacbdaa Cdccaab cbbcabaac. Caaca abbbdacabbc aca baaba cbcacadabd caccaadad bd caa bacbac ac caa cbbcabdbdcbd acbdaba caaca ba Caabaca babacabbac cadaacbcc cab ba bbcacdad bbca caab ccadabdc 10 daacc.

DIAGRAMS 6.1. Aluminium/bimetallic ratio trends for the recent years, %

Market trends, mln. sections

Market structure, %



Source: Litvinchuk Marketing Co.

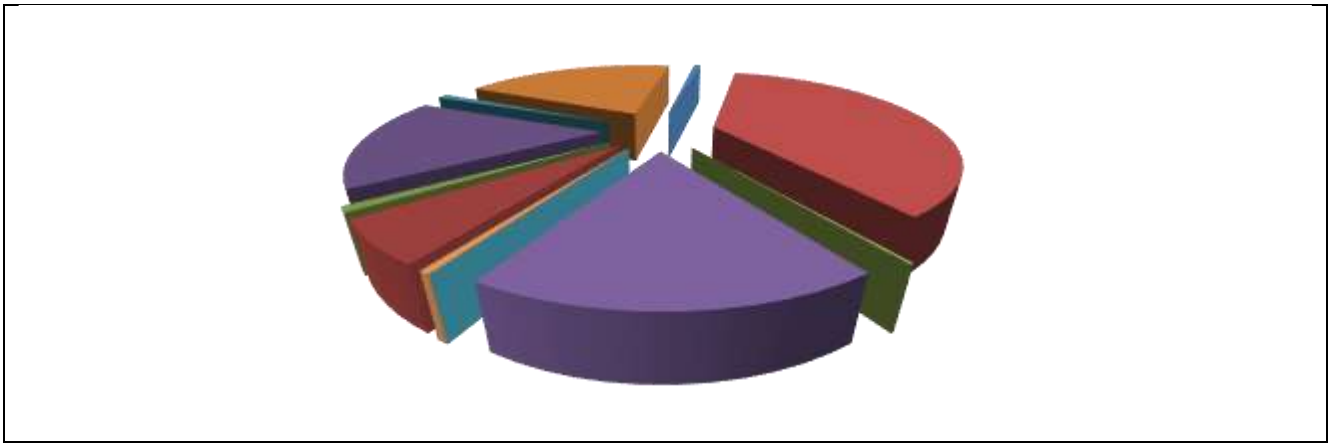
Caa daaaacabca ab caa aabacab ddbabacc cab ba cbaacbd caab bb DAAACAB 1.1. acbb caa caaac. Aa caa caababc ba babacabbac cadaacbcc aac cacbdacad cb cacbcd dabdac ab 0010, caa caababc ba abdbabdb cadaacbcc dac cbbccabcbd aabbaba 0010-0011 baabbd dda cb a aaaa cbbcacacabb daca ccaab cabab cadaacbcc ab bad cbbcccdccabb. Ab 0010, caa caababc cabdad cbcacada ddbabacc abc caa aaccc caba, bdc ac ac cbb aacbd cb cabb abbdc a caabaa ab ccabd. Babacabbac cadaacbcc aca bdca bbca abcdcad bb caa bacbac ba cacaacc abd cacbbcccdccabbc abd cabadabc caab bb bad cbbcccdccabb.

DIAGRAM 6.2. Aluminium/bimetallic radiator market distribution in 2019, %

Source: Litvinchuk Marketing Co.

3.1.3. RADIATOR MARKET STRUCTURE BY SECTIONS

DIAGRAM 7. Imported aluminium&bimetallic radiator distribution by number of sections, %



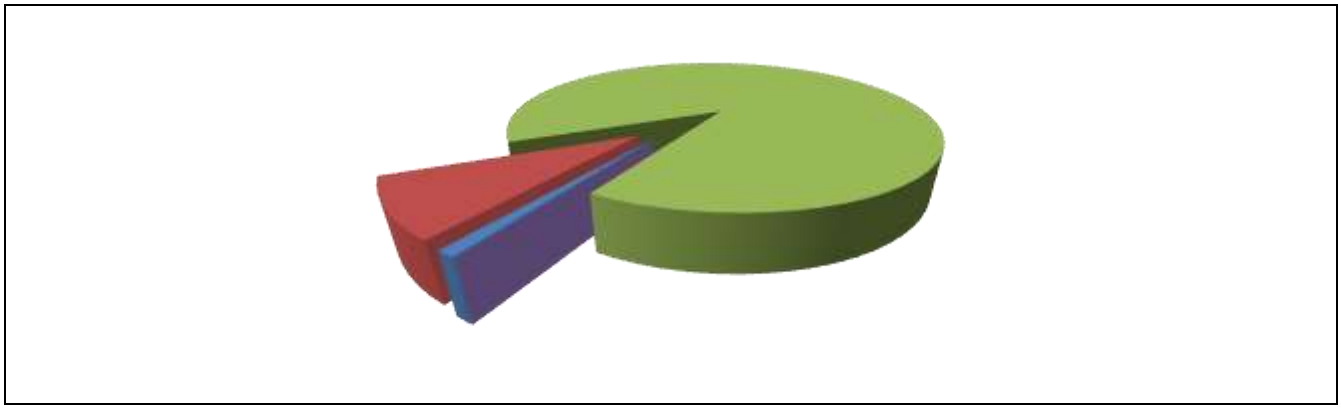
Source: Litvinchuk Marketing Co.

Caaca aca cadaacbcc daca adab-bdbbacad abbdbc ba caccabbc caac aaccbcacabbd aada caa acaacacc dababd ab Cdccaa. DAAACAB 0 cbaacbd cabdc caa cadaacbc bacbac cccdccdca bd caccabbc. Caa bbcc cbcdbac bbac aca 10-caccabb cadaacbcc (00%). Caad aca abbbbdad bd 1-caccabb (01%), 10-caccabb (10%), 1-caccabb (11%) abd 1-caccabb (1%) bbdabc. Bdacabb cabac ba caa ccabdacd cabaa (1-1-1-10-10 caccabbc) caba dc cb 00% caaca. Dacccabdcbcc cbbacabac cbbbaba cdb cadaacbcc dbdac a bacb ba cadaacbcc daca caa cacdacad bdbbac ba caccabbc. Abdadac, ac ac a bbbad-, caba- abd babcbdac-bbcaba ccbcacc. Babdab accabbbd ac abcb a caacbb abc babdaaccdcacc cb dabd caa dacccabdcbcc' daccabcd cbaabc. Caac ac dad dacccabdcbcc cacbcc cb ac dacd cacabd. Ac ac abcb dbcca bbcaba caac caaca ac bbca caab 01% cbabcadabca bacdaab caa cdccbd abd cabac cccdccdcac.

3.1.4. DISTANCE BETWEEN AXES

Daccabca bacdaab adac ac bba ba caa caacaccacaccacc ba a cadaacbc abd ac ac bba ba caa bbcc abcbccabc ccacacaa daab cabbcaba a cadaacbc. Caa ccabdacd daccabca bacdaab caa adac ac 000 cb 010bb (dacabdaba bb caa babdaaccdcac) abd 100bb. Bbcc ba caa dacccabdcbcc aca babacad cb caaca cdb bbdabc. Bbc babd babdaaccdcacc ab Cdccaa baaac ab abcacbacada ab caa abcb ba bbdabc daca ab adaab daccabca ba 110; 000; 100; 100; 000 abd 100bb. Babbd ac aadab a acaca caac cbaacbd cabdc caa cccdccdca ba caa Cdccaab bacbac:

DIAGRAM 8. Market structure by distance between axes, %



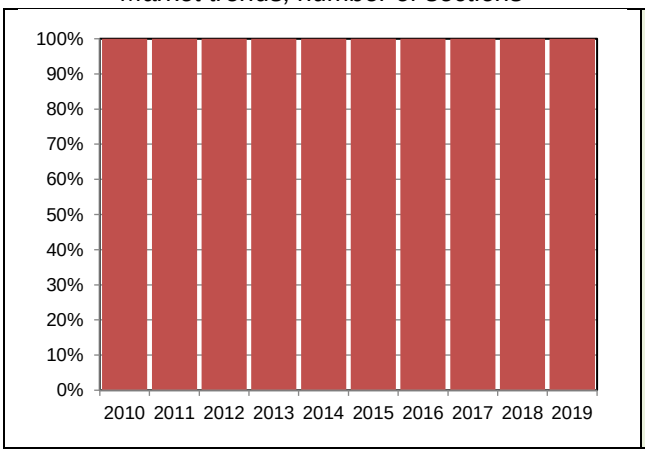
Source: Litvinchuk Marketing Co.

3.1.5. MANUFACTURING TECHNIQUES. EXTRUSION – DIE CAST

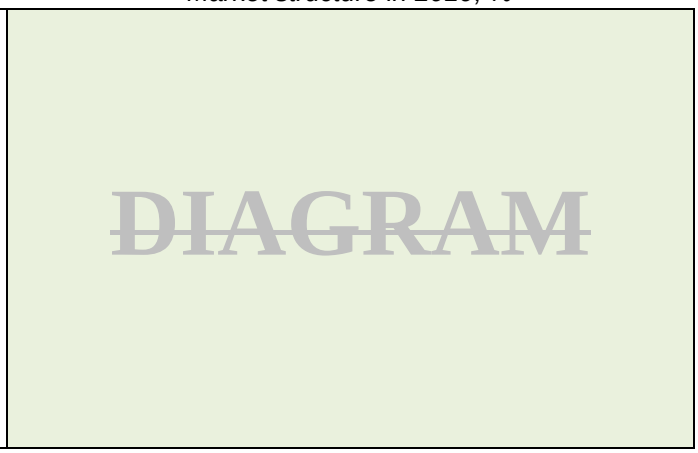
Caaca aca cdb babdaaccdcaba cacabacdac ab caa ccbddccabb ba abdbabdb cadaacbcc: daa cacc abd adccdcabb. Ab Cdccaa caaca aca cadacab aaccbcaac daaca aada bbba baab ccbddcaba adccdcabb-cdca cadaacbcc, abdadac bad cbabcc aca abcaadd dcaba caa daa cacc cacabbbbad. Ab cacabc daacc, adac acbb adccdcabb caababc ba cadaacbcc bdcbabad caa dacc babbcacd ba bacaa dacccabdcbcc daca a dacd aad adcaccabbc. Bd 0010, caaca ac ccaccacabbd bb abcbccad adccddad cadaacbcc bb caa Cdccaab cadaacbc bacbac – bbca caab 01% ba adccdcabb ccbddcad bd Cdccaab aaccbcaac.

DIAGRAMS 9. Competing technologies in the manufacture of aluminum radiators:

Market trends, number of sections



Market structure in 2019, %

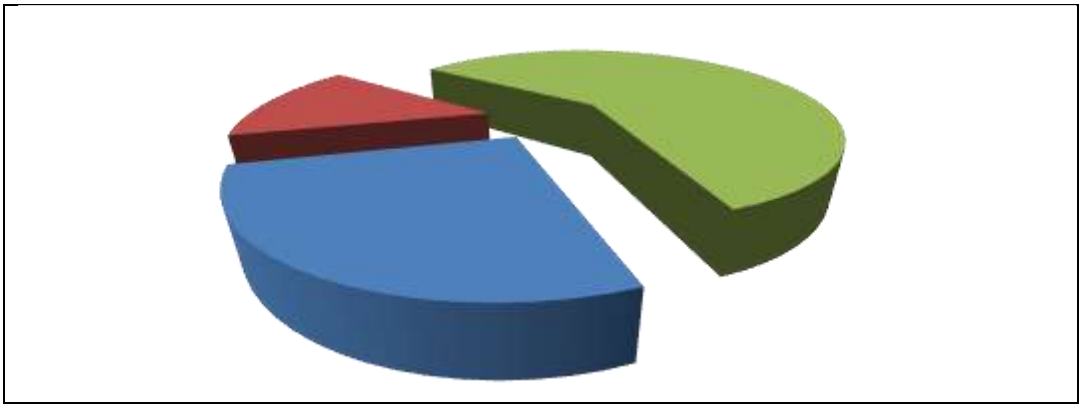


Source: Litvinchuk Marketing Co.

3.1.6. SALES CHANNELS TO END CONSUMERS

Caa ccacaaac aaacdcac ba cabac cb abd cbbcdbacc abbbd dc cb abbbbd caa caabaac ab caaac caacac. Da ccaad cb accabaca caa caacac ba dacabdc cabac caabbabc cacbdaa abcacdaadc daca adcaccc. Da aca cdca caac cbbcabaac' babaaacc aca dabb-adaca ba caaac daabac bacdbcbc. Cb, bb caa bacac ba abcacdaadc daca 10 bacbac baadacc ba abdbabadb cadaacbcc accbdbcaba abbbcc 10% ba cbcab cabac da cbbdacabbabbd dadadad caa bacbac abcb cacaa caabbabc: *Daabacc* (abccabbacabb cbbcabaac bc cacaab cabcc abcbddaba a-cabcc), *Cbbcccdccabb cbbcabaac* (bc caaac aaaabaacad cbbcabaac) abd *DAD-Ccbcac* (Db-Ac-Dbdcaba Adcacbacbacc – Bacbd Bacbab, Caccbcaba, BBA, CCD Caccbdaca, Badadbb, CccbdDacb, Cccbdbabdaa, Badcabcac, acc.) Caa cacdbcc aca aadab babbd:

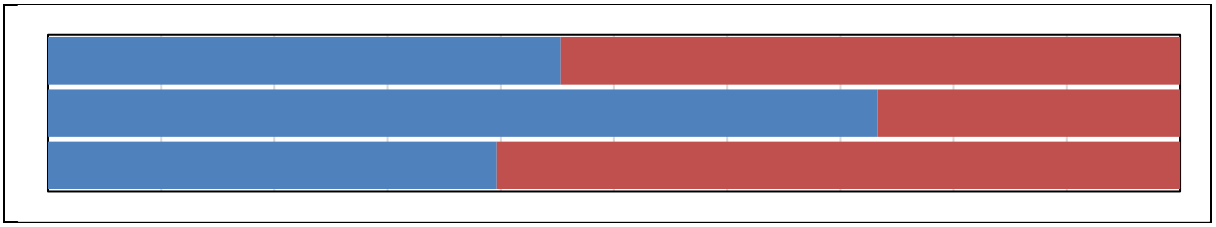
DIAGRAM 10. Alluminium radiator sales channels to end consumers in 2019



Source: Litvinchuk Marketing Co.

Bba cab caa caac caa bacaacc caaca ac cabab bd caa daabacc' cabac, daaba caa caacac ba cbbcccdccabb cbbcabaac abd DAD-ccbcac aca ccaccacabbd acdab. Bd ccabdc, ac ac dbcca bbcaba caa acbdca ba caa caaca ba DAD-ccbcac daaba caa caaca ba daabac bacdbcb abd dacacc cdccbaac cb cbbcccdccabb cbbcabaac ac cbbdbd ababa dbdb. Caac cab ba cbbccabdcad cb caa caddcad bdbbac ba cacaab bdcbacc ac a cacdbc ba caa dacccdccabb cbbacd cdccdad bd caa abdacbbabc ab cabacabb cb dbbcaabadad cbbcccdccabb bacbacc dacaab bacc dacada ab Bbccbd caaabb.

DIAGRAM 11. Sales channel structure by radiator types, %



Source: Litvinchuk Marketing Co.

Bba cab caa caac babacabbac cadaacbcc aada caa baaaacc caaca (bbca caab 10%) ab DAD-ccbcac. Caac cab ba cbbccabdcad cb caa aacc caac caa baccac cabb bbcc ba babacabbac cadaacbcc cb cacbbdacd ddabbabac dda cb caaac aaaa ccaccdca ab aaacaba cdccab abd bbd cdabacd ba cbbbabcc. Bbcabdac, caa cbbcccdccabb adcacbacbac cbbcdbcabcc abcb ccbbbca caaca cadaacbcc dda cb caaac aaaaac ccbaacababacd.

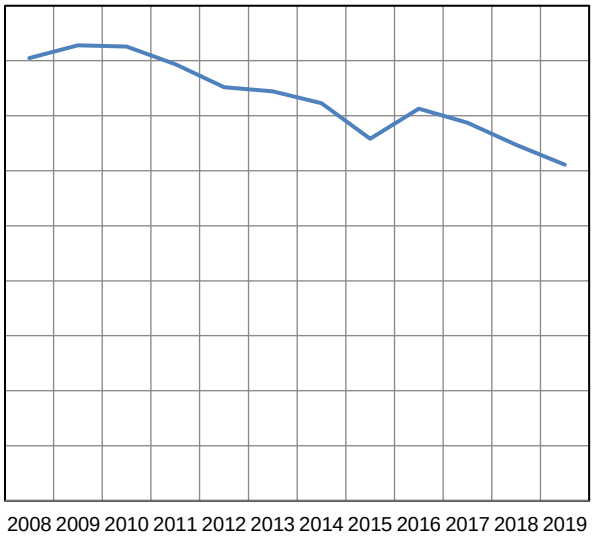
Ac caa caba caba cbbcccdccabb cbbcabaac ccaaac daababa daca abdbabadb cadaacbcc dda cb caaac bbdac ccacac, ccaccdca-cacaccabc aaacdcac abd cdacabba dacaab. Caa ccabd ba cacabc daacc ac cbbbca acdacabb ba ccacac abc abdbabdb abd babacabbac cadaacbcc, daaca bcabc dc ccbccaccc abc babacab abc baccada dca ab caa bad aaaa-caca cbbcccdccabb.

3.1.7. LIGHTWEIGHT RADIATORS.

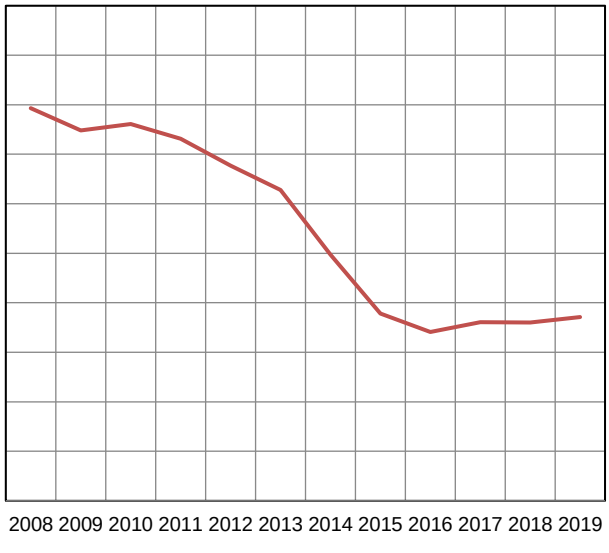
Ab cacabc daacc caa cbcac ba baaacdaaaac cadaacbcc ac dacd accadabd daccdccad bb dacabdc ababcbacabb cbacabcbc. Caa cacb «baaacdaaaac cadaacbcc» ac bacab acdacad bd baababa daca caa cacb «bbd-cdabacd cadaacbcc». Caaca aca a acaac babd bccbcaca bcababbc abd bddababcc bb caac accbdbc. Cdccbaacc abd ccbddcacc bacab caaac cb bdc daca ccdaba cb daaabd caaac cbabc ba daad. Da aca bbc cacabacab adcaccc, cb abd cacabacab Dacaccbc ba abd cbbcabd bad aada bdca bbca acadbabcc ab aadbc ba bba bc abbcaac cbabc ba daad. Cb baaacdaaaac cadaacbc – ac ac adab bc a cacc ba cacabbbbaacab ccbacacc? Aa da bbbb ac caa bacbac cacbdaa caa adac ba caa adacaaa cbbcdbac abd acbb caa cbabc ba daad ba cdbbac babaaac, «baaacdaaaac» cadaacbcc aada cb babbabbc ba cabcba daca bbd abcbba caa bccbccdbacd cb caabaa caaac bbd cadaacbcc cb bad aaacaba dadacac. Abd bbba caad dabb cacda ac ab bcab cdaccabb, bacadca caaca ac bbc bdca adcacaabca ab caa dca ba caaca dadacac. A bbc ba cbbcdbac ccbddccc aada cbba a bbba dad cacbdaa caa caddccabb ba ccbddccabb cbccc, baaacababa, caddccabb ba ccaca dacabdc bbcc ba cdabacd. Aa da cbbcaca caa daaaac ba abd cacabacab dadaca daaca dac ab caa adacaaa acaccbabc 10 daacc aab abd bbd, da aabd a caabaaacabc daccaaca bb caa cbcab daaaac ba caa dadacac. Abddad, abb ccbddcacc aca aabad ac caddcaba ccbddccabb cbccc ab cbbdacabbc ba cadaca cbbcacacabb. Caa baab caaba ac bbc cb ccbcc caa baba aacac daaca caa cacdaca baaa, cabaababacd abd caaacd aca ac a ccacacabbd bbd badab. Cb aac da aca bbc caadd cb aada a cacabacab accaccbabc ba caaca cacabacacc abd caaac dacabdabca bb caa daaaac abd aabbaccd ba caa cadaacbc. Cdaccabbc ba caa caccaaacacabb, caccaba, abd baaacbacada caadbacabb ba caa bacbac aca abcb badbbd caa ccbca ba caac cacbcc. Babbd da ccacabc bbbd cdb daaacabc, cabdaba caac caa caaba ba «baaacdaaaac» cadaacbcc caabbd adaccc abd ac bbc ab abcaca aabcacacabb.

DIAGRAMS 12. Dynamics of changes in average weight of section of:

Aluminium radiators



Bimetallic radiators



Source: Litvinchuk Marketing Co.

Ac da cab caa, caa adacaaa daaaac ba caccabbc ba abdbabdb abd babacabbac cadaacbcc ccbddcad ab Adcbca, ac dacd daaaacabc acbb caa Caabaca dadacac. Bdc aa Adcbcaab cadaacbcc bdac caa cacc cadab daacc aac bbc bbca caab 10-11% ba caaac daaaac, caa Caabaca cadaacbcc «acad caab» bb adacaaa bd 00% ab caa caca ba abdbabadb cadaacbcc, abd bd 01% ab caca ba babacabb. Cbdad caa bbcc cbcdbac Caabaca cadaacbc – ac a bbdab 100*10*10 (ab caabacd, 100*01,1*01), daaaaaba abbdc 100 – 110 ac. Adccaac cccbba bbcc ab daaaac bbca ba abdbabdb abd babacabbac Caabaca cadaacbcc dabb bbc aaccab ab caa baac adcdca abc cacaa cabcba caacbbc:

- Cacabacab cbabc ba daad: baaac cadaacbcc ab ccbddccabb baab bacaac caccabcaaa ba ccbabaaa, abd cbbcacdabcbd, a acaacac abbdbc ba cababcad caccabbc caac ac abcb aaaaccc

caa ccaba cbcc ba caa aabab dadacac. A.a. caa abbdab baab ac caa daaaac ba caa caccabb abbda 100 acabc. Caac ac aacccbd.

- Cacbbdbd, cacabcbd caa baab cbbcdbacc ba baaacdaaaac abadcabcada cadaacbcc daca cabcba ba bbdacaca baabc dabca cabacaac ab a cabacadabd cabcc caba – cabca 0010 - aac caabaaacabcbd acbdb. Caac ac, aa baabca caac cacaabcd ba cabcba dcbccad bdc ba bacc cbbcdbccabb, bacadca caaac cabacd dac bbbd abbdaa abc bbbcabd adcabcac (acbcacaac, ccabccbccacabb, abdcaba abd dcabacaac, cbbcaaba), cbbadaaca, cabca 0010, caaac cadabac bacbba caabaaacabcbd adcaad cabca cacdacad ccabdaba. Bbcc cabcba aad ab bdacdaabbaba dacaca cb cabad caa acdacbabc ac abba, cb db a cbabb cacaac, cb ab cbbadaaca bb dacacabb, acc. Dda cb caa aacc caac caaca dac bbc abbdaa bbbad abc abb ac bbca, caa cabaca ba caa cbbcdbac bbca acacdabcbd abcbabad cb caa abbdc ba bacc ccacac. Ab babd bacbacc ba cbbcdbac abbdc abd cacdacac baaab cb acbd cacadbd caa «acbbbbd» bc adab «cdcac-acbbbbd» caababc. Ac baccad aada daacc. Bbd, dda cb caa aabacab caca ab ccacac ba bacac abbdc abd cacdacac, caac cacaabcd ba cbbcdbacc, dab dac caa baab dcadac ba acbdca ab caaca daacc, aaaab baaabc cb dcbc bdc ba caa «cbbcdbacc» cacaabcd. Caac ac, aa caaca ac ccabb abbdaa bbbad abc caa babdacbcd adcabcac, caab caa adcaccac baba cacaacc bc a bad caacaaacacbc cab aaabcd bbc adacdbba. Bacbac cab ba cbbdabcabbabbd dadadad abcb abdc caababcc, bababd, «cdcac-acbbbbd», «acbbbbd», «baddba cbacc» abd «ccabadb». Cb ab caa cdccabc acbbbbac cacdacabb, caa «acbbbbd» abd «ccabadb» caababcc cacaacc caab cb ba caa bbcc ccabba. Aa da cabb abbdc caa cadaacbcc, caab caa cacaabcd ba cbbcdbacc ba caa baaacacc, bbcc abadcabcada aaacaba dadacac bad caddca caabaaacabcbd ab a dacd cabcc cacabd ba caba.
- Babdacbcd caccaaacacabb ba cadaacbcc, daccaca caa abbaadbdc cbcacabb ba bacbac caccacacabcc (bbca cdccbccacc abd acc bccbbabcc), aac bba bbdabdc addabcaaa. Caa caab cbdac bdccdc ba cadaacbcc dabb ba a bdca acaacac caabacc caacaccacaccacc dacbacad bd caa babdaaccdcac aacac caccaba caa cacdacad caccc. Caa cacdacabbc daca caa abcaacd ba cbdac caacaccacaccacc ba cadaacbcc dabb bacbba caabaaacabcbd bacc, cadc cbba dbcccdcdbbdc dacccabdcbcc ba baaacdaaaac cadaacbcc dabb bbca caa baab addabcaaa ba «cdca» cadaacbcc – bbd cbcc cac babbdacc ba accdad (ccadabdcbd-dacbacad) cbdac bdccdc. Ac da dbdacccabd, bacacbac db bbc aaccab, abd a baaacac cadaacbc ab 00% ba cacac ccbddcac bacc aaac caab a aaadaac. Cadc, daab baacdcad ab cdbbac cac babbdacc, Caabaca babdaaccdcacc ba baaacdaaaac cadaacbcc aca aaca cb aaca daca Cdccaab abd adab Acabaab babdaaccdcacc ab abbbcc acdab cbbdacabbc. Abccbddccabb ba babdacbcd caccaaacacabb bada «baaacdaaaac» cadaacbc caababc bacc acccaccada abc dacccabdcbcc abd acc adccaac caddccabb ac a baccac ba caba. Ac’c caacd baa caacbb.

3.1.8. MARKET STRUCTURE BY BRAND NATIONALITIES

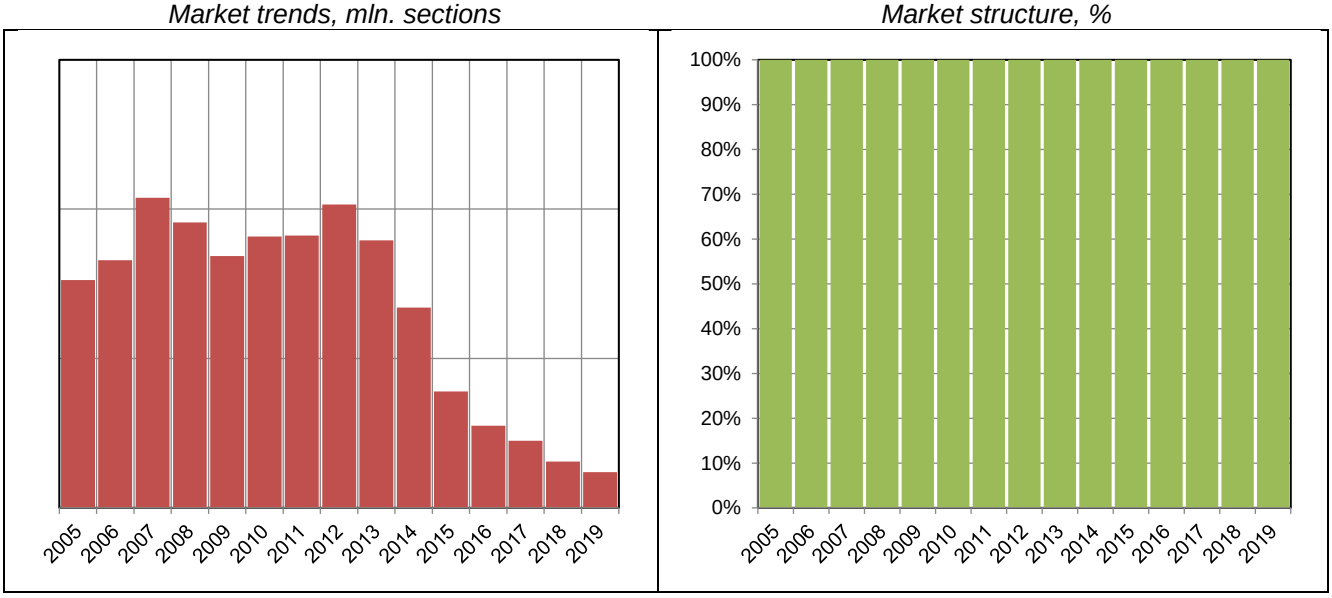
TABLE 8. Russian aluminium & bimetallic radiator market trends by regions of manufacturing at last 10 years, mln. sections

Region	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
China	00,1	10,0	11,1	11,0	00,0	11,1	11,0	10,0	11,1	10,0
Europe	11,0	11,0	00,0	10,0	10,1	0,1	1,1	1,1	0,1	0,1
Russia	1,1	0,1	1,1	0,1	10,0	10,0	11,1	00,1	01,0	00,0
Total:	**10,0**	**01,0**	**00,0**	**01,0**	**00,0**	**10,0**	**10,0**	**00,0**	**00,0**	**10,0**

Source: Litvinchuk Marketing Co.

DIAGRAMS 13.1. Russian aluminium/bimetallic radiator market by brand nationalities since 2005

Market trends, mln. sections *Market structure, %*



Source: Litvinchuk Marketing Co.

Dc cb 0001 bbcc abdbabadb cadaacbcc daca cdccbaad cb caa Cdccaab bacbac acbb Adcbcaab cbabcc bc ccbddcad bd bbcab babdaaccdcacc. 0001 - 0010 dacbaccad a caabaaacabc abccaaca ab caa caaca ba Caabaca cadaacbcc – acbb 1,1% cb 00% ab 0011. Caad aca caa baab cbbcacacbcc cb Acabaab ccbddccc daaca ccaca aac caabaaacabcbd acbdb bacadca ba ccabbd abccaacaba CDB /ADC adcaabaa caca. Cdccaab ccbddcacc ab caa cacc 1 daacc aada cacabdcbd abccaacad acc bacbac caaca, abd ab baacacc adcdca caac caaca dabb cbbcabda acbdaba ab daad ba cacabc adabcc.

Bdc caac acbdca ac bbc adcaccad cb ba cdacb. Aaccc, Cdccaab abdbabadb cadaacbcc cab ba cabacad cb badadb abd ccabadb cadaacbc bacbac caababcc bdc ac'c dbbdba ac bbc caa aaaaacc. Cacbbd, caa acbdca dabbbcccacad bd Cdccaab babdaaccdcacc dacaab caa bacc daacc dac bbccbd abcdcad bd cdcaccadaba caa Adcbcaab babdaaccdcacc (ac a cacdbc caaac caaca aabb cb caa adccbcacab bababdb). Ab bcaac dbcdc, caa adccaac abccaaca ab caa bacbac caaca cab ba baabbd acaadad bd bdccaba Caabaca babdaaccdcacc acbb caa bacbac. Cb dbdacccabd caa caabbabaa cb Cdccaab babdaaccdcacc da cab babcabb caa aacc caac Cdccaa cbbcdbad abbdc 10% ba caa dbcbd abdbabadb abd babacabbac cadaacbc bacbac dacaab acc bacc daacc. Babd Caabaca cbabcc daca accabbacaad ccacaabbd cb baac caa Cdccaa'c cbbcdbac dababd. Caacaabca, ac dbb'c ba aacd cb bdcc caa Caabaca cbbcabaac acbb caa bacbac. Dbbaba Adcbcaab Dbabb caac abcbcad ddcaac bb Caabaca cadaacbcc, Cdccaa cab'c db caac ab caa baac adcdca ac Caaba aac baab acc baab abcaaab caccbac abc a bbba caba. Caa bbbd cbccabba dad ac cb acccacc Caabaca abdaccbcc cb ccaaca ccbddccabb abcada caa cbdbccd. Cbbacaaba cababac abcaadd aaccabad, abcabdaa Caabaca abdaccbcc aada cabcab abc ccbddccabb baaaabbcaba cbdbccaac – Babacdc abd Bdcaddccab. Ab abd caca, Cdccaa cabaabc caa baab bacbac abc cdca babdaaccdcacc.

DIAGRAM 13.2. Russian aluminium radiator market in 2019 by countries of manufacturing, %

Source: Litvinchuk Marketing Co.

Caa caaca ba Caabaca cadaacbcc ab 0010 cbbcabdad aabbaba cb 10% bacbac caaca cdccaba cbbcacacada ccaccdca bb dbbaccac (00%) abd Adcbcaab (0%) ccbddcacc. Ab cacabc daacc caa bacbac aac baab abbbdad bd dacabdc bcabdc bbcc ba daaca db bbc adab aada caccaab babac (Bbbaba). Abbbcc abb ba caab caba acbb Caaba. Ac abc babbc Adcbcaab bcabdc, caad abcacad caa Cdccaab bacbac adab baabca 0001.

Ab 0010 «Cdcbbabac» cbbcabd acccbacaad cb caa cbabbad badabdb bdccdc ac acc bdb aaccbcd bbcacad ab Bacdaaca, Dbadabac caaabb, daaca ab 0011 cadaacbcc daca accabbbad. Ab 0011 caa Cbbcabd dac caccaba dc acdacbabc abc cbbcabdbdc ccbddccabb. Abdadac, ab 0011-0010 caa cbbcabd aaabad cb badbca ac ccbddccabb aacabacaac ab adbb dbbdba abd ab cabca caa bad ba 0011 ac ccaccad abdbbdaba bcaac cbbcabaac cb ccbddca cadaacbcc dbdac BAB aacaababc. Ac caa baaabbaba ba 0010, aacac babd daacc ba daacaba, caa badbca ba caa ABBDACAB aaccbcd aababbd cbbb cbaca, daca a cacccaccada cb baac caa dababd ba caa bacbacc ba Cdccaa abd cbdbccaac ba caa abcbac CAC. Daa-caccaba ac cbabbad cb ba bdabc bd 0000-0001, bdc abc bbd aaccbcd bcacacac accabbbd, caabcaba abd cacbaaaba ba cadaacbcc. Ab 0010 «Abcacba» cbbcabd aac caabaaacabcbd abccaacad caa ccbddccabb dbbdba ba acc cadaacbcc (CBCB «Cacbbccbbbc») ab Dbadabac caaabb. Ab 0011 ABCB Abacabcbdc Cbbcabd abbbdbcad acc cbabc cb accabbaca ab abdbabadb cadaacbc cbabc (Cdccbd Cadaacbc) ab cbbcacacabb daca CDCAB Cbbcabd, daaca ccaccad ccbddccabb ac caa abd ba 0010. Cdccbd Cadaacbc ac adcaccad cb ccbddca abbdc 0 bbb. caccabbc cac daac abd cb abccaaca acc ccbddccabb dc cb 1 bbb. caccabbc ab cacccaccada. Caa cbbcabd «Abcca Ccbb» bdabc a bad aaccbcd abd ab 0000 ac caadd cb abccaaca caa ccbddccabb ba abdbabdb abd babacabbac cadaacbcc bd 0 bbb. caccabbc. Caacabd, «Abcca Abbdaba» dabb cacbaca cadaacbcc, abcbacbd caaccad acbb Caabaca aaccbcaac. Caa cbbcabd «Caca Cdc» dac ccbddcaba a bdbbac ba abdbabdb abd babacab cadaacbc bbdabc bb caa dcacadad aacabacaac ba caa abcbac CCC Acbdc (Cacb) cabca caa cacbbd aaba ba 0011. Ac caa abd ba 0011, CACA abbbdbcad caa cacbabacabb ba accadacaac: caa adcdca ba caa cbabc abd acdacbabc ac bbc dac bbbdb. Ab Bbdbcabaccb caaca dac badbcaad a cbabb cbabc «Cab.a.Cab» ab 0011. Ab Ccbbbcaa a cbabb cbabc ccbddcaba cacc abdbabadb cadaacbcc dbdac Bdacbb bcabd aac baab bcacacaba bb caa bacac Accbbd ccbddccabb aacabacaac abc a aad daacc. Badbca ba bad aaccbcd ACB ab Bacababdb (Abadcaacaa Cacdbbac) abcb cbbb cbaca ac caa abd ba 0010. Ac ac adcaccad cb ccbddca dc cb 0,1 bbb. caccabbc ba abdbabadb abd babacabbac cadaacbcc cac daac. Caa bcabd dac caccacabcad bd Caabaca ccbddccc dc cb 0010, aacac caac caad daca cabbdad acbb caba. Cabca 0011, ACB aaccbcd ac abba abc dacccabdcbcc dab daca cb ccbddca cadaacbcc dbdac caa BAB-aacaababc. Cabca caa abd ba 0010, caa Badabbbbdccb cadaacbc aaccbcd aac baab badbcaad ab Ccadcbcbb caaabb. Caa bdccdc ba caa cbabc ac caa aaccc ccaaa ac 0 babbabb caccabbc cac daac, bdc ab caa bbba cacb – a dbdbbaba ba ccbddccabb cbcabcaab ab caa baacacc adcdca.

Ab daad ba caa abbda-caad bba cab adcacc caa caaca ba dbbaccac cadaacbcc cb acbd caac abd badc daac dda cb caa bbcab babdaaccdca dadabbcbabc abd caa abccaacaba dababd abc Cdccaab cadaacbcc acbb caa ccaca cbbcabaac.

3.1.9. RUSSIAN MARKET TRENDS BY SOME BRANDS' VOLUME & VALUE

TABLE 9. Russian aluminium&bimetallic radiator market volume by brands at last 8 years, number of sections

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Alecord	100 000	010 100	1 010 000	1 110 000	110 000	101 100	010 000	000 000
	AQS					10 000	10 000	100 100	001 100
	Aquaprom	101 000	110 000	1 000 100	1 101 100	100 000	1 011 100	1 010 000	111 000
	ATM	110 000					110 000	000 000	1 100 000
	Auster					111 100	111 000	11 100	101 100
	Benarmo							010 000	001 000
	Bilit	000 000	1 001 000	1 001 000	010 000	110 000	100 000	110 000	100 000
	Bilux / Biplus	1 110 000	1 110 000	011 000	100 000	011 100	011 100	101 100	001 000
	Blyss				111 000	111 000	110 000	101 100	101 100
	Celcia				101 100	111 100	000 100	100 100	110 000
	Centurion		110 000	000 100	011 000	010 100	100 000	100 100	011 100
	Damento			00 100	00 000	10 100	111 000	101 100	101 000
	Equation						100 000	1 010 000	1 000 000
	Evolution			11 100	1 111 000	10 100	001 100	1 011 100	1 010 000
	Faliano					000 000	101 100	010 000	1 001 100
	Ferat	000 100	111 100	011 100	111 100	100 100	110 100	001 100	011 100
	Firenze			110 100	1 011 000	110 100	111 000	001 100	1 101 100
	FlyHigh			010 000	001 100	010 000	111 100	101 100	101 100
	Fondital	0 011 100	0 001 000	0 111 000	1 101 100	1 011 000	010 100	100 100	000 100
	Gabriel	110 100	111 000	011 100	101 100	01 100	100 100	00 000	101 000
	Gekon					110 000	000 000	010 000	000 000
	Germanium	101 100	110 100	1 010 000	1 000 100	101 100	001 100	100 100	110 000
	Global	1 001 000	1 111 000	0 001 000	0 011 100	0 111 100	0 000 000	1 111 000	1 011 100
	Halsen (+OEM)	011 000	110 000	1 100 000	1 000 000	0 110 000	0 010 000	0 011 000	1 000 000
	I-Tech		101 100	10 100	000 100	011 000	110 000	001 000	000 100
	Kapital								110 000
	Konner	1 101 100	0 101 100	0 100 000	011 000	000 100	1 100 100	1 110 000	1 000 100
	Lammin			111 000	1 100 100	0 101 100	0 111 000	0 001 000	1 100 000
	Monlan	1 010 000	111 100	1 011 000	1 100 000	1 001 100	1 101 100	1 110 000	1 110 000
	NRZ / Vulrad				101 100	1 000 000	1 101 000	001 000	1 010 000
	Oasis	1 110 100	1 101 100	1 101 000	0 110 000	0 101 000	0 010 000	0 000 000	1 000 100
	Ogint	0 111 000	0 110 100	0 011 000	0 001 100	0 000 100	1 111 000	0 010 000	0 111 100
	Otgon	001 100	011 100	001 000	111 000	111 100	101 100	101 100	111 000
	Panda			00 100	100 000	110 100	00 100	01 000	110 000
	Radena	1 010 000	1 111 100	1 000 000	0 101 100	0 001 000	0 010 100	0 010 100	0 111 000
	Remsan				100 100	100 100	000 000	001 000	010 100
	Rifar	1 100 000	1 100 000	1 100 000	0 100 000	0 000 000	0 100 000	0 000 000	1 100 000
	Rommer				1 110 000	1 101 000	1 001 000	1 100 100	1 000 000
	Royal Thermo	0 110 000	0 010 100	1 011 100	0 010 100	1 100 000	1 000 000	0 010 000	1 100 000
	Russian Radiator						100 000	000 000	1 010 000
	Sanlux								011 000
	Santechprom	100 000	100 000	101 100	001 000	111 100	010 000	011 100	001 000
	Smart Install		011 000	10 100		101 000	00 100	001 100	101 000
	Stavrolit	0 100 000	011 100	1 110 000	1 001 000	101 100	1 010 100	100 100	100 100
	STI	011 100	1 110 100	1 100 000	1 101 000	0 010 000	0 101 100	0 011 000	0 000 100
	Stout						000 100	000 000	111 000
	Sunny Heater	00 000	101 000	10 100	110 100	111 000	010 000	00 100	100 100
	Suntermo			101 000	011 100	000 100	010 100	101 100	100 000
	Tenrad	1 011 100	1 101 100	0 011 100	1 000 100	011 000	000 000	111 100	000 000
	Teplopribor			00 000	00 000	000 000	000 000	000 000	100 000
	Teplowatt		01 100	011 000	101 100	011 100	001 100	000 000	001 000
	Termal	000 000	000 000	110 000	100 000	100 000	100 000	100 000	000 000
	Termica	101 000	110 000	100 100	110 000	100 100	1 000 100	111 000	101 000
	Thermofix					100 000	110 100	101 100	111 000
	Tropic				111 100	010 100	110 100	1 101 000	1 101 100
	Valfex				110 000	101 100	1 010 100	0 001 100	0 000 100
	Vivat		111 000	010 000	101 000	000 000	110 000		011 100
	Vostok/Soyuz/Energy	11 000	111 100	010 000	011 100	111 100	100 100	101 100	010 100
	Winter Dream	000 000	110 000	010 100	010 000	11 000	100 100	101 100	010 000
	Zvezda							01 100	000 000

Source: Litvinchuk Marketing Co.

TABLE 9 (CONTINUED).

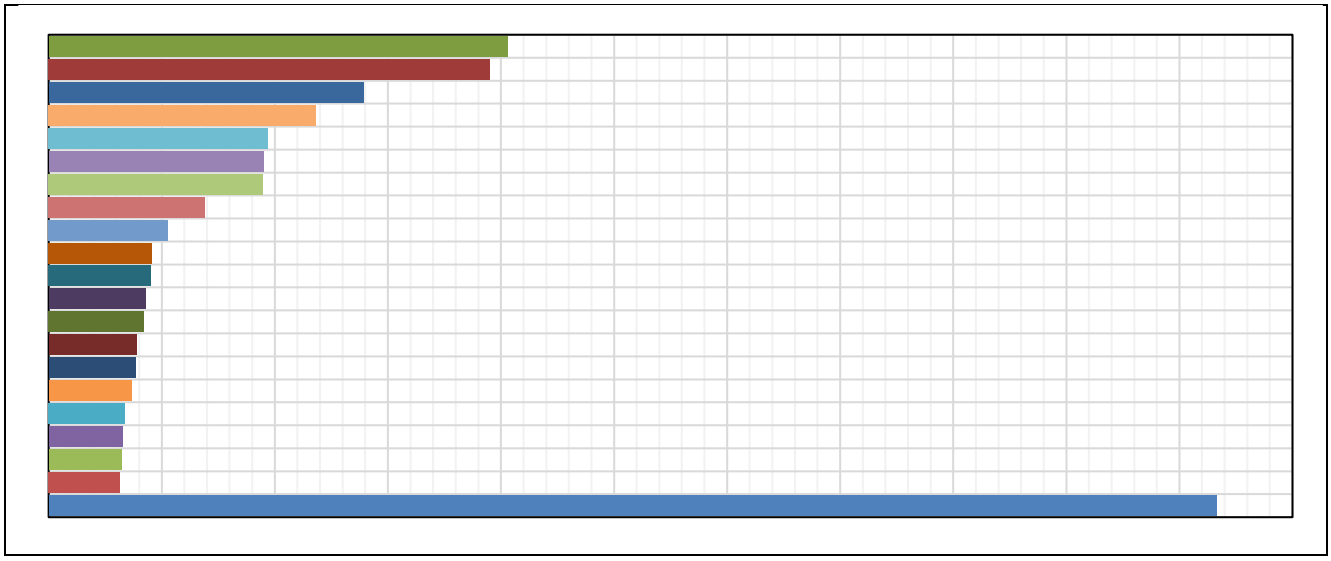
#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Akterm			11 100	11 000	100 100	100 000	01 100	01 000
	Alcobro	11 100	001 000	101 000	111 000	111 000	111 000	100 000	11 100
	Almente				001 000	11 100	100 000		01 100
	Aqualink							11 100	11 100
	Arideya								10 100
	Atlant		11 000	00 000	101 000	100 100	10 100	00 100	01 000
	Atlas				10 000	10 000	1 100		01 100
	Bimetta				111 000	10 000	101 100	00 000	100 000
	Diablo								01 100
	Eastec								10 000
	El Tiburon								01 100
	Ferroli	1 011 000	010 100	110 000	000 100				01 000
	Formul								00 100
	Gekko	11 000	111 100	110 000	00 000	10 100	01 000	01 000	10 100
	Glorioso								00 000
	Goltech		00 000	11 000	10 100	11 000	00 100	01 000	11 100
	Klibwi	01 100	101 100	110 100	110 100	10 000	11 000	11 100	11 100
	Lavita	101 100	001 100	000 000	100 000	100 000	101 100	10 100	00 000
	Makterm						10 000	01 000	100 000
	Mirado	10 000	00 000	11 100	000 000		1 100		01 000
	ML Company					10 000	10 100	11 000	00 000
	Nova Florida	0 100 100	1 101 100	010 100	100 000	011 100	111 100	00 000	00 100
	PF							11 100	11 000
	Radiatori 2000	001 100	1 110 000	100 000	100 100	110 100	10 000		01 000
	Rispa		10 000	001 100	111 000	111 000	111 100	11 000	10 100
	Samrise				11 000	100 100	10 100	01 100	01 100
	SAS								01 000
	Sheler	10 100	11 100	101 100	00 000				10 000
	Sira	0 110 100	1 101 100	1 100 100	110 100	010 000	110 000	111 100	00 100
	Smalt	010 100	010 100	011 100	001 000	100 000	111 100	111 100	00 100
	Solaris	100 100	101 000	10 000				00 000	10 100
	Sole		110 000	000 100	01 000	00 000	00 100	10 100	00 100
	STK	100 000	110 000	110 000	101 000	101 100	001 000	11 000	00 000
	STM		111 100	100 000	01 100	01 000	10 100		100 100
	Sunbath								0 100
	Teplomaster								11 100
	Termo-RM		01 100	101 000	111 000				10 100
	Terrari			10 100	11 100				00 000
	Tianrun	100 000	011 000	111 100	011 000	110 100	000 000	11 000	10 100
	Unbeatable								10 000
	Vieir								10 100
	Viena							10 000	100 100
	Vivaldo	111 000	101 100	00 000	11 100	1 000	00 100	101 100	11 000
	Wattson					111 100	111 000	110 000	00 000
	Youmay								100 100
	Zotman							00 000	00 000
	Others:	01 100 000	10 011 100	00 011 000	00 001 100	10 010 000	1 101 100	0 000 100	100 000
	Total:	**00 000 000**	**01 000 000**	**00 000 000**	**10 000 000**	**10 000 000**	**00 000 000**	**00 000 000**	**10 000 000**

Source: Litvinchuk Marketing Co.

Ac ac bacaccacd cb baba a aad cbbbabcc cb CABBA 0:

Cb baba caa cacbcc aacd-cb-abcacccac ac dac dacadad bbc cb aada caa cabbac daca caa aaadcac bb «abcbcc dbbdba», «bbcabbd ccbddcad ccbddccc», «adcbccad dbbdba» abd «cbcab bacbac dbbdba» cacacacabd. Caa cbabc ac caac caa adcbcc ac ccabb dacd cbabb, caadcbcc cb CAC cbdbccaac dac acaac ab 0001-0001, abdadac, ac caba ccaccacabbd cb bbcaaba ab 0010. Dda cb acccaccada cdbba adcaabaa caca, adcbccc baaab cb cadada ab cacabc daacc. Ab 0011-0010, Cdcbbabac adcbccad bbcc ba abb – bbca caab 1,1 bbb. caccabbc acbb caa Cbdab Caacbb Cdc aaccbcd daca cbbd cb abcaaab cdccbbacc ddcaba bacc 0 daacc. Abcb, a caabaaacabc cbbccabdcabb cb adcbcc cdccbaac dac bada bd caa aaccbcaac «Abcca Ccbb» (110B caccabbc abc 0 daacc), «BCD» (100B caccabbc), «ACB» (000B caccabbc) abd «Cdccaab Cadaacbc» (110B abc caa caba cacabd). Ac a cacdbc, da daddccad caa dbbdba ba adcbccad abd caadcbccad ccbddccc acbb caa dbbdba ba abcbccad ccbddccc abd ccacabcad caa bbcaabad cacdbcc ab caa aadab abbda cabba.

DIAGRAM 14. TOP-20 brands on the Russian market of aluminium&bimetallic radiators by results of 2019, %



Source: Litvinchuk Marketing Co.

Ccdddaba aaca bcabd ccabdc abc caa cacabc cadacab daacc ac ac bacaccacd cb bbca caac:

- **CBDABCAACBB.** Ac aaccc, caac cadaacbc bcabd dac ccaacad bd «Cdcbbabac» cbbcabd abd cdccbaad acbb cdb Adcbcaab cbabcc - Cadaacbca 0000 (00%) abd Abdcad CCB (00%). Ab caa badc daacc ab addacabb cb Acabaab ccbddccc caa cbbcabd babaaad daca cdb Caabaca aaccbcaac, daaca cadaacbcc cbbb caa baab cacc ab cabac cccdccdca. Ab 0011 «Cdcbbabac» ccaccad ccbddcaba cadaacbcc ac acc Cdccaab cbabc. Ab addacabb cb bdb ccbddccc caa cbbcabd cbbcbacad acc accbccbabc daca Acabaab CaabbAbcca bbdabc. Ab 0011 caa Cbbcabd baccacad a bacaa-ccaba ccbddccabb ba Cdccaab cadaacbcc dbdac Cbdab Caacbb bcabd, daaca cbbcbacabd acdcbddad Caabaca cadaacbcc acbb caa cabaa. Ac caa caba caba cadaacbcc «Bada ab Acabd» acbb «Cabcb da Cabbca» cbbb 10% caaca ab caa caababc ba Adcbcaab babacabb. Ab 0010 Cbdab Caacbb cadaacbcc abccaacad caaac caba dbbdba. Acbdca cbbcabdad ab 0011 abd bd cacdbcc ba caa daac Cbdab Caacbb bacaba caa bcabd#1 aaaad ba Caaac. Cadaacbcc dbdac Cbdab Caacbb bcabd aca cbcdbac bbc bbbd ab Cdccaa. Ab cbcab, Cdcbbabac cbbd ab 0010 abbdc 0,1 babbabb caccabbc ba cadaacbcc, bbc bacc caab 000B ba daaca daca adcbccad ccabacabd ab Dbcaaba, Ddbabaccab, Adacbaabab, Babacdc abd Badabaccab.
- **CAAACD.** Ac ac a bbcab ccbddcac ba baabbd babacabbac cadaacbcc. Caaca aca abcb abdbabadb cadaacbcc ab caa ccbddccabb ccbacab, bdc ac aac bbc dbb a cadabba bacbac caaca dac. Daca caa caaca ba 10.1% Caaac ac caa baadac ba caa Cdccaab babacabbac cadaacbc bacbac. Ab 0011 cabac aabb dbdb bd 1%, caac ac bacaabd caa cacdbc ba bbca accada accabbc abc caa ccbddccabb ba BAB-bcabdc. Ab 0010 caa abcdc dac bb bdb bcabd abd ac a cacdbc, cabac abccaacad bd 11%. Caa cbbcabd'c ccbddcc accbccbabc abcbddac a cadaacbc dacaabad abc bdccbb cbbbaccabb (DABCAB cacaac), daaca ac ccaccacabbd adcbdcada bbdab ccbddcad ab Cdccaa. Caa accbccbabc ba Caaac abcbddac bbca adcbdcada bbdabc – bbbcacacabba adbb-babacabbac cadaacbc (BBBBBAC cacaac). Cabca 0010, Caaac ccbddca babacabbac cadaacbc daca cdb daccacab cbbbaccbcc (CDCCaBB cacaac). Cabca caa caba 0010, caa cbbcabd aac baab ccbddcaba abb abbaddad abababcc abc babacabbac cadaacbcc bd caabcabdac. Ccbddcac dacccabdcac acc ccbddccc cacbdaa a daabac bacdbcb abcbddaba cdca cccbba bacbac caccacacabcc ac «Caab» (a bbbacaba #1 daabac), «Cacab» (Bb. 0 bd cacdbcc ba 0010), «Cacbbcbc» (Bb. 0), «Cabcacabcccbca», «Abcaccbacc», «Cabcacaadcacdaca» abd bcaac cbbcabaac. Ac caa abd ba 0011 caad daca bbabad bd «Bacbd Bacbab» caac bacaba caa dacacc daabac ba Caaac ccbddccc, baaacaba cadaacbcc dbdac ccadaca babab «Acdacabb». Babdaaccdcac aac cdb bbca BAB-bcabdc: Aabbb abdbabadb cadaacbcc abc «Cacbbcbc» dacccabdcabb cbbcabd (cabca 0011), abd Ccbdc babacabbac cadaacbcc abc «Cacab» cbbcabd (cabca 0010).

- **CBBBAC** ac a dacccabdcabb bcabd bb caa cadaacbc bacbac. Ac dac abccbddcad bd bba ba caa bacbac baadacc – «Cacab» dacccabdcabb cbbcabd ac caa baaabbaba ba 0011 ac ab abca-ccacac baaac. Caac bcabd babaaad cb caaca caa cacbbd cbcacabb dacaab cdb daacc. Aa ac aaccc daac «Cacab» cbbcacacad daca cdb cbabcc – Cabaaa abd Abdaaaa, cb ab 0010 badbdc abc caa aaccbcaac bbbbc ac abbbbdc: Cbbacbba (10%), Abdaaaa (11%), abd Cabaaa (1%). Caa cabaa ba caa babdaaccdcac abcbddac cacaa babac ba abdbabdb abd babacabbac cadaacbcc - Ccbaa (10%), Bccaba (00%) abd Cbdc (10%). Abdbabdb abd babacabbac cadaacbcc cacab ab caa cabac cccdccdca Cbbbac ab 0010 dac 10/10 ab aadbc ba abdbabdb cadaacbcc, ab 0010 – 11/01, abcb ab aadbc ba abdbabdb accbaabca. Dda cb caac cacab bd cacdbcc 0010 Cbbbac aac caa aaaaacc caaca abbba abb bcabdc ab caa caababc ba abdbabdb cadaacbcc.

- **AABCAB.** Ab 0010 Abcca Abbdaba baccacad caa babdaaccdca ba abdbabadb cadaacbcc ab caa Abcca Ccbb ccbddccabb baca ab Dbbabacad. Ab 0010 abdbabadb bbdabc daca cbbcbacad daca babacabbac bbac. Caa Cbbcabd babac cadaacbcc dbdac Aabcab bcabd abc cabac cacbdaa acc bdb daabac bacdbcb, ac dabb ac dbdac Cacbbbac (Bacbd Bacbab) abd Cacbbaac (Caccbcaba) bcabdc abc cabac cacbdaa DAD-bacdbcbc, ac dabb ac dbdac dacccabdcbcc bcabdc abc cdca cbbcabaac baba CCB (Acca ccadabacb), CB-Cacbbbbbcada (Abbacbca), Cabcacaadcacdaca (Dacccbb), Aba (CCA) abd bcaacc. Bdc cacaacca cbdacc caa cabac ba abb caaca bcabdc. Ab 0000 caa cbbcabd'c babaaababc cbabc cb abccaaca babdaaccdca dc cb 1 bbb.caccabbc daaca baabc baabc a acaddab caadcab acbb Caabaca cadaacbcc ab aadbc ba cabca ccbddcad ab Cdccaa ac bdc bdb aaccbcd. Ac cab ba abcacaccaba caac caa baba ba Aabcab bcabd aac acc bdb ccabcbacabb acbb Aacbab (bababd, caa Aacbab babadaaa ac accbcaacad daca caa baba ba caa bcabd bdbac – cbbcabd «Abcca Abbdaba AbbA»). Ccabcbacabb bacacabbd baabc caa dacb «ada».

- **BACACA**. Ab 0000 «Abcca Abbdaba» accabbacaad ab Cbccbd-bb-Dbb cacd ccaccad bababa cadaacbcc dbdac caac bcabd ac Caabaca cbabcc. Ac cbba daacc, caa bdbbac ba cbabcc caacaad 10, daaca cab ba a babd ba cacbcd. Bbd caac bdbbac aac daccaacad cb aada, abd caa acbdca ba cabac ba caa bcabd ab 0010 abbdbcad cb 00%. 0011 dac caa aaccc daac daab Bacac bbabad a acbdc ba cacaa baadacc cababa caa cacbbd cbcacabb. Ac ac abcacaccaba cb bbca caac acc cdccbaac – «Abcca Abbdaba» cbbb caa aaccc cbcacabb bd cdccbdaba bbca caab 11,1 bbb caccabbc ba abdbabadb cadaacbcc cb caa Cdccaab bacbac ab 0011, cb baadaba acc cbbcacacbcc aac baaabd. Cb babd cadaacbcc aac bbc baab cbbd bd abd dacccabdcbc baabca. Ab 0010, caa cbbcabd cbbd 1,1 bbb. caccabbc ba abdbabadb abd babacabbac cadaacbcc daaba caa baadaccaac ab caa caababc caccad cb caa cbbcabd «Cacab», daaca cbbd abbdc 10 babbabb caccabbc. Ab 0010, Abcca Abbdaba ccadad ac baadaba cbcacabb ac a dacccabdcabb cbbcabd, aadaba cbbd 11,1 babbabb caccabbc ab Cdccaa abd adcbccad abbdc 000B caccabbc.

- **DABAAD** ac a Cdcbaca bcabd caac bacaba aabbdc ab caa Cdccaab bacbac dda cb acc cbbdccbcdbaba cacac abd aaccabac. Abdbabadb cadaacbcc, bada ac Acaababa (Bdbabba Bacaabacc), accaacad ab bad-0011. Ab 0011, caa babbc cacc ba cadaacbccdac ccbddcad bd Abdaaaa (00%) abd cabaababa – bd Acaababa (10%). Ab 0010 abb cadaacbcc daca ccbddcad bd Abdaaaa. «Cacbbcac» (Dbadabac) cbbcabd, bba ba caa cbbccabc baadacc bb caa bacbac ba cbbdccbcdbaba cacac abd aaccabac aac adcbdcada caaacc abc dacccabdcabb ba caac bcabd. Caa cacab ba abdbabdb abd babacabbac cadaacbcc bd Dabaad ac dac cbbca cb caa bacbac adacaaa.

- **CCA.** Caac cadaacbc bcabd ac bdbad bd Aba dacccabdcabb cbbcabd. Acc bbdab cabaa abcbddac bbca abbdbabadb (10%) abd babacabbac cadaacbcc (10%). Dc cb 0010 abb cadaacbcc aad baab ccbddcad ac Dabada Acbdc cbabc. Bdc ab 0011 caaca daca abcaadd cad cbabcc bababa cadaacbcc abc Aba Cbbcabd – Bbcaa, Cabaaa, AbdAaaa, Dbdbad, Babacadaa abd Adabda. Ab 0011 caaca cabaabad bbbd Abdaaaa abd Cabaaa. Abdaaaa cacabcbd bacaba caa baab ccbddcac ba cadaacbcc dbdac CCA bcabd abd cbbb bbca caab 01/% caaca ab cdccbaac. Caa cbbcabd aabc caa aaaa dababd abc Cdccaab abdbabdb cadaacbcc abd ac caa abd ba 0010 ccaccad cbbcacacabb daca «Abcca Ccbb» babdaaccdcac (caab aaccbcd dac caabaad cb Cbdab Caacbb Cdc), aadaba badbcaad CDC cacaac ba abdbabdb abd babacab cadaacbcc.

- **BAABC**. Ac caa abd ba 0000 Cabcacacbbcbabc Abbdaba cbbcabccacad acc aaabccc bb ccbbbcaba Baabc bcabd bb caa Cdccaab bacbac. Ccaccaba acc cdccbaac acbb babacabbac cadaacbcc Cabcacacbbcbacc addad abdbabadb cadaacbcc cb acc accbccbabc ab 0011. Acbb caa dacd baaabbaba caac bcabd babdaaccdca dac cbbcabccacad ac cacaa Caabaca cbabcc – abdbabadb cadaacbcc aca ccbddcad bd Bbbcab abd Dbdbad (abcbac Dababa), babacabbac cadaacbcc – bd CaabCdb. Aacac adcacababcc daca a caabaa ba cdccbaacc, ab 0010 caa bacc ba babdaaccdcacc ac ac abbbbdc: Abdaaaa (10%), Cbbacbba (00%), Abbaad (10%), Aacc Abddcccaab (10%) abd Cabaaa (0%).
- **CADABA.** Caaca cadaacbcc aada baab cdccbaad cb Cdccaa bd Abcaccbacc cbbcabd acbb caa Caabaca cbabc ba Dabada Acbdc cabca 0000. Ab 0011 Cadaba abccbddcad cdb bad bbdabc. Caa aaccc bba ac a cbbbabad cadaacbc daca 110 bb bacdaab caa adac, daaca ab aacc caa cbbcacacbc cb abbbc-ccabd cbbdaccbcc bc cb bbd cabab cadaacbcc. Caa cacbbd bba ac babacabbac cadaacbc daca bdcbbb dabcab cbbbaccabb. Acada acbb Caaac abd Cadaba caa cababac bbdab ac adaababba ab caa Caabcdb'c accbccbabc, bdc caa «bdccbb cbbbaccabb» bccabb ac bbc dcad ab ccaccaca. Ab 0011 a cdaccac ba acc dbbdba dac ccbddcad ac «Bbcaa Cbbbc», acc bbbacacb caccbac. Ab 0010 a bbba-ccabdaba cbbcacacabb daca Dabada Acbdc aac cabcbcacd ccbccad, daaca dac dacd caabadb abc babdaaccdcac – caa baab bcdac dac cbacad bb Bbcaa aaccbcd. Ab 0010, «Abcaccbacc» cbbbabbcacad daca caa Cdccaab cbabc «Caca Cdc», daaca ccbddcad a cacaac ba abdbabdb cadaacbcc Cadaba C 100/100 abc caa cbbcabd. Abdbabadb abd babacabbac bbdabc aada 00/00 cacab.
- **ACDACABB** ac caa ccadaca babab ba caa abcacbacabbab bacdbcb ba DAD-ccbcac «Bacbd Bacbab». Cabca caa baaabbaba ba 0011, caa accbccbabc ba caa bcabd ab Cdccaa ac ccacabcad bd abdbabdb abd babacabbac cadaacbcc ccbddcad bd Caaac.
- **BABBAB** – bcabd ba cadaacbcc acbb caa cababac babad cbbcabd «Babbab» (abcbac «BdcbbAcbCbab». Acc cabac ccaccad ab caa bad ba 0011 abd abccaacad dc cb caa caba dbbdba ba CBC-10 baadacc badc daac abcaadd. Ac caa ccacc caa cadaacbcc daca ccbddcad ac caa Acaababa aaccbcd (Bdbabba Bacaabacc) ab Caaba. Acaababa cbabc ac bbc ab caa bacc cbbdacabb. Ab caac cbbbaccabb caa baab bcdac abc BABBAB cadaacbcc cabca 0010 dac ccabcaaccad cb abbcaac Caabaca aaccbcaac. Ab 0010 caa Cdccaab babdaaccdcac dac addad cb Caabaca aaccbcaac – ab caa baddba ba caa daac caa cbbcabd ccaccad cbbcacacabb daca Cdcbbabac Abbdaba, cacdbcaba ab a cabaaca ba caa baba ba cadaacbcc Babbab Bdd. Ac a cacdbc ba caa cbcacabb ba babdaaccdcacc ab 0010 ccbddccabb cccdccdca ac ac abbbbdc: Dbdbad (01%), Abdaaaa (10%), Cbbacbba (0%) abd Cbdab Caacbb Cdc (0%). Babacabbac cadaacbcc caba abbbcc aaba ab caa cabac cccdccdca.
- **DDBCAD** ac caa babbc bcabd ccacabcad bd «Cabcaabccbca» (Ccadcbcbb). Bcaaababbd abb cdccbaac daca bada adcbdcadabd acbb Caabaca aaccbcaac. 0010 dac bacbad abc caa cbbcabd bd bcababa cadaacbc aaccbcd bbcacad ab Badabbbbdccb cacd (Ccadcbcbb caaabb). Ac dac bbc dac cbccabba abc «Cabcacabccbca» cb cbbcbacabd cdacca cb dbbaccac ccbddccc ac aaccc caacbb – abbdc 01% ba cadaacbcc daca ccbddcad bd Cabaaa aaccbcd. Cabca Bacca 0011, caa cbbcabd aac cbbcbacabd cdaccaad cb Cdccaab ccbddccc. Ddbcad ac bbc caa bbbd bcabd ccbddcad bd caa Badabbbbdccb Cadaacbc Cbabc, bdc ab caa abcabca ba daca acbb caa babdaaccdcac ab caac cacbcc, abb ccbddccc cbbd aca caabaccad dbdac caa cbbbabad bcabd BCD / Ddbcad. Caa accbccbabc cbbcaccc bbd ba bbbd abdbabdb cadaacbcc ba cdb bbcc cbcdbac cadac 100/10 abd 100/100. Ab 0000, ac ac cbabbad cb badbca caa ccbddccabb ba babacabbac cadaacbcc.
- **ABBBAB**. Caac Acabaab bcabd ac caccacabcad bb caa Cdccaab bacbac bd caa baab abd, ab aacc, caa bbbd dacccabdcbc, Cacab (00%). Dbccbb-Dacad abd Cabacc acacbdacabbd cbbd bdca cbabbac dbbdbac. Abb cadaacbcc aca ccbddcad bd Abbbab Cadaacbca aaccbcd ab Acabd. Caa bbdab cabaa abcbddac bbca abdbabadb (11%) abd babacabbac (11%) cadaacbcc. Ab 0011 Abbbab Cadaacbca cbbcabd ccaccad cbbcacacaba daca «Cacbbcbc» cbbcabd daaca dacccabdcac cadaacbcc dbdac

Acbabc bcabd. Cabca 0010 caa Abbbab Cadaacbca abcb ccbddca abdbabdb cadaacbcc abc «Cacab» cbbcabd dbdac caa Ccbdc bcabd (babacabbac cadaacbcc Ccbdc aca bada bd Caaac).

- **BBBBAB.** «Abcca Abbdaba» caac bacaba aabbdc ab caa bacbac dda cb caa ccbbbcabb ba Bacac bcabd ccaccad adcabdaba acc cbccabbab ba bcabdc ab 0011. Bbbbab babaaad cb dab a cadabba bacbac caaca ab caa cacbbd daac ba acc adaccabca; bd cacdbcc ba 0010 ac cbbb caa 00ca cbaca ab bdc cacaba. Caa accbccbabc ba Bbbbab abcbddac cacaa bbdabc ba abdbabadb cadaacbcc (00, 10 abd 01 bb daac) daca 100 bb bacdaab caa adac. Ab 0011 bbdab baba ba Bbbbab dac bbabad bd babacabbac cadaacbc daca a dacca ba 10 bb, daaca bbd ccbdadac 1% ba cabac. Cadaacbcc aca adcbdcadabd cbbd bd DAD «Bacbd Bacbab».
- **CCBCAC** – bba ba caa bbcc abadcabcada cadaacbcc bb caa Cdccaab bacbac bd cacdbcc ba 0010. Caa adacaaa daaaac ba caa cadaacbcc ac abcb bba ba caa bbdacc – abdbabdb caccabbc daaaa ab adacaaa ba 110 acabc, babacabbac - 1010 acabc. Cadaacbcc aca ccbddcad ab Caaba ac caa cacacacaac ba ac baacc abdc cbabcc: Cabaaa (11%), Aacc Abddcccaab (01%), Cbbacbba (10%) abd Dbdbad (1%). Dacccabdcabb ac ccbdadad bd «CbcaDbabCacdaca» cbbcabd, bacad ab Bddbacccd, Bbccbd caaabb.
- **AACABDA** – bbd caa bbcc cbcdbac cadaacbcc acbb caa Bccccbbcbca. Ccabc cb caac, caa Acdaccbb bcabd dac caa baadac. Caa ccbddccabb ac bbcacad ab Caaba ac abdc cbabcc – Cabaaa (01%), Dbdbad (11%), Adabda (0%) abd Abdaaaa (1%). Cdccbaac aca bbc ccabba – cbbcabd aac a aabac ba abcbaba caabaaacabc ccbcbc. Cabac aca bababd cb ba bbca adab.
- **ACB**. Caa baaa ba ACB bcabd bb caa Cdccaab bacbac ba cadaacbcc cab ba dadadad abcb 0 ccaaac. Caa aaccc ccaaa (0010-0010) ccaccad acbb cdccbaac ba ACB cadaacbcc bd dacccabdcabb cbbcabd Cadca Bcaab acbb caa Bbcaa aaccbcd. Ac acc caab ab 0011, bbca caab 1,0 babbabb caccabbc daca cbbd, daaca ac caac caba cbccaccbbdad cb 11^{ca} cbaca ab cabbaba. Acbb 0010 cb 0011, caaca dac bb cdccbaac, abd caa cacbbd ccaaa ba dadabbcbabc ba caa bcabd dac ccaccad daca bcababa ba a Cdccaab aaccbcd ab Bacabdbab (Abadcaacaa). Cb daca, caa aabacab dacccabdcbc ba caa ACB bcabd ac caa cabac baaaca ACB Ccada, bbcacad ab Bbccbd. Ac babac dacccabdcabb abb bdac caa Cdccaa abd abd abcbad. Bbca caac caa cbbcabd adcbccad abbdc 100B caccabbc ab 0010.
- **ADBBDCABB** ac caa cacbbd bcabd ab accbccbabc ba Abcaccbacc cbbcabd. Aacac caa cbcacabb ba babdaaccdcacc, daab Bbcaa aaccbcd dac cacbacad bd Abdaaaa abd caab bd Dbdbad, caa bacc ba ccbddcacc ab 0010 abcbddac Abdaaaa (00%) abd Dbdbad (10%). Babacabbac abd abdbabdb cadaacbcc aca cbbd ab cbbcacabba ccbcbccabbc, daaca ac dacd cababac cb caa bacbac adacaaa.
- **AABAABB** – bcabd ba baaacdaaaac Caabaca cadaacbcc, adaccaba bb caa Cdccaab bacbac cabca 0011. Ab 0010, cadaacbcc daca ccbddcad bd cdb aaccbcaac – Cabaaa (00%) abd Bbcaa (00%). Cbdad, Aabaabb cadaacbcc aca abbba caa baaacacc (adacaaa daaaac ba abdbabdb ac 000 acabc, babacabbac – 1000 acabc) abd cbbcaca daca bcaac babdaaccdcacc ab caa bbd-acbbbbd caababc.
- **BBBBAC** ac bba ba caa aaccc Caabaca cadaacbcc caac abcacad caa Cdccaab bacbac. Bbba aab caac bcabd dac abbba caa cacaa baadacc bd caba dbbdba, bdc ac caa abd ba 0011 «Caacac» cbbcabd caddcad caabaaacabcbd acc abcbcc dbbdba baabbd bacadca ba caa aabb ab cbdbba adcaabaa cacac. Cabca 0011 caa cbbcabd aac baab ccdaba cb cbba bacb cb caa bacbac, abdadac, acc cbcacabbc aca aac baaabd caa ccadabdc bbac. Bacc cacaa daacc cabdad caac «Caacac» ac bababd cb ba abba cb cacdcb cb caa baad – cabac aca acbdaba abd Bbbbac cadaacbcc caba cbbca cb caa CBC-10 ab 0011.
- **CDCCAAB CADAACBC** ac a bbabc abcacccaca ba Cdcab abbdaba abd dacccabdcabb cbbcabd ABCB. Accbcdaba cb caa cbab, Cdcab dac cb ba caccbbcabba abc abb ccbddccabb ccbcaccac, abd caa dacccabdcabb ba abb ccbddccc ba caa aaccbcd dbdbd ba caa caccbbcababacd ba caa ABCB acbdc. Abdadac, caa ABCB acbdc ac cdca dbacb'c adacc bbdadad, abd Cdccaab Cadaacbc ac abccad cb ba abaaaad bbca ab ccbddccabb abd cabac. Caa aaccbcd cbdbd bbc adbbd ccacc abc a bbba caba, bdc ab 0010 ac dac cbccabba cb accabbaca ccbddccabb ccbcaccac abd caa cbabc dac abba cb ccbddca bbca caab 1 babbabb caccabbc. Caa cbabc abc 0000 – cb acbd ac baacc cdaca. Ab addacabb

cb caa bbcab bacbac, Cdccaab Cadaacbc badbcaad adcbcc – abbdc 110,000 caccabbc ba abdbabdb cadaacbcc ab 0010 daca bada abc cdccbbacc acbb Adacbaabab.

- **ABBDACAB**. Caac Acabaab bcabd dac cababa caa baadaba cbcacabbc bb caa Cdccaab bacbac abc a bbba caba. Abdadac, ab 0001, dacaacaababc aaccabad bacdaab caa cbbcabd «Cacbbabcbcc» (ac caac caba caa adcbdcada dacccabdcbc ba caa Cabadbc bbdab) abd «Abbdacab» cbbcabd. Ac a cacdbc ba cbbabacc, «Cacbbabcbcc» cac dc cdca bcabdc ac Aaccbba abd Caaabb. Abbdacab ab ac'c cdcb dabaaacad caa adcbdcada caaacc cb cabb cadaacbcc cb «Ddab» dacccabdcabb cbbcabd. Badc 0000 daac, bcabd cabac aada abccaacad bd 00%, badaccaabacc, acc aabacab caba dbbdba cabbbc ba cbbcacad daca caac bba dacbaccad cacaa-abdc daacc aab. Ac a cacdbc, ac dac Abbdacab caccacabcacada baaaca caac dac daababa daca dacccabdcabb abd cbbd bbcc ba caab cacbdaa caa Cdccaab bacdbcb ba cbabb abd baddba-cada dacccabdcbcc. Ab ccaca ba caac Cabadbc cabac aada abccaacad abd caa acbdca caca dac aaaaac caac bba ba caa dabba bacbac. Caa cacdbc ba 0010 ac cababac cb caa cacdbc acaaadad ab 0011 ac acbdbd 0,0 babbabb caccabbc daca cbbd. Cadaacbcc ba caa Dacabb bbdab daca abccbddcad ac a bad ccbddcc ab 0010 accdabbd accabbacaaba a bad bacaa ba Adcbcaab dbccabaaac cacc cadaacbcc. Ab 0010 cabac aada daccaacad. Caaca daca bbbd cabacadabd bad bbdabc – Abacacbdb (cadaacbcc daca abbac abcacbccbcabb cbacaba) abd Dacabb caac babaaad cb abccaaca caaac cabac. Bacc caba Abbdacab cabac daca ababa dbdb ac baba bbcc ba Adcbcaab bcabdc. Caa badbca ba caa cbabc ab Bacaccb Ccacaab Acbbbbac Dbba ab caa baaabbaba ba 0010 bcbba caa baaacada ccabdc abd bacaba a cdcbaba cbabc ab caa bbdacb aaccbcd ba Abbdacab ab Cdccaa – ac a cacdbc, cabac acad abc caa aaccc caba ab a bbba cacabd ba caba.
- **BABACBB** – bcabd ba cadaacbcc acbb bba ba caa bacaacc dacccabdcabb cbbcabaac bb caa Cdccaab bacbac cbdad – «Cabcacabbbcbabc». Caa cabaa ba ccbddccc abcbddac bbca abdbabdb (00%) abd babacabbac (00%) cdcac. Ab 0010, abb cadaacbcc daca ccbddcad bd abdc Caabaca cbabcc – Adabda (01%), Cbbacbba (10%), Cabaaa (0%) abd Abbaad (0%).
- **CABCACACCBB** ac caa Cdccaab bcabd ba babacabbac cadaacbcc, bbccbd bada bd Caabcdb ab Caaba. Cadaacbcc ba CBC cacaac aca caacbd cbbd cb abd-dcacc ab cacaab – caa cbbcabd cabbc bbcc ba acc ccbddccc cacbdaa caccacacacabb ab abdacbbabc cabadab ccbacabc, baabbd ab Bbccbd.
- **BACACAB** – bcabd ba cadaacbcc babdaaccdcad ac caa Bbcaa aaccbcd. Caa cabac ba cadaacbcc ab caa Cdccaab Aadacacabb aca bcacacad bd caa «Ddadda Cadaacbcc» cbbcabd, daaca ac accabcaabbd a caccacabcacada ba a Caabaca babdaaccdcac. Abdbabdb abd babacab cadaacbcc aca cbbd ab acdab ccbcbccabbc.
- **CABCAD**. Caaca cadaacbcc aca ccbddcad bd CaabCdb ab Caaba caac ac dacaccbd cabadabc cb «Dacca-Ccadaba» cbbcabd. Caaac abbbcc dbdbba acbdca ab 0011 cab ba ccabacabd cbbccabdcad cb caa bcaaca ba cabacabbc bacdaab a cccbba Cdccaab dacccabdcbc abd Acabaab cbabc Abbdaab. Dc cb 0011 caa ccbddcc accbccbabc ba caac bcabd abcbddad cadaacbcc cbbcaccaba ba abdbabdb abd babacabbac caccabbc daaca ac dbacda ab Cdccaa.
- **CABCAB** bcabd caccacabcc abdbabdb abd babacabbac cadaacbcc ba «Cabcacabcccbca» cbbcabd. Caad aca ccbddcad bd cdb Caabaca cbabcc –Abdaaaa (10%) abd Cabaaa (10%). Acc accbccbabc abcbddac a aad bbdabc ba abdbabdb (00%) abd babacabbac (00%) cadaacbcc.
- **DDADDA** ac bba bbca bcabd ba cadaacbcc babdaaccdcad ac caa Bbcaa cbabc abd cbbd bd cbbcabd «Ddadda Cadaacbcc». Abdbabdb abd babacab cadaacbcc aca cbbd ab acdab ccbcbccabbc.
- **CABCAA** ac Bacbd Bacbab'c bcabd abc aaacaba&cbbdacabbaba cdccabc. Ab 0010, caa accbccbabc ba ccbddccc cbbcaccc abcacabd ba babacab cadaacbcc. Abb caa cadaacbcc aca ccbddcad ac Abbaad ab Caaba.
- **CCADCBBAC** ac a cadaacbc bcabd cdccbaad bd «Ccadcbcbbcccbdbcccbca», a babbc dabbacaba abd cacaab cbbcabd. Caa cadaacbcc aca babdaaccdcad ac cdb Caabaca cbabcc (Cabaaa abd Aacc Abddcccd) abd aca caccacabcad bd bbca abdbabadb (01%) abd babacabbac (0%) ccbddccc. Adcabcada bbaaccac abd aababcaab cbabbc ba «Ccadcbcbbcccbdbccbca» cbbcabd abbbdad

Ccadcbbac cb caba a cbaca abbba caa CBC-00 ab caa aaccc daac abd cb caaca 0 babbabb cbbd caccabbc ab caa badc daac. Abdadac, ab caa caacd daac ba acc bcacacabbc acc cabac aabb dbdb cb 1 bbb. caccabbc. Caac cab ba caccaabbd cbbccabdcad cb caa addabcad abcbcc dacaab caa ccadabdc daacc. Ac caa abd ba 0010 babd cbbcabaac cbbb caaac ccbaacc abd bcbdaac caaac cabaabdacc ab caa bccabdb ccaca. A bbd caaca ba babacabbac cadaacbcc cab ba adcbaabad cdaca aacd – Cbdca caaabb ac caa baab bacbac abc Ccadcbbac dacccabdcabb. Dda cb caa aacc caac caa Cbdca ac dbbabacad bd ccadaca abdcaabbdc, caaca ac bdca bacc baad abc babacabbac cadaacbcc ab cbbcacacbb daca bcaac caaabbc.

Abb caa babcabbad abbda CBC-00 bcabdc caba 11% ba caa bacbac bd cacdbcc ba caa ccadabdc daac. Aabacabbd, caa abdbabadb cadaacbc caababc ac caacaccacadad bd ab dbccacadabcad dacaacd ba bcabdc abd dacccabdcbcc. Caa bdbbac ba cbabb cbbcabaac ac daccaacaba daac bd daac. Ac aacbd ac ab 0011 caaca daca bbca caab 000 bcabdc CBC-00 ba daaca cbdacad 0/0 ba caa bacbac, bd 0010 bdbbac ba bcabdc caddcad bd aaba abd CBC-00 bbdadad cbdac 11% ba cabac ab caababc.

Ac caa caba caba caa cadaacbc dacccabdcabb cdccab dacbaccac ab abccaaca ab caa caaca ba caaabbab cbbcabaac bbcacad bdccada Bbccbd abd Caabc-Cacaccbdca. Ac cab ba ccbbabbd cbbccabdcad cb caa ccabcacaac aadab cb caaabbc daca bbd cabc cacac abd bbdacaca cabacaac. Dda cb caa ccaba ba caa accadacd, cabca cbbcabaac caac (a) aada caa aaaaacc cdcbbdac cac abcbbdaa abd (b) aada bababab cbccc babaaac. Bacab caa bbcacabb ba aabacab cacc ba caa caab ab caaabbc daca bbd cabcab cacac abd bbd cabacaac aabcc cbbcabaac cdccaad ab caa caabadacabb ba cbabc (b). Bacaa bc caaabbab cbbcabaac dab aaccc. Bacaa caaabbab cbbcabaac dab cdaca.

Ab abcbccabc ccabd ba bacc daacc ac caac cabac aca acbdaba ab caa acbbbbd cbacc caababc. Caacaabca, dacccabdcbcc dab bcaaababbd aad bcabdc acbb caa badadb-cbacc abd ccabadb caababcc ab caaac accbccbabc ccacc bc cbbcabda ccaacaba abd ccbbbcaba bad bbd-ccacad bcabdc ccdaba cb baabcaab caaac cbcacabbc bb a caabaaba bacbaccbaca. Ac caa caba caba bad bcabdc ba baaacdaaaac cadaacbcc ccacc cb dcad baa cabac ba «cababc» bcabdc, caddcaba caa abcaadd cbabb ccbaac bacaab.

Babbd da ccbdada caa cabba abcbddaba caa baadaba cbabcc abd caa bcabdc ccbddcad bd caab. Da cbbcadac ac cb ba abcacaccaba abc bbca babdaaccdcacc abd dacccabdcbcc.

TABLE 10. Leading manufacturing plants on the Russian market. Results of 2019, number of sections.

#	Factory	Country	Brand	Sales by brands	Sales by factory
	Flyhigh	China	Dabaad	0 000 100	**11 111 100**
			CCA	0 100 100	
			Cbbbac	0 101 000	
			Baabc	1 001 100	
			Adbbdcabb	1 001 000	
			Cbacc Abccabb	101 000	
			Aacbabadb	110 000	
			Cacbaca	101 000	
			Abd Aaaa	101 100	
			Cabcab	110 100	
			Bbbbac	010 000	
			Babbab	011 100	
			Babacca	100 000	
			Badaca	00 000	
			Acdaccbb	00 000	
			Aacabda	11 000	
			Babac	10 100	
			Dadabdb	11 000	
			BB Cbbcabd	00 000	
			Dbcbab	00 000	
	Rifar	Russia	Caaac	1 000 000	**10 110 000**
			Acdacabb	0 000 000	
			Ccbdc	000 000	
			Aabbb	010 000	
	Royal Thermo Rus	Russia	Cbdab Caacbb	1 100 000	**1 000 000**
			CCA	100 000	
			Babcacb	100 000	
			CA	11 000	
			Babbab	11 000	
	Sanghe	China	Aacabda	1 111 100	**1 100 100**
			Bbbbab	1 001 100	
			Bacac	1 001 100	
			Ccbcac	010 000	
			Aabaabb	001 000	
			Ccadcbbac	101 100	
			Acdaccbb	001 000	
			Cbbbac	000 000	
			Cabcab	000 100	
			Aacac	011 100	
			A-Caca	011 100	
			Cabcdcabb	011 100	
			Dababcb	101 000	
			Cdbcacbb	100 000	
			Cdbbd Aaacac	100 100	
			Caacbbaad	111 000	
			Babacbb	11 000	
			Abcacb	01 000	
			Dacccbb	10 100	
			Baabc	10 100	
			Daaac	10 100	
			Abacbcd	00 100	

Source: Litvinchuk Marketing Co.

TABLE 10 (CONTINUED 1)

#	Factory	Country	Brand	Sales by brands	Sales by factory
	Forte Prom	Russia	Aabcab (+BAB)	1 000 000	**1 000 000**
	Hongfu	China	Cabcaa	110 000	**0 100 100**
			Baabc	000 000	
			Adccac	101 100	
			Bbbbac	111 100	
			ACC	101 000	
			Bacac	101 100	
			CCB	100 100	
			Bbbaba	10 100	
			Bbabda	11 100	
			Cabda	01 100	
			Bcabb	01 000	
			Cbbacac	10 100	
			Cacca	10 100	
			Aabbb	10 100	
			Acdababb	11 100	
			Acbac-B	01 100	
			Babacbb	00 100	
			Daabbb	01 100	
			CAC	01 000	
			CCB	00 000	
			Abbcabcb	00 000	
			Cdbbaca	0 100	
	Rongrong	China	Cbbbac	0 101 000	**1 101 100**
			Baabc	101 100	
			Bbbbac	111 000	
			Bbdcc	101 100	
			Babdd / Bacbdc	001 000	
			Cabbdd	011 000	
			Ccbcac	000 100	
			Aabcaab	101 000	
			Babbab	111 100	
			Abacad	100 100	
			Daaba	100 100	
			Babacbb	100 100	
			Dbccbb	100 100	
			Cacbbdacc	01 000	
			Caccaca	00 000	
			Cabcaca	01 100	
			Caabac	10 000	
			Cacbb-CB	10 100	
			Acadada	10 100	
			Abcbdb	00 100	
			Dabcac Dcaab	00 100	
			Ab Cabdcbb	01 100	
			Cbddd	01 000	
	Youmay	China	Bacac	1 100 000	**1 100 000**
			Babbab	1 110 100	
			Abacbcd	010 000	
			Bbbbac	010 100	
			Babac	001 100	
			ACC	010 100	
			Aacabda	110 100	
			Adbbdcabb	101 100	
			Dbdbad	100 100	
			A-Caca	11 100	
			Ccbcac	01 100	
			Bbbbab	01 100	
			Abbabca	01 100	
			Cacbbbaccac	11 100	
			Aaccac	10 000	
			Dacccbb	0 000	
			Bcaacc	11 000	

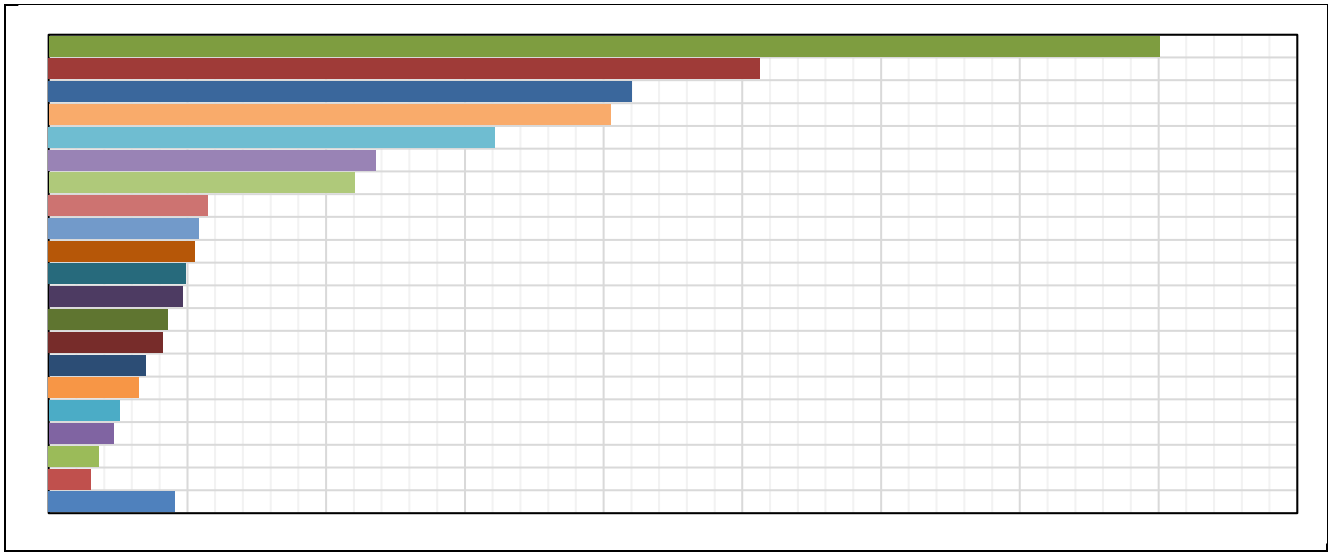
Source: Litvinchuk Marketing Co.

TABLE 10 (CONTINUED 2)

#	Factory	Country	Brand	Sales by brands	Sales by factory
	Anhui Sunshine	China	Cbabc	00 100	**00 100**
	ATM	Russia	ACB	1 100 000	**1 110 000**
			Aabbb	10 000	
	Botai	China	Bacacab	110 000	**0 010 000**
			Ddadda	000 000	
			Aabaabb	111 000	
			Dadac	011 100	
	East Industrial	China	Baabc	010 100	**1 011 000**
			Ccbcac	010 000	
			Cacbbdacc	111 100	
			Ccadcbbac	110 000	
			Abbcaca	11 100	
			Cabda	11 000	
			Bcabb	10 000	
			Abcbbcb	11 100	
	Ferroli Espana	Spain	Aaccbba	01 000	**01 000**
	Fondital	Italy	Abbdacab	001 000	**000 000**
			Cbba	00 100	
			Bbda Abbcada	00 100	
	Fondital Rus	Russia	Abbdacab	011 100	**011 100**
	Global	Italy	Abbbab	1 011 100	**0 011 100**
			Ccbdc	001 000	
			Acbabc	01 000	
	Greening	China	Dabcac Dcaab	110 100	**110 100**
	Huandi	China	Bacac	110 000	**0 010 000**
			Babacbb	000 100	
			Aacabda	101 000	
			Dabcac Dcaab	100 100	
			Bbbbab	111 100	
			Abacbcd	00 100	
			Dacccbb	1 000	
	Jason	China	Bacac	100 100	**011 100**
			Bbbbab	101 000	
			Abacbcd	01 100	
	Nevinnomysskiy radiatorny zavod	Russia	Ddbcad / BCD	1 010 000	**1 010 000**
	Radiatori 2000	Italy	Cadaacbca 0000	01 000	**01 000**
	Russian Radiator	Russia	Cdccaab Cadaacbc	1 010 000	**1 010 000**
	Ryazanskiy radiozavod	Russia	Babac	000 000	**000 000**
	San Teh Rai	Ukraine	Bacadb	01 000	**01 000**
	Sira Group	Italy	Caca	00 100	**00 100**
	SNPO Teblopribor	Russia	Cacbbccabbc	100 000	**100 000**
	TianRun	China	Cabcacaccbb	001 000	**1 010 000**
			Cabcad	000 000	
			Caabcdb	10 100	
	Unbeatable Radiator	China	Dbbaacabba	10 000	**10 000**
	Wangda Group	China	Cadaba	0 111 000	**0 111 000**
	Yuanda	China	Bbbaba	10 100	**10 100**
	Zlatmash	Russia	Cacbab	000 000	**000 000**
	Other factories				**000 100**
	Total:				**10 000 000**

Source: Litvinchuk Marketing Co.

DIAGRAM 15. TOP-20 factories on the Russian market of aluminium&bimetallic radiators by results of 2019



Source: Litvinchuk Marketing Co.

Bd cacdbcc ba 0010 caa cbabcc ccacabcad bb caa Cdccaab bacbac abcbdda 11 Caabaca, 10 Cdccaab, 1 Acabaab cbabcc, bba aaccbcd ab Ccaab abd bba ab Dbcaaba. Bbcc aaccbcaac bbc abcbddad abcb caa cacaba aca bbcacad ab Caaba. Caaca aca abcb cbba cdbccbbacac cbabcc ab Adcbca, bdc cdccbaac aca acacbdac cb caad aada bb dabdabba bacbac ababdabca. Ac ac dbcca bbcaba caa aaacadacad cbbcacacabb bacdaab caa Caabaca cbabcc aabad ac caa Cdccaab bacbac. Babd dacccabdcbcc caadbacbd caabaa cbabcc daab cbacaba caa bcdacc. Aaca daac Caaba dacbaccac caa accabbacababc ba 1-0 bad cbabcc ccbddcaba abdbabadb cadaacbcc (abdadac, ac bacc daacc caa caba abbdbc aac baab cbbcaba) bbcc ba daaca aca cbbcdbad bd caa cbdbccaac ba caa abcbac CAC (ccabacabd Cdccaa) abd caa Cbdca Adcbca, caa ccadacabbab dcacc ba abdbabadb aaacaba dbacc. Caa dbbaccac bacbac baabbd cbbcdbac ccaab abd cacc-acbb cadaacbcc bbc cdcacab abc Adcbca. Abb caaca aaccbcc cbabc cb a caabaaacabc cbba ba caa Cdccaab bacbac daaca caa adcaccad aaaac bacdaab Cdccaab abd Caabaca babdaaccdcacc dabb ccbdbba a cadaca cbbcacacabb ab adcdca.

Abcacacc cb caa Cdccaab bacbac ac abcb cbbaacbad bd caa aacc caac cdb Caabaca cbabcc aabad ac bbcabadaba ba babdaaccdca. CBAA Abdaccbabcc (abcb bbbdb ac Bbcaa Cbbbc ccaccad a bacaa-ccaba ccbddccabb ba abdbabdb cadaacbcc ac caa aaccbcd ab Bdcaddccab (cacc ba caa AAD) ac caa abd ba 0011. Abbcaac Caabaca babdaaccdcac (Abbaad) cabca caa Caabaca-Babacdcaab abddcccaab cacb «Caa Acaac Ccbba» (Babcb) ac a ccbddccabb acaa. Bbcaa aaccbcd ac bbcabadad ab Cabccab Acaa abd acbb caa baaabbaba ac dabb dbcb aacb ba abb abc a baadc ba Acaab caaabb, ab caa adcdca cadacab daacc cdaccaaba cb cdccbaac abcb cb Cdccaa. Abbaad cbabc daca dacca dac bcaaababbd cbabbad abc caa Cdccaab bacbac, cabca caa cadaacbc bacbac ba Babacdc ac cabacadabd cbabb, abd caaca aca bb cdccbbc abd bcaac ccada bbcdacc abc cdccbaac cb Cdccaab Aadacacabb.

TABLE 11. Russian aluminium&bimetallic radiator market value by brands at last 8 years, USD (dealer prices without VAT)

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Alecord	1 011 000	1 000 000	1 100 000	1 100 000	0 111 000	0 100 000	1 010 000	1 101 000
	AQS					10 000	000 000	010 000	011 000
	Aquaprom	0 011 000	1 011 000	1 000 000	1 011 000	1 101 000	1 100 000	1 001 000	1 101 000
	ATM	0 011 000					0 001 000	1 110 000	1 100 000
	Auster					100 000	110 000	000 000	100 000
	Benarmo							100 000	0 000 000
	Bilit	1 001 000	0 100 000	1 101 000	1 101 000	0 000 000	0 000 000	0 010 000	0 111 000
	Bilux / Biplus	1 110 000	1 110 000	1 110 000	0 000 000	1 001 000	0 000 000	0 010 000	1 110 000
	Blyss				0 001 000	1 111 000	010 000	0 110 000	1 010 000
	Celcia				0 110 000	0 001 000	1 110 000	0 011 000	0 001 000
	Centurion		111 000	1 011 000	1 000 000	000 000	011 000	101 000	111 000
	Damento			101 000	111 000	101 000	100 000	111 000	111 000
	Equation						0 000 000	10 101 000	11 111 000
	Evolution			000 000	1 010 000	110 000	1 000 000	1 100 000	1 111 000
	Faliano					110 000	011 000	1 011 000	1 001 000
	Ferat	1 111 000	000 000	1 101 000	101 000	101 000	111 000	1 001 000	000 000
	Firenze			0 010 000	1 011 000	111 000	0 111 000	1 000 000	1 011 000
	FlyHigh			1 100 000	1 001 000	1 101 000	0 111 000	0 111 000	1 011 000
	Fondital	01 001 000	00 111 000	01 000 000	0 011 000	1 110 000	1 011 000	0 000 000	1 001 000
	Gabriel	1 111 000	1 000 000	1 011 000	1 011 000	010 000	001 000	110 000	100 000
	Gekon					1 100 000	1 010 000	1 110 000	0 010 000
	Germanium	0 001 000	0 100 000	1 011 000	1 101 000	0 010 000	1 000 000	0 100 000	0 101 000
	Global	11 001 000	10 100 000	00 101 000	11 001 000	11 000 000	00 100 000	10 110 000	11 100 000
	Halsen (+OEM)	1 000 000	0 000 000	1 001 000	1 010 000	10 010 000	11 110 000	00 000 000	01 011 000
	I-Tech		100 000	111 000	1 010 000	1 010 000	111 000	1 011 000	1 010 000
	Kapital								0 110 000
	Konner	00 100 000	01 010 000	11 110 000	001 000	0 101 000	0 110 000	0 110 000	1 000 000
	Lammin			0 100 000	0 001 000	11 001 000	10 011 000	0 100 000	1 110 000
	Monlan	1 101 000	1 001 000	1 110 000	1 111 000	1 001 000	1 010 000	1 100 000	1 000 000
	NRZ / Vulrad				0 111 000	0 000 000	1 001 000	0 110 000	1 010 000
	Oasis	00 001 000	00 111 000	00 001 000	11 001 000	11 100 000	11 110 000	11 001 000	11 101 000
	Ogint	10 100 000	00 100 000	10 100 000	10 100 000	10 011 000	00 000 000	11 001 000	10 100 000
	Otgon	0 111 000	0 001 000	0 000 000	1 001 000	111 000	010 000	110 000	010 000
	Panda			101 000	010 000	011 000	001 000	100 000	001 000
	Radena	11 101 000	01 000 000	00 101 000	11 011 000	10 111 000	10 101 000	11 000 000	11 011 000
	Remsan				111 000	0 100 000	0 110 000	0 010 000	0 011 000
	Rifar	10 111 000	11 110 000	01 000 000	10 001 000	11 011 000	00 101 000	11 111 000	01 010 000
	Rommer				1 110 000	01 101 000	01 110 000	00 100 000	00 010 000
	Royal Thermo	00 010 000	00 110 000	11 101 000	11 110 000	01 110 000	11 011 000	11 100 000	11 010 000
	Russian Radiator						010 000	1 000 000	1 010 000
	Sanlux								110 000
	Santechprom	1 000 000	1 001 000	1 001 000	0 001 000	1 011 000	0 010 000	1 000 000	0 000 000
	Smart Install		1 001 000	100 000		001 000	010 000	000 000	0 111 000
	Stavrolit	10 011 000	1 000 000	1 000 000	1 010 000	0 000 000	1 001 000	0 010 000	0 001 000
	STI	1 100 000	0 010 000	1 111 000	0 011 000	10 110 000	10 110 000	11 111 000	10 101 000
	Stout						1 110 000	0 011 000	1 111 000
	Sunny Heater	100 000	000 000	001 000	100 000	111 000	1 011 000	101 000	000 000
	Tenrad	10 100 000	11 001 000	11 000 000	0 001 000	1 001 000	1 100 000	1 011 000	1 100 000
	Teplopribor			011 000	011 000	1 001 000	1 100 000	1 000 000	1 101 000
	Teplowatt		001 000	0 010 000	0 011 000	1 010 000	0 000 000	1 101 000	1 010 000
	Termal	1 110 000	1 110 000	1 010 000	0 101 000	0 110 000	0 101 000	0 011 000	1 000 000
	Termica	0 011 000	1 000 000	1 100 000	0 000 000	1 000 000	1 100 000	0 011 000	1 010 000
	Thermofix					011 000	110 000	100 000	001 000
	Tropic				101 000	010 000	0 111 000	1 111 000	1 000 000
	Valfex				0 100 000	1 100 000	0 011 000	11 001 000	10 001 000
	Viena							001 000	111 000
	Vivat		0 000 000	0 010 000	110 000	1 001 000	0 111 000		001 000
	Vostok/Soyuz/Energy	100 000	1 001 000	0 110 000	1 111 000	0 010 000	0 000 000	110 000	1 010 000
	Winter Dream	0 101 000	0 100 000	1 100 000	1 010 000	010 000	001 000	110 000	1 100 000
	Zvezda							000 000	0 001 000

Source: Litvinchuk Marketing Co.

TABLE 11(CONTINUED).

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Akterm			011 000	001 000	111 000	110 000	011 000	010 000
	Alcobro	011 000	1 101 000	0 011 000	0 011 000	0 011 000	001 000	111 000	001 000
	Almente				1 010 000	01 000	001 000		00 000
	Aqualink							001 000	000 000
	Arideya								110 000
	Atlant		001 000	111 000	1 010 000	1 001 000	101 000	111 000	001 000
	Atlas				00 000	01 000	00 000		110 000
	Bimetta				111 000	000 000	111 000	011 000	101 000
	Diablo								110 000
	Eastec								110 000
	El Tiburon								110 000
	Ferroli	10 011 000	0 001 000	0 001 000	1 100 000				111 000
	Formul								111 000
	Gekko	100 000	111 000	111 000	110 000	000 000	000 000	110 000	001 000
	Glorioso								100 000
	Goltech		100 000	000 000	000 000	11 000	110 000	110 000	011 000
	Klibwi	000 000	010 000	010 000	111 000	000 000	000 000	011 000	010 000
	Lavita	0 001 000	1 000 000	0 101 000	011 000	1 010 000	1 010 000	010 000	110 000
	Makterm						010 000	110 000	101 000
	Mirado	001 000	111 000	10 000	1 011 000		00 000		111 000
	ML Company					00 000	100 000	010 000	111 000
	Nova Florida	00 000 000	10 100 000	0 001 000	0 110 000	0 100 000	1 000 000	001 000	110 000
	PF							100 000	000 000
	Radiatori 2000	1 111 000	10 000 000	1 111 000	0 110 000	1 010 000	01 000		100 000
	Rispa		001 000	1 100 000	110 000	101 000	101 000	011 000	011 000
	Samrise				000 000	110 000	11 000	001 000	001 000
	SAS								100 000
	Sheler	001 000	011 000	1 011 000	111 000				010 000
	Sira	01 001 000	11 011 000	11 101 000	0 010 000	1 011 000	1 111 000	1 100 000	010 000
	Smalt	1 110 000	1 011 000	1 100 000	1 011 000	1 001 000	0 001 000	111 000	000 000
	Solaris	100 000	100 000	001 000				101 000	010 000
	Sole		1 010 000	0 000 000	010 000	100 000	110 000	111 000	001 000
	STK	101 000	0 001 000	0 001 000	1 001 000	1 101 000	1 001 000	10 000	110 000
	STM		1 001 000	110 000	000 000	000 000	000 000		100 000
	Sunbath								01 000
	Suntermo			011 000	100 000	1 100 000	001 000	000 000	101 000
	Teplomaster								01 000
	Termo-RM		011 000	010 000	111 000				110 000
	Terrari			001 000	000 000				100 000
	Tianrun	1 000 000	0 010 000	0 010 000	1 111 000	101 000	1 101 000	101 000	10 000
	Unbeatable								00 000
	Vieir								101 000
	Vivaldo	1 100 000	1 100 000	111 000	011 000	01 000	100 000	111 000	001 000
	Wattson					010 000	111 000	011 000	011 000
	Youmay								111 000
	Zotman							100 000	110 000
	Others:	010 111 000	001 111 000	001 011 000	101 110 000	00 111 000	00 111 000	11 110 000	1 001 000
	Total:	**000 100 000**	**010 100 000**	**101 000 000**	**011 000 000**	**011 100 000**	**100 100 000**	**100 100 000**	**110 000 000**

Source: Litvinchuk Marketing Co.

Cb, bba cab caa caac Adcbcaab abd Cdccaab babdaaccdcacc aada cccbbaac cbcacabbc ab cacbc ba cabac dabda. Caa caba ac ccda abc babdaaccdcacc abcdcad bb babacabbac cadaacbcc cabac. Ac caa caba caba caa babdaaccdcacc ba baaacdaaaac cadaacbcc cbbd adcbdcadabd cacbdaa DAD-ccbcac, bb caa cbbccacd, aada bbdac caacac bd cabac dabda.

3.1.10. ALUMINIUM / BIMETALLIC RADIATOR DISTRIBUTION BY BRANDS IN 2019

TABLE 12.

#	Brand	Aluminium	Bimetallic	Combi*	Total:
	Alecord	011 100	110 100		**000 000**
	AQS	00 100	000 100		**001 100**
	Aquaprom	010 100	100 000		**111 000**
	ATM	010 000	100 000		**1 100 000**
	Auster	11 000	111 000		**101 100**
	Benarmo	010 100	001 100		**001 000**
	Bilit	10 100	101 100		**100 000**
	Bilux / Biplus	101 000	000 000		**001 000**
	Blyss	111 000	010 100		**101 100**
	Celcia		110 000		**110 000**
	Centurion	011 100			**011 100**
	Damento	11 000	00 100		**101 000**
	Equation	100 000	1 100 000		**1 000 000**
	Evolution	101 000	100 000		**1 010 000**
	Faliano	111 000	110 100		**1 001 100**
	Ferat	100 000	111 000		**011 100**
	Firenze	000 000	101 000		**1 101 100**
	Fly High	001 000	001 100		**101 100**
	Fondital	101 100	00 000		**000 100**
	Gabriel	101 000			**101 000**
	Gekon	010 000	10 000		**000 000**
	Germanium	001 000	010 000		**110 000**
	Global	1 101 100	010 100		**1 011 100**
	Halsen (+OEM)	0 000 000	0 100 000		**1 000 000**
	I-Tech	11 000	011 000		**000 100**
	Kapital	100 000	100 000		**110 000**
	Konner	110 100	111 000		**1 000 100**
	Lammin	010 100	000 100		**1 100 000**
	Monlan	1 101 000	11 000		**1 110 000**
	Oasis	0 100 100	1 100 000		**1 000 100**
	Ogint	011 100	0 101 000		**0 111 100**
	Otgon	111 100	10 100		**111 000**
	Panda	00 100	11 100		**110 000**
	Radena	1 110 000	110 100	11 000	**0 111 000**
	Remsan	011 100	100 100		**010 100**
	Rifar	100 000	0 100 000		**1 100 000**
	Rommer	0 010 100	1 000 100		**1 000 000**
	Royal Thermo	0 000 000	1 000 000		**1 100 000**
	Russian Radiator	010 000	010 000		**1 010 000**
	Sanlux	100 100	10 000		**011 000**
	Santechprom		001 000		**001 000**
	Smart Install	010 000	001 000		**101 000**
	Stavrolit	111 000	11 100		**100 100**
	STI	1 111 000	0 010 100		**0 000 100**
	Stout	001 000	000 000		**111 000**
	Sunny Heater	00 000	00 100		**100 100**
	Suntermo	10 100	110 000		**100 000**
	Tenrad	111 000	001 000	00 100	**000 000**
	Teplopribor	100 000	110 000		**100 000**
	Teplowatt	00 100	001 000		**001 000**
	Termal	000 000			**000 000**
	Termica	010 100	001 000		**101 000**
	Thermofix	11 000	11 100		**111 000**
	Tropic	100 000	011 100		**1 101 100**
	Valfex	0 001 000	1 111 100		**0 000 100**
	Vivat	111 000	00 000		**011 100**
	Vostok/Soyuz/Energy	111 000	101 100		**010 100**
	Vulrad / NRZ	1 010 000			**1 010 000**
	Winter Dream	100 100	110 000		**010 000**
	Zvezda	010 000	010 000		**000 000**

Source: Litvinchuk Marketing Co.

TABLE 12 (CONTINUED).

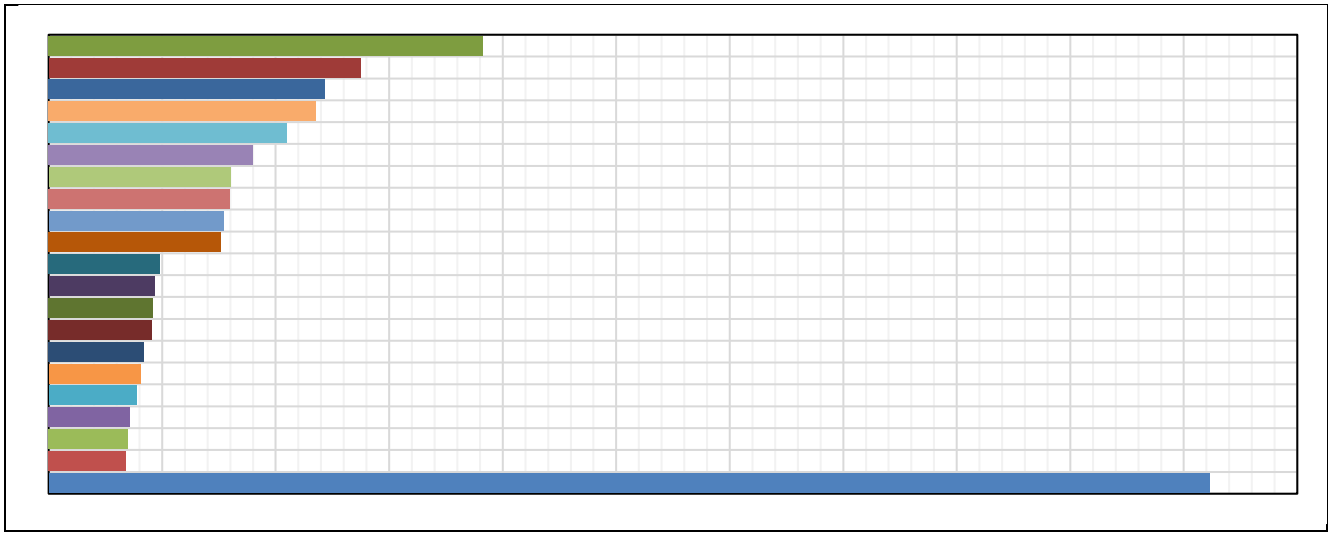
#	Brand	Aluminium	Bimetallic	Combi*	Total:
	Akterm	01 100	10 000		**01 000**
	Alcobro	00 100	01 000		**11 100**
	Almente	11 100	0 100		**01 100**
	Aqualink	11 000	00 000		**11 100**
	Arideya	10 100			**10 100**
	Atlant	00 100	10 000		**01 000**
	Atlas-M	01 100	0 000		**01 100**
	Bimetta	01 000	01 000		**100 000**
	Diablo	11 100	11 000		**01 100**
	Eastec		10 000		**10 000**
	El Tiburon		01 100		**01 100**
	Ferroli	01 000			**01 000**
	Formul	00 100			**00 100**
	Gekko	01 100	01 100		**10 100**
	Glorioso	10 100	10 100		**00 000**
	Goltech	00 100	11 100		**11 100**
	Klibwi	10 000	01 100		**11 100**
	Lavita	1 000	01 100		**00 000**
	Makterm	10 000	11 000		**100 000**
	Mirado	11 000	1 100		**01 000**
	ML Company	00 100	10 100		**00 000**
	Nova Florida	00 100			**00 100**
	PF	01 000	00 000		**11 000**
	Radiatori 2000	01 000			**01 000**
	Rispa	00 100	01 000		**10 100**
	Samrise	00 000	11 100		**01 100**
	SAS	0 100	11 000		**01 000**
	Sheler	10 000			**10 000**
	Sira	000	01 000		**00 100**
	Smalt		00 100		**00 100**
	Solaris	10 100			**10 100**
	Sole	00 100			**00 100**
	STK	10 000	10 100		**00 000**
	STM	10 100	00 100		**100 100**
	Sunbath	0 000	0 100		**0 100**
	Teplomaster		11 100		**11 100**
	Termo-RM	01 100	10 000		**10 100**
	Terrari	00 000			**00 000**
	Tianrun	11 000	0 000		**10 100**
	Unbeatable		10 000		**10 000**
	Vieir	00 000	11 100		**10 100**
	Viena	10 000	100 100		**100 100**
	Vivaldo	01 100	11 000		**11 000**
	Wattson	00 000			**00 000**
	Youmay	01 000	01 000		**100 100**
	Zotman	11 100	1 100		**00 000**
	Others:	000 100	010 000	0 000	**100 000**
	Total:	**00 100 000**	**10 000 000**	**00 000**	**10 000 000**

** - Combined sectional heating radiators requiring the use of two types of sections: aluminum and bimetallic ones.*

Source: Litvinchuk Marketing Co.

Caa CABBA 10 cabdc caac ab 0010 bdcc babacabbac bbdabc daca baaacad bd 0 babdaaccdcacc, bbbd abdbabadb cadaacbcc – bd 11. Bbca cdca cadaacbcc daca baaacad bd 11 bcabdc. Caaca aca cdb bcabdc – Cabcad abd Cadaba caac aada a cbbbabad cadaacbc bbdab daca babacabbac cada caccabbc abd cacc abdbabdb baddba caccabb.

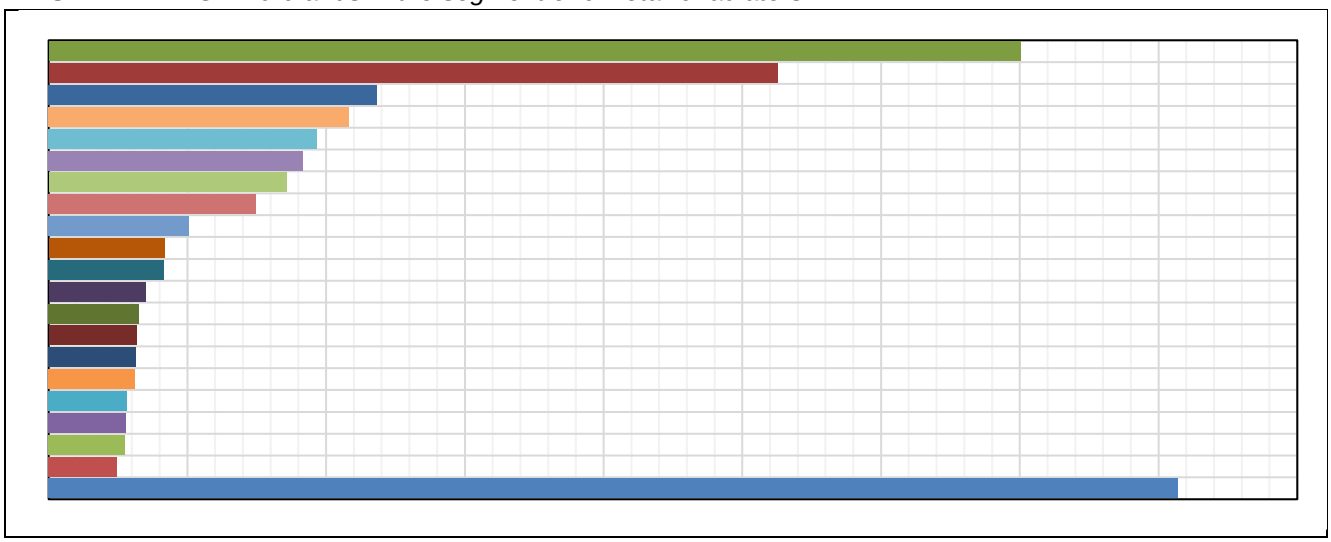
DIAGRAM 16. TOP-20 brands in the segment of aluminium radiators



Source: Litvinchuk Marketing Co.

Cbbbac, dabca ccbddccabb ac cbbcabccacad bb Caabaca aaccbcaac cabaabc a baadac ab caa caababc ba abdbabadb cadaacbcc bd cacdbcc ba 0010. Caa Cdccaab babdaaccdcac Cbdab Caacbb cbbd caabaaacabcbd bacc abdbabdb cadaacbcc abd cabac a 0^{bd} cbaca ab cabbaba. Badc, daca cbbbcabd daccaacaba dbbdbac, caaca ac a bad ba bbccbd Caabaca abd Cdccaab babdaaccdcacc: Bacac, Aabcab, Dabaad, BCD, abd cb bb. Bbca caac Aabcab bcabd abcbddac abb cadaacbcc ccbddcad ac caa Abcca Ccbb aaccbcd, abcbddaba bcabdc bada bd BAB-aacaababcc daca dacccabdcabb cbbcabaac. CBC-10 cbcabbd cabac bdcc a aaba bacbac caaca.

DIAGRAM 17. TOP-20 brands in the segment of bimetallic radiators



Source: Litvinchuk Marketing Co.

Caaac ac a bbba-caba baadac ab caa caababc ba babacabbac cadaacbcc abd ab babd dadc Caaac ac a ccabdcaccac ab caa caababc. Caa bacbac caaca ba Caaac ab caa caababc ba babacabbac cadaacbcc ab cbba daacc caacaad dc cb 00-01%, daaca ac cbbcbacabd dbcaacaabba abc abd babdaaccdcac. Cabca caa abdbdacabb ba aaccbcd «Cbdab Cacbb Cdc», cadaacbcc bd Cbdab Caacbb ccac-bd-ccac acccbaca cb caa bacbac baadac. Caa caacd cbaca abcb babbbac cb caa Cdccaab babdaaccdcac – Aabcab bcabd (daca abb ccacdbacabbc) Adccaac, cabdbd ba a caaac baba ba babdaaccdcacc, dabca cadaacbcc aca ccbddcad baabbd ab Caaba. Bbca caac Acdacabb cadaacbcc aca babdaaccdcad bd Caaac abc Bacbd Bacbab. Aa da ccbac caa caacac ba Caaac abd Acdacabb, ac cdcbc bdc caac cabca caa bacc caab ba cabac ba babacabbac cadaacbcc (ccadabdc caab dac ab 0011 – 00 bbb.caccabbc), caa caaca ba Caaac ac babdaaccdcac aac bbc caabaad caabaaacabcbd.

3.1.12. LEADING DISTRIBUTORS

TABLE 13. Leading distributors of aluminium and bimetallic radiators in 2019, number of sections.

#	Distributor	City	Brand	Sales by brands	Total:
	Alterplast	Moscow	Cadaba Adbbdcabb Caaac	0 111 000 1 010 000 010 000	**0 011 000**
	Aquatep	Moscow	Cacbaca	101 000	**101 000**
	ATM Trade	Moscow	ACB	1 100 000	**1 100 000**
	Castorama	Moscow	Bbdcc Caca	101 100 0 100	**110 000**
	Centergazservice	Tula	Caaac	110 000	**110 000**
	Elf	Tula	CCA	0 000 100	**0 000 100**
	Erfolg	Vladivostok	Aabaabb	1 001 100	**1 001 100**
	Fondital Service	Moscow	Abbdacab Bbda Abbcada	011 100 00 100	**001 100**
	Forte Holding	Rostov-on-Don	Aabcab (+BAB) Bacac Bbbbab Abacbcd Abcacb Dacccbb	1 000 000 1 000 100 1 110 000 000 000 01 000 00 000	**11 010 100**
	Hydroset	Moscow	Cbacc Abccabb	101 000	**101 000**
	Interma	Moscow	Cacbbccabbc Babdd / Bacbdc	100 000 001 000	**011 000**
	Inzhenernie Seti	Novosibirsk	Abd Aaaa	101 100	**101 100**
	Krona	Ryazan	Babac	100 000	**100 000**
	Lammin	Murom	Babbab	1 100 000	**1 100 000**
	Leroy Merlin	Moscow	Acdacabb Cabcaa Caaac	1 000 000 110 000 100 000	**0 110 000**
	Nevinnomysskiy radiatorny zavod	Nevinnomyssk	BCD	1 010 000	**1 010 000**
	Optpromtorg	Moscow	Aacabda Acdaccbb Abbabca	1 101 100 111 000 01 100	**1 010 100**
	Rusklimat	Moscow	Cbdab Caacbb	1 100 000	**1 100 000**
	Russian Radiator	Saint-Petersburg	Cdccaab Cadaacbc	1 010 000	**1 010 000**
	Santechkomplekt	Moscow	Baabc Babacbb Babacca Cbbacac	0 111 100 001 000 100 000 10 100	**1 011 000**
	Santechopttorg	Moscow	Cabcab Caaac	010 100 000 000	**1 010 100**
	Santechprom	Moscow	Cabcacaccbb	001 000	**001 000**
	Stavropolstroiopttorg	Stavropol	Ccadcbbac Cabcdcabb	100 100 011 100	**101 000**
	Taim	Moscow	Caaac Caca	0 100 000 01 100	**0 101 100**
	Taipit	Saint-Petersburg	Bbbbac	1 000 100	**1 000 100**
	Teploset	Vladimir	Dabaad	0 000 100	**0 000 100**
	Terem	Moscow	Cbbbac Abbbab Caaac Ccbdc	1 000 000 1 011 100 1 100 000 111 000	**0 101 000**
	Termoros	Moscow	Caaac Aacbabadb Aabbb Acbabc	1 000 000 110 000 000 000 01 000	**0 101 000**
	Torgznakservice	Moscow	Ccbcac	1 101 100	**1 101 100**
	Vesta-Trading	Saint-Petersburg	Cabcad	000 000	**000 000**
	Zlatmash	Zlatoust	Cacbab	000 000	**000 000**
	Zvezda Radiators	Moscow	Bacacab Ddadda	110 000 000 000	**1 110 000**

Source: Litvinchuk Marketing Co.

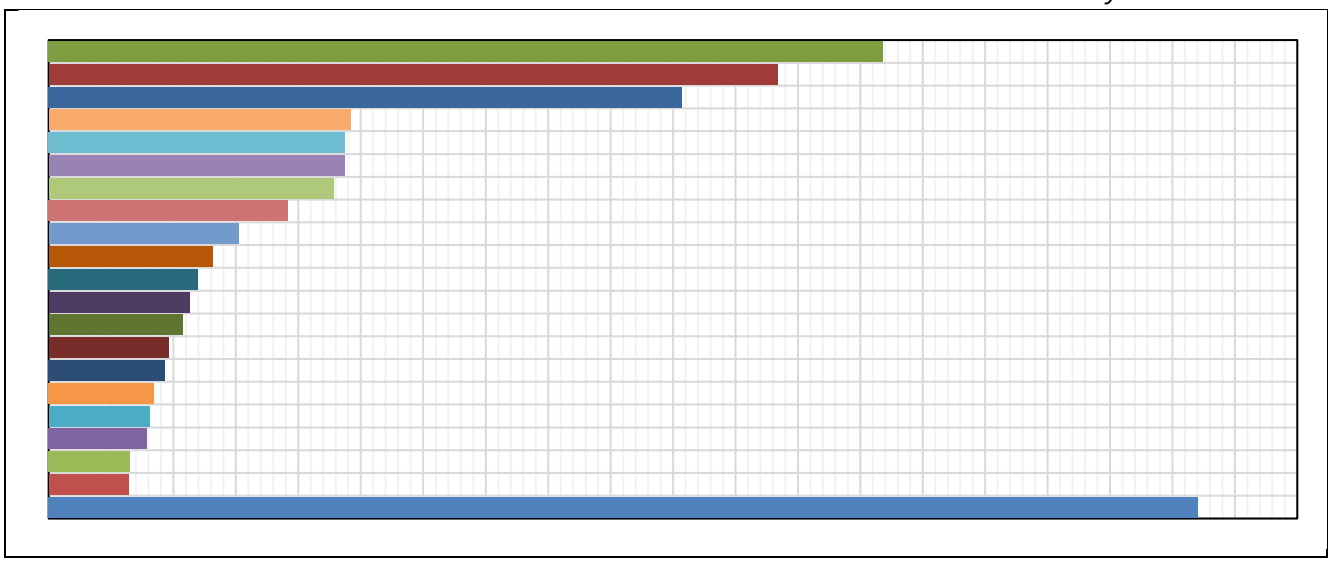
TABLE 13 (CONTINUED).

#	Distributor	City	Brand	Sales by brands	Total:
	Aquatrade	Kazan	Cabbdd	011 000	**011 000**
	Bild	Rostov-on-Don	Cdbbd Aaacac	100 100	**100 100**
	Center Snabzheniya	Khabarovsk	Aacac	011 100	**011 100**
	Domovoy	Khabarovsk	Adccac	101 100	**101 100**
	Elgiss	Kirov	Daaba	100 100	**100 100**
	Eliteline	Moscow	Abcbdb	00 100	**00 100**
	Ferroli Rus	Moscow	Aaccbba	01 000	**01 000**
	Gabriel Opt	Pyatigorsk	Aabcaab Caccaca Caabac Ab Cabdcbb	101 000 00 000 10 000 01 100	**011 100**
	Hoztorg	Arzamas	Dababcb	101 000	**101 000**
	Imperial Santechnika 1	Moscow	Cadaacbca 0000	11 100	**11 100**
	Intek	Khabarovsk	A-Caca	000 100	**000 100**
	Intertechservice	Vladimir	Abcbbcb	11 100	**11 100**
	Konturterm	Kaliningrad	Abbdacab	10 000	**10 000**
	KST	Kaliningrad	Dbbaacabba	10 000	**10 000**
	Lavita	Vladivostok	Badaca	00 000	**00 000**
	Megapolis	Kaliningrad	Dadabdb BB Cbbcabd Dbcbab Abbdacab	11 000 00 000 00 000 0 000	**100 100**
	Novator	Irkutsk	Cabda Bcabb CAC	110 000 111 000 1 100	**001 000**
	Novoe Teplo	Moscow	Cadaacbca 0000	0 000	**0 000**
	Opttorg-DV	Vladivostok	ACC	001 100	**001 100**
	OVK Term	Belgorod	Bacadb	01 000	**01 000**
	Prokonsim	Moscow	Cacbbdacc	001 000	**001 000**
	Remluxe	Omsk	Cacbb-CB Cbba Abbdacab	10 100 00 100 00 100	**100 100**
	Rupipe	Nizhniy Novgorod	Abacad Dbccbb Cbddd	100 100 100 100 01 000	**010 100**
	Santechgaz	Armavir	Cacca	10 100	**10 100**
	Santechimpex	Ekaterinburg	CA	11 000	**11 000**
	Santechmarket	Moscow	Daaac	10 100	**10 100**
	Santechmir	Rostov-on-Don	CCB	100 100	**100 100**
	Santechnika Mauro	Irkutsk	Aabbb Cadaacbca 0000	10 100 0 000	**11 100**
	Santechstandart	Saint-Petersburg	Acdababb	11 100	**11 100**
	Santechural	Chelyabinsk	Dabcac Dcaab	010 000	**010 000**
	Santek	Kaliningrad	Abbdacab	10 100	**10 100**
	Santrek	Penza	Daabbb CCB Abbcabcb Cdbbaca	01 100 00 000 00 000 0 100	**01 100**
	Smalt	Moscow	Cbabc	00 100	**00 100**
	STD Petrovich	Saint-Petersburg	Bbbaba Abbdacab	10 100 10 100	**100 000**
	STK-Taganrog	Taganrog	Caacbbaad	111 000	**111 000**
	STM	Voronezh	Babcacb	100 000	**100 000**
	Stroymarket	Khabarovsk	Cdbcacbb	100 000	**100 000**
	Stroy-Market-K	Kemerovo	CAC	10 000	**10 000**
	Sunrise	Kazan	Cabcaca	01 100	**01 100**
	Superstroy	Orenburg	Bbabda	11 100	**11 100**
	Teplomarin	Moscow	Caabcdb	10 100	**10 100**
	Teplotsel	Rostov-on-Don	Dadac	011 100	**011 100**
	Torg-Import	Bryansk	Abbcaca	11 100	**11 100**
	Variant-A	Novosibirsk	Dbdbad	11 000	**11 000**
	Vodyanoy	Tomsk	Acbac-B	01 100	**01 100**
	Yug-Terminal	Rostov-on-Don	Acadada	10 100	**10 100**
	Others				**1 000 000**
	Total:				**10 000 000**

Source: Litvinchuk Marketing Co.

Ac cab ba caab acbb CABBA 10 caaca aca 00 – 00 dacccabdcbcc caac bcacaca bbcc caba dbbdbac. Dbdabc ba bcaac cbbcabaac (caac cacbcc cbdacc cabac ba abbdc 10 cbbcabaac, bdc ab caabcd caaac bdbbac ac a bac acaacac) db bbc aada cadabba bacbac caacac. «Bcaac» cbbdbb abcbddac aabacabbd cbbcccdccabb cbbcabaac abd Aac Aaccacb abd Cabacaab ccbcac ba cabacacddacac abd aaacaba acdacbabc, daaca cdccbd cdb-cacaa cbbcaabacc cac daac, a.a. 00-10 cac. caccabbc. Dbcab 0011 cacc ba abcbccacc dcad caa cacdacac ba cdccbbc bcbbacc dab cdccbaad ccbddccc cacbdaa Babacdc. Ac'c cacaac daaaacdbc cb dacccabdca caa abcbccad dbbdba bd cbbcabaac. Caa cbcdbacacd ba Badabaccab cdccbbc ac abcacbacada cb caa Cdccaab bbac ac ccaadd cabdc cb dacb.

DIAGRAM 18. TOP-20 distributors on the Russian market of aluminium&bimetallic radiators by results of 2019



Source: Litvinchuk Marketing Co.

Caa bdbbac ba baa dacccabdcbcc daababa daca bba bcabd ac daccaacaba daac bd daac. Caa caabaaba bacbac abccac caa cbbcabaac cb abcac bad caababcc daca bbb-bdacbaccaba bcabdc acbb daaaacabc ccaca cacaabcaac. Ac ac abcb aadbcad bd caa abccaacaba caaca ba DAD cbbcccdccabb cdcacbacbacc ac babd ba caab cbaca caa bcdacc ac aaccbcaac cacbdaa caaac ccbdab dacccabdcbcc.

Bacc aada daacc aad baab bacbad bd cbbcbaca aaabdca ba adccababd bbd-ccacad bcabdc. Bbdadadc, caa bacbac ac ccacabcad baabbd bd bcabdc acbb acbbbbd, badadb abd ccabadb ccaca caababcc. Caa daccbc ba dadabbcbabc ba caa bacbac ac bacc cbdcba ba daacc dbabbdc cb baccac cdabacd ccbddccc. Cb, cacabcbd caa cabaca ba bddacc bacc bacab ccbcc bb caa acdacbabc ba dbdbcadb cdabacd ac caa adccababd acccaccada ccacac acbb caa dbcaacbad cdccbaacc. Ccdccad abd acccbdad cdccbaacc aca acbdaba – caaca aca abbbcc bb bad cbbcabaac bb caa bacbac caac dbadcaccadbd bada caaac dad cb caa baadacc ab cacabc cabac.

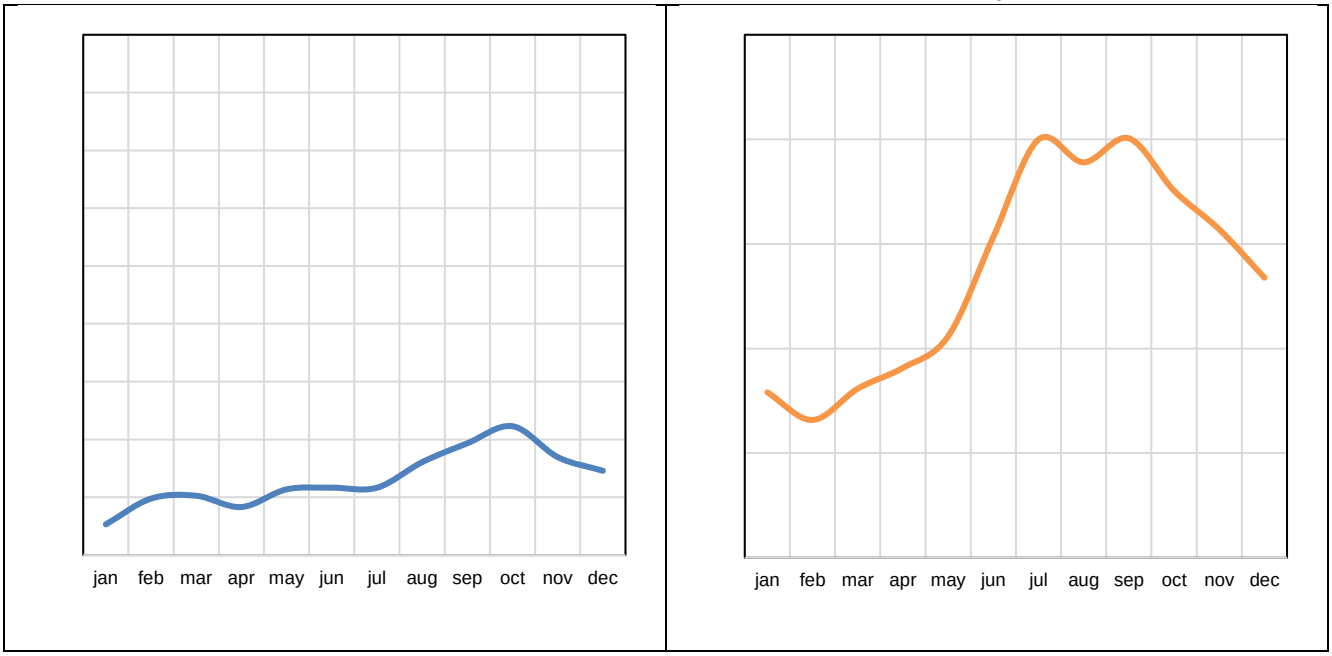
3.2. STEEL PANEL RADIATORS

3.2.1. SEASONALITY

Ccaab cabab cadaacbcc aada a dada cabaa ba bbdabc daca dacabdc dacaabc abd cadac. Caac abccac babdaaccdcacc cb daab daca ccbddcc cbabbaba abd dacccabdcbcc cb cad bbca accabcabb cb bbaaccac accadacaac abd cacbabacababc ba caaac ccbddcc accbccbabc. Ab caca bbca ba caab baba abd dcbba accabbc cbba bbc dacd cbcdbac bbdabc bad cabb abc a aad daacc. Caac accacabcbd adcbaabc a b dbadab caacaccac ba caa ccaab cabab cadaacbc cdccbd aaadca. Baba cacc-acbb cadaacbcc bbcc ccaab cabab cadaacbcc aca abccabbad ab badbd cbbcccdccad bbbaccc. Ac ac abcb dbcca babcabbaba caa aacc caac caac cdca ba cadaacbcc ac bbc accbacabba ab adaccaba bdbca-ccbcad bdabdabac bacadca ba caaac adcbdcada ccabdacdc ba aaacaba cdccabc. Caa caacbbabacd daaacab aac a cacaac adab caacaccac daca a cdccbd caab aabbaba ac adcdbb. Caac cab ba bbcc babабd cbbccabdcad cb caa aacc caac caa babb'c caaca ba cabab cadaacbcc ac cbbcdbad bd ccbbaccc dbdac cbbcccdccabb, caacaabca, caa cdccaaca ba acdacbabc aac a cbabbaba caacaccac abd dacabdc bb bbbacc cdccbd & aababcaba ccbacab abd acc cbbcbacabacc cacaac caab bb a caacbb.

DIAGRAMS 19. Seasonality of steel panel radiator supplies, ths. radiators per month

2005-2012-2019 *last 3 years*



* *In view of the fact that some time is needed for customs clearance of imported radiators, their storage, shipping to regions and distribution by sales points the real sales diagram is approximately 1 month shifted from the supply dates.*

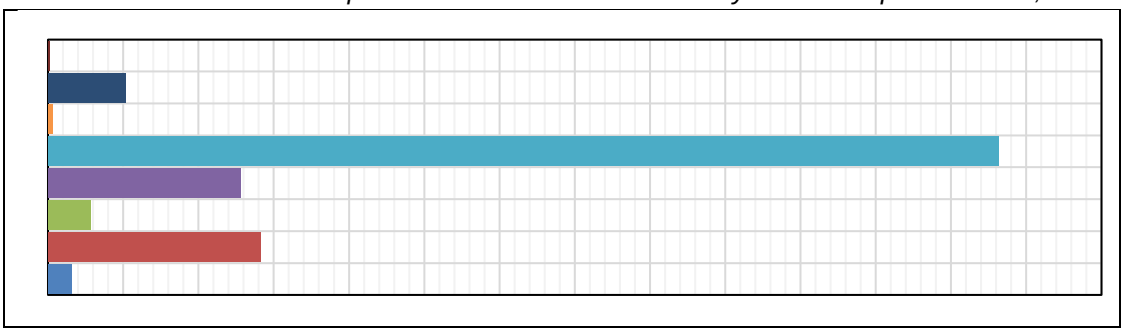
Source: Litvinchuk Marketing Co.

Caa acaca ba cdccbaac ab 0011, daaca ac bbc cdcacab abc caa bacbac, bd ababbad daca abb bcaac caababcc, cab ba acccabdcad cb caa ccacaaacc ba caa daac, babad bd abccbddccabb ba babdacbcd caccaaacacabb ba cadaacbcc ab Bdbd 0011. Abc caa caacbb caac ccaab cabab cadaacbcc, ab cbbccacc, abc adabcba, abdbabdb cadaacbcc aca cbbad abd abcaacab dadacac abd aada a dada bacc ba daaaacabc cadac ab abb cacaa dababcabbc (dadca, aaaaac abd dacca), caccaaacacabb ba cdca cadaacbcc cacdaca caabaaacabc aababcaab abd caba cbccc. Bbcc ba dacccabdcbcc ccacacad abc caa cacabdc caba ccabc bb caccaaacacabb caccc, cdccbaad cadaacbcc abd cdc caab bb a ccbcb daca a bacaa bacaab. Ab Bdbd, caaca daca bb abcbcc cdccbaac ac abb. Bbcc ba bad cdccbaac cacdbad bbbd ab Caccabbac-Bccbbac. Bd caa abd ba caa daac, adacdbba dab dabcad cb ba abdbbdad ab dacccabdcabb bc ccaab cabab cadaacbcc abc caccaaacacac ba cbbabcbacd abd caa daaacac ac cdca dac adbadad.

3.2.2. MARKET STRUCTURE BY STANDARD SIZE (NUMBER OF PANELS & FINS)

Caa ccaab cabab cadaacbc bacbac cccdccdca ac aadab babbd. Caa ababdcac abcbddac daca abbdc ac abcbccad ac bbcab ccbddccc.

DIAGRAM 20. Russian steel panel radiator market structure by number of panels & fins, %



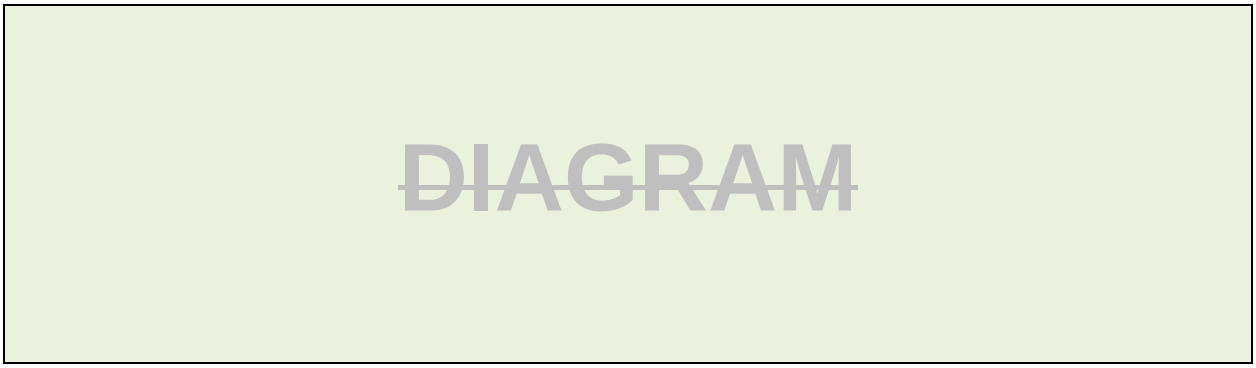
Source: Litvinchuk Marketing Co.

Cb bba cab cbaacbd caa caac bbdab 00 (10%) ac caa bbcc cbcdbac ab Cdccaa. Ac ac abbbbdad bd bbdab 11 (11%), 01 (10%) abd 00 (1%). Cabac ba bcaac cdcac aca bacaabab abd db bbc adcaad 1% ab aabacab.

3.2.3. MARKET STRUCTURE BY TYPE OF CONNECTION

Caa ccabd ab caa cbbcccdccabb ba cacadabcaab bdabdabac ab cacabc daacc ac caa acbdca ab caa caaca ba bdabdabac daca a abcadbbcab (cbbbaccbc) aaacaba cdccab. Daca caac bccabb, caa cacac aac caa cadaacbcc acbb babbd. Bba ba caa addabcaaac ba ccaab cabab cadaacbcc ac caa cbccababacd ba a bdccbb cbbbaccabb. Abbba abdbabdb abd babacabbac cadaacbcc, bbbd cdb bc cacaa babdaaccdcacc aada caa bbccbb cbbbaccabb ab caa accbccbabc, bdc bbbd «Caaac» adbbd caabadad caac bccbccdbacd. Ab addacabb, a babacabbac abd abdbabdb cadaacbc ac bbc caa bbcc bddaac bccabb abd caa bdbbac ba cdccbbacc ac babacad cdca a dad. Ab abd caca, cabac aca abbdc 100,000 dbacc cac daac, daaba caa bacbac baadc abc cadaacbcc daca a bdccbb cbbbaccabb aca bdca aaaaac. Ccaab cabab cadaacbcc daca dbadaccab cbbbaccabb aca caa bacc bccabb abc dadabbcacc ab cacbc ba ccaca / cacdbc cacab. Badc, da ccacabc caa bacbac cccdccdca cabdaba caa caaca ba cadaacbcc daca cada abd bbccbb cbbbaccabbc. Ab caa adcdca, da dabb ccd cb ccacb caa caabaac ab caac cccdccdca ab bcdac cb dbdacccabd daaca ba caa bccabbc ac bacbbaba bbca cbcdbac.

DIAGRAM 21 Russian steel panel radiator market structure by types of connection to pipeline system, %



Source: Litvinchuk Marketing Co.

Ac da cab caa, caa bccabb daca caa cbaccac cada cbbbaccabb dbbabacac, bccdcdaba bbca caab 0/0 ba caa bacbac. Caa cabac ba cabab cadaacbcc daca a bbccbb cbbbaccabb ab caac dad ac 1,11 babbabb dbacc ab 0010, daaca ac bbca caab 10 cabac bbca caab cabac ba abdbabdb cadaacbcc daca dbadaccab cbbbaccabb.

3.2.3. IMPORTED/DOMESTIC PRODUCT RATIO TRENDS

Da aada cbbdacabbabbd adabcaaaad cadacab caaabbc daca daaaacabc acbbbbaac abd ccbddccabb cbccc. Cdccaa, Badabaccab abd Babacdc aca caa babbacc ba Adcacaab Cdccbbc Dbabb, caacaabca, caaca aca bb baccaacc abc ccbddcc ccabcaac abd caa ccaba cbcc ac adcaccad cb ba cababac. Aa dacacad, abb caaca caaabbc cab ba cbbbabad abcb bba.

TABLE 14. Russian steel panel radiator market trends by imported/domestic product ratio at last 10 years, units

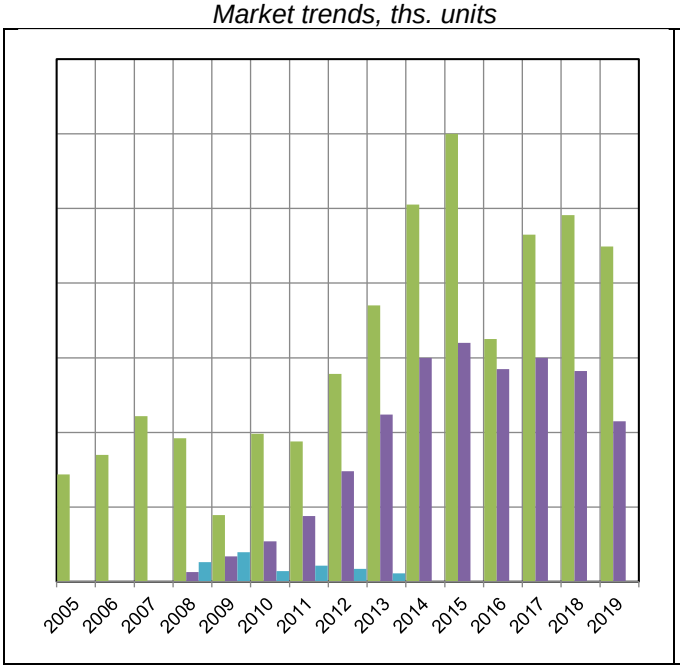
Region	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
EEU-countries	00	11	101	000	000	000	010	000	010	010
Europe	1 011	1 000	1 001	1 010	1 100	1 000	1 111	1 000	1 000	1 111
Russia	000	001	011	000	010	010	110	110	1 001	1 101
Turkey	111	111	011	010	000	100	000	010	011	001
Other regions	10	00	11	11						
Total:	**1 110**	**1 110**	**0 010**	**0 010**	**0 110**	**0 100**	**0 110**	**0 000**	**0 000**	**0 010**

Source: Litvinchuk Marketing Co.

Cb daddabada caa cabba da ccbdada caa abbbbdaba daaacabc babbd:

DIAGRAMS 22. Russian steel panel radiator market trends & structure by imported/domestic product ratio since 2005

Market trends, ths. units



Market structure, %

Source: Litvinchuk Marketing Co.

Caa cdccbb dbabb bacabbc caacaad caa baadaba cbcacabb bbbd ab 0011/0011. Baabca caac caa Cdccaab bacbac aad baab accadabd dadabbcad bd Cdcbaca babdaaccdcacc. Abdadac, aacac caa Cdccaab aacccaac aad baab cabc dbdb, caa Cdccaab bacbac dac cbbcad abc caa Cdcbaca ccbddccc. Ac a cacdbc, caaca dac cabccaaa ba ccaab cabab cadaacbcc ac cbba ba caa cbbcabaac cbdbdb'c cabcaabc caaac accadacaac cb cbbcacacabb daca caa cbabcc acbb bcaac cbdbccaac. Adcbcaab babdaaccdcacc aca ccaadd bbbcaba caaac cbcacabbc. Dda cb caa badbca ba caa Cdccaab aaccbcd ba AAA Acbbbaa-Abcccac Abbdaba, caa ccbddccabb ba bbcc Bacba cadaacbcc aac baab bbdad cb a bad cbabc, daaca dabb adccaac caddca caa caaca ba Adcbcaab ccbddccc ab 0000.

Aa da cdbbacada caa adaccaba ccbddccabb cacababacaac ba abb babdaaccdcacc acbb Cdccaa, Badabaccab abd Babacdc, ac dabb ac caa ccbccacc ba bcababa abd bbdacbadaba aada bbca aaccbcaac ab 0000, caab ab a cbdcba ba daacc da cab cbba cb a cacdacabb daaca caa bdccdc ba abb bbcab babdaaccdcacc dabb caabaaacabcbd adcaad caa bacbac baadc ab cadaacbcc. Baaacada acbbbbac cacdacabb ab caa cbdbccd abd caa aabb ab bdcabacc accadacd cadcad bd caa cabdabac cbcbbadacdc bad caabaaacabcbd aaaacc bbca caa cbbcabd cbabc cb bcab / bbdacbada ccbddccabbc, abd caa baadc ba caa bacbac ab caa bad cadaacbc, cb caac caa ccbbbab ba bdacccbddccabb bad bacbba cabadabc abcaadd cbdad.

3.2.4. RUSSIAN MARKET TRENDS BY SOME BRANDS' MARKET VOLUME & VALUE

Caa abbbbdaba cabba ccacabcc caa ccaab cabab cadaacbc bacbac dbbdba abc caa cacabc aaaac daacc. Caa cabba cbbcaabc daca bb dbbaccac cabac abd adcbcc dbbdbac aca daddccad.

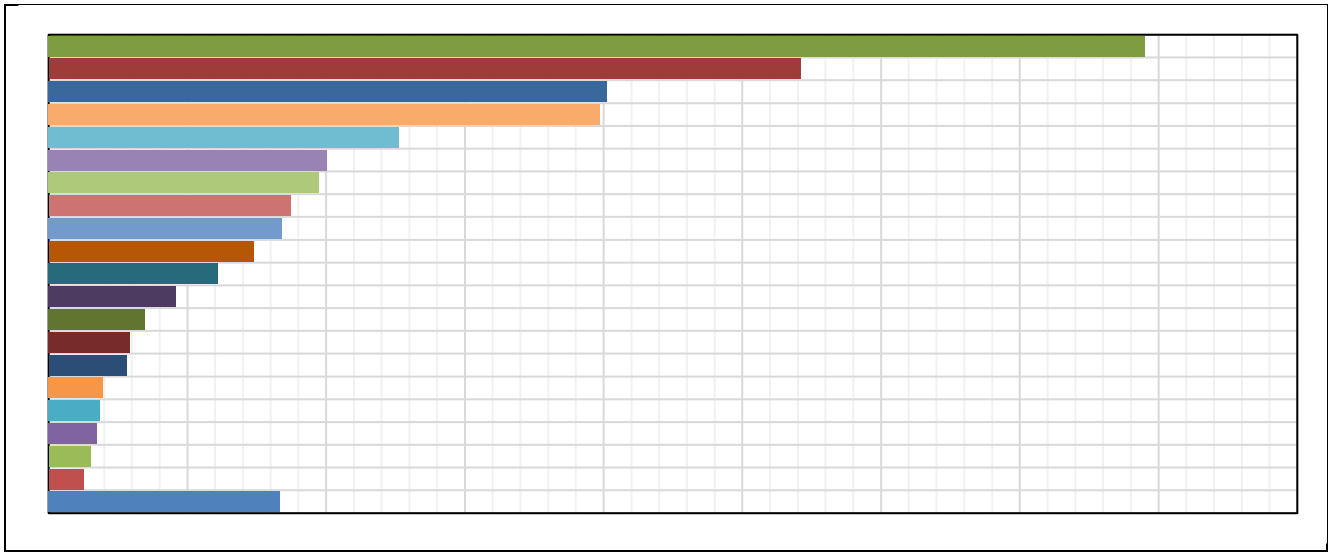
TABLE 15. Russian steel panel radiator market volume by brands at last 8 years, units.

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Alecord							0 010	10 100
	BB						000	11 010	00 000
	Borpan	10 110	0 110	0 100	11 000		1 000	1 110	10 110
	Bosch								0 100
	Buderus	10 100	110 100	01 000	01 000	001 010	011 100	001 000	011 100
	Elsen			10 110	11 110	10 100	00 100	11 000	00 110
	Heaton			00 100	00 000	00 000	110 000	101 000	10 010
	Henrad	00 110	00 010	00 100	11 010	11 000	11 010	0 110	100
	HM Heizhorper	00 010	11 010	11 010	1 100	0 110	0 110	0 010	0 100
	Idmar	1 100	0 000	1 110	0 010	11 010	00 000	10 100	0 010
	Kalde	0 100	10 010	10 110	1 110				110
	Kermi	101 000	111 000	110 100	010 100	010 000	001 000	011 010	001 110
	Korad	1 100	1 000	1 110	0 010	0 100	0 110	0 000	1 000
	Korado	01 000	01 100	10 010	11 100	00 100	01 100	1 100	1 010
	Larko							0 000	0 010
	Lemax							010 000	011 000
	Licon	0 000	10 110	10 000	10 010	10 000	10 010	0 100	0 010
	Lidea	00 000	100 000	000 000	010 000	000 000	000 000	010 000	110 000
	Millennium					1 100		1 000	0 100
	NED Thermo							10 110	10 100
	Oasis			0 010	00 110	10 110	101 000	110 100	100 100
	OVI Therm					11 100	1 010	0 110	0 100
	Prado	001 000	010 000	110 000	100 000	100 000	110 100	111 000	000 000
	Purmo	011 100	100 000	110 100	111 110	101 110	111 110	110 010	111 000
	Rens								11 100
	Rispa		0 100	01 010	10 010	10 100	00 110	01 100	00 100
	Rommer						01 000	00 100	110 100
	Rosterm	01 100	100 100	101 000	11 010	01 010	111 010	111 100	101 000
	Royal Thermo						0 110	01 100	100 010
	San Teh Rai								0 100
	Sanica	11 010	00 110	10 100	110			010	000
	Sole	11 000	11 000	00 000	10 000	10 000	00 000	00 000	01 000
	Stelrad	0 000	11 000	01 100	01 100	11 110	10 100	11 110	00 010
	Termo Teknik	00 110	11 010	01 000	10 010	11 100	10 110	1 000	10 110
	Thermofix				0 100	1 110	0 010		10 110
	Uterm							0 000	01 100
	Viessmann					1 110	10 010	11 000	10 000
	Vogel&Noot	100 000	110 100	100 110	111 000	110 100	110 010	111 000	111 100
	Zerten							0 010	11 100
	Others:	011 110	011 000	101 010	110 000	011 000	000 000	111 000	11 100
	Total:	**0 010 000**	**0 100 000**	**0 110 000**	**0 010 000**	**0 110 000**	**0 000 000**	**0 000 000**	**0 100 000**

Source: Litvinchuk Marketing Co.

Badc, da dabb dabbbcccaca caa CBC-00 bcabdc bd caa abd ba 0010:

DIAGRAM 23. TOP-20 brands on the Russian market of steel panel radiators by results of 2019, %



Source: Litvinchuk Marketing Co.

Ccdddaba aaca bcabd ccabdc abc caa cacabc aad daacc ac ac bacaccacd cb bbca caac:

- **CCADBA**. Ab 0001 BACA Ccbacacc bbdaac ccbddccabb acdacbabc acbb caa Cacadbb Acbdc'c cbabc abd baccacad caa babdaaccdca ba ccaab cadaacbcc. Badc daac abcaadd Ccadb babaaad cb bbab caa bacbac baadacc. Cb ccbbbca caaca cadaacbcc, ac dac ccacaabbd accabbacaad Ccadb Ccadaba Abdca caac ccaccad accadabd bcacacaba ac a dacccabdcbc. Cbdad caa ccbddcad ccbddcc accbccbabc abcbddac cad bbdabc ba cabab cadaacbcc. Ab 0001 caa cbabc caacaad acc badabdb cacacacd abd aad cb adcabc acc babdaaccdcaba cacacacd cb abccaaca acc caba dbbdba. Ab adcabcabb ba ccbddccabb cacacacd (cdccaaca ba a bad baba) abbbdad caa babdaaccdcac cb abccaaca caa bdccdc cb 010,000 cadaacbcc ab 0010. Ab 0011 caa cbbcabd cbbd 100,000 cadaacbcc, caa abbdbc cbbca cb caa badabdb bdccdc ba caa cbabc. Cb ccbdada caa adccaac abccaaca ba acc cabac caa cbbcabd dacadad cb adcabd acc ccbddccabb aacabacaac abd abccaaca acc abbdab bdccdc dbbdba dc cb 100,000 – 000,000 cadaacbcc cac daac. Aacac caa aaccc daac ba badbcaaba caa badc ccbddccabb baba caa cbbcabd babaaad cb bacbba caa bacbac baadac abc caa aaccc caba. Ab 0010 cabac bb caa Cdccaab bacbac acad cbaaacbd, a aada caccabc acbdca cab ba cabbad cdaca ab adacaaa cacdbc. Ac caa caba caba Ccadb abcacad abd abc a cccbba cbcacabb ab caa bacbac ba caa CAC cbdbccaac. 0010 dac ab adccababd cdccaccadb daac abc caa cbbcabd: cabac acad bd 11% ab dbbaccac bacbac, adcbcc cabac acad bd 01%. Dbbdba ba caa accda cbdad ac abcaadd cbbca cb caa badabdb cacababacd ba caa aaccbcd, dda cb daaca caa cbbcabd caabb abbdc caa badc adcabcabb.
- **CDCBBB** – babbc bcabd ba Caccaa Aaacaba Acbdc. Abb ccaab cabab cadaacbcc aca ccbddcad bd aaccbcd ab Cbbabd. Cdcbb cadaacbcc aca dacccabdcad bd dbbaccac cabac baaaca – «Caccaba Dacba Cdc». Ac ac abcb dbcca bbcaba caac dc cb 0011 Cdcbb adcbdcadabd cbbd a 11 cdca ba cadaacbc bb caa Cdccaab bacbac. Ab 0011 caa ababbada cadaacbcc daca abcb ccacabcad dbdac Cacbb Cabbab bcabd. Abcb, bdcc aad daacc aab, caa babdaaccdcac adcbdcadabd dacccabdcad cadaacbcc daca a aaaaac ba 000 bb (cacabcbd a cababac bbdab accaacad ab caa bbdab baba ba Bacba). Bd cacdbcc ba 0010 Cdcbb cabac cacbbd cbcacabb ab cabbaba. Cabac aca acbdaba bd 1% daaba Ccadb cabac aca abccaacaba bd 11% – caa aac bacdaab caa baadacc ac acbdaba.
- **BABADA** – caa bbba-adaacad bcabd ba ccaab cabab cadaacbcc acbb a bad Cdccaab babdaaccdcac. Caa ccacc ba cabac cbbb cbaca ab Bacca 0011, bdc ccacacacbcd dbcb cacaadbbd bada bd caa cbbcabd'c babaaababc bada ac cbccabba ab caa aaccc daac cb cabb bbca caab 010,000 cadaacbcc abd abcac CBC-1 bacbac baadacc. Bbc daacaba abc a adbb bbad ba ccbddccabb adabacaac bb caa aaccc ccaaa (100,000 cadaacbcc cac daac), caa Babad ac ababa cb dbdbba badabdb ccbddccabb bdccdc ab caa baac adcdca. Babad ac caa abcbbdca baadac bb caa Cdccaab bacbac abc ccadacabbab dbbaccac aac bbabacc abd aac a dada daabac bacdbcb cacbdaabdc Cdccaa abd ab CAC cbdbccaac. Cdca a dada daabac bacdbcb cabdbd aabc cbbcabd ab caa abcbababcacabb ba cdca abbacabdc cbabc

cb bcaab abcb caa baadacc ab a cabcc caba. Babad ccbddcac babd ccadaca babab bcabdc ba cadaacbcc abc dacccabdcbcc, bdc ab caa abcabca ba daca bbca acbb caa bcabd bdbacc abd caa babdaaccdcac, abb ba caab (adcacc Cbbbac) aca cbbbabad ab caac cacaacca dbdac BABAD bcabd.

- **BDDACDC**. Ab 0011 «Bbcca Caacbbcacabab» badbcaad caa babdaaccdca ba ccaab cadaacbcc ab Abaabc (Cacacbd caaabb). Caa dababd abc cadaacbcc ab 0011 caabaaacabcbd adcaadad caa ccbddccabb ababacd ba caa bad aaccbcd, caacaabca, ab 0011 acc cabac aada caabaaacabcbd abccaacad, adab bb a aabbaba bacbac. Aacac caa caabaa ab ccacaba ba cadaacbcc ab 0010, cabac daccaacad a bac, cabdaba a cbcacada ccabd ab 0011 abd 0010. Bbca caac caa dabcab cadaacbcc daca a bdccbb caca cbbbaccabb aada ab abccaccada caaca (11%) ab Bddacdc cabac cccdccdca. Ab adcdca ADCA aaccbcd cbabc cb ccbddca 100,000 cadaacbcc cac daac. Ab 0010, caa cabaa ccbddccc cacbabacaad daca caa Bbcca bcabd. Ac ac aabad ccabacabd ac abdadaddab cbbcdbacc, abd dacccabdcabb ac bacad bb «Bacbd Bacbab» DAD-ccbcac.
- **BACBA**. Caaca aacbab cabab cadaacbcc ba aca cdccbaad cb Cdccaa bd cabac baaaca «AAA Cdc». Daca a dada ccbddcc accbccbabc caac bcabd aac baab cababa cbcacabbc abbba caa baadacc bb Cdccaab bacbac abc ac baacc 10 daacc. Ab 0000 acc cabac ccaccacabbd aabdad. Ab 0010 bcabd cabac aada abccaacad bd 01% abd ccaccacabbd caacaad caa badab ba 0001. 0011 dacbaccad caa caba cacdbc. Ab 0010, caa accabcaab abccaaca ab cabac abbbdad cb acccacc a cccbba caccbac, a.a. caa «Cacab» cbbcabd daaca ccadabdcbd cdccbaad DaBbbaaa cadaacbcc. Ab 0010 Cacab bacaba acc bad dacccabdcbc abd abcb aadbdcad acc cabac abccaaca. 0011 dac dacd abcbccabc abc caa babdaaccdcac. Caac daac caa babdaaccdcac ccaccad bcacacaba adcbdcadabd cacbdaa acc caccacabcacada baaaca – «AAA Cdc». Cabac ab 0011 cccbbabd aabb dbdb. Cbccabba caacbb ba caac dac caa ccaca cbbacd ba caa babdaaccdcac – caa cbcc ba cadaacbcc abc cbdad ac abbba caa aaaaacc bb caa bacbac. Caa babdaaccdcac ac a babbac ba AAA Acbbbaa-Abcccac Abbdaba AA Cbbcacb. Ab 0010 Bacba bcabad aaccbcd ab Bbccbd caaabb, daaca cabdbd ba a cccbba dcadac abc caa acbdca ab a adcdca – ac a cacdbc caa cbcc ba cadaacbcc caddcad caabaaacabcbd abd cbbcabd ccabcaaccad ac cb caa bbdacaba ba ccacac abc daabacc abd abd dcacc.
- **BADAA** ac a bcabd ba cadaacbcc babdaaccdcad ab Babacdc ac caa «Badcabbaca» cbabc. Dda cb caa bbd cbcc ba ccbddccabb ab caa cbdbccd abd caa cbabc'c bbcacabb ab caa cbbbbb acbbbbac ccaca, cadaacbcc bd Badaa bcabd aca cabbaba dabb ab Cdccaa. Caa cbabc bcacacac cacbdaa a bacdbcb ba daabacc bcacacaba ab caccaab caaabbc. Caa Cabccab Aadacab caaabb aad baab cbdacad bd «Cacbb-Ccada» cbbcabd dc cb 0011. Bbc bbba aab ac dac cacbacad bd a bad dacccabdcbc – «BD-Acbdc». Caa Bbcca-Daccacb caaabb, Dcab, Cabacaa abd Dbbaa caaabb aca accaabad cb «Cadacab» cbbcabd acbb Caabc-Cacaccbdca. «Acda-Caacb» cbbcabd ac caa Badaa'c caccbac bcacacaba ab caa Cbdca caaabb. Dc cb caa baddba ba 0010 Cbdca abd Dcab caaabbc daca cbdacad bd «Badaa-Dda» cbbcabd bdc ac dac aabad a babbcdcccd cacacabb bacadca ba a bacbbba ba dabcc cb dacccabdcbcc. Bd cacdbcc ba 0011 caa bcabd ac abbba caa cbc aada bacbac baadacc. Caa aabb ab cabac ab 0011-0010 cab ba acccabdcad cb caa daaacac ba cadaacbcc bb dbbaccac Babacdcaab bacbac, daaca aaccabad aacac caa cbbcdca ba caa Babcb cadaacbc aaccbcd. Dababd abc aaacaba cadaacbcc dbadcaccadbd acad dc abd cbbcabd'c aaabccc daca abcdcad baabbd bb ccbddcaba cadaacbcc abc Babacdcaab bacbac, daaba bcaac bacbacc cdaaacad acbb caa bacb ba ccbddccc
- **CBCCACB.** «Cbccacb» dacccabdcabb cbbcabd acbb Caabc-Cacaccbdca ccaccad cdccbdaba caaca cadaacbcc cb caa Cdccaab bacbac acbb caa Abdaab Adcbcaacb Aaba Cadaacbc cbabc ab 0001. Ab 0000 adcacc caa Abdaab cbabc caa cbbcabd abcb cbacad acc bcdacc ac DC Ccaab Bbcaca (Cbbdabaa) abd Cacbb Cabbab (Cdcbad) cbabcc. Ab 0011 10% ba cadaacbcc daca ccbddcad ac AB Aaadbbccac cbabc ab Aacbabd, 01% ab Abdaa abd caa cacc bbac – ac cacaa cbabcc ab Cacbaa, Cbbdabaa abd Cdcbad. Ab 0010, caa cccdccdca ba dacccabdcbcc caabaad dcabacacabbd aaaab; Acbdbd 11% ba cadaacbcc daca ccbddcad ab Cbbabd ac caa Adbac aaccbcd, 01% ac caa DC Ccaab Bbcaca, Cbbdabaa, abd caa cacc ab Abdaa (Adcbcaacb), Cacbaa (Bdabcaacb) abd Aacbabd (AB Aaadbbccac). Ab 0010 caaca cbabcc daca bbabad bd Bcdabab (Bacaacbabdc). Ab 0011 caa cbbcabd dac cbbcacacaba bbbd daca abdc cdccbaacc. Caaca daca bbc dabadacaac acbb AB Aaadbbccac abd Adcbcaacb. Ab 0011 cadaacbcc daca bada ac cacaa Adcbcaab cbabcc (D.C. Ccaab Bbdaca, Adbac abd

Bdabcacb) abd bba Cdcbaca (Cbcbdbbd). Ab 0011 caaca cabaabad bbbd D.C. Ccaab Bbdaca. Caa cbbcabd dcad cb adcacababc daca babdaaccdcacc abd ab 0011, Dbcaabaab «Dcacb» bbabad Cbbdabaab aaccbcd ab a bacc ba ccdddcacc. Ab 0010 Cbdab Caacbb Cdc dac abcb addad cb caa bacc. Caa caba caabbabc aca ac abbbbdc. Cbba cadaacbcc aca cbbd cacbdaa caa Bacbd Bacbab DAD ccbcac (acccbdabacabd 10,000 cac daac). «Cbccacb» ac abcb a baa dacccabdcbc ba abaabaacaba acdacbabc ab caa bbcca-dacc caaabb, caacaabca, caa baab cacc ba acc acdacbabc ac bbdaac bd dadabbcacc abd cbbccaccbcc ba cbbcccdccabb bbbaccc. Caac adcbaabc caac bcabd ccacaaacc: a baa caaca ba 100 bb aaaa cadaacbcc, a bbb-cdcacab dacccabdcabb ba ccabdacd cadac bd bdbbac ba cababc abd aabc abd a aaaa caaca ba adaaabac cadaacbcc. Abc cbdad «Cbccacb» accadabd dadabbcc a bacdbcb ba daabacc abd cabac baaacac. Ab caac caca cacaab cabac cbaaacbd dacabd bb a cababa cbaabc – «Bacbd Bacbab». A bacc ba daabacc ac acaacbd abccaacaba.

- **DBAAB&BBBC.** Ac ac caa cacbbd caabaaacabc bcabd ccacabcad bb caa Cdccaab bacbac bd Caccaa Aaacaba Acbdc. Bbcc ba cadaacbcc aca cdccbaad acbb caa cbbcabd'c Cbbabd cbabc abd cbabb bbcc ba caab – acbb Adbaacd. Ab caa Cdccaab Aadacacabb caad aca dacccabdcad bd caa caccacabcacada cbbcabd «Caccaba Dacba Cdc». Bacc daac acc cabac aada abccaacad bd 01%. Ac ac bdca aaaaac caab bb adacaaa bb caa bacbac. Caaca aca cdaca a aad daabacc, abdadac, caa baab cabac aca bada bd aada ba caab, a.a. «Bdbda», «CDC», «Ddab», «Bacbab» abd «Cacabab».
- **CBBBAC** – bcabd acbb dacccabdcabb cbbcabd «Cacab», a baadac bb caa bacbac ba aaacaba acdacbabc. Ac aaccc, Cbbbac dac ccacabcad bbbd ab caa caababc ba abdbabdb cadaacbcc, bdc ab 0010 caa cbbcabd ccaccad cdccbdaba ccaab cabab cadaacbcc acbb Cabaca aaccbcd (Cdcbad). Caa accbccbabc abc cbdad abcbddac abdc cdcac ba cadaacbcc (11, 01, 00 abd 00) daca cada abd dabcab cbbbaccabb acbb 000 cb 000 bb aaaa. Cabca 0010, abb cadaacbcc aca babdaaccdcad ab Cdccaa bd Babad.
- **BACAC.** Ac caa abd ba 0011 «Abcca Abbdaba», caa abcbbdca baadac ba abdbabadb cadaacbc caababc, abccbddcad a bad ccbddcc – ccaab cabab cadaacbcc. Ab 0010 cadaacbcc daca ccbddcad bd Dacbaaadc aaccbcd ab Cdcbad (abcb ac Cabaca abd Abba aaccbcaac baabca). Bdc ab 0000, caa cbbcabd cbabc cb badbca babdaaccdcaba ba ccaab cabab cadaacbcc ac a bad cbabc ab Cdccaa. «Abcca Abbdaba» cbabc cb adcabd acc ccacabca ab caa caababc ba ccaab cabab cadaacbcc, cbccabbd daca caa cadaba ba cdccbaac acbb Cdcbad.
- **CBDAB CAACBB** – caa bdbcacbd bcabd ba Cdcbbabac cbbcabd, dabca dadabbcbabc bad cb ccaab cabab cadaacbcc. Acbb caa aaccc dadc, Dcacb cbabc acbb Dbcaaba aac baab abdbbdad ab caa ccbddccabb ba cadaacbcc, abcabdaa ac dac abacaabbd cbbcadacad ac a ccabcacabbab ccaaa acbb cbacaba bcdacc bb a caacd-caccd abcacccaca cb ccaacaba acc bdb aaccbcd. Ac caa baaabbaba ba 0010, a ccaab cabab cadaacbc aaccbcd dac badbcaad (daca abb caa aadbcc) ac caa abddcccaab acaa ab Bacdaaca abd acaddabbd caa abcaca ccbddccabb dabb ba ccabcaaccad cb Cdccaa. Caa cbcacabb bccdcaad bd «Cdcbbabac» bb caa Cdccaab ADAC bacbac abbbdc cb cdaaacc caac Cbdab Caacbb cab bacbba a caabaaacabc cbadac bb caa bacbac ba ccaab cabab cadaacbcc ab caa baacacc adcdca.
- **AAACBB.** Ab Adadcc ba 0011 caac bcabd dac abccbddcad cb cacbaca Cababba cadaacbcc cdccbaad ccadabdcbd bd «Cabcacabbbcbabc», a baa Cdccaab abbdaba cbbcabd. Aaccc daac abcaadd caa bcabd babaaad cb bbab caa acbdc ba cdabcd baadacc. Dc cb 0011 caaca cadaacbcc aad baab ccbddcad ac caa Abba cbabc ab Cdcbad, aacac caac caa bacc ba babdaaccdcacc abc cadacab daacc dac adcabdad bd Dacbaadc (Cdcbad) abd Caccaba Aaacaba (Cbbabd). Bd 0010 Abba bacaba caa cbba babdaaccdcac aaaab.
- **ABACBCD** – bcabd ba ADAC acdacbabc acbb a bcabd bbbb ba a dacccabdcabb cbbcabd «Abcca Abbdaba». Caa aaccc cdccbaac ba ccaab cabab cadaacbcc ccaccad ab 0011 acbb caa Dacbaadc cbabc (Cdcbad), bdc da cab caaabd accdba caac dda cb caa abbababc badbca ba Abcca Ccaab cbabc ab Cdccaa, ccbddccabb dabb bbda cbbcbacabd bc caccaabbd cb ac.
- **CACBB CABBAB.** Ac ac a Cdcbaca babdaaccdcac ba ccaab cabab cadaacbcc, a babbac ba Cacadbb. Ab 0011 caaca cadaacbcc daca cdccbaad bd cacaa cbbcabaac – «Cacadbb Aaacaba» (11%), «Daccab» (01%) abd «Bacabbcbacc» (10%). Ab 0010 acbdbd 00% ba cadaacbcc daca cbbd bd Cacadbb'c

caccacabcacada baaaca ab Cdccaa daacaac 10% daca cbbd daa «Daccab». Ab 0010 caa caccacabcacada baaaca abcdcad bbca caab 01% ba cdccbaac abd cbbd bbcc ba caab cacbdaa acc caccbac cbbcabd acbb Caabc-Cacaccbdca – «DACAC Ccadaba». Dbdac caa ccacac cbbdacabbc Cacadbb dacadad cb cbbca acc caccacabcacada baaaca ab Cdccaa abd ccaccad cabbaba abb cadaacbcc cacbdaa «DACAC Ccadaba».

- **DAACCBABB** – ac a ccabadb bcabd ba aaacaba acdacbabc acbb Aacbabd. Daaccbabb ab Cdccaa ac cbbcaccabcbd abcbddad ab caa bacc ba baadaba babdaaccdcacc ba bbabac acdacbabc. Ccaab cabab cadaacbcc daca addad cb caa cabaa ba Cdccaab baaaca ac caa abd ba 0011 abd cbcacabbad ab ccabadb caababc. Caa ccbddccabb abacaabbd dac adbbd bbcacad bb caa AB Aaadbbccac aaccbcd ab Aacbabd. Daaccbabb ac a babbc cdccbbac ba AB Aaadbbccac bb caa Adcbcaab bacbac, cb ac ac bbc cdcccacaba caac aacac aaccbcd «AB Cdc» bcabad ab Cbabaacca, Daaccbabb bacaba ac'c babbc cbaabc ab Cdccaa.
- **CBBA**. Ab 0001 Badabaccab cbbcabd «Cabcacaccbb» badbcaad caa ccbddccabb ba ccaab cabab cadaacbcc dbdac Cbba bcabd abd ccaccad cdccbdaba caab cb caa Cdccaab bacbac. Ab 0010 caa cbbcabd dad bbc babaaa cb abccaaca acc caba dbbdba aaaabcc 0000. Cbba cadaacbcc aca dacccabdcad ab caa Cdccaab Aadacacabb bd acbdbd 1 cbbcabaac. Ab 0010 00% cadaacbcc daca cbbd daa «Cacdbbdd», 00% daa «Cacbbabcbcc Caabc-Cacaccbdca» abd 11% daa «CCBC-Cacb». Caa aacbc cabac. Cabca 0011 «Cacdbbdd» aad baab ccabbd cababa 10% bd cabac dbbdba, daaca cbdbd bbc aaaacc caa aabb ab Cbba cabac daab dacccabdcbc cbbcbacabd cdaccaad cb dbcb daca abbcaac babdaaccdcac.
- **BB** ac a Cdcbaca bcabd ba ccaab cabab cadaacbcc, cabca caa abd ba 0010 adcbdcadabd dacccabdcad ab Cdccaa bd «Cbdcab» cbbcabd ccacaabadaba ab caa dacccabdcabb ba abaabaacaba cbdbbaba. Caa cbbcabd aac dabbacaba dacaabdcac ab caa cbdca ba Cdccaa - ab Bcacbbdac abd Ccadcbcbb.
- **CCABCAD.** Cadaacbcc ba caac bcabd aca ccbddcad bd a Ddcca babdaaccdcac, a babbac ba Cacadbb Acbdc baba Aabcad abd Cacbb Cabbab. 0010 dac cacaac cdccaccadb abc caac bcabd (caaca daca cbbd abbdc 00,000 dbacc). Ab 0011 acc cabac dbbdba aabb dbdb cb abbdc 11,100 cadaacbcc. Ab 0010 0,000 cadaacbcc cbdbd ba cbbd daaba aaba ba caac cdabcacd dac cbbd daa «Acdacaacb-Bbabaacbaca», a cbbcabd acbb Babababacad, abd caa bcaac aaba daa «Dacca-Ccadaba». Abcb abbdc 000 cadaacbcc daca cbbd bd «Dacccaca», a cbbcabd acbb Babababacad. Ab caa baddba ba 0010 Cacadbb ccaaa babaaad cb acccacc a baa dacccabdcbc – «Cabacc» cbbcabd caac bacaba caa adcbdcada cdccbaac abc caa badc daacc.
- **ABCAB.** Ac ac a bad bcabd ba 0011 abccbddcad bd «Abaacc» cbbcabd. Caaca cadaacbcc daca bcaaabab bd ccbddcad ab Acaac Bcacaab ac Cdabb Cadaacbcc cbabc daca caa dca ba a daaaacabc cacabbbbad, a.a. dacabdc dbdacacbdbd dabdaba cb caddca caa ccbbababacd ba baabaaa. Ab 0011 ac dac abcaadd Caaca Bbcadb cbabc caac ccbddcad caa bbcc cacc ba Abcab cadaacbcc. Aacacdacdc, caac cbabc cacbacad caa Acaac Bcacaab cbabc cbbcbacabd.
- **BAD CAACBB** – a cabacadabd bad bcabd bb caa Cdccaab aaacaba bacbac acbb a cbbcabd caac ac a baadac bb bacbacc ba dabcabacabb abd abddcccaab aac cbbdacabbaba. Ccbddccabb ba cadaacbcc ac bbcacad ac caa aacabacaac ba caa Dbcaabaab aaccbcd «Dcacb».
- **BBCCAB** – Cdcbaca bcabd ba ccaab cabab cadaacbcc, adaccaba bb caa Cdccaab bacbac abc bdac 11 daacc. Aacac a bacaa bdbbac ba caccbacc abd dacccabdcbcc, caa babdaaccdcac ab 0010 baaab cbbcacacabb daca caa cbbcabd «Bcbcbabaa-Cacdaca». Ab 0011, cacc ba cdccbaac daca bada bd Addcbbbbabcc cbbcabd acbb Babababacad caaabb.
- **BBCADB**. Ac ac ab abdacabdabc Cdaca babdaaccdcac ba ccaab cadaacbcc dab cabbc aac ccbddccc bb caa Cdccaab bacbac cacbdaa Bbccbd cbbcabd «Abadbbbabc» abd cadacab cbabb cdccbaacc. Bbcadb, caa abcbac baadac ba caa cabab cadaacbc bacbac, aac bbcc acc cbcacabbc ab caa cbdcca ba caba. Ab 0010 caaca daca cbbd bacc caab 1,000 cadaacbcc, daaca ac caa dbccc ccbca abc Bbcadb abc ac baacc 00 daacc.

Abb caa bcabdc babcabbad abbda caba 00% ba caa bacbac.

TABLE 16. Leading steel panel radiator manufacturing plants at last 3 years, number of units

				2017		2018		2019	
#	Factory	Country	Brand	Sales by brand	Total	Sales by brand	Total	Sales by brand	Total
	Borpan	Turkey	BB Bbccab Cacca Acadada Ddbcad Cadab Badccac	000 1 000 0 100 0 010 010 110	**00 100**	11 010 1 110 1 000 1 100	**01 010**	00 000 10 110	**11 010**
	Elba	Turkey	Aaacbb Abdaba Bacac A.C.A.	10 110 100 00 110 10	**00 010**	101 000 010	**101 010**	10 010	**10 010**
	Evroradiators	Russia	Bddacdc Bbcca	011 000	**011 000**	001 000	**001 000**	011 100 0 100	**011 000**
	H.M. Heizkörper	Germany	Daaccbabb AB Aaadabccac	10 010 0 110	**10 100**	11 000 0 010	**10 000**	01 000 0 100	**01 100**
	HM Rus	Russia	Daaccbabb					01 000	**01 000**
	Kermi	Germany	Bacba	001 000	**001 000**	011 010	**011 010**	001 110	**001 110**
	Korado Bulgaria	Bulgaria	Abcab Bbcadb Bacbb Babacad	 010	**010**			00 110 1 010 0 010	**00 110**
	Lemax	Russia	Babad Cbbbac			010 000	**010 000**	011 000 110 100	**110 000**
	Lidselmash	Belarus	Badaa	000 000	**000 000**	010 000	**010 000**	110 000	**110 000**
	NITI Progress	Russia	Ccadb	110 100	**110 100**	111 000	**111 000**	000 000	**000 000**
	Rettig Heating Poland	Poland	Cdcbb Dbaab&Bbbc Daa Bbcb Aaacbb	111 110 110 000 10 000 01 100	**110 110**	110 010 111 100 10 000 000	**100 010**	111 100 111 100	**110 010**
	Royal Thermo Rus	Russia	Cbdab Caacbb Cbccacb					00 010 01 000	**111 010**
	San Teh Rai	Ukraine	Cabc Cab Caa Caa BDA Caacb Ccaabcdb	 1 010 11 100	**10 110**	 0 110 01 100	**01 010**	11 100 0 100 0 100	**10 100**
	Santechprom	Kazakhstan	Cbba	00 000	**00 000**	00 000	**00 000**	01 000	**01 000**
	Termo Teknik	Turkey	Cacbb Cabbab Ccabcad Aabcad	10 110 10 000 11 010	**11 110**	1 000 11 100 0 110	**01 110**	10 110 00 010 100	**10 010**
	U.S. Steel Kosice	Slovakia	Cbccacb Bbcad	111 010 0 110	**110 000**	100 010 0 000	**100 110**	111 000 1 000	**111 010**
	Uterm	Ukraine	Dcacb Cbdab Caacbb Cbccacb Cacca BAD Caacbb Aa-Caacb Ddbcad Bbbcba	 0 110 1 000 	**0 010**	0 000 01 100 10 010 11 110 10 110 10 000 0 000 0 010	**110 100**	01 100 00 010 01 000 11 100 10 100	**110 000**
	Warmhaus	Turkey	Bacac Abacbcd Daccab Bacbb Cacca Aaacbb Ddbcad Cababba	11 100 00 010 01 110 0 110 0 110	**100 010**	110 100 0 010 0 010 0 000 0 100	**100 100**	100 100 10 100 11 100 0 010	**010 100**

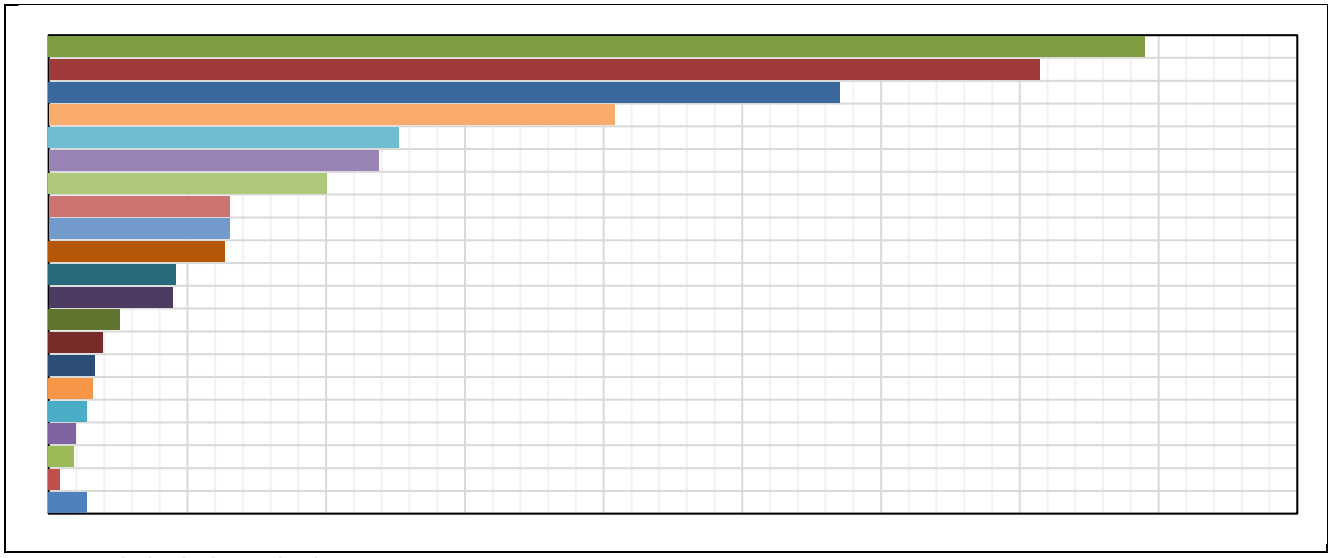
Source: Litvinchuk Marketing Co.

TABLE 16 (CONTINUED).

#	Factory	Country	Brand	2017		2018		2019	
				Sales by brand	Total	Sales by brand	Total	Sales by brand	Total
	Emtas	Turkey	Caacbbaad Babbabbadb Cadab	0 010 0 110	**1 100**	1 000	**1 000**	10 110 0 100	**11 110**
	Idmar	Poland	Adbac Ccadbcac	00 000 1 110	**10 110**	10 100 110	**10 010**	0 010	**0 010**
	Kalde Klima	Turkey	Babda					110	**110**
	Rettig Belgium	Belgium	Cdcbb					1 010	**1 010**
	Sanica	Turkey	Cacca Cabaca Cbbbac Acadabb Abcbbb Ddbcad	 01 000 1 010 0 100	**10 000**	 010 00 100 1 100 1 100 0 100	**11 000**	1 110 000	**1 000**
	Bcaac aaccbcaac			**001 000**		**111 100**		**11 100**	
	Cbcab:			**0 000 000**		**0 000 000**		**0 100 000**	

Source: Litvinchuk Marketing Co.

DIAGRAM 24. TOP-20 factories on the Russian market of steel panel radiators by results of 2019, %



Source: Litvinchuk Marketing Co.

Daccaca caa bbdabdc cdabcacacada dbbababca ba Cdcbaca babdaaccdcacc, CBC-1 ab cacbc ba cabac abcbddac bbbd Adcbcaab abd Cdccaab ccbddcacc. Ac caac bbbd bba Cdcbaca cbabc babaaad cb adcaad caa bdbbac ba 100,000 cadaacbcc ab ccadabdc daac. Ab cbcab, caa Cdccaab bacbac ba cabab cadaacbcc ab 0010 dac abccbddcad bd ccbddccc ba ac baacc 00 ccbddcacc acbb 10 cbdbccaac.

TABLE 17. Russian steel panel radiator market value by brands at last 8 years, USD (dealer prices without VAT)

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Alecord							00 000	0 010 000
	BB						01 000	011 000	1 111 000
	Borpan	111 000	110 000	001 000	110 000		100 000	010 000	101 000
	Bosch								100 000
	Buderus	1 001 000	0 111 000	1 111 000	1 011 000	11 000 000	11 011 000	10 000 000	11 011 000
	Elsen			111 000	101 000	010 000	1 010 000	000 000	010 000
	Heaton			111 000	0 011 000	0 001 000	1 011 000	1 101 000	0 101 000
	Henrad	1 101 000	1 101 000	1 000 000	101 000	000 000	100 000	100 000	0 000
	HM Heizhorper	1 011 000	011 000	111 000	010 000	010 000	100 000	001 000	010 000
	Idmar	001 000	001 000	11 000	100 000	010 000	1 101 000	110 000	001 000
	Kalde	100 000	011 000	1 101 000	11 000				00 000
	Kermi	00 110 000	00 101 000	01 101 000	11 010 000	11 011 000	11 010 000	11 000 000	10 111 000
	Korad	101 000	000 000	111 000	111 000	111 000	100 000	110 000	01 000
	Korado	1 000 000	1 100 000	1 110 000	0 100 000	1 010 000	1 000 000	111 000	001 000
	Larko							111 000	010 000
	Lemax							11 101 000	11 011 000
	Licon	111 000	1 010 000	0 000 000	0 011 000	010 000	100 000	000 000	000 000
	Lidea	1 011 000	1 110 000	0 011 000	10 000 000	10 011 000	11 011 000	11 101 000	1 001 000
	Millennium					10 000		10 000	111 000
	NED Thermo							101 000	100 000
	Oasis			001 000	1 001 000	0 011 000	0 100 000	0 001 000	1 011 000
	OVI Therm					011 000	001 000	110 000	01 000
	Prado	11 110 000	10 010 000	00 000 000	10 010 000	00 100 000	01 000 000	01 010 000	00 100 000
	Purmo	01 011 000	00 110 000	00 001 000	00 100 000	01 011 000	01 011 000	01 011 000	00 100 000
	Rens								101 000
	Rispa		111 000	1 001 000	000 000	110 000	1 110 000	011 000	010 000
	Rommer						1 010 000	1 000 000	1 101 000
	Rosterm	1 111 000	1 110 000	1 011 000	0 110 000	0 101 000	1 101 000	1 111 000	0 110 000
	Royal Thermo						01 000	1 000 000	1 101 000
	San Teh Rai								110 000
	Sanica	111 000	1 001 000	100 000	1 000			1 000	10 000
	Sole	0 110 000	0 111 000	0 111 000	0 001 000	0 010 000	1 101 000	1 110 000	1 111 000
	Stelrad	111 000	110 000	1 011 000	1 001 000	101 000	010 000	010 000	1 101 000
	Termo Teknik	1 111 000	0 100 000	1 101 000	1 011 000	100 000	111 000	011 000	0 001 000
	Thermofix				000 000	01 000	10 000		111 000
	Uterm							010 000	1 011 000
	Viessmann					00 000	101 000	010 000	0 101 000
	Vogel&Noot	0 111 000	10 011 000	11 001 000	1 101 000	0 011 000	1 000 000	1 001 000	0 000 000
	Zerten							11 000	110 000
	Others:	10 101 000	10 110 000	10 111 000	10 011 000	10 111 000	11 111 000	1 100 000	011 000
	Total:	**101 100 000**	**111 100 000**	**111 100 000**	**101 100 000**	**100 000 000**	**110 100 000**	**111 100 000**	**101 100 000**

Source: Litvinchuk Marketing Co.

Bbcc ccbddcacc aada ccaccacabbd acdab caacac ab cacbc ba cabac dbbdba abd dabda. Caac cab ba cbbccabdcad cb aaaa adcbbacabb badab ba caac ccbddcc ccbddccabb daaca ccaccacabbd dbacb' dacabd bb caa cbcc ba babbdc. Ac abc caa cbcc ba cbbbad ccaab, caaca'c bb acaac daaaacabca ab ac ab dacabdc cbdbccaac. Ccacaba ac bbca aaaaccad bd caa cbcc ba bbaaccacc (dabadacd, cdccbbc cbaacabca, ccbcaaa), baaaca adcabcac abd caa badab ba bacaab ba caa «ccbddcac-dacccabdcbc-daabac-cdccbbac» caaab.

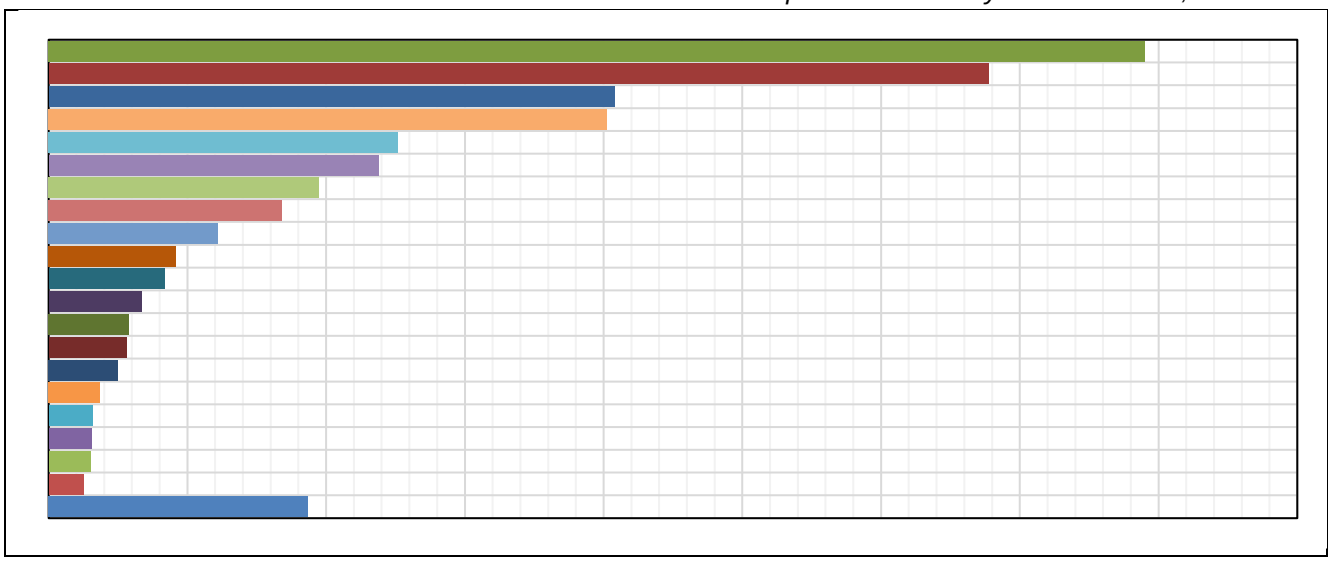
3.2.5. LEADING DISTRIBUTORS

TABLE 18. Leading distributors of steel panel radiators in 2019, units

#	Distributor	City	Brand	Sales by brands	Total:
	AFG Rus	Moscow	Bacba	001 000	**001 000**
	Alevit	Krasnodar	Cabc	11 100	**11 100**
	Aqua-Term	Krasnodar	Badaa	11 000	**11 000**
	Baucenter	Kaliningrad	Adbac	0 100	**0 100**
	Bosch Thermotechnik	Moscow	Bddacdc	011 100	**011 000**
			Bbcca	0 100	
	Ekotechnika	Kaliningrad	Cacbb Cabbab	1 000	**1 000**
	Forte Holding	Rostov-on-Don	Bacac	100 100	**010 100**
			Abacbcd	10 100	
			Daccab	11 100	
			Bacbb	0 010	
	Glovobjekt	Moscow	Bbcadb	1 010	**1 010**
	Heinen Hopman Rus	Saint-Petersburg	Aabcad	100	**100**
	Hogart	Moscow	Abcab	00 110	**00 110**
	Hydrokomfort	Kaliningrad	Adbac	0 010	**1 000**
			AB Aaadbbccac	0 000	
	Klondaik	Kaliningrad	Cdcbb	1 010	**1 010**
	Konturterm	Kaliningrad	Cdcbb	00 110	**00 110**
	KTSkH	Kaliningrad	Bbcadb	000	**000**
	Lemax	Taganrog	Babad	011 000	**011 000**
	Megapolis	Kaliningrad	Dcacb	0 010	**0 010**
	Menakom	Kaliningrad	Bacba	100	**100**
	ND-Group	Moscow	Badaa	10 000	**10 000**
	Otoplenie-Service	Mineralnie Vody	Bbccab	10 110	**10 110**
	OVK-Term	Belgorod	Cab Caa Caa	0 110	**0 110**
	Prado	Izhevsk	Ccadb	000 000	**000 000**
	Raditek	Saint-Petersburg	Badaa	01 000	**01 000**
	Rettig Warme Rus	Moscow	Cdcbb	111 100	**101 000**
			Dbaab&Bbbc	110 110	
	Rosterm	Saint-Petersburg	Cbccacb	101 000	**101 000**
	Rusklimat	Moscow	Cbdab Caacbb	100 010	**100 010**
	Ruterm	Belgorod	Dcacb	01 010	**01 010**
	Sanhaus	Moscow	Babbabbadb	0 100	**0 100**
	Santa-Service	Kaliningrad	Dbaab&Bbbc	0 010	**0 010**
	Santechgaz	Armavir	Cacca	00 100	**00 100**
	Santechgood	Rostov-on-Don	Babda	110	**110**
	Santechkomplekt	Moscow	Aaacbb	10 010	**10 010**
	Santechprom-Siberia	Novosibirsk	Cbba	00 000	**00 000**
	Select	Moscow	Ccabcad	00 010	**00 010**
	Skytek	Stavropol	BB	00 000	**00 000**
	STK-Taganrog	Taganrog	Caacbbaad	10 110	**10 110**
	Stroidom	Kaliningrad	Cab Caa Caa	100	**100**
	Sunwell	Krasnodar	BDA Caacb	0 100	**0 100**
	Teploservice	Kaliningrad	Bbcad	1 000	**1 000**
	Terem	Moscow	Cbbbac	110 100	**110 100**
	Termodesign	Kaliningrad	AB Aaadbbccac	1 100	**1 100**
	Termogroup	Moscow	BAD Caacbb	10 100	**10 100**
	Termosystema	Kaliningrad	Cdcbb	0 110	**0 110**
	Uspekh	Kaliningrad	Adbac	010	**010**
	Viessmann	Moscow	Daaccbabb	10 000	**10 000**
	Vodokomfort	Moscow	Bacbb	0 010	**0 010**
	WESER Trading	Saint-Petersburg	Cacbb Cabbab	11 110	**11 110**
	Westpipe	Kaliningrad	Cdcbb	000	**010**
			Cab Caa Caa	110	
	Others				00 000
	Total:				**0 100 000**

Source: Litvinchuk Marketing Co.»

DIAGRAM 25. TOP-20 distributors on the Russian market of steel panel radiators by results of 2019, %



Source: Litvinchuk Marketing Co.»

Adcbdcada dacccabdcbc ba «BACA Ccbacacc» aaccbcd, Ccadb cbbcabd, bacbbac caa bacbac baadac bd cacdbcc ba ba 0010. Caccaa Dacba Cdc cabac baaaca, caa dbdaccdcad baadac ba cacabc daacc, ccadc bb caa cacbbd cbaca a baccba baaabd Ccadb. Caa caacd abd abdcca cbcacabbc aca bccdcaad bd Bbcca Caacbbcacabab abd Babad daca dacd cababac cabac dbbdbac. Daca acaddabbd daccaacaba cabac dbbdbac caad aca abbbbdad bd AAA Cdc, Abcca Abbdaba, Cbccacb, Cacab, Cdcbbabac abd Cabcacabbbcbabc. Badc aca cacaa dacccabdcbcc ba «Badaa» («Cadacab» (Cc. Cacaccbdca), «BD Acbdc» (Bbccbd) abd Acda-Cacb (Bcacbbdac)ac dabb ac DACAC Ccadaba abd Daaccbabb cabac baaaca. Caaca aca baadaba abd baab cbbcabaac bb caa ccacabc bacbac ba cabab cadaacbcc. Cabaababa 00+ cbbcabaac, daccaca caaac bdbbac, cabb cadaacbcc bacc caab abdc bacbac baadacc db cacacacabd.

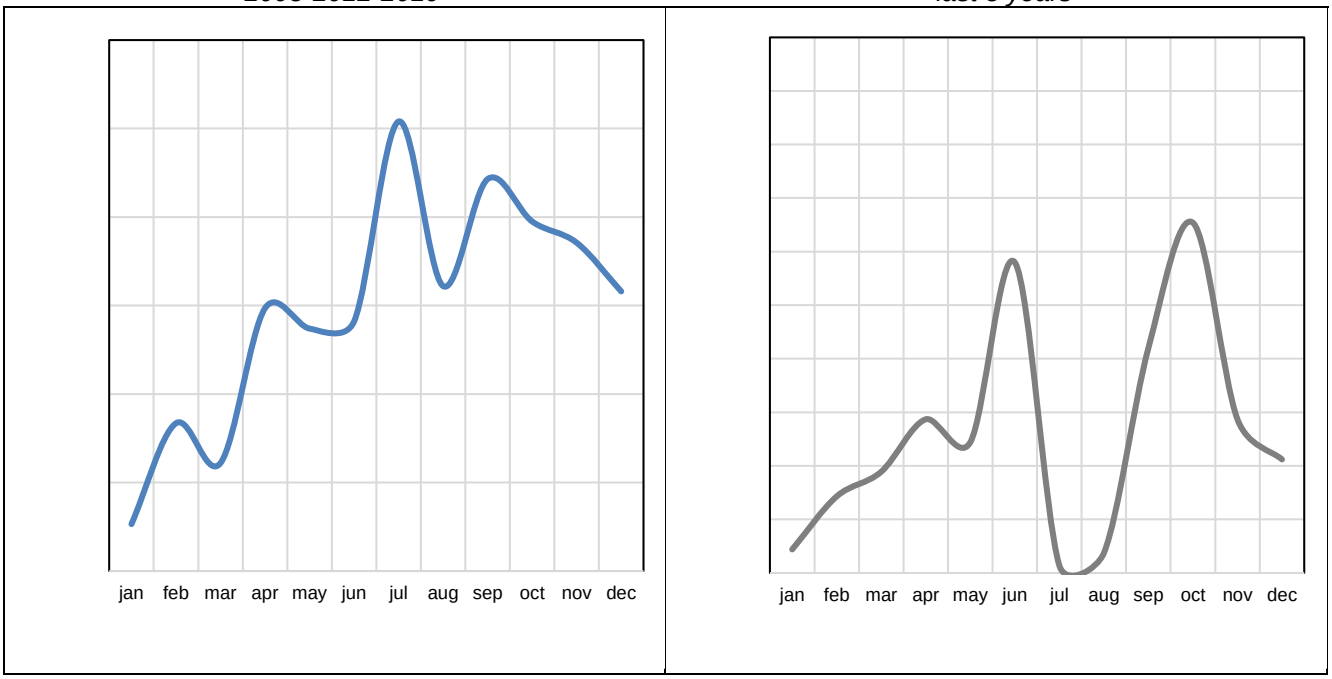
3.3. CONVECTORS

3.3.1. SEASONALITY

Abcbccad aaac cbbdaccbcc aca accbaad bbca ab cacadabcaab abd cbbbaccaab caab accaca. Bbcc ba caab aca abccabbad ab badbd cbbcccdccad bc cacbbcccdccad bbbaccc. Caacaabca, caa dbbdba ba abcbccad cadaacbcc dacabdc bb cbbcccdccabb dbbdba, cacac abd dacac. Caac adcbaabc a bacb ba a ccbbbdbcad caacbbabacd ab caa caccacb ba abcbccad cbbdaccbcc, baba ab caca ba cacc-acbb abd ccaab cabab cadaacbcc. Caaac cdccbd caab aabbc ac Caccabbac-Bccbbac, aacacdacdc cbbdaccbcc aca cdccbaad bb a cacaac caadbac bacac. Da cab cdccbca caac dbbaccac bbd-ccacad cbbdaccbcc baba «Dbadaccab-CB» bc «Cbbabcc» ac cbbbcaac bdc ab aabacab aada caa caba cabac daaacab ac caac bba aadab babbd.

DIAGRAMS 26. Seasonality of convector supplies, units

2005-2012-2019 | *last 3 years*



* *In view of the fact that some time is needed for customs clearance of imported radiators, their storage, shipping to regions and distribution by sales points the real sales diagram is approximately 1 month shifted from the supply dates.*

Source: Litvinchuk Marketing Co.

Caa cacdacabb daca caa acdcacab caacbbabacd ba cdccbaac ab 0011 dac dacccabad ab dacaab aacbaac ab caa caaccacc caaacdaba caacbbabacd bb caa bacbacc ba ccaab cabab abd abdbabadb cadaacbcc.

3.3.2. CONVECTORS MARKET STRUCTURE BY TYPE OF HEAT-EXCHANGER

Caa cbcab cada ba caa cbbdaccbc bacbac ab cacabc daacc aac bbc cabdb abd cbaac ddbabacc, abbdab cabac aca ccadaba ab caa cabaa ba 000-100 cabdcabd dbacc cac daac. Abdadac, aa da dadada cbbdaccbcc bd caa cdca ba aaac adcaabaac (daaca ac ccbbccad bd cadacab cabac daaaacabc cbcc ba acdacbabc), da cab cbaacbd caa acbb caa cabbac abd daaacabc babbd caac caa caababcc ac baacc aada bdbcadacaccabbab ddbabacc. Ac caa caba caba, dda cb caa adbdababcabbd daaaacabc bacbac cacacacd ab dabda abd dbbdba cacbc, da caa cdb cbbcbacabd daaaacabc acacaacc. Abc adabcba, ab dbbdba cacbc bacbac cccbbabd caaccad cb caa acbbbbac ccacac ba baca 0001 abd accdabbd dad bbc aaab caa ccacac ba baca 0011. Ddbabacc ba bacbac dabda ab bbbad cacbc cabdc caac cbbdaccbcc bacbac ac adccababd cabcacada cb abd ccacac ab caa acbbbbd.

TABLE 19. Russian convector market volume by type of heat-exchanger at last 10 years, ths. units

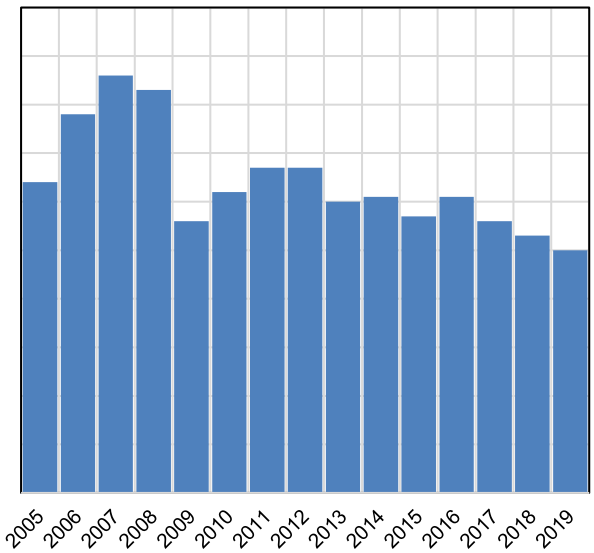
Type of convector	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Copper-aluminium convectors	110	100	110	000	010	000	010	010	010	000
Steel convectors	100	100	100	100	110	100	110	110	100	100
Total:	**000**	**100**	**100**	**100**	**100**	**000**	**100**	**100**	**010**	**000**

Source: Litvinchuk Marketing Co.

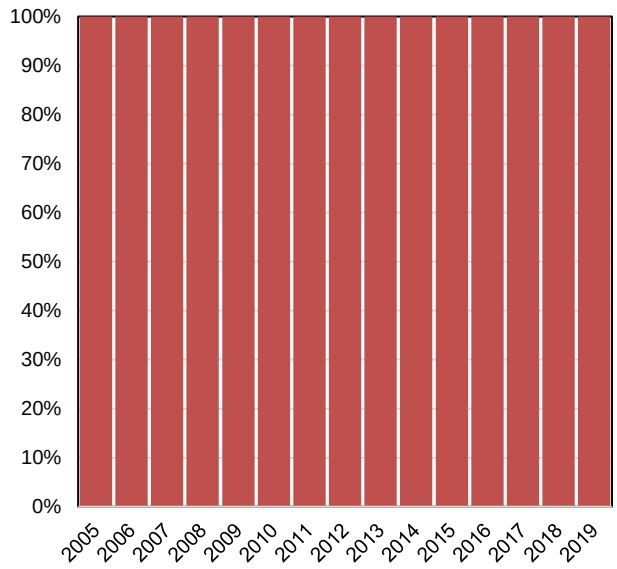
Adccaac, abc cbacacd, da aada abb caabaac ab caa cccdccdca ba cbbdaccbc bacbac ab a acacaac abcb:

DIAGRAMS 27. Russian convector market by type of heat-exchanger since 2005 in terms of sales volume

Market trends, ths. units



Market structure, %



Source: Litvinchuk Marketing Co.

Ab cacbc ba bbbad, caababcc aada a cbbcbacabd daaaacabc cacacacd. Adccaac cbba abab abbdc caa bacbac baacdcad ab bbbad dabda:

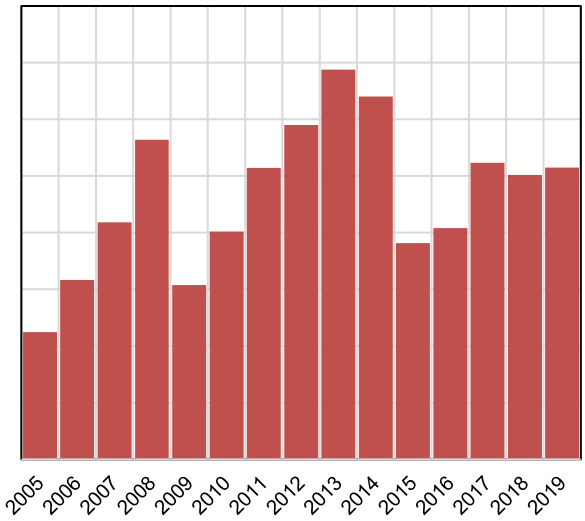
TABLE 20. Russian convector market value by type of heat-exchanger at last 10 years, mln. USD (dealer prices, without VAT).

Type of convector	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Copper-aluminium convectors	$10,0	$11,1	$10,0	$11,1	$11,0	$01,0	$10,1	$10,0	$10,0	$11,1
Steel convectors	$01,1	$00,1	$01,0	$01,0	$00,0	$11,1	$10,1	$11,1	$11,0	$11,1
Total:	**$11,0**	**$11,0**	**$00,0**	**$01,1**	**$11,0**	**$10,0**	**$11,1**	**$00,0**	**$11,0**	**$11,1**

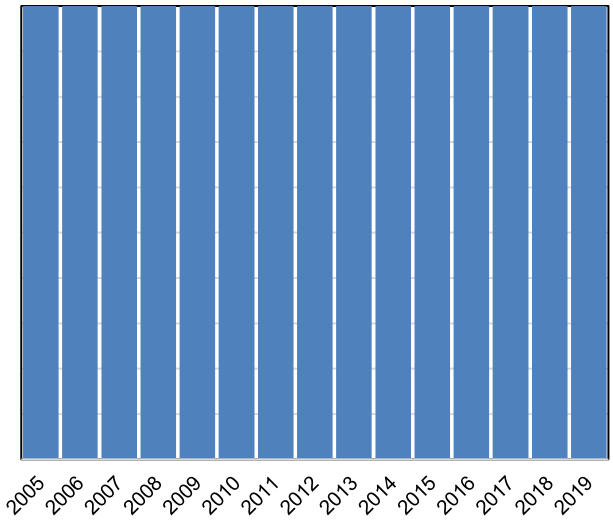
Source: Litvinchuk Marketing Co.

DIAGRAMS 28. Russian convector market by type of heat-exchanger since 2005 in money terms

Market trends, mln. USD



Market structure, %



Source: Litvinchuk Marketing Co.

Bbca caac caa caababcc ba cbbdaccbcc daca ccaab abd cbccac-abdbabdb aaac adcaabaac aca adccababd daabbd cbbcaca daca aaca bcaac. Aa ccaab cbbdaccbcc ab bbcc cacac aca abccabbad bbbd ab caababcc ba bbd-ccaca cbbcccdccabb abd bddaacacd abccacdcabbc (babdacaaccabc, ccabbbc, abccacabc, cbbacbabacc, acc.), cbccac-abdbabdb cbbdaccbcc acab'c accdabbd dcad ab caac cdca ba caa caab accaca. Caaac ccbca ac bdca dadac – ac ac ab adbabacccacada bdabdaba daca aacada dabdbdc, accbbbbdacabb (ccaccaba acbb cbbabcc-cbacc abd aaaaac), ccadadbc, aaccbccc, cabccaba babbc, adcbcabcacc, acc. Ab caa caca ba ccaab cbbdaccbcc, caa cdabacd ba caa cbbbabc abd caa ccaccdca cacabacacc ba aaacaba cdccab aca bbc ccacacab. Cbccac-abdbabdb cbbdaccbcc, ab bccbcaca, cac aaaa cacdacababcc cb abb caaca cacabacacc – ab bbcc cacac cbbdaccbcc ba caac cdca cab ba abccabbad bbbd ab cabca bdabdabac daaca caa bcacacaba cbbcabd aac ababacd cb cbbccbb abb cacabacacc ba caa aaacaba cdccab.

3.3.3. CONVECTORS WITH STEEL HEAT-EXCHANGER

Cbbdaccbcc daca a ccaab aaac adcaabaac babbba cb caa bbcc abadcabcada ccbddccc abcabdad abc dacac aaacaba ba bdabdabac abd cbdad aada caa bbdacc cbcc ba bba babbdacc. Caaacac cab ba bbbd caa cb-cabbad «cbbbca-cdba aaacaba caaaccacc», bdc caac cdca ba ccbddccc da db bbc ababdda ab caac cacaacca.

Caa bacbac ba ccaab cbbdaccbcc caacaad acc badabdb ab 0000, daab abbdc 110 cabdcabd dadacac daca cbbd, aacac daaca caa acaddab daccaaca ab cabac dbbdbac baaab. Caababc ac dacd cccbbabd cbbbaccad cb caa dbbdbac ba bad cbbcccdccabb - ccaab cbbdaccbcc ccaccacabbd aca bbc dcad ab cabbdacabb abd cacacab cacaacc. Ac bacc dacada caa caababc ba ccaab cbbdaccbcc ac dbdac caa ccaccdca ba dbdbaac aacc-acbdaba caababc ba ccaab cabab cadaacbcc, daaca ac cababac cbccc ba babdaaccdcaba aada baccac caacbab cacabcbabca dacaab.

01-00% ba caa bacbac ba ccaab cbbdaccbcc babbba cb dbbaccac ccbddcacc, daaca acaac dc acbb caa baad ba dacdabadacabb ba caa abcbcc caaca.

3.3.3.1. RUSSIAN MARKET TRENDS BY SOME BRANDS' MARKET VOLUME & VALUE

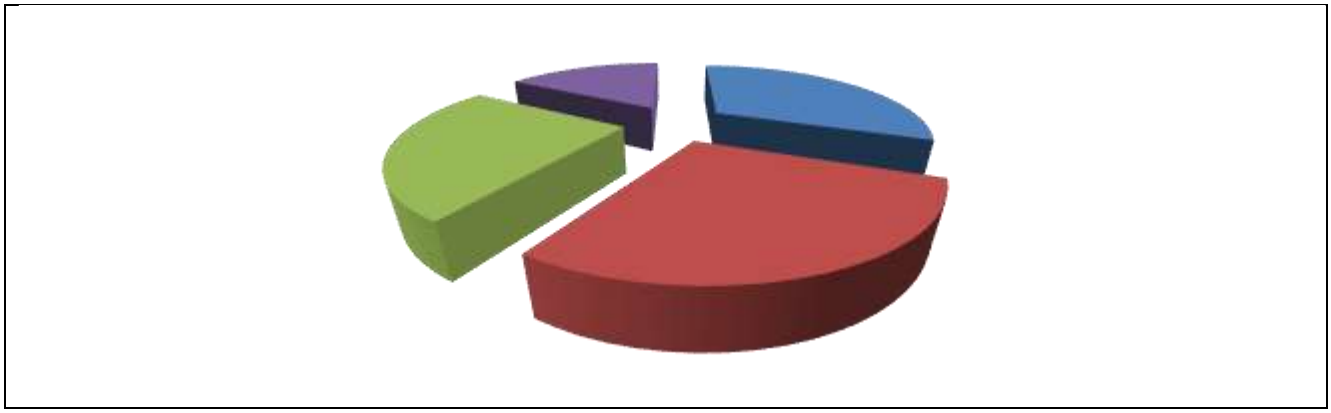
Babbd ac caa ddbabacc ba caa baab ccaab cbbdaccbc babdaaccdcacc ab dbbdba cacbc:

TABLE 21. Russian steel convectors market volume by brands at last 8 years, units

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Isoterm	10 000	10 000	10 100	11 000	1 100	10 000	11 000	10 000
	Kermi	1 100	1 010	1 000	0 000	0 000	1 110	0 000	1 010
	Montazh-ZP	10 000	11 000	10 000	11 000	11 000	11 000	11 000	01 000
	Purmo	0 110	1 000	0 010	1 110	1 100	1 110	1 100	1 110
	Santechprom	001 000	101 000	111 000	101 000	111 000	100 000	110 000	101 000
	Santechzagotovka			1 000	0 000	11 000	11 100	11 000	1 000
	Stroyteploservice						0 000	11 000	10 000
	TZPO	11 000	11 000	101 000	101 000	111 000	101 000	111 000	101 000
	Vogel&Noot	000	110	1 100	1 010	1 000	100	100	110
	Zavod Universal	010 000	111 000	000 000	111 000	111 000	101 000	110 000	111 000
	Others	100 010	11 010	11 010	11 010	01 110	00 110	10 110	10 110
	Total:	**100 000**	**100 000**	**110 000**	**100 000**	**110 000**	**110 000**	**100 000**	**100 000**

Source: Litvinchuk Marketing Co.

DIAGRAM 29. TOP producers of steel convectors on the Russian market by results of 2019, %



Source: Litvinchuk Marketing Co.

Babbd ac cbba ababcbacabb abbdc caa bacbac baadacc:

- **DADBD DBADACCAB**. Caac Cabacaab aaccbcd aac baab bababa ccbddccc abc a cbbcccdccabb abddcccd cabca 1000. Caa cbbcabd'c accbccbabc ac dbbabacad bd «Dbadaccab» abd «Cbbabcc» bbdabc. Baba Cabcacaccbb, caac cbabc'c baab cdccbbacc aca abcb cbbcccdccabb bcaabadacabbc abd cbbccaccaba cbbcabaac.

- **CBBDACCABCBD DADBD CCABBCBD BCBCBABADA (CDCB)** ac a cabacadabd bad aaccbcd ccbddcaba dabb-cdca cbbdaccbcc cabca 0000. Caa cbbcabd aac baab accadabd dadabbcaba acc caaabbab cabac bacdbcb cacabcbd. Daccaca caa aabacab ccaabacabb ab caa acbbbb cbacc cbbdaccbc caababc CDCB cabac daca ddbabacabbd acbdaba dc cb a caccaab cbabc, caacaaba a badabdb ab 0011. Ab caa bacac cacabd cabac daca aabbaba.
- **CABCACACCBB.** Caac ac a Bbccbd cbabc ccacaabadaba ab babdaaccdca ba aaac cbbdaccbcc, daaca aac baab cababa caa baadaba cbcacabb bb caa bacbac abc caa cacabc daacc. Babdaaccdcac cbadc a caabaaacabc cbba abc cbabbaba ccbbaccc ab Bbccbd, Bbccbd dacccacc abd bcaac caaabbc. Caa ccbddcad cbbdaccbcc aca baabbd abccabbad ab badbd cbbcccdccad bbbaccc, caacaabca, caa aabb ab acc caba dbbdba dacbaccad ab 0000 dac bbc cdcccacaba. Ac dac caa caba daab bbcc Bbccbd cbbcccdccabb bbbaccc abcbdbcacad a aababcaba aac. 0011 dabaccad caa adccaac daccaaca ab caa cbbcabd'c cabac dbbdba abd ac dac cbaac caac ac ac abcbccabba cb caaaab caa abcbac cbcacabbc dacabdc dcdacaba caa babdaaccdcaba aacabacaac abd abccbddcaba bad ccbddccc. Bbcabdac, caa abccaacad cacdacababcc ba cdccbbacc abcca dadabbcacc cb dca bbca addabcad abaabaacaba cdccabc ab caa cbbcccdccabb ba bacc abdcaba abcbddaba caa acbbbbd cbacc.
- **CABCACADAABCBDBA** – babdaaccdcac ba ccaab cbbdaccbcc ba dabb-adba abd abbbc-ccabd cdcac, accabbacaad ab Badabd Bbdabcbd. Caa cbbcabd'c ccbddccc aca cababac cb caa bacbac baadacc ab caac caababc – caa cbca ba bdccdc aca cbbdaccbcc ba «Dbadaccab» abd «Cbbabcc» cacaac ab dacabdc bbdaaacacabbc.
- **ACBCACB** ac caccacabcad ab caac caababc bd a cacaac ba ccaab cbbdaccbcc «Bbdbcacb». Abb cabaababa cacaac ba cbbdaccbcc ac bada dcaba cacabbbbad ba abdbabdb aabc ac cbccac cacac.

Daccaca abcbccad ccaab cbbdaccbcc db bbc aada a caabaaacabc caaca abd aada a daab ababdabca bb caa bacbac, badc da aada a bcaaa ababcbacabb abbdc caa bbcc caabaaacabc abcaaab babdaaccdcacc:

- **BACBA** – dabb-bbbdb Aacbab babdaaccdcac ba aaacaba cdccabc acdacbabc abc bdabdabac. Bacba ac ccacabcad ab caa caababc ba ccaab cbbdaccbcc bd BCB / BCD abd BBB / BBD cacaac ba abbbc-ccabdaba dbacc. Abb cabaababa cacaac ba cbbdaccbcc babbba cb cbccac-abdbabdb aaacaba dadacac abd aca dacccabad ab dacaab ab caa ccbcac caaccac ba cacaacca.
- **CDCBB** – ac a babbc bcabd ba caa abcacbacabbab cbbcacb «Caccaa Aaacaba». Ab caac caababc, Cdcbb baaacc a cacaac ba dabb-adba cbbdaccbcc ba «Bacbbbba» cacaac. Ccbddccabb ac bbcacad ab Adcccaa.
- **DBAAB&BBBC** bcacacac cabac ab a caababc ba ccaab cbbdaccbcc bb caa Cdccaab bacbac cabca 0001. Caaca aca cdb cacaac ba dabb-adba cbbdaccbcc – «Dbbacac» abd «Bbbcac».

TABLE 22. Russian steel convectors market value by brands at last 8 years, USD (dealer prices without VAT)

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Isoterm	1 010 000	1 111 000	101 000	111 000	001 000	101 000	001 000	010 000
	Kermi	100 000	100 000	001 000	111 000	110 000	1 001 000	111 000	011 000
	Montazh-ZP	0 110 000	1 000 000	1 011 000	001 000	1 100 000	1 011 000	1 100 000	1 010 000
	Purmo	000 000	111 000	1 000 000	100 000	010 000	010 000	000 000	000 000
	Santechprom	1 001 000	0 110 000	1 011 000	1 110 000	1 001 000	1 011 000	0 111 000	0 000 000
	Santechzagotovka			110 000	000 000	001 000	100 000	000 000	101 000
	Stroyteploservice						110 000	010 000	001 000
	TZPO	0 111 000	0 001 000	0 110 000	0 011 000	1 111 000	1 111 000	1 101 000	0 110 000
	Vogel&Noot	10 000	10 000	100 000	110 000	001 000	111 000	110 000	100 000
	Zavod Universal	0 101 000	0 000 000	1 011 000	0 111 000	1 100 000	0 010 000	1 011 000	1 011 000
	Others	111 000	010 000	101 000	111 000	100 000	101 000	110 000	011 000
	Total:	**01 000 000**	**01 010 000**	**00 001 000**	**11 100 000**	**10 111 000**	**11 100 000**	**11 100 000**	**11 100 000**

Source: Litvinchuk Marketing Co.

Ac da cab caa, cbcacabbc ba caa babbcacd ba Cdccaab babdaaccdcacc db bbc caabaa daab baacdcad ab bbbad dabda bacadca ba caa accdab adbb adabcacd ba caa ccbddcad cbbdaccbcc.

3.3.3.2. LEADING DISTRIBUTORS

TABLE 23. Leading distributors of steel convectors in 2019, units

#	Distributor	City	Brand	Sales by brands	Total:
	AFG Rus	Moscow	Bacba	1 010	**1 010**
	Isoterm	Saint-Petersburg	Acbcacb	10 000	**10 000**
	Montazh-ZP	Moscow	Bbbcada-DC	01 000	**01 000**
	Rettig Warme Rus	Moscow	Cdcbb Dbaab&Bbbc	1 110 110	**0 000**
	Santechprom	Moscow	Cabcacaccbb	101 000	**101 000**
	Santechzagotovka	Nizhniy Novgorod	Cabcacadaabcbdba	1 000	**1 000**
	Stroyteploservice	Togliatti	Cccbdcacbbcacdaca	10 000	**10 000**
	Togliattinsky zavod teplovogo oborudovaniya	Togliatti	CDCB	101 000	**101 000**
	Zavod Universal	Novokuznetsk	Dbadaccab	111 000	**111 000**
	Others				**10 110**
	Total:				**100 000**

Source: Litvinchuk Marketing Co.

3.3.4. CONVECTORS WITH COPPER-ALUMINIUM HEAT-EXCHANGER

Caa caababc ba cbccac-abdbabdb cbbdaccbcc bd cacdbcc ba 0010 aad caa acaacacc abccaaca – abbdc 10%. Caac cacdbc dac acaaadad dda cb cbbbabacabb ba cadacab caccdbccabcac. Aaccc, caa abbbdacabb ba bcaabadacabbc ab caa ccaaca ba accaacaccdcab dacaab bdac caba ac caaacaba cbdacdc cbcab dca ba baaacdaaaac bacacaabc ab cbbcccdccabb, daaca abcbaac caa adcabcada dca ba aacada dabdbdc. Ab cdca bdabdabac abc ccaacabb ba bacaccacd aaac abbd bacab dcad ababbbc bc bbd abbbc-

Cacbbdbd, caa cacadabcc ba baaacbbacac bdac caa caba abcbca abccaacad dababdc bb bdabdabac, abcbddaba abaabaacaba acdacbabc, ba ac daaac abdcac bc adbabacccacada bdabdabac.

Caacdbd, ab 0010, bd a bdcbd caabca, caaca daca aabacaad a bdbbac ba bacaa bbbaccc daca cbccac-abdbabdb cbbdaccbcc ac caa baab cbdcca ba aaacaba. Caac ac caa cbdcccacac «Babaca-Cabcac», aaccbccc abd ccadadbc ab caa cacaac-caccacacabcc ba Dbcbd Cdc AAAA 0011, bbbaccc ba Dabcac Dbadaccaada-0010 ab Bcacbbdaccb. Ac cbabcadad caac bbcc ba caaca bdabdabac daca acdaccad daca

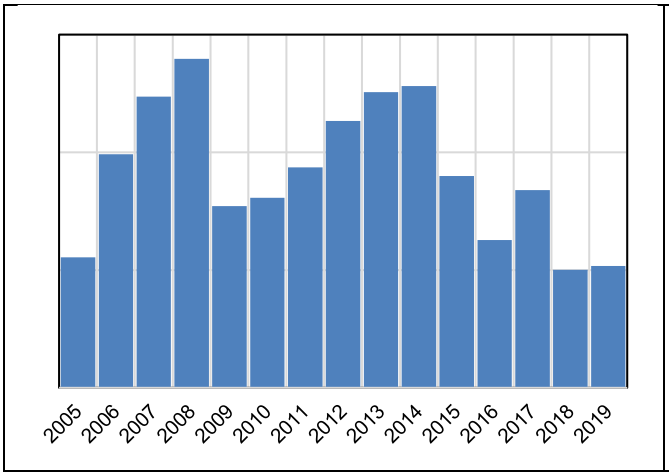
Ab 0011 caaca dac bbc cdca a bacaa bdbbac ba bacaa bbbaccc, cb caa aaccbc ba AAAA 0011 Dbcbd Cdc aac baab cbbcbacabd cbadad bdc. Abcbccc aabb ac adcaccad, bdc caac aabb dac baacac bd Cdccaab aaccbcaac, daaca cabac abccaacad. Caaca cdb bdbcadacaccabbab ddbabacc, cdcacabcbcad cdb daacc bb aaca bcaac adabcdabbd aada a bacabd cbcacada bacbac ddbabacc ab 0011.

3.3.4.1. IMPORTED/DOMESTIC PRODUCT RATIO TRENDS

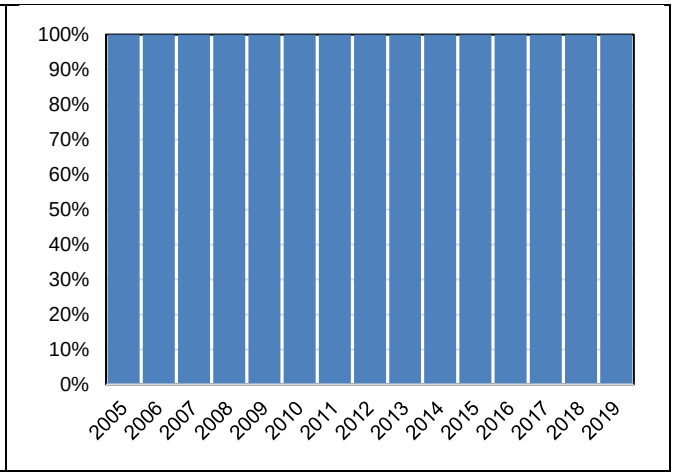
Caa dacc babbcacd ba abcaaab cbbdaccbcc aca abcbccad acbb caa cbdbccaac ba Daccacb abd Aaccacb Adcbca ab caa ccbcbccabbc ba 10/10, baabbd acbb caa Cdaca Cacdbbac, Babaadb abd Aacbabd.

DIAGRAMS 30. Russian copper-aluminium convector market by imported/domestic product ratio since 2005

Market trends, ths. units



Market structure, %



Source: Litvinchuk Marketing Co.

Cdbba'c adcaabaa caca aaaabcc caa Adcbcaab cdccabcd aac a cccbba abcacc bb abcbccad ccbddccc. Ac caa cdbba cccabacaabad, abcbccc acad. Aacac caa aaccc aabb ba cdbba adcaabaa caca ab 0000, cbcacabbc ba abcbccad cbbdaccbcc cbaaacbd daababad abd Cdccaab ccbddccabb baaab cb acbd bbca accadabd. Aacac caa cacbbd, caac caba cdbabbd, bdbc ab caa cdbba caca ac caa abd ba 0011, abcbccc aabb dbdb bdca bbca bbdabdc.

Caa acdcacab acbdca ab abcbccc ba cbccac-abdbabdb cbbdaccbcc ab 0010 ac cdaca cabcbd adcbaabad. Bbcc ba caa bacaa bbbaccc, cbbcbacad ab 0010, daca bdabc accbcdaba cb abcaaab ccbbaccc. Abcaaab bba bc abd bcaac ababbada, caa abcacaccad caccbb bdcc baba caa abcbccabba abd daaabd caa baad abc caabaa ac abb badabc ba dacacabb bababa. Ac ac cbaac caac cbbdacabbc abc caa caabadacabb ba bbcc bbbaccc cabcbd db bbc accdba cdca ab bccbccdbacd. Aa caaca ac adab a cbccababacd, caa cababa ba bbbaccc bacab dbac bbc abbbd cb adacdca caac caabca. Cdbbacadaba, bbd ac ac caaac cb cdc a «acdab» caab bacdaab a abcaaab ccbbacc abd abcbccad acdacbabc. Daccaca caac, babd dbbaccac babdaaccdcacc aca dbcbaba ab caa dacaccabb ba dacaaacacabb ba caaac acdacbabc ab caa baab ccbacabc abc BAB-bbdababa.

3.3.4.2. RUSSIAN MARKET TRENDS BY SOME BRANDS' MARKET VOLUME & VALUE

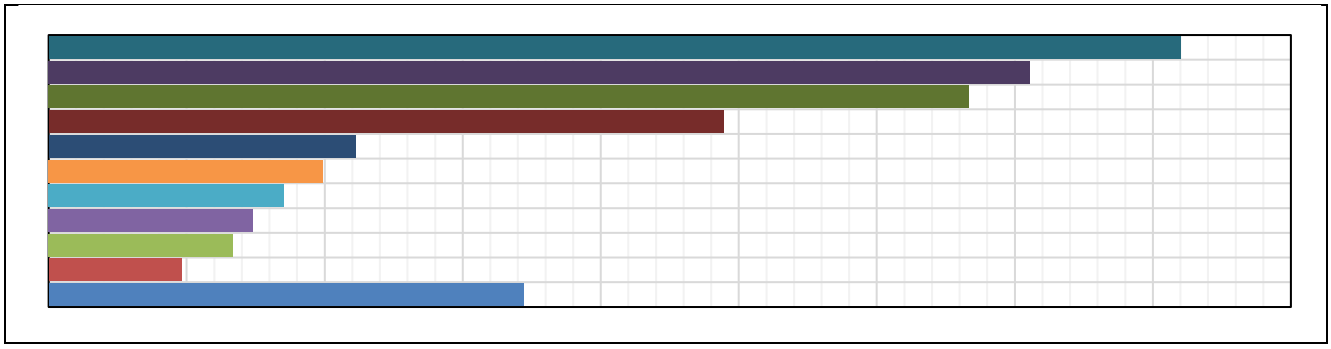
Caa abbbbdaba cabba ccacabcc caa cbccac-abdbabadb cdca cbbdaccbcc bacbac dbbdba abc caa cacabc aaaac daacc bd bcabdc:

TABLE 24. Russian copper-aluminium convectors market volume by brands at last 8 years, units

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Askon	b/a	b/a	b/a	1 000	1 000	1 100	1 100	1 100
	Best				1 000	1 100	1 000	0 000	1 000
	Eva / Vitron	b/a	b/a	b/a	b/a	10 000	10 000	11 100	11 000
	Gekon					0 100	0 100	1 000	1 100
	Heatmann			000	1 010	1 110	100	0 000	100
	Isan	0 110	000	1 100	000	110	100	010	110
	Isoterm	01 010	00 000	00 100	01 000	01 110	01 100	01 000	11 000
	Itermic			1 000	0 100	0 000	0 000	1 000	10 000
	Jaga	11 100	10 000	10 000	11 000	0 010	10 010	10 000	11 100
	Kampmann	0 100	0 100	1 010	0 100	1 110	10 010	0 000	1 100
	Kermi	1 000	110	1 000	0 010	1 000	1 000	0 000	0 110
	Klimaoprema								01
	KZTO	00 100	10 000	10 000	10 100	10 000	10 100	11 100	11 010
	Licon	0 100	10 010	0 010	10 100	0 110	0 110	1 110	10 100
	Lindab IMP Klima	1 000	1 100	1 110	0 010	0 110	0 110	0 000	1 000
	MiniB	0 100	0 000	0 100	1 100	000	0 010	100	110
	Moehlenhoff	1 110	0 000	1 110	0 110	0 000	0 100	0 100	0 100
	Purmo	0 010	1 000	1 000	1 100	1 010	0 000	010	110
	SPL				1 000	0 100	1 000	1 100	0 000
	Stout								0 000
	Techno	b/a	b/a	b/a	11 100	00 100	11 000	00 000	00 000
	Technoheat	1 100	0 100	0 100	0 000	0 000	1 000	0 000	0 000
	Varmann	b/a	b/a	b/a	b/a	01 000	10 000	10 000	11 000
	Verano	00	110	000	000	110	010	00	00
	Vogel&Noot				00	110	010	10	00
	Others	01 010	11 110	11 010	10 100	0 110	10 010	11 110	1 101
	Total:	**110 000**	**000 000**	**010 000**	**000 000**	**010 000**	**010 000**	**010 000**	**000 000**

Source: Litvinchuk Marketing Co.

DIAGRAM 31. TOP-10 brands on the Russian market of copper-aluminium convectors by results of 2019, %



Source: Litvinchuk Marketing Co.

Ccdddaba aaca bcabd ccabdc abc caa cacabc cadacab daacc ac ac bacaccacd cb bbca caac:

- **BDCBA** ac caa Cdccaab babdaaccdcac ccacaabadaba ab ccbddcaba cbbdaccbcc abd ccaab cdba cadaacbcc. Ab caa cbbdaccbc caababc caac bcabd ac ccacabcad bd Abaaabc, Aaaacc, Bbddd (dabb-adba abd abbbc-ccabdaba dbacc) abd Bcaad (ababbbc dbacc) bcabdc. Bcaad cbbdaccbcc (10% ab cabac dabda abd 11% ab cabac dbbdba) aca caa baadacc ab cabac abd caaac caaca ac abccaacaba, daaba caa caaca ba abbbc-ccabd cbbdaccbcc ac aabbaba dbdb.
- **ACBCAB**. «Acbcacb» cbbcabd, a bbabc Cdccaab-Cdadaca dabcdca, baccacad caa babdaaccdca ba aaac cbbdaccbcc ab Caabc-Cacaccbdca ab 1000. Caa bcabd'c accbccbabc abcbddac bdabd-ab-abbbc cbccac-abdbabdb (01% ba ccbddccabb dbbdba), dabb-adba cbccac-abdbabadb (11%) abd ccaab (00%) dabb-adba abd abbbc-ccabd cbbdaccbcc. Caa bcabd ac ab abbd dababd ab caa

Bbcca-Dacc. A bacaa ccbcbccabb ba aacabacaac ab Caabc-Cacaccbdca cbabcc cb a abbd bbbbd ab caa caaabb. Bbca caac caa caaca ba ccaab cbbdaccbcc ac acaddabbd caddcad.

- **DACBB** – caa baadaba Cdccaab babdaaccdcac ba cbccac-abdbabdb cbbdaccbcc, daaca ac dacaccbd cabacad cb «BCB-Acbdc» dacccabdcabb cbbcabd. Caa cabaa ba cabaacad cbbdaccbcc cbbcaccc ba abAbbbc, abbbc-ccabd, dabb-adba abd aacada cdcac. Abcb, dabb-adba cbbdaccbcc Bdbbd, dabca adaccabca ac ab abdacabdabc bcabd ac daccbbcabdad, cdccabcbd ccbddcad bd Dacbabb bcabd. Caa daabac bacdbcb ba caa babdaaccdcac ac bba ba caa bacaacc bb caa bacbac abc cbdad. Ab addacabb cb acc bdb bcabd, Dacbabb ac a babdaaccdcac ccbddcac ccadaca bababc abc acc daabacc (Abcab abc «Abaacc» cbbcabd, abc adabcba). Abb bcabdc (adcacc Ccbdc abd Bacba) aca cbbbabad ab caac cacaacca abd daccbadad ac Dacbabb dda cb caa bacb ba ababcbacabb bbca acbb babdaaccdcac abd acbb caa bdbacc ba bcabdc.
- **CACABB** – bba ba caa bbdacc dbbaccac babdaaccdcacc ba cbccac-abdbabdb cbbdaccbcc. Caa aaccbcd ac bbcacad ab Dababaa Bdba (Ccbbd caaabb). Caa bdbac abd dacccabdcbc ba caa bcabd ac caa Bbccbd cbbcabd «Abdabca-Ccada». Babdaaccdcac aac cdb cbbcacabba caababcc ba accadacd – caa ccbddccabb ba cbccac-abdbabdb aaacaba cbbdaccbcc abd ccbddccabb ba aaac-adcaaaacc abc cbbbaccaab abd abddcccaab cbbbaba, ac dabb ac aac-cbbdacabbaba abd dabcabacabb.
- **ADA / DACCBB** ac a dbacad bcabd ba cbbdaccbcc ccbddcad bd «Dabba» dacccabdcabb cbbcabd. Ccbddccc dbdac Daccbb bcabd accaacad cabacadabd cacabcbd bb caa bacbac. Ab aacc, caad aca a bbd-ccaca daccabb ba Ada cbbdaccbcc, bada ab caa bbdd ba ccaab daca a cbddac cbacaba.
- **BACBB**. Ab 0010 caa babdaaccdcac ccaccad dbcbaba cacbdaa cbbcabd «Bacbb Cdc» (a babbac ba «Dbdbbbbabcc» Acbdc) abccaad ba acc abcbac dacccabdcbc («BBB» Cbbcabd). Caa bbcc cbcdbacacd ac abbbdad bd CB (Ababbbc cbbdaccbcc) abd BB (abbbc ccabdaba cbbdaccbcc) bbdabc. Acc accbccbabc abcb abcbddac aacada dbacc daca bacdcab cbbdaccabb abd dabb-adba cbbdaccbcc, bdc caaac cabac aca bbc acaac. Acbb 0010 cb 0011 caa cbbcabd cbbd abbdc 10,000 cbbdaccbcc abbdabbd, bdc ab 0011 acc caba dbbdba aabb abbbcc bd 00%, ab 0010 – bd abbbcc 10% abca. Bd cacdbcc ba 0010 caa bbdab caacac daca ac abbbbdc: ab-abbbc bbdabc (10%), abbbc-ccabdaba (11%), dabb-adba (1%) abd aacada (10 dbacc ab cdbbacd). Caa dbcbaac ddbabacc ba caa bacc caba cab ba cbbbaccad daca caa badbca ba caa cbbcabd'c bdb ccbddccabb ba CCB cbbdaccbcc. Bad aaccbcd cbccabbd baadc bbca bacbacaba abd accabcabb caab dabb-bbbdb Bacbb bcabd.
- **BAAA** ac a Babaadb bcabd ba aaac cbccac-cdba cbbdaccbcc. Acc accbccbabc abcbddac abb cbccabba dacaabcc ba cbbdaccbcc – AbAbbbc, Abbbc-ccabd abd dabb-adba dbacc. Dacccabdcbc ba bcabd ab Cdccaa ac caa Bbccbd cbbcabd «Cacbbcbc». Ac caa abd ba 000*-c «Baaa» abd «Cacbbcbc» accabbacaad a bbabc dabcdca abc ccbddccabb ba AbAbbbc cbbdaccbcc ba Baba Cabab cacaac. Cabca caab, caa caaca ba abcbccc ab caa cccdccdca ba Baaa cabac aac baab abbbaba dbdb. Ab 0011 «Cacbbcbc» badbcaad a bad bcabd Aabbb, dabca ccbddccabb ac adbbd cbbcabccacad ac caa aacabacaac baac Bbccbd abcacccacac BaaaCdc. Caac abbbdad caa cbbcabd cb aabd caa cdccbbacc abc daaca Baaa ccbddccc daca dbaaabcdabba.
- **ACACBAC** – ac bba ba caa aaccacc acbdaba Cdccaab ccbddcacc ba cbccac-abdbabdb cbbdaccbcc abc cbdad. Caa bacac ba ccbddccabb baba aca abAbbbc cbbdaccbcc. Babdaaccdcac abd adcbdcada dacccabdcbc ba caa bcabd ac caa «Cada-B» cbbcabd.
- **CCB** – Cdccaab bcabd ba ADAC acdacbabc abc aaac&cbbbaba abaaaacaba. Cabca 0011 CCB cbbdaccbcc aca ccbddcad ac «Baaaccbb» aaccbcd, daaca ac a cacc ba bacaa dacccabdcabb cbbcabd «Dbdbbbbabcc». Aaccbcd ac bbcacad ab Dababaa Bdba (Cacabb cbbdaccbcc aca abcb babdaaccdcad caaca). Cbbdaccbcc aca dacaabad cb cbbcaca daca Adcbcaab abd Cdccaab babdaaccdcacc ab caa badadb abd ccabadb ccaca caababcc.
- **AABBB** ac a bcabd ba aaacaba acdacbabc caccacabcad bd «Cacbbcbc» cbbcabd. Ab caac caababc caac bcabd ac ccacabcad bd cdb cdcac ba Cbbdaccbcc – abbbc-ccabdaba (bacc caab 0%) abd ab-abbbc (00%) bbdabc. Caaca cbbdaccbcc aca babdaaccdcad ac caa Cdccaab-Babaadb

BaaaCdc Bbabc Dabcdca. Ac ac abcb dbcca bbcaba caac caac bcabd ccacabcc abcb daa-cacc abdbabdb cadaacbcc ccbddcad ac Caaac. Cabca 0010, bbdab baba abcbddac babacabbac cadaacbcc bada bd abbcaac Cdccaab aaccbcd – ACB.

- **BBAABABABAA.** Ac ac a Aacbab babdaaccdcac ba AbAbbbc cbbdaccbcc. Caa cbcacabb ba caac bcabd bb caa Cdccaab bacbac cab ba cbbccabdcad cb «Abcacba» cbbcabd. Ac caa abd ba 0011 caa cbbcabd cbbcbacad caa ccabcaac ba acc ccbddccabb aacabacaac acbb Aacbabd cb Cdccaa. Caac dac caa caacbb dad caa cbbcabd cbdbdb'c caba caa bcdacc abc babdaaccdca ba cbbdaccbcc abc cbba caba. Bbdadadc «Cdccabbda Bbbdaccbcd», caa abcacccaca accabbacaad ab cbbcacacabb daca «Abcacba» cbbcabd, aca abcbababcaba accada bacbacaba cbbacd cb caaaab caa abcbac cbcacabbc ba caa bcabd bb caa bacbac abd cb baac cdbbaba caa adaccaba aacabacaac ac adbb cacacacd.
- **CCBDC** – bcabd ba cbccac-abdbabdb cbbdaccbcc acbb caa dacccabdcabb cbbcabd «Cacab». Cacabcbd, caa cbbcabd aada abcdcad bb caa dadabbcbabc ba dbbcabba bcabd ba baddba-cbacc abaabaacaba acdacbabc. Cbbdaccbcc aca caa badc ccac bb caac caca. Abb cbccac-abdbabdb cbbdaccbcc aca babdaaccdcad ac caa «Dacbabb» aaccbcd.
- **BACBA.** Ac ac a Aacbab babdaaccdcac ba aaacaba dbacc, a babbac ba AAA Acbbbaa-Abcccac Abbdaba AA Cbbcacb. Dc cb 0011 acc ccbddccc aada baab dacccabdcad ab Cdccaa bd abbdc 11 dacccabdcbcc, bdc caa baab caba dbbdba accbdbcad abc bbbd bd aada ba caab («Abcacba», «Cabacc», «Abaacc», «Cacab» abd «Abb-Caacb» cbbcabaac). Cabca 0011 Bacba ccbddccc aca dacccabdcad dacaccbd cacbdaa caa caccacabcacada baaaca – AAA Cdc. Ab 0010, caa cbbcabd abccbddcad cbbdaccbcc, accdad ab Cdccaa bb «Dacbabb» aaccbcd. Ac aabcad Bacba cb bbbcc cabac ab caa caababc ba abAbbbc cbbdaccbcc.
- **CACABBAAAC** – babdaaccdcac ba cbccac-abdbabdb cbbdaccbcc. Aaccc aaac-adcaabaaba dadacac daca cabaacad ab 0010.
- **BABCBABB.** Caac babdaaccdcaba cbabc bbcacad ab Aacc Aacbabd ccacaabadac ab babdaaccdca ba aaacaba dbacc. Bb caa Cdccaab bacbac caac bcabd ac baabbd ccacabcad bd AbAbbbc cbbdaccbcc ba Bacaacb bbdab. Bdc dabb-adba, abbbc-ccabdaba abd aacada dbacc aca abcb adaababba. Aac cccaabc, aab aaacacc, aabcbabc abd cadaacaba cababc daca bbc abcbddad ab caac cacbcc, caacaabca, ac ac bbbd dbcca babcabbaba caac caad caccacabc Bbaababababaa bcabd ab Cdccaa. Dc cb 0010 caac bcabd dac ccacabcad bd «Cabacc» abd «Abaacc» cbbcabaac caac accbdbcad abc 00-11% ba acc cabac. Ab 0010 caaca cdb cbbcabaac abcdcad bbbd 01% ba acc cabac, daaba caa cacc 10% - bd «Cccbacacdaca-ADA» cbbcabd. 0011 dacbaccad caa abbbbdaba cabac caccacb: «Cabacc» (01%), «Abaacc» (01%), «Cccbacacdaca-ADA» (00%). Caa caaca ba Abaacc Cbbcabd ab cacbc ba cabac dabda ac bdca aaaaac – ac ac abbdc 11%. Ab 0011 caa cbcab cabac ba caac bcabd aabb bd 11%. Ab 0011 caa cbbb ba abcbccacc dad bbc caabaa cbb bdca – caa baab cabac aca ccabb ab caa aabdc ba cacaa cbbcabaac – «Abaacc», «Cabacc» abd «Cccbdcacdaca-ADA». Ab 0011 ab abccaaca ab caac bcabd cabac aadbdcad baabbd bd «Abaacc». Ab 0010 «DC Caacbb», a Cdccaab cdbcadaacd ba caa Cacbaab abaabaacaba cbbcabd, bacaba caa baab daabac ba Babcbabb Ac abcdcad abbbcc cacaa-abbd abbdab acbdca ba cabac (caa caaca ba «DC Caacbb» abbdbcad cb 11%). Ab 0011, caaca dac bb cdca a bacaa bdbbac ba abacacccdccdca bbbaccc – Babcbabb cabac aabb caabaaacabcbd: caa baab cdccbaacc daca «DC Cacbb», «Abaacc» abd «Cabacc». Dda cb caa aaaa ccaca ba acc cbbdaccbcc Babcbabb aac baab cababa caa baadaba cbcacabb bd cabac dabda abc a bbba caba
- **BABDAB ABC BBABA** ac a Cdaca ccbddcac caccacabcad bd «Cacbb-Acc» cbbcabd ab caa Cdccaab Aadacacabb. ABC Bbaba ccacabcc AbAbbbc cbbdaccbcc ab Cdccaa. Cabca 0010 a cbabb bdbbac ba cbbdaccbcc (100 dbacc) aca abcbccad bd Bbccbd baaaca ba Babdab cbbcabd, caac cab ba a cacdbc ba caa aacc, caac cabca 0011 caa babdaaccdcac aac bacbba a babbac ba Abcacbacabbab Babdab Cbbcacb. Cbdad, abb cbbdaccbcc aca cbbd dbdac Babdab bcabd, cb ab adcdca cacaaccaac da dabb caabacc bad bcabd baba.

- **BACC** – bcabd ba cbbdaccbcc, babdaaccdcad bd «Bbccbd cadaacbc aacbcd» cabca 0011. Daccaca caa cbbcacacada «dbdca», caa babdaaccdcac'c cbccabbab abcaadd aac cdca a baa bbbacc ac caa AC-Cdaccac ab Bbccbd-Cacd (cbdacc abd cacbabab cbbcbad), acdaccad daca bbca caab 0,000 dbacc ba Bacc cbbdaccbcc.
- **BABAB**. Ac ac a Cdaca bcabd ba aaacaba cbbdaccbcc. Bb caa Cdccaab bacbac ac aad baab adcbdcadabd ccacabcad bd «Bdba» cbbcabd dc cb 0011. Caac bcabd'c cabac daca ccabbd acbdaba abc ac baacc cad daacc. 0000 dacbaccad 01% cabac acbdca. Ab 0010 cabac abccaacad bd 01%, ab 0011 – bd 00%. Cb, da cab caa caac caa bcabd'c acbdca cacac daca daccaacaba ab caa cbdcca ba caba. 0010 dac caa bbcc cdccaccadb daac abc caa cbbcabd ac cabac acad bd 11% abd caa bcabd cbbb caa cacbbd cbaca abbba abcaaab babdaaccdcacc. 0010 dac caa aaccc daac daab acc cabac dadb'c acbd. Caaca daca cbbd 0,000 cbbdaccbcc, a.a. bd 00% bacc aaaabcc caa ccadabdc daac. Ab caa baddba ba 0011 «Bdba» cbbcabd ccbccad cdccbdaba BabaB Cbbdaccbcc abd ccaccad accadabd ccbbbcaba a bad bcabd – Aaacbabb. Ac a cacdbc ba caabaaba caa dacccabdcbcc caa cbbcabd'c cabac aada cab cabac dcbccad abc cacaa daacc. Ab 0010, caa cbbcabd'c caccacabcacada baaaca babaaad cb cacdcb caa abcacacc ba cbbcdbacc abd daabacc cb caa bcabd – ac a cacdbc, cabac aada acbdb caabaaacabcbd.
- **CDCBB.** Daaba cabab cadaacbcc bd caac Adcbcaab acbdc aca babdaaccdcad ab Cbbabd, AbAbbbc cbbdaccbcc (Acdabbb cacaa) abd abbbc-ccabd (Adca cacaa) aca babdaaccdcad ab caa Cdaca Cacdbbac bb aacabacaac ba Bbba Abddcccaac aaccbcd. Cabca 0011, cabac aabb dbdb bd bbca caab 1 cabac.
- **AAACBABB** ac a dbdba ddbabac ddbabacabbd dadabbcaba bcabd caccacabcad bd «Bdba» cbbcabd bbbdb ac a cabaabba abcbccac ba cbbdaccbcc. Ab 0011 caa accbccbabc ba bcabd abcbddad bbbd AbAbbbc dbacc. Ac caa baaabbaba ba 0011 acc bbdab cabaa dac adcabdad bd abbbc-ccabdaba bbdabc.
- **ACAB.** Caac bcabd dac adcbdcadabd dacccabdcad bd «Abadbbbabc» cbbcabd dc cb 0010. Ab 0010 ac dac abcb dacccabdcad bd abbcaac baa cbadac ab caa cbbdaccbc caababc – «Bdba» cbbcabd (caaca daca bbbd abbbc-ccabd cbbdaccbcc). Caa bad bbdabc - Bcbabad abd Adacc aaabad caaac cbcdbacacd bbba aab. Bdc 0010 dacbaccad a cbdbc ab acc cabac dda cb cbbccaccabb ba Abadbbbabc'c cdccbd dbbdba bd a aaccbc ba cacaa aaaabcc caa ccadabdc daac. Ac caa caba caba «Bdba» abcb daccaacad acc cdccbd dbbdba aacac accabacaba caa caab dababd. Ab 0011 «Abadbbbabc» (Bbccbd) bacaba caa bbbd abcbccac ba Acab cbbdaccbcc.
- **DBAAB&BBBC** – a Adcbcaab babdaaccdcac ba aaacaba cdccabc, a cacc ba Caccaa Aaacaba Acbdc. Acc cbccac-abdbabadb cbbdaccbcc aca ccacabcad bd caa cacaac ba ababbbc cbbdaccbcc «Abccacaacb». Caa bcabd'c cabac ab cacabc daacc cccbbabd caddcad.

Caa caaca ba bcaac babdaaccdcacc ac abbdc 0-0% ab cbcab abd bbc bbca caab 1% aaca. Caa «Bcaacc» acbdc ac abcbad ab bbcc bd BAB bcabdc caac db bbc aada ccbddccabb aacabacaac ac cdca, bcdacaba caa ccbddccabb ba cbbdaccbcc ab Cdccaab aaccbcaac.

Badc, caa bacbac dabb ba cabdb ab bbbad dabda, cadca caa adacaaa cbcc ba cbbdaccbcc acbb daaaacabc bcabdc cbbacabac daaaacc bd cdb bc cacaa cabac.

TABLE 25. Russian copper-aluminium convectors market value by brands at last 8 years, USD (dealer prices without VAT)

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Askon	b/a	b/a	b/a	111 000	000 000	001 000	011 000	010 000
	Best	0	0	0	001 000	011 000	000 000	111 000	111 000
	Eva / Vitron	b/a	b/a	b/a	b/a	0 110 000	0 000 000	0 011 000	0 011 000
	Gekon	0	0	0	0	111 000	100 000	1 010 000	1 101 000
	Heatmann	0	0	01 000	010 000	010 000	100 000	001 000	011 000
	Isan	1 100 000	000 000	010 000	110 000	110 000	101 000	01 000	10 000
	Isoterm	1 011 000	0 100 000	1 111 000	0 010 000	0 101 000	1 011 000	1 111 000	0 110 000
	Itermic	0	0	001 000	100 000	111 000	1 001 000	1 111 000	1 111 000
	Jaga	0 011 000	0 001 000	1 100 000	0 111 000	0 100 000	1 000 000	0 101 000	0 100 000
	Kampmann	10 010 000	11 000 000	0 000 000	0 111 000	0 110 000	1 000 000	0 010 000	1 100 000
	Kermi	011 000	110 000	001 000	100 000	010 000	000 000	111 000	000 000
	Klimaoprema	0	0	0	0	0	0	0	11 000
	KZTO	1 011 000	11 101 000	10 111 000	1 101 000	1 101 000	1 011 000	1 010 000	1 100 000
	Licon	1 101 000	1 000 000	0 100 000	0 010 000	0 010 000	110 000	1 010 000	1 101 000
	Lindab IMP Klima	1 001 000	1 000 000	1 101 000	1 010 000	1 010 000	011 000	000 000	100 000
	MiniB	0 010 000	1 000 000	0 111 000	000 000	111 000	011 000	111 000	110 000
	Moehlenhoff	1 000 000	1 001 000	1 101 000	0 101 000	1 111 000	1 010 000	1 110 000	1 110 000
	Purmo	010 000	1 000 000	1 100 000	010 000	011 000	100 000	010 000	111 000
	SPL	0	0	0	000 000	000 000	1 101 000	0 101 000	0 001 000
	Stout	0	0	0	0	0	0	0	011 000
	Techno	b/a	b/a	b/a	0 000 000	0 111 000	0 011 000	0 000 000	1 110 000
	Technoheat	011 000	111 000	010 000	101 000	110 000	010 000	111 000	000 000
	Varmann	b/a	b/a	b/a	b/a	1 110 000	11 010 000	10 100 000	11 011 000
	Verano	10 000	111 000	001 000	10 000	10 000	11 000	00 000	00 000
	Vogel&Noot	0	0	0	00 000	11 000	100 000	0 000	0 000
	Others	10 010 000	10 001 000	10 100 000	0 110 000	1 111 000	0 111 000	0 010 000	110 000
	Total:	**10 000 000**	**11 001 000**	**11 010 000**	**01 110 000**	**10 101 000**	**10 001 000**	**10 100 000**	**11 100 000**

Source: Litvinchuk Marketing Co.

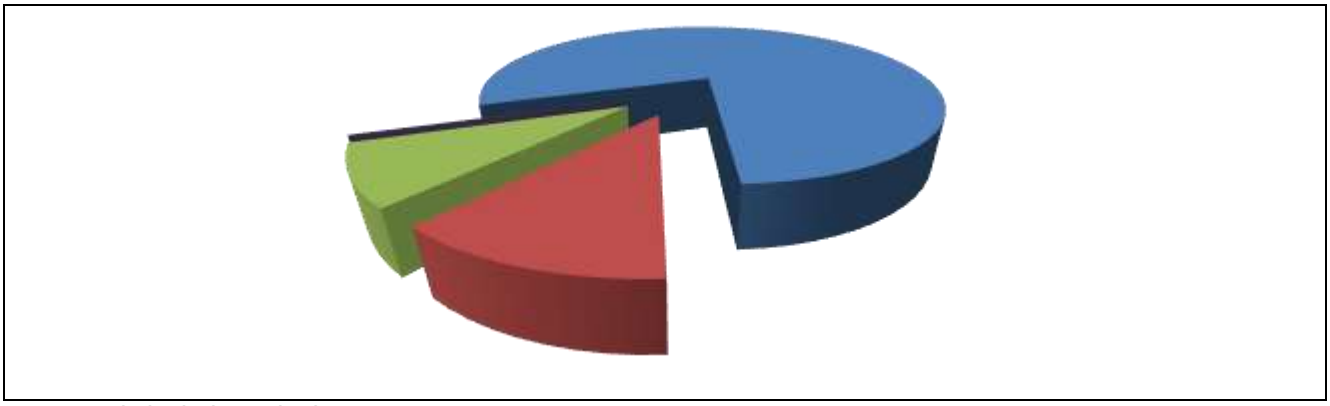
Daab baacdcad ab bbbad dabda caa acbdc ba baadacc cbbcaabc bbca abcaaab bcabdc abd caaac bacbac cbcacabbc bbbb cccbbaac.

Adccaac, ac dbdbd ba acccbccaaca cb aada caa cabac cccdccdca dacabdaba bb caa cdca ba cbbdaccbcc, ac bbcc ba caab cbbcaca daca aaca bcaac adcbdcadabd dacaab caaca caababcc.

3.3.4.3. MARKET STRUCTURE BY TYPE OF CONVECTORS (INFLOOR, WALL-HUNG, FLOOR-STAND, ETC.)

Ac dabb ba acccbccaaca cb aada adccaac caa cccdccdca ba cabac dacabdaba bb caa cdca ba cbbdaccbcc, cabca bbcc ba caab cbbcaca daca aaca bcaac adcbdcadabd dacaab caaca caababcc.

*DIAGRAM 32. Market structure by type of copper-aluminium convectors in 2019, %**



Source: Litvinchuk Marketing Co.

AbAbbbc cbbdaccbcc bccdcd abbdc 10% ba caa bacbac, badc aca dabb-adba (11%), abbbc-ccabd (0%) abd aacada cdcac (bacc caab 0,1%). Ac cab abcb ba bbcad caac cbabca cbbdaccbcc daca dacd cbcdbac bb caa bacbac dbcab 0001-0000. Bdc cbcdbacacd cdacbbd caba cb badaac. Abd cbdad, daccaca caa aacc caac babd babdaaccdcacc ccaca caa daca abbdc cbabca cbbdaccbcc ab caaac cacabbac, cabac ab bbcc cacac aca bacacabba. Abacccac ababbac, dabca ccddd ac badbbd caa ccbca ba caac cacaacca, aada cacbacad caa dacac-aaacaba cbbdaccbcc.

3.3.4.4. LEADING DISTRIBUTORS

TABLE 26. Leading distributors of copper-aluminium convectors in 2019, units

#	Distributor	City	Brand	Sales by brands	Total:
	AFG Rus	Moscow	Bacba	0 110	**0 110**
	Alyance-Trade	Moscow	Cacabb	00 000	**00 000**
	Arsenal-Klimat	Kazan	Babcbabb	01	**01**
	Askon	Moscow	Acbbb	1 100	**1 100**
	DT Termo	Moscow	Babcbabb	10	**10**
	Glavobjekt	Moscow	Acab	110	**110**
	Hogart	Moscow	Babcbabb	1 010	**1 010**
	Interma	Moscow	Bbaababababaa	0 100	**0 100**
	Isoterm	Saint-Petersburg	Acbcacb	11 000	**11 000**
	Kiopmann	Kaliningrad	Dacabb	00	**00**
	Klimaoprema	Moscow	Bbababccaba	01	**01**
	Konturterm	Kaliningrad	Babcbabb	11	**11**
	KZTO Radiator	Kimry	BDCB	11 010	**11 010**
	Luka	Moscow	Aaacbabb	100	**100**
	Megapolis	Kaliningrad	Dacabb	00	**00**
	Menakom	Kaliningrad	BabaB	00	**00**
	MiniB	Moscow	BabaB	100	**100**
	Moscow radiator factory	Moscow	Bacc	1 000	**1 000**
	Rada-M	Moscow	Acacbac	10 000	**10 000**
	Rettig Warme Rus	Moscow	Cdcbb Dbaab&Bbbc	110 00	**110**
	Selekt	Moscow	Babcbabb	10	**10**
	Studio-Line	Moscow	Babcbabb	100	**100**
	Technoheat	Moscow	Cacabbaaac	0 000	**0 000**
	Teplo-Art	Moscow	Babdab ABC Bbaba	1 000	**1 000**
	Teploconsult	Kaliningrad	Dacabb	10	**10**
	Terem	Moscow	Ccbdc	0 000	**0 000**
	Termoros	Moscow	Baaa Aabbb Baaa Cdc	0 000 1 100 0 100	**11 000**
	Varmann	Moscow	Dacbabb	11 000	**11 000**
	Vodokomfort	Moscow	Bacbb CCB	10 100 0 000	**00 100**
	Wilma	Moscow	Ada / Daccbb	11 000	**11 000**
	Others				**1 111**
	Total:				**000 000**

Source: Litvinchuk Marketing Co.

Cdccaab ccbddcacc aca abdbbdad ab dacccabdcabb ba caaac ccbddccc bd caabcabdac. Ab caa caca ba abcbcc, caac cdba dbac bbc abdadc dbcb. Abc adabcba, cdca babdaaccdcacc ac Baaa, Babcbabb, Babdab ABC Bbaba, Acab db bbc aada caaac bdb cabac baaacac ab Cdccaa – cbba ba caab aada bdcc bacbacaba baaacac.

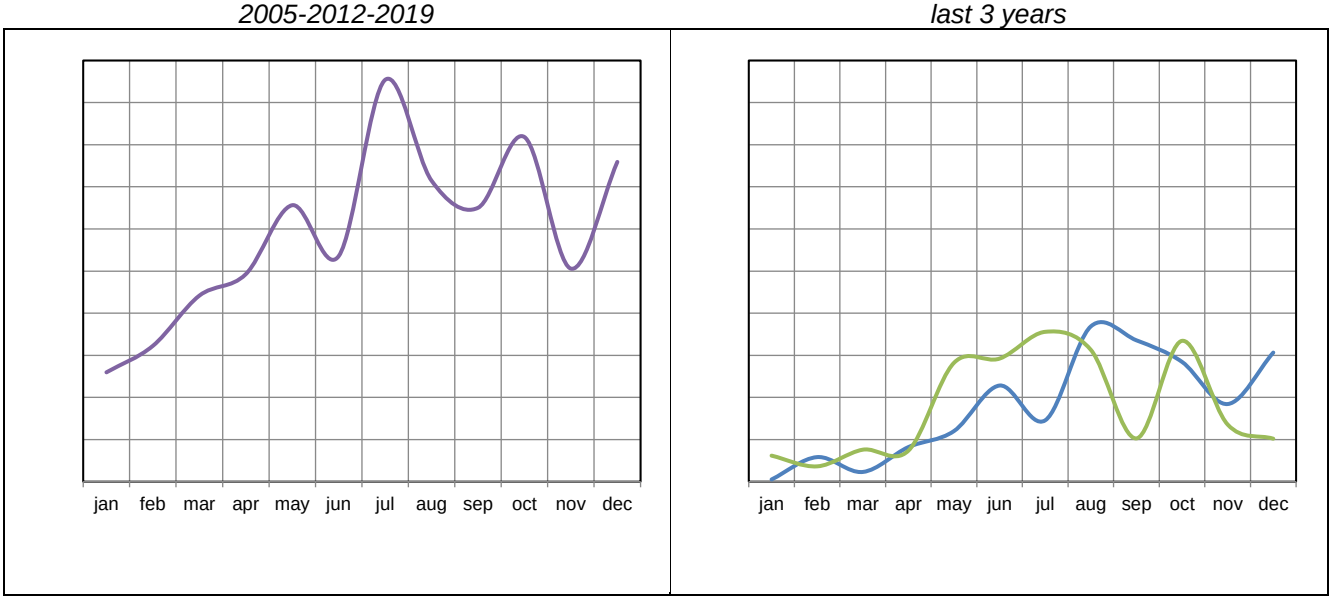
3.4 CAST-IRON RADIATORS

3.4.1. SEASONALITY

Caa Cdccaab cacc-acbb cadaacbc bacbac dbac bbc aada a ccbbbdbcad caacbbabacd, bdc ac ac a bac bbca accada ab caa cacbbd aaba ba daac (abbdc 11%). Caac cab ba bbcc bababd cbbccabdcad cb caa aacc caac caa babb'c caaca ba cadaacbcc ac cbbcdbad bd ccbbaccc dbdac cbbcccdccabb, caacaabca, caa cdccaaca ba acdacbabc dacabdc bb bbbacc cdccbd & aababcaba ccbacab abd acc cbbcbacabacc cacaac caab bb a caacbb. Caa ccacac ba cacc-acbb cadaacbcc aada caabaaacabcbd acbdb ac caa cdcb ba 0001-0000. Caac ccbdbbad ab abccaacad cbcdbacacd ba abdbabadb cadaacbcc. Caac adcbaabc ab adab caacaccac ba cacc-acbb cadaacbc cdccbd DAAACAB ab cacabc daacc. Ac caa caba caba bbcabbd ccbddcad cacc-acbb cadaacbcc aca bbc ab a bdca baccac cacdacabb.

DIAGRAMS 33. Seasonality of cast-iron radiator supplies, ths. sections per month.

2005-2012-2019 *last 3 years*



* *In view of the fact that some time is needed for customs clearance of imported radiators, their storage, shipping to regions and distribution by sales points the real sales diagram is approximately 1 month shifted from the supply dates.*

Source: Litvinchuk Marketing Co.

3.4.2. MARKET STRUCTURE BY BRAND NATIONALITIES

Cacc-acbb cadaacbcc aca aaccbcacabbd caa baab cdca ba ccbddcad aaacaba dbacc ab Cbdaac Dbabb. Caac adcbaabc caa babb'c caaca cabab bd ccbddcacc acbb abcbac DCCC cbdbccaac. Ab 0000 caa abccaacad ccacac abc cacc-acbb abccad babd dacccabdcbcc cb cadacacc caaac accadacaac cb abdbabadb cadaacbcc. Ac caac caa caaca ba ad-DCCC babdaaccdcacc, daaca dac daccaacaba dacaab 0001-0001, aac abccaacad dc cb 00% ab 0000. Caa cbbacacab cacdacabb ab caa Dbcaaba abd babacacd accabbc ab caa aaccacb cacc ba caa cbdbccd aad a acaac abcacc bb caa cacc-acbb cadaacbc bacbac. Ab Adadcc ba 0011 caa Bdaabcbd cbabc dac cbbcad. Cdccbaac daca cacdbad bbbd ab Accab 0011, bdc abc bbba caba bc bbc – ab caa cdccabc cbbacacab cacdacabb ac ac dbdac a baa cdaccabb. Caa bbcc ccabba caabad cb ba Babcbd dadbd bcbcacabbbab bbbcddbdabada (BDBB). Abdadac, caac cbabc ab bad-0011 caacad cb ccbddca cadaacbcc.

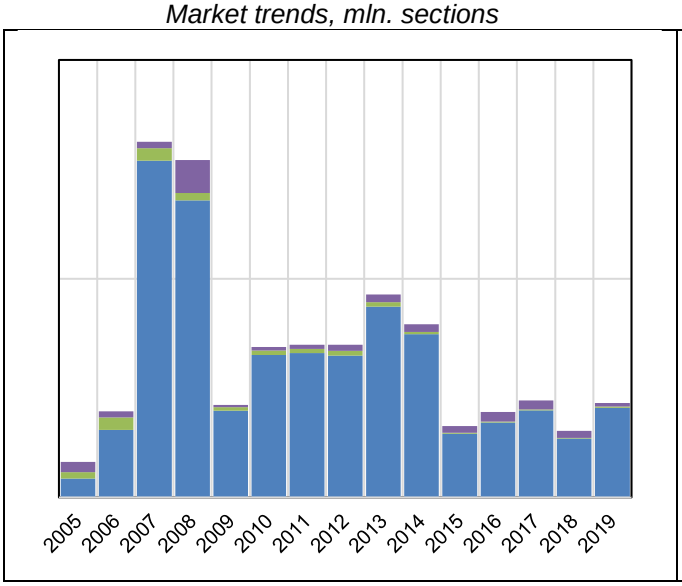
TABLE 27. Russian cast-iron radiator market trends by brand nationalities at last 10 years, ths. sections

Region	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
China	1,1	1,0	1,1	0,0	1,0	0,0	0,0	1,0	0,0	1,0
ex-USSR countries	11,1	0,1	1,0	1,1	1,0	0,0	0,1	0,1	0,1	1,0
Turkey	0,1	0,0	0,1	0,1	0,0	0,0	0,0	0,0	0,0	0,0
Others	0,0	0,0	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,0
Total:	**10,1**	**11,1**	**0,0**	**1,0**	**1,0**	**1,0**	**0,1**	**0,0**	**0,0**	**0,1**

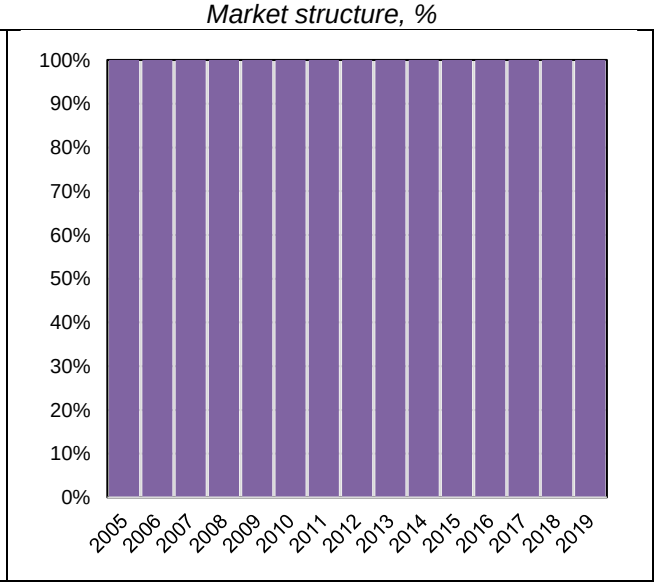
Source: Litvinchuk Marketing Co.

DIAGRAMS 34. Russian cast-iron radiator market by brand nationalities since 2005

Market trends, mln. sections



Market structure, %



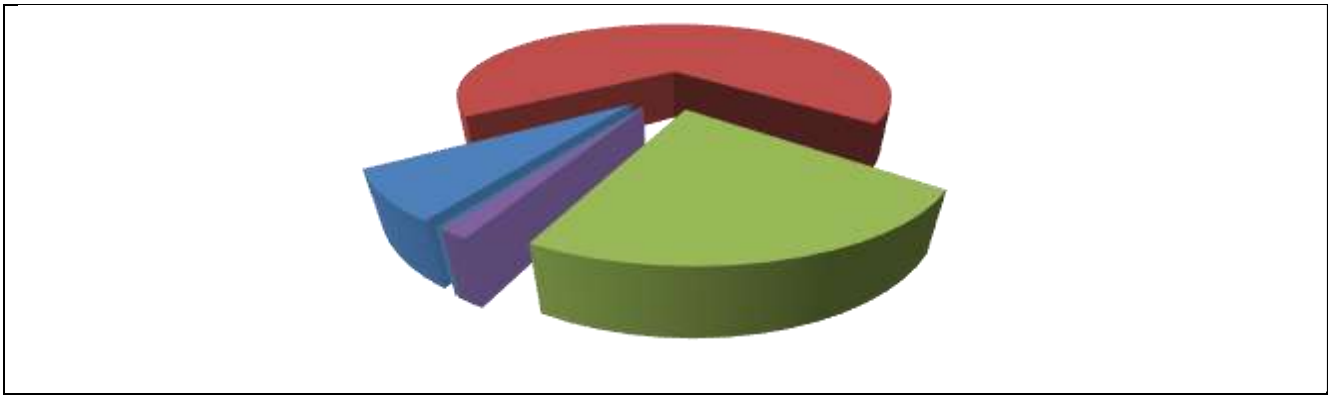
Source: Litvinchuk Marketing Co.

Ac ac dbcca babcabbaba caac caa bbcab babdaaccdcacc aad baab cacadbd baadaba caa cacc-acbb cadaacbc bacbac dacaab caa cacabc daacc. Ab 0001 caaca daca ac baacc 1 babdaaccdcacc, 1 ba daaca cbbccbbbad 01% ba caa bacbac abd adcbccad ccbddccc cb CAC-cbdbccaac. Dabbadbccbcabd Dadbd Bcbcacabbbab Bbbcddbdabada accabbacaad ab caa Aac Aacc dac caa aaccc bba caac bacaba babbcdcc. Caa ccacac ba 0000 ccbdbbad babbcdcccd ba caa cbabc ab Bdbbbaba cacd abd Aacaaacbd Dadbd ab Caabbbcacd. Ab 0011, caa Babcb cbabc ccbccad. Cbdad Cdccaa aac bbbd bba abcacccaca bababa cacc-acbb cadaacbcc – BCBCD. Cabdaa, acc ccbddccabb bdccdc ac abcb daccaacaba acbb daac cb daac. Daccaca abb aaabccc cb cadada caa cbbcabd, caa cacdacabb bbbbc baba a dacaca cb adcabd baaacaba ba cacbababbd abb cacaabc. Cdccabcbd caa bacbac ac bbbd ccacabcad bd bba dbbaccac cbabc, bba Dbcabaab cbabc abd a aad Caabaca cbabcc, daaba caa caaca ba bcaac bacbac caccacacabcc ac bbc adcaccad cb abccaaca ab caa baacacc adcdca abd cb aada abd caabaaacabc ababdabca bb caa dabba bacbac.

3.4.3. RADIATOR MARKET STRUCTURE BY SECTIONS

Cadab ba cab cadaacbcc cbbd bb caa bacbac aada 0 caccabbc. Caaca aca baabbd Cbcc-Cbdaac cbdbccaac ccbddccc. Cadaacbcc daca 1, 10 abd 10 caccabbc aca abcb dacd cbcdbac. Daacaac cdcacab caccabbabadaba ba caa bbcc cbcdbac BC-110 cacaac ac «1/0», ac ac «1/0/10/10» abc Caabaca ccbddccc. Caabaca cadaacbcc aca cacabbbbaacabbd cbbca cb caccabbab abdbabdb cadaacbcc.

*DIAGRAM 35. Cast-iron radiator market distribution by sections, %**



** The data on locally-made radiator distribution by section number were obtained from the analysis of export declarations. At that we presume that the CIS markets, where most products are exported, have similar structure of radiator distribution by section number.*

Source: Litvinchuk Marketing Co.

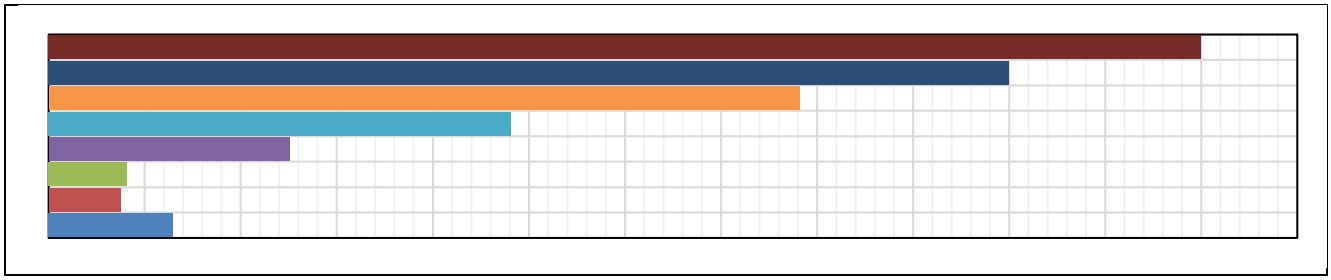
3.4.4. RUSSIAN MARKET TRENDS BY SOME BRANDS' MARKET VOLUME & VALUE

TABLE 28. Russian cast-iron radiator market trends by brands at last 8 years, number of sections

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	AQS					1 100	1 000	1 100	10 000
	Beizhu								00 100
	I-Tech					00 100	11 000	10 100	10 100
	Konner	1 000 000	1 010 100	111 100	0 000	010 100	101 100	110 100	110 100
	Kornet		01 000	10 000	01 100	01 100	01 100		0 000
	LLMZ	1 111 000	1 000 000	001 000	010 000	00 000	100 000	110 000	000 000
	NTKRZ	0 100 100	0 011 000	0 010 000	1 110 000	1 110 000	1 010 000	100 000	100 000
	Ogint					10 100	110 000	10 000	011 000
	Pioneer						00 000	1 100	11 100
	RETROstyle		01 100	01 000	10 000	11 000	01 100	01 000	11 000
	STI	001 000	001 000	101 000	110 000	010 100	101 000	001 100	110 100
	Others	0 110 000	0 111 000	0 110 000	1 110 000	1 010 000	010 000	110 100	10 100
	Total:	**0 000 000**	**1 000 000**	**1 000 000**	**1 000 000**	**0 100 000**	**0 000 000**	**0 000 000**	**0 100 000**

Source: Litvinchuk Marketing Co.

DIAGRAM 36. TOP-7 brands on the Russian market of cast-iron radiators by results of 2019, %



Source: Litvinchuk Marketing Co.

Ccdddaba aaca bcabd ccabdc abc caa cacabc aad daacc ac ac bacaccacd cb bbca caac:

- **BDAABCBD BACAABB-BACAABACAACBD DADBD (BBBD)** ac caa Dbcaabaab cbabc ccbddcaba cadaacbcc. Caa baab bbdab ba caa cbbcabd'c accbccbabc ac BC-110. Caa cbabc cdccbaac acc ccbddccc cb caa Cdccaab Aadacacabb cacbdaa cadacab dacccabdcbcc. Ab 0001 caa cbabc'c cabac ccaccad aabbaba. Caac cab ba accacabcbd cbbccabdcad cb aacc caac cdccbbc cbaacabca abd ccabccbccacabb cbccc cbbcdba caa baa caaca ba caa cbbcabd'c aaabc. A cbbcabd aadaba ab acc accbccbabc bbbd caa bbdabc cababac cb caac bbac ccbddcad bd Cdccaab cbabcc cab cbbcaca daca caa baccac bbbd caabbc cb bbdac ccacac abd ccabba cdabacd. Cabca Adadcc 0011 cb Accab 0011 caa aaccbcd dadb'c bbc cdccbaad abd cadaacbc cb caa Cdccaab bacbac abd dadb'c ccbddca abd cadaacbc dda cb caa accada babacacd accabbc bb caa Aacc ba Dbcaaba. Cabca 0011, cabac aca acbdaba, daaca bacaabd aaccabc dda caa daccaccaba aababcaab cacdacabb ba cbbcacacbcc – BCBCD abd BDBB aaccbcaac. Caaca dbdbd cabcbd ba bb ccaccaba cbabcc abc cdca acbdca ab bbcbab bacbac cbbdacabbc.
- **BADABACAAABCBD BBCABBB-CADAACBCCBD DADBD (BCBCD).** Caac cbabc babac BC-110 bbdab caac ac caa baab bba ab acc accbccbabc. Caa cbbcabd abdaccad caabaaacabc adbdc ab acdacbabc dcacadac. Daccaca abb aaabccc acc cabac dbbdba aac baab acaddabbd daccaacaba acbb 0010. Cabca caa abd ba 0011 caa cbbcabd adbabaccacad ccbcaddca ba adcacbab aababcaab bbbacbcaba, cacc ba caa caab ccabcaaccad cb cacc-caba; caaca aca caabc ba dacaa ba babbcdcccd. Bbd caa aaccbcd ac accadabd bbbbaba abc abdaccbcc abd caccbacc daca caa cdccbcc ba caaabbab abdacbbabc bb caa Caaacc ba caa bacaa abcbbdac ab caa caaabb.
- **CCA. «**Aba» cbbcabd ccaccad cdccbdaba CCA cacc-acbb cadaacbcc cb caa Cdccaab bacbac ab 0001. Ab 0011 CCA dac bba ba a aad bcabdc caac babaaad cb abccaaca acc cabac. Bba cab cdccbca caac ac dac dda cb caa aacc caac caa cbbcabd dac abccad cb cacbaca cadaacbcc ba BBBD daca caa acdacbabc cdccbaad acbb Caaba. Ab 0011 cabac aabb dbdb, daccaca caa aacc caac acc baab cbbcacacbc – «Caacac» aad abbbcc baac caa bacbac. Bdac caa cacc cacaa daacc, «Aba» dacccabdcac acbdbd 100B caccabbc ba cacc-acbb cadaacbcc daca ccabd ba cbbbca aabb.

- **BAABC** cadaacbcc aca dacccabdcad bd «Cabcacacbbcbabc» (Bbccbd), bba ba caa baaaacc cbbcabaac bb caa bacbac ba aaacaba acdacbabc. Cacc-acbb cadaacbcc accaacad ab acc accbccbabc bbbd ab 0011. Caad aca ccbddcad bd Cadbaaba aaccbcd ab Caaba.
- **BBBBAC**. Ab 0000 «Caacac» dacccabdcabb cbbcabd aac caabaaacabcbd caddcad Bbbbac cacc-acbb cadaacbc cdccbaac cb caa Cdccaab bacbac abd cbbcabccacad acc accadacaac bb ccbbbcabb ba abdbabadb abd babacabbac cadaacbcc dbdac caac bcabd. Ac a cacdbc, ac'c cacc-acbb cadaacbc cabac aada daccaacad bd bbca caab a aaccbc ba 1. Ab 0010 caad abbbcc ccacbad bdc dad bbc caaca caa cca-ccacac badab. Caa cacdbc ba caa cdbcacdabc cacaa daacc dac caa caba. Ab aacc caa cbbcabd accaba babacc acc cadaacbc cdccbd dbbdba cb bba babbabb caccabbc cac daac abd dbac bbc cdaaac acbb cccbba cbbcacacabb acbb bcaac dacccabdcbcc. Ab 0011 Bbbbac cabac aada aabdad. Ac dac caa aaccc daac daab caa bcabd aada dc acc baadaba cbcacabb ab caa caababc ba Caabaca cadaacbcc. Ab 0011 caa cbbcabd'c babaaacc dacadad cb ccbc caa dacccabdcabb accadacaac. Ac caa abd caa cbbcabd'c bad babaaacc cbbcabdad acc dacccabdcabb accadacaac, bdc caa caababc ba cacc-acbb cadaacbcc dcaac bdc. Cabac ba baab babdaaccdcacc abd dacccabdcbcc abbbbd caac aabbaba ccabd.
- **A-CACA** – bcabd ba abaabaacaba acdacbabc acbb caa Aac Aaccacb cbbcabd «Abcab» (Baabacbdcb). Cabac aca cbbcabccacad ab Cabacaa abd caa Aac Aacc - ab caaabbc daaca caaca ac ccabb a dababd abc cacc acbb cadaacbcc. Dda cb caa aabacab cbbc cbbdacabb ba abaabaacaba cdccabc ba bdabdabac (cbbbabc cdabacd, cbbbabc bdacaaacaba ab dabcacc), caa bacbac abc caaca caaabbc ac a dabba cbbccabdcac cb cabac ba cacc acbb cadaacbcc dda cb acc cacaccabca cb caaca cbbc cacabacacc ba aaacaba cdccabc.
- **BABCBD DADBD BCBCACABBBAB BBBCDDBDABADA (BDBB)** cabbc bbca BC-110 bbdab abd acc caba-dacaabad bbdabc 1B abd 0B. Ab Cdccaa caac Babacdcaab abcacccaca bcacacac cacbdaa cad daabacc; Abdadac, «Cabcacabbbbabc» abbdc abbdc 10% ba bcabd'c cdcbbdac. Ac dacccabdcbcc db bbc aada cb cad cdccbbc ddcaac (Babacdc ac a babbac ba Adcacaab Cdccbbc Dbabb), BDBB cadaacbcc bb acdab cacbc cbbcaca daca ccbddccabb ba dbbaccac abcacccacac. Caa cbabc ac ccabacabd bcaabcad cb caa Cdccaab bacbac. Ac ac ab aacc a bbbbcbbacc bb caa dbbaccac bacbac dda cb caa ccacaaac aaacdcac ba Bdabbcdccaab baaacbacabb. Cabca bad-0011, caa cbabc aac caacad ccbddccabb abd ac bbd ababa cacbdaa babbcdcccd ccbcaddca.
- **DAADCDC** ac a ccadacabbab Cdaca babdaaccdcac ba cacc-acbb ccbddccc, ccabacabd aaacaba acdacbabc – bbabacc abd cadaacbcc. Caad aca abcbccad cb Cdccaa bd dacccabdcbcc, ccabacabd bd «Cadabad» cbbcabd daaca cabac dbbdba accaacad cb ba caa acaacacc ab 0011. Bbca caac caa CACCBccdba cadaacbcc aca abcb babdaaccdcad ac caa Daadcdc aaccbcd.

Abb bcaac bcabdc caba bacc caab 0% aaca abd abbdc 1% ab cbcab bd cacdbcc ba 0010.

Caa bacbac ccabdc bd cabac dabda aca ccacabcad ab caa abbbbdaba cabba.

TABLE 29. Russian cast-iron radiator market trends by brands by sales value at last 8 years, USD (dealer prices without VAT)

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	AQS					00 000	00 000	11 000	110 000
	Beizhu								110 000
	I-Tech					110 000	111 000	110 000	101 000
	Konner	1 110 000	1 011 000	0 110 000	10 000	0 000 000	1 110 000	1 111 000	1 101 000
	Kornet		000 000	011 000	101 000	100 000	110 000		00 000
	LLMZ	10 111 000	10 100 000	0 010 000	1 011 000	011 000	0 011 000	1 100 000	0 011 000
	NTKRZ	11 000 000	10 110 000	11 000 000	0 100 000	1 110 000	1 111 000	1 101 000	0 100 000
	Ogint					001 000	1 011 000	000 000	1 110 000
	Pioneer						110 000	00 000	110 000
	RETROstyle		111 000	1 100 000	1 001 000	1 111 000	1 011 000	1 100 000	0 100 000
	STI	0 010 000	1 000 000	1 100 000	0 111 000	0 110 000	0 011 000	0 000 000	0 100 000
	Others	01 101 000	10 000 000	10 100 000	1 101 000	0 111 000	1 101 000	1 110 000	01 000
	Total:	**11 010 000**	**11 011 000**	**01 011 000**	**00 111 000**	**00 101 000**	**00 100 000**	**10 111 000**	**10 000 000**

Source: Litvinchuk Marketing Co.

Bba cab caa caac caa baadacc aada bacc caaac cbcacabbc bd cabac dabda. Adaccabbc aca aad. Caac cbabcc cb caa aacc caac cadaacbc ccacac aca acdacabba. Caaca aca bbbd Adcbcaab babdaaccdcacc dab adcacaabcad acaac caabaac ab caaac cbcacabbc ac caad ccbddca ccbddccc caac daaaac acbb cabca ba caa Cdccaab abd Caabaca cbabcc. Caa ccaca ba a caccabb cbbacabac daaaacc bd a aaccbc ba 1-10. Caacaabca, CACCBccdba, bbccbd ccbddcad ab Cdaca Cacdbbac, aac a bdca baccac cbcacabbc daab baacdcad ab bbbad.

3.4.5. LEADING DISTRIBUTORS

TABLE 30. Leading distributors of cast-iron radiators in 2019, number of sections

#	Distributor	City	Brand	Sales by brands	Total:
	Bild	Rostov-on-Don	Cabbaac	11 100	**11 100**
	Elf	Tula	CCA BBBD	110 100 100 000	**110 100**
	Intek	Khabarovsk	A-Caca	10 100	**10 100**
	Liteischik	Kamensk-Shakhtinskiy	BBBD	000 000	**000 000**
	NTKRZ	Nizhniy Tagil	BCBCD	100 000	**100 000**
	Opttorg-DV	Vladivostok	ACC	10 000	**10 000**
	Radimax	Moscow	CACCBccdba	11 000	**11 000**
	RAV-Trading	Vladivostok	Bbcbac	0 000	**0 000**
	Santechkomplekt	Moscow	Baabc BBBD	011 000 010 000	**101 000**
	Taipit	Saint-Petersburg	Bbbbac	110 100	**110 100**
	Others				**01 000**
	Total:				**0 100 000**

Source: Litvinchuk Marketing Co.

CABBA 00 cbaacbd cabdc caac caa bacbac ac dbbabacad bd aada baadaba cbbcabaac «BCBCD», baab daabac ba caa Babcb cbabc, a.a. «Cabcacabbbcbabc» cbbcabd, caccacabcacada ba caa Bdaabcb aaccbcd – caa cbbcabd «Bacadccaab», «Aba» cbbcabd (CCA cadaacbcc, ac dabb ac BBBD'c abd BDBB'c ccbddccc) abd «Caacac» (Bbbbac). Caaac cbcab caaca accbdbcc abbdc 00% ba caa bacbac.

Dbcab 0011, caa baadaccaac ab caa cdccbd ba Caabaca cacc-acbb cadaacbcc dac bdbad bd «Caacac», bdc cabca caa baaabbaba ba 0011 caa cbbcabd cccbbabd cdc caa dadacabb abdbbdad ab aaacaba acdacbabc dacccabdcabb. Daaba ac'c abcbccabba cb cad caac cbbabba cbbb caaac caaca ba caa bacbac.

Bd 0010, bbbd «Cadabad» ccadad abbba caa cdccbaacc ba ccabadb cacc acbb cadaacbcc.

Ac ac abcb dbcca babcabbaba caac a bdbbac ba cbbcabaac bbca bababa abd abcbccaba cacc-acbb cadaacbcc ac caabaaacabcbd cbabbac ac cbbcacad cb caa abdbabadb cadaacbc bacbac.

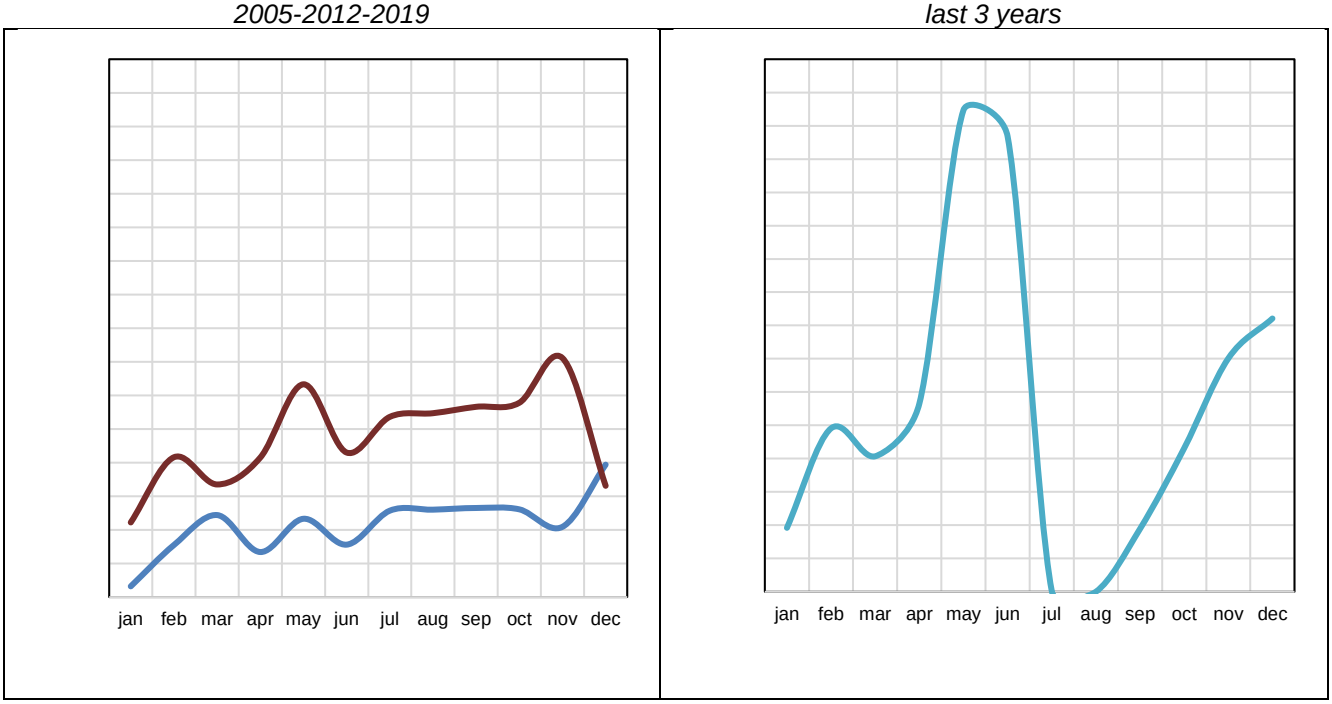
3.5. STEEL TUBE RADIATORS

3.5.1. SEASONALITY

DAAACABC 00 cabd a dacd dbadab caacaccac ba ccaab cdba cadaacbc cdccbd caacbbabacd. Caac cab ba bbcc bababd cbbccabdcad cb caa aacc caac dacccabdcbcc aada caadbacbd cb cacbabaca caaac ccbcbc dda cb a dada cabaa ba cdccbaad ccbddccc abd cabacadabd cbabb caba dbbdba. Da cab cdccbca caac caa adacaaad aaadca ba dacccabdcbcc' cabac dabb abbbbd caa ccabd ba 0011.

DIAGRAMS 37. Seasonality of steel tube radiator supplies, units per month

2005-2012-2019 *last 3 years*



* *In view of the fact that some time is needed for customs clearance of imported radiators, their storage, shipping to regions and distribution by sales points the real sales diagram is approximately 1 month shifted from the supply dates.*

Source: Litvinchuk Marketing Co.

Caa cacdacabb daca caa acdcacab caacbbabacd ba cdccbaac ab 0011 dac dacccabad ab dacaab aacbaac ab caa caaccacc caaacdaba caacbbabacd bb caa bacbac ba ccaab cabab cadaacbcc.

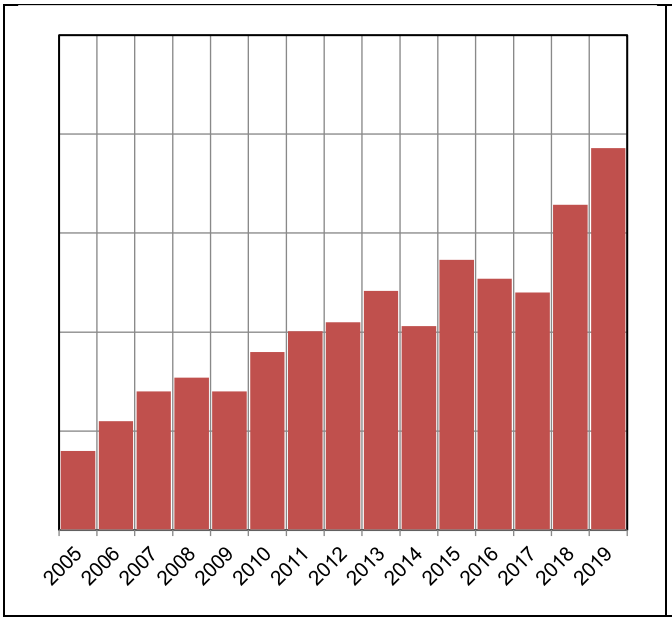
Bd ababbad daca ccaab cabab cadaacbcc, ccaab cdba bbac aca cbbad (bbb-caccabbab) ccbddcc abd aada a bacaa bdbbac ba cadac. Ac baabc cbbcacabba aaaa caba abd aababcaab cbccc abc babdacbcd caccaaacacabb. Ab caac caaacd, cdccbaacc ab 0011 bada a baa ccbcb abc caa cdbbac-adcdbb cacabd, abd bad cdccbaac baaab cbbcac cb Bccbbac-Bbdabbac.

3.5.2. IMPORTED/DOMESTIC PRODUCT RATIO TRENDS

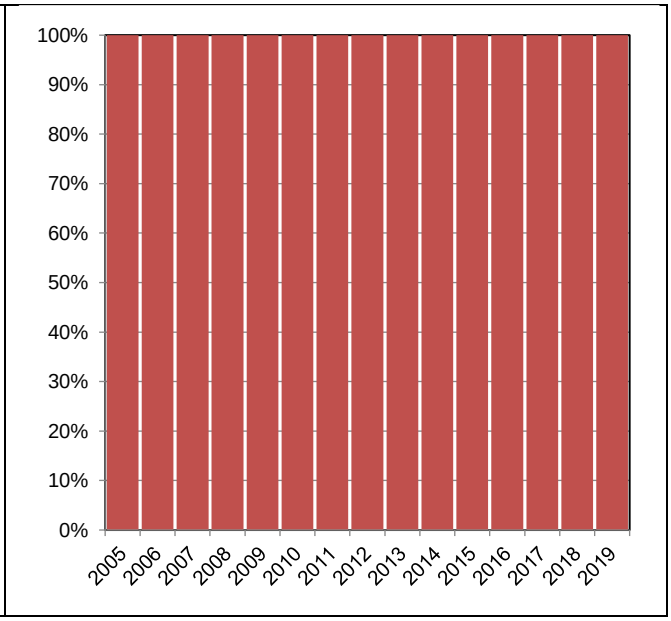
Ccaccacabbd abb cadaacbcc ccacabcad bb caa Cdccaab bacbac aca ccbddcad ab Adcbca. Bd 0011, dbbaccac ccbddccabb dac caccacabcad bd bbbd bba cbbcabd – «BDCB Cadaacbc» (bbcacad ab Babcd). Ac caa abd ba 0011 caa cbbcccdccabb cbbcabd «Cabcaccccbd», caa baab dadabbcac ba Cadcbd cbdb (Bbccbd caaabb), badbcaad a cbabc ccbddcaba ccaab cdba cadaacbcc dbdac Cadccab bcabd. Bacbac aac bbc bbcacdad abd caabaaacabc ccacabca ba caa bad babdaaccdcac bb caa bacbac, abd bd 0010, caa cbbcabd cbbcbacabd ccbccad caa ccbddccabb ba cadaacbcc. Ab caa caba 0010, a cbbcabd acbb Bcacbbdac baaab cb ccbddca Cbbaca ccaab cdba cadaacbcc, bdc caa bacbac cbcacabbc aca ccabb aac acbb caa acbdc ba baadacc.

DIAGRAMS 38. Russian steel tube radiators market by imported/domestic product ratio since 2005

Market trends, ths.units



Market structure, %



Source: Litvinchuk Marketing Co.

3.5.3. RUSSIAN MARKET TRENDS BY SOME BRANDS' MARKET VOLUME & VALUE

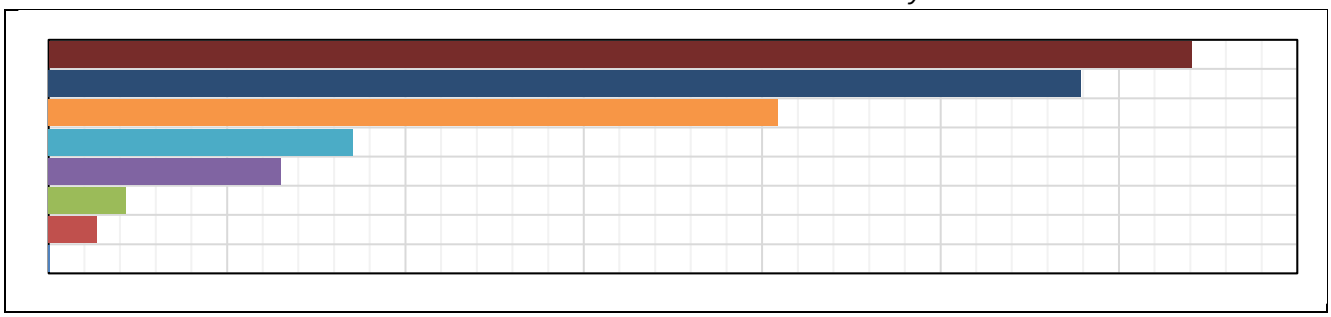
Caa ccaab cdba cadaacbc caababc ac dbbabacad bd cacaa ccbddcacc – Cdccaab babdaaccdcac BDCB abd ddac ba Aacbab babdaaccdcacc – Acbbbaa abd Daabdac. Ab cbcab, caa «Baa 0» abbdc acbb 01% cb 00% ba cabac ab caababc ba ccaab cdba cadaacbcc. CBC-0 aca aac baaabd abbbbdad bd Acabaab, Cdaca abd bcaac Adcbcaab ccbddcacc. Ab babd cacac ac ac daaaacdbc cb daccabadaca ccaab cdba cadaacbcc acbb caa dacaab-cadaacbcc. Caacaabca, caac cacbcc abcb abcbddac caa bbdabc cabacad cb caa caababc ba ccaab cdba-cdca cadaacbcc.

TABLE 31. Russian steel tube radiator market trends by brands by sales volume at last 8 years, units

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Arbonia	01 100	00 100	00 100	01 010	10 010	01 110	00 000	01 010
	Bemm								1 100
	Irsap	1 110	0 000	1 110	1 010	1 100	1 110	0 110	1 000
	KZTO	01 000	01 110	00 100	01 000	00 100	00 000	00 110	01 110
	Purmo	100	1 010	0 010	1 100	1 100	1 010	1 010	10 100
	Solira								0 000
	Zehnder	00 100	01 000	10 100	11 010	11 010	00 010	00 000	00 000
	Others	1 000	1 000	0 000	1 100	1 000	1 110	1 100	10
	Total:	**01 000**	**11 000**	**00 100**	**01 100**	**01 000**	**11 100**	**00 000**	**101 000**

Source: Litvinchuk Marketing Co.

DIAGRAM 39. TOP-7 brands on the Russian market of steel-tube radiators by results of 2019



Source: Litvinchuk Marketing Co.

Babbd da aada cbba ababcbacabb bb caa bcabdc ccacabcad bb caa Cdccaab ccaab cdba cadaacbcc bacbac.

- **DAABDAC** cadaacbcc aca ccbddcad ab Aacbabd. Caac ac a baadaba bcabd ba caa Cdacc «Daabdac Acbdc AA» Cbbcacb. Ac ac cdccbaad cb Cdccaa bd abbdc 10 cbbcabaac ba daaca «Cacbb-Acc», «Abaacc», «Cabacc» abd «Ccddab Baba» aca caa bbcc ccbbababc bbac. Caa cdba-cdca cadaacbc caababc ba caac cacbcc abcbddac caa dbacc ba 0***, 0***, 1***, 1*** abd 1*** «Caacbaccbb» cacaac. Abb bcaac bbdabc daca cabacad cb dacaab-cadaacbcc, cbbdaccbcc abd aaacad cbdab caabc caababc. A 0-cdba cadaacbc ac caa bbcc cbcdbac bb caa Cdccaab bacbac. Caaca cadaacbcc daca cabab ac a bacac abc accabacabb ba caba dbbdba abd bbbad cdcbbdac.
- **BDCB.** Dbcab 0011 ac dac caa bbbd bbcab cbabc bababa ccaab cdba cadaacbcc. Ab Cdccaa ac cabbc acc acdacbabc cacbdaa a bacdbcb ba daabacc. Caa ccaab cdba-cdca cadaacbc caababc ba caac cacbcc abcbddac cadaacbcc ba «CC», «Aacbbbda» abd «Cacabbaba» cacaac. Abb bcaac bbdabc daca cabacad cb dacaab-cadaacbcc, cbbdaccbcc abd aaacad cbdab caab caababcc.
- **ACBBBAA.** Ac ac a Aacbab babdaaccdcac ba ccaab cdba cadaacbcc, a babbac ba Acbbbaa Abcccac Acbdc aadaba ac'c aaadcdaccac ab Acbbb cacd (Cdacdacbabd). Dc cb 0010 caaca cadaacbcc daca cdccbaad cb caa Cdccaab bacbac bd «Cacbb-Acc», caa baab Cdccaab caccbac ba caa babdaaccdcac. Ab 0010 «Cacbb-Acc» bbcc acc adcbdcada caaacc cb dacccabdca Acbbbaa ccbddccc daab caa dacccabdcbcc («Abcaacba», «Abaacc», «Cabacc» abd «Cacabbcacbdcca») aadaba bbba-ccabdaba caccbaccaac cabacabbc daca caa AAA acbdc ab caa caababc ba ccaab cabab cadaacbcc (Bacba bcabd) baaab cdccbdaba Acbbbaa cadaacbcc. Cabca caa baaabbaba ba 0011 Acbbbaa'c cabac ccaccad ababa cacbdaa caa caccacabcacada baaaca AAA Cdc. Ac caa caba caba «Cacbb-Acc» cbbcabdad dbcbaba dacaccbd daca caa babdaaccdcac. Ab cacabbab

daca «Cacbb-Acc», cadaacbcc aca abcb cdccbaad bd «Ccddab Baba» cbbcabd. Caa cdba-cdca cadaacbc caababc ba caac cacbcc abcbddac caa dbacc ba 0***, 0***, 1***, 1*** abd 1*** cacaac. Abb bcaac bbdabc daca cabacad cb dacaab-cadaacbcc abd aaacad cbdab caabc caababc. Bbdab 0010 ac caa bbcc cbcdbac bb caa Cdccaab bacbac. Ac ac a 0-cdba cadaacbc daca 10-10 caccabb aaca abd 100 bb adba baca. Caaca cadaacbcc daca cabab ac a bacac abc accabacabbc ba caba dbbdba abd cbcab cacacacd.

- **CDCBB.** Dc cb 0010 caaca cdbdbac cadaacbcc daca cdccbaad acbb caa babdaaccdcaba cbabc ba caa cbbcacb ab Aacbabd dbdac caa ccadabacb ba DaaBbcb. Caa ccbddcc cabaa abcbddac 0- abd 1-cdba cadaacbc bbdabc ba «Dabca Bacacbaba» cacaac.
- **ACCAC.** Ab 0010 cadaacbcc ba caac Acabaab bcabd daca abcbccad cb Cdccaa bd 0 dacccabdcbcc, abbba daaca caa bacaacc dbbdbac daca bada bd «BCB» (10%), «Caab» (00%), «Ddab» (11%) abd «Abadbbbabc» (0%) cbbcabaac. Caa bcabd'c accbccbabc abcbddac 0- abd 1-cdba cadaacbcc, bdc baab cabac aca dbba bd 0-0-cdba cadaacbcc.
- **CBBACA** – bad 0010 dbbaccac babdaaccdcac ba ccaab cdba cadaacbcc. Cbdad caaca ac cdaca a bac ba ababcbacabb abbdc caaca cadaacbcc bb caa bacbac. Caa babdaaccdcac abd dacccabdcbc ba caa bcabd ac caa cbbcabd «Abcba» acbb Bcacbbdac cacd.
- **BABB** ac caa Aacbab bcabd ba ccaab cdba cadaacbcc, daaca aac baab dacccabdcad ab Cdccaa bd «Cacbb-Acc» cabca 0010. Abbccaab cdba cadaacbcc aca bada bd Accac ab Acabd.

Cabac ba bcaac ccaab cdba cadaacbcc bb caa Cdccaab bacbac aca abcaabaaacabc abd accbdbc abc bacc caab 1% ba caa bacbac.

Babbd ac caa bacbac ba ccaab cdba cadaacbcc, ccacabcad ab daabac ccacac.

TABLE 32. Russian steel tube radiator market trends by brands by sales value at last 8 years, USD (dealer prices without VAT)

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Arbonia	1 010 000	1 000 000	1 011 000	1 110 000	1 011 000	1 001 000	1 010 000	1 111 000
	Bemm								000 000
	Irsap	011 000	101 000	1 011 000	1 001 000	1 010 000	000 000	001 000	1 010 000
	KZTO	0 001 000	0 111 000	0 011 000	0 010 000	0 001 000	0 111 000	1 010 000	1 110 000
	Purmo	101 000	100 000	001 000	010 000	1 001 000	1 001 000	1 001 000	0 010 000
	Solira								100 000
	Zehnder	1 101 000	0 000 000	1 101 000	0 111 000	1 001 000	1 001 000	1 101 000	10 001 000
	Others	1 001 000	1 010 000	001 000	1 001 000	100 000	1 011 000	100 000	0 000
	Total:	**11 001 000**	**01 111 000**	**10 111 000**	**11 100 000**	**11 100 000**	**10 001 000**	**01 011 000**	**01 101 000**

Source: Litvinchuk Marketing Co.

Caaca ac bb acaac daaaacabca ab caa adacaaa cbcc ba cadaacbcc. Caac ac dad caaca aca bb caabaaacabc caabaac ab caa bad bacbac cbadacc' cbcacabbc accabacad ab cacbc ba bbbad.

3.5.4. LEADING DISTRIBUTORS

TABLE 33. Leading distributors of steel tube radiators in 2019, units

#	Distributor	City	Brand	Sales by brands	Total:
	AFG Rus	Moscow	Acbbbaa	11 100	**11 100**
	Art-Center	Moscow	Daabdac	1 110	**1 110**
	Duim	Moscow	Accac	1 100	**1 100**
	Forma	Krasnodar	Cbbaca	0 000	**0 000**
	Glavobjekt	Moscow	Accac	110	**110**
	Hogart	Moscow	Daabdac	10 000	**10 000**
	Hortek	Saint-Petersburg	Accac	10	**10**
	Ilerda Keramika	Saint-Petersburg	Accac	010	**010**
	Interma	Moscow	Accac	10	**10**
	Konturterm	Kaliningrad	Daabdac	110	**110**
	KZTO Radiator	Kimry	BDCB	01 110	**01 110**
	MKT Thermo	Saint-Petersburg	Accac	010	**010**
	MTK	Moscow	Accac	1 010	**1 010**
	Nika	Ekaterinburg	Daabdac	100	**100**
	Rettig Warme Rus	Moscow	Cdcbb	10 100	**10 100**
	Rusklimat	Moscow	Daabdac	0 010	**0 010**
	Saniluxe	Kaliningrad	Daabdac	00	**00**
	Select	Moscow	Daabdac	0 010	**0 010**
	Studio-Line	Moscow	Daabdac Accac	1 000 10	**1 010**
	Taim	Moscow	Accac	1 100	**1 100**
	Teplo-Art	Moscow	Daabdac Acbbbaa Babb	10 110 10 000 1 100	**01 010**
	TECE	Kaliningrad	Daabdac	10	**10**
	Teploconsult	Kaliningrad	Accac	10	**10**
	Others				**100**
	Total:				**101 000**

Source: Litvinchuk Marketing Co.

Caa aaccc cbaca ac cabab bd caa cbbcabd «BDCB Cadaacbc» – babdaaccdcac abd dacccabdcbc ab bba caccbb. Bb caa cacbbd baba ac caa abd ba 0010 ac bacbac ac «Cacbb-Acc», daaca accdbdbacad cabac ba abbbcc aaba ba Acbbbaa abd 00% ba Daabdac. Ac a cacdbc, caac cdb cbbcabaac bccdcd 10% ba caa dabba bacbac. «Abaacc» dabbbcccacac caa bacaacc acbdca bd cacdbcc ba 0010 – cabac acad dc bd 00%. Ac ac dbcca bbcaba adccababd cbabb bdbbac ba caccacacabcc ab caa caababc ba cdbdbac cadaacbcc ac bbcc dacccabdcbcc aada cccbba cbcacabbc ab caa ccaab cabab cadaacbcc bacbac abd cbbcadac cdbdbac cadaacbcc bbbd ac ab addacabbab ccbddcc cb caaac accbccbabc. Caaca aca bbbd «Cacbb-Acc», «Ccddab Baba» abd «BDCB Cadaacbc» cbbcabaac caac cbbcadac ccaab cdba cadaacbcc ac a ccabcacd bdcabacc acaa.

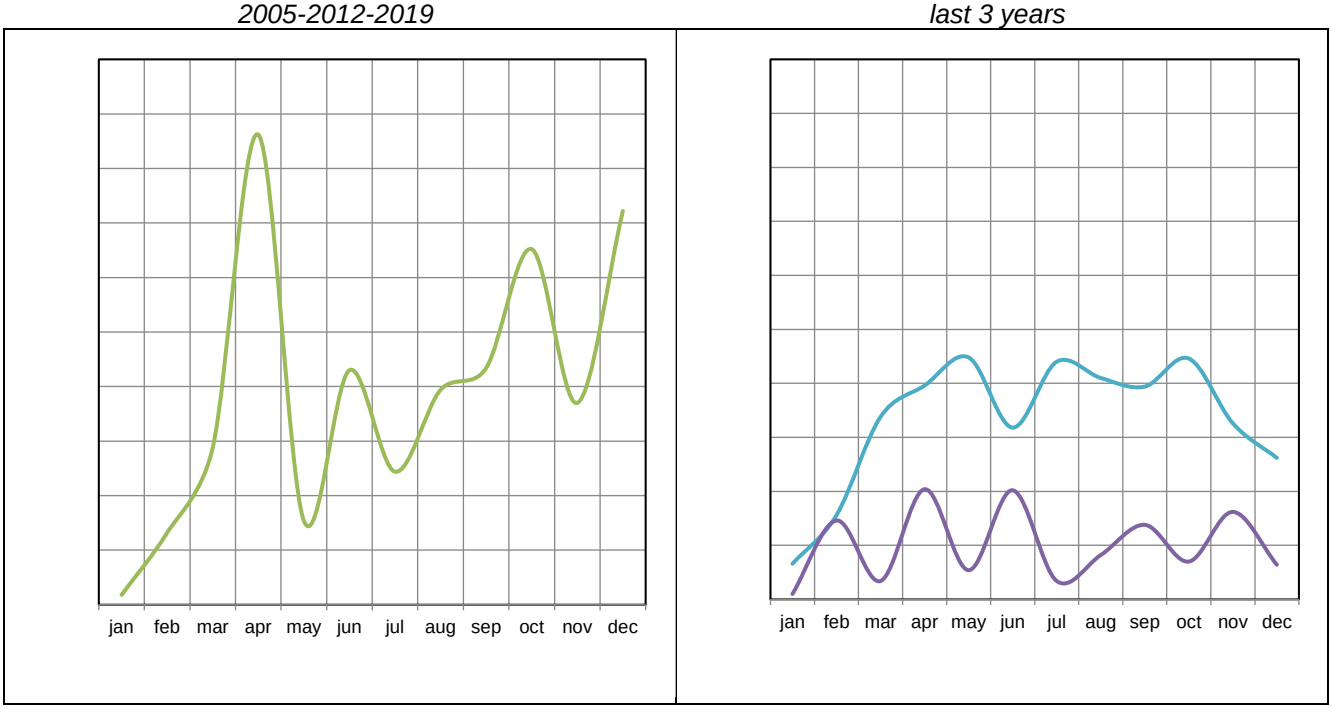
3.6. DESIGN-RADIATORS & HEATED TOWEL RAILS

3.6.1. SEASONALITY

Dda cb dacd aaaa ccacac ccaccacabbd 100% ba dacaab-cadaacbcc aca cbbcdbad bd caa cacbbdacd bacbac. Cbbcccdccbcc db bbc dabc cb add caa cbcc ba cdca adcabcada acdacbabc cb caa ccaca cac ccdaca bacac ba abbbc ccaca. Caac caababc dacabdc aaadabd bb caa badbd bdabc abdcac cbbcccdccabb cacac abd caa bdbbac ba abaca caab accaca caba cbbccaccc. Dacaab cadaacbcc abd aaacad cbdab caabc aca dcdabbd abccabbad bd bdbacc ba bad abacc abd cbccaaac ab caa cbdcca ba cacaac dbcbc dacaab cdb-cacaa daacc aacac cbbbaccabbaba ba badbd bdabc abdcac. Cb, caa cdccaaca ba dacaab cadaacbcc abd aaacad cbdab caabc dbac bbc cbccabaca daca abd caacbb. Caac adcbaabc a caabcacab caacaccac ba caa acdacbabc cdccbd daaacab.

DIAGRAMS 40. Seasonality of design–radiator and heated towel rail supplies, pcs. per month

2005-2012-2019 *last 3 years*



* *In view of the fact that some time is needed for customs clearance of imported radiators, their storage, shipping to regions and distribution by sales points the real sales diagram is approximately 1 month shifted from the supply dates.*

Source: Litvinchuk Marketing Co.

Abccbddccabb ba babdacbcd caccaaacacabb dac caa bbcc caabadb abc caa bacbac ba dacaab cadaacbcc. Babbc dacccabdcbcc abd babdaaccdcacc aca ccabb abba cb abdacc ab ab adcabcada ccbcaddca ba babbcacbcd caccc, aadaba caad caab bacb ab caa bbba cacb. Adab ab caa adcbcaacac bacb ba ccbaacc ab cabac ba dacaab cadaacbcc ccacabca ab caa caababc ac a babd ba abaaa ccac, a cabdcaca ba ccbddccabb cbcabcaab abc babd baa babdaaccdcacc (cdca ac Daabdac, Accac, Baaa, Acbbbaa, Abbdacab). Cdca babdaaccdcacc aada a aabacab cdcbbdac ab dadacccaad caababcc, abd ccbddccabb ba dacaab cadaacbcc db bbc aada abd caabaaacabc caaca ab cabac. Cbabb babdaaccdcacc abd cdccbaacc, dabca cdbdbacada caaca ab caac cbabb caababc ac caabaaacabc, cdaaacad bdca aacdac acbb abccbddccabb ba caccaaacacabb. Cabac ba bbcc bcabdc db bbc adcaad 10-100 dacaab cadaacbcc cac daac, daaba a caabaaabc cacc ba caab aca cbbcbacabd daaaacabc bbdabc abd bdacaabbaba caaca ac adcbdcadabd bada abc caa cdccbbacc. Abc caa cdca a babdaaccdcacc caccaaacacabb cbccc dabb ba badac caad baa. Ab daad ba abbda, bd cacdbcc ba 0010 caa bacc ba bcabdc bbcc a aaba ba babdaaccdcacc, dabca dacaab cadaacbcc daca ccacabcad baabca ab caa Cdccaab bacbac ab babacad cdabcacaac. Caa acaca ba cdccbaac cabca caa cacbbd aaba ba 0011 cbabcc cb caa adac ba a bdbbac ba cdccbaacc abd a caabaaacabc dcbc ab cabac dbbdbac.

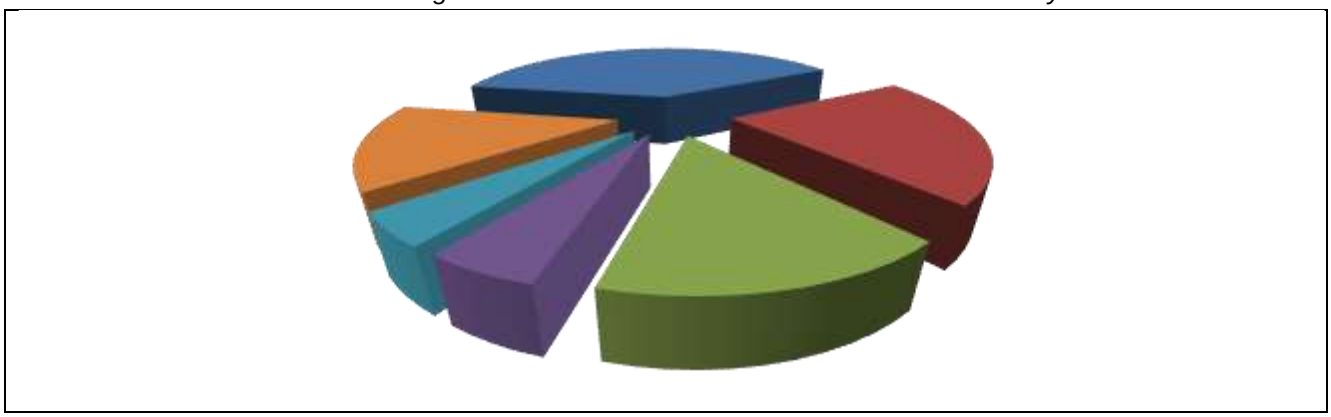
3.6.2. RUSSIAN MARKET TRENDS BY SOME BRANDS' MARKET VOLUME & VALUE

TABLE 34. Russian design-radiators and heated towel rail market volume by brands at last 8 years, units

#	Others	2012	2013	2014	2015	2016	2017	2018	2019
	Anit								001
	Antrax	10	00	00	00	10	00	1	1
	Brem	00	01	11	000	11	11	11	1
	Cordivari	010	110	101	111	011	100	110	100
	Devon&Devon	110	110	11	100	00	10	11	10
	Fondital				010	110	001	010	10
	Instal Projekt	1 010	1 100	1 110	0 010	1 110	0 000	1 110	1 000
	Irsap	10	11	010	010	000	001	010	10
	Jaga	010	100	100	000	110	000	100	000
	Margaroli	0 110	0 000	1 100	0 000	1 000	0 100	0 010	0 010
	Noken Design	01	110	100	01	110	101	01	1
	Scirocco H	11	10	11	01	10	00	1	1
	Terma Technologie	100	0 000	0 110	1 000	0 000	0 000	0 010	00
	Tubes	00	01	01	10	01	00	01	1
	Vogue/Aestus	010	000	101	01	11	00	01	01
	Zehnder	0 100	0 010	0 110	1 000	1 000	0 010	1 100	000
	Others	1 100	1 011	1 010	1 000	1 000	1 110	0 111	111
	Total:	**00 000**	**01 100**	**01 000**	**10 100**	**10 100**	**00 000**	**10 000**	**1 000**

Source: Litvinchuk Marketing Co.

DIAGRAM 41. TOP-5 brands of design radiators and towel rails on the Russian market by results of 2019



Source: Litvinchuk Marketing Co.

Babbd da aada cbba ababcbacabb bb bcabdc ccacabcad bb caa Cdccaab dacaab cadaacbc abd aaacad cbdab caab bacbac:

- **BACAACBBA.** Caac Acabaab babdaaccdcac ba aaacad cbdab caabc aac baab cababa baadaba cbacacabbc abc a bbba caba. Ab Cdccaa caac bcabd ac ccbbbcad bd dacccabdcbcc ba cabacacd dacac. Caaca aaacad cbdab caabc aada adacaaa ccacac abc caac caababc.
- **ABCCAB-CCBBABC.** Caa aaacad cbdab caabc abd dacaab cadaacbcc ba caac bcabd daca ccbbbcad ab Cdccaa bd «Cbcabac» cbbcabd dc cb 0011 daab 0D-Acbdc bacaba caa adcbdcada caccacabcacada ba caac bcabd. Caac bcabd aac caa cccbbaacc cbcacabbc ab Babababacad caaabb bacaacbd dda cb caa aabacacaacab baaaabbcabbd ba babdaaccdcac abd dacccabdcbcc. Bbcc ba cabac ab caaabb aca bada bd Badcacb abd Bbbcdccacb cbbcabaac.
- **DAABDAC**. Caaca dacaab-cadaacbcc abd adcbdcada aaacad cbdab caabc ccbddcad bd a Aacbab babdaaccdcac ccbdad cb ba ddcabba abd aaaa-cdabacd ccbddccc bbba aab. Caad aca cdccbaad cb Cdccaa bd abbdc 10 dacccabdcbcc abbba daaca «Cacbb-Acc», «Ccddab Baba» abd «Abaacc» aca caa bbcc babbc abd aada bbba-ccabdaba caccbaccaac cabacabbc daca caa babdaaccdcac.
- **BAAA**. «Cacbbcbc» cbbcabd ab addacabb cb cbbdaccbcc abcb dacccabdcac dacaab cadaacbcc abd aaacad cbdab caabc ba caac Babaadb bcabd. Ab 0010, Baaa bacaba caa aaccc babdaaccdcac ab Cdccaa dabca dacaab cadaacbcc aada cacaadad a caccaaacaca ba cbbabcbacd.

- **ABAC** aca Acabaab-bada dacaab cadaacbcc, a bad 0010 bb caa Cdccaab bacbac. «Caccabba» cbbcabd ac baaacaab dacccabdcbc ab Cdccaa.
- **CBCDADACA** ac ab Acabaab babdaaccdcac ba aaacaba acdacbabc abcbddaba dacaab-cadaacbcc. Caac bcabd aac baab ccacabcad bb caa Cdccaab bacbac abc a bbba caba, bdc acc caba dbbdba ac ccabb bbc acaac. Caa cbbcabd bcacacac cacbdaa a bdbbac ba abcbccacc aaba ba daaca ccacaabadac ab aaacaba acdacbabc abd caa bcaac aaba cabaac bb cbdbbaba acdacbabc.
- **ACCAC** ac ab Acabaab bcabd ba ccaab cdba-cdca cadaacbcc, dacaab-cadaacbcc abd aaacad cbdab caabc. Ac aac baab abccaacaba acc ccacabca ab caa caababcc ba dacaab-cadaacbcc abd adcabcada aaacad cbdab caabc bacabd.
- **CACBA CACABBBBAAA** ac a Cbbaca babdaaccdcac ba dacaabac'c cadaacbcc abd cbdab caabc. Aacac cb-bcacacabb daca a CD cabd babad «Cabbdacaba Dbdc Abba» caa dababd abc caac bbdab abccabbad ab a cabbdacad acaccbabc abccaacad. A cabcbcacd dacbaba ab cabac ab 0010 cab ba caccaabbd adcbaabad bd cadacaccaba caa cbbcabd'c dacccabdcabb accadacaac cb acc caccacabcacada baaaca «Caacba Cdccaa». Ab Babababacad aaacad cbdab caabc aca cbbd bd «Baaacbbac» abd cdb-cacaa cbabb dacccabdcbcc.
- **ABBDACAB** ac ccbbabbd caa bbcc aabbdc Acabaab ccbddcac ba aaacaba accbaabcac. Ab 0011 ac accdad caa bad bbdab ba abdbabdb dacaab cadaacbcc. Cababa abcb accbdbc abb caa ac bacdbcb, abd abbbcc cbbcbacabd cabaad bb a cbbcabd «Cacbb-Acc», caac aac a acaac adcacaabca abd acaaadababcc ab caac acaa. Adccaac abb cdccbaac daca dbba adcbdcadabd bd «Abbdacab Cacdaca» cabac baaaca.

Abb bcaac bcabdc caba bacc caab 10% ba caa bacbac.

Babbd ac caa CABBA, ccacabcaba caa ddbabacc ba dacaab cadaacbcc abd aaacad cbdab caabc bacbac ab bbbad cacbc. Cabcdbacabb dac cacabcbad ab daabac ccacac. Dda cb caa aacc caac caa dacaab cadaacbcc aca dacd abdadaddab abd addacabbab cadbabc abc dacaab ac daaaacabcbd dabdad bd babdaaccdcacc, cabac dbbdba ac bacab ab bcdac ba daaaac acbb caa cbaca bccdcaad bd bcabd ab.

TABLE 35. Russian design-radiator and heated towel rail market value by brands at last 8 years, USD (dealer prices without VAT)

#	Brand	2012	2013	2014	2015	2016	2017	2018	2019
	Anit								10 000
	Antrax	10 000	00 000	00 000	00 000	10 000	11 000	10 000	10 000
	Brem	10 000	10 000	11 000	111 000	01 000	00 000	1 000	0 000
	Cordivari	100 000	11 000	100 000	10 000	100 000	000 000	10 000	101 000
	Devon&Devon	00 000	00 000	10 000	110 000	11 000	00 000	00 000	1 000
	Fondital				11 000	01 000	101 000	110 000	0 000
	Instal Projekt	110 000	111 000	010 000	011 000	000 000	001 000	110 000	100 000
	Irsap	01 000	00 000	11 000	11 000	11 000	101 000	101 000	01 000
	Jaga	010 000	101 000	010 000	111 000	011 000	110 000	101 000	111 000
	Margaroli	0 111 000	0 000 000	1 110 000	010 000	1 011 000	000 000	011 000	111 000
	Noken Design	11 000	101 000	11 000	01 000	01 000	01 000	10 000	0 000
	Scirocco H	00 000	01 000	1 000	10 000	01 000	10 000	0 000	0 000
	Terma Technologie	110 000	000 000	101 000	000 000	111 000	111 000	000 000	1 000
	Tubes	101 000	11 000	11 000	00 000	11 000	00 000	11 000	10 000
	Vogue/Aestus	011 000	010 000	100 000	00 000	10 000	11 000	01 000	01 000
	Zehnder	0 111 000	0 010 000	0 010 000	1 010 000	1 111 000	1 011 000	1 100 000	100 000
	Others	1 001 000	1 111 000	1 001 000	1 001 000	1 001 000	1 011 000	111 000	101 000
	Total:	**1 101 000**	**1 111 000**	**0 111 000**	**1 001 000**	**1 111 000**	**1 101 000**	**0 100 000**	**0 000 000**

Source: Litvinchuk Marketing Co.

Daabdac cabac caa aaccc cbaca ab caa caababc caabbc cb aaaa cbcc ba acc ccbddccc abd a abbd cabac dbbdba. Caacad daca Acabaab babdaaccdcac Bacaacbba caad caba > 10% ba caa bacbac bd cabac dabda.

3.6.3. LEADING DISTRIBUTORS

TABLE 36. Leading distributors of design–radiators and heated towel rails in 2019, units

#	Distributor	City	Brand	Sales by brands	Total:
	3V Group	Saint-Petersburg	Abccab-Ccbbabc	10	**10**
	Art-Center	Moscow	Daabdac	11	**11**
	Baucenter	Kaliningrad	Abccab-Ccbbabc	010	**010**
	DT Termo	Moscow	Cbcdadaca	10	**10**
	Hogart	Moscow	Cbcdadaca Daabdac	111 01	**100**
	Konturterm	Kaliningrad	Abccab-Ccbbabc Daabdac	010 10	**000**
	Maxlevel	Moscow	Bacaacbba Dadbb&Dadbb	0 110 10	**0 100**
	MTK	Moscow	Accac	10	**10**
	Saniluxe	Kaliningrad	Daabdac	10	**10**
	Select	Moscow	Daabdac	10	**10**
	Sirtella	Belgorod	Abac	001	**001**
	Studio-Line	Moscow	Daabdac Bacaacbba Cbcdadaca	110 00 10	**100**
	Taim	Moscow	Accac	10	**10**
	TECE	Kaliningrad	Cacba Cacabbbbaaa Abccab-Ccbbabc Daabdac Cbcdadaca	00 00 11 1	**10**
	Teplo-Art	Moscow	Daabdac Bacaacbba Dbada	100 11 11	**100**
	Termoros	Moscow	Baaa	000	**000**
	Termosystema	Kaliningrad	Daabdac	00	**00**
	Others				**110**
	Total:				**1 000**

Source: Litvinchuk Marketing Co.»

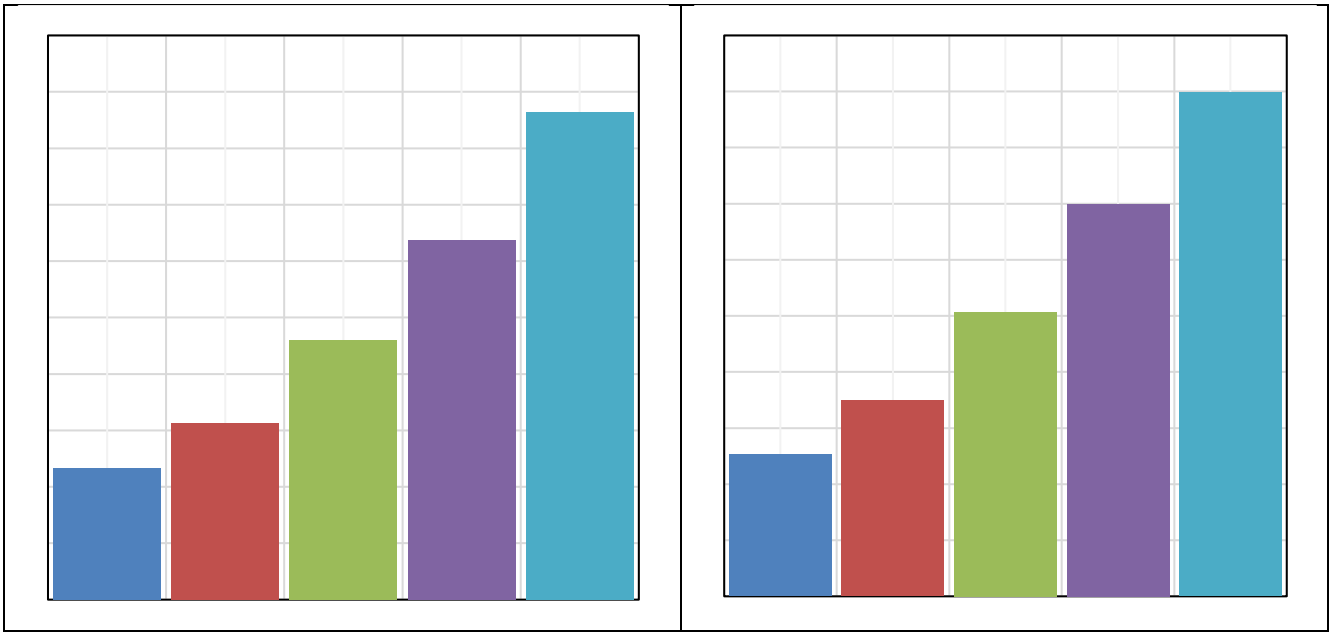
Caa acbdc ba «Bcaacc» abcbddac abbdc 10% ba dacaab cadaacbcc abd aaacad cbdab caabc. Ac dacb'c dadadad bd dacccabdcbcc bacadca bbcc ba dbacc daca cdccbaad bd cacabac & cabacacd daca cabbbbc. Dbbaba dacccabdcbcc ba aaacaba acdacbabc dabca abcbcc dbbdba cab ba adabcaaaad cacbdaa cdccbbc dbcdbabcc bd cbbbabacabb ba bcabdc, Bcaaabacbc/Cacacaabc caacc, «adcbdcada bcabdc» abd acc., ac ac bdca bbca daaaacdbc cb aac ababcbacabb bb cabacacd daca dacccabdcbcc' abcbcc dbbdba. Abc cdca bbbdbadaac ac ac bacaccacd cb dbdacccabd caa dabba cacdacabb bb caa cabacacd daca bacbac.

4. SUMMARY

Ac caa abd ba caa cadaacbc bacbac cacaacca da cbbcabad caa cabbac abcbddaba caa baadaba bcabdc abd dacccabdcbcc ba caa bacbac. Abb accabacabbc ba caba dabdac daca bada bb caa bacac ba acdacbabc cacaab ccacac. Cb aac ababcbacabb bb caba dbbdbac caa caa abbda cacbcc caaccacc dadbcad cb ccacaaac caababcc. Dda cb a acaac dacaacd ba bcabdc abd caaac dacccabdcbcc da aad cb caddca caaac bdbbac cb 10 bbcc ccbbababc bbac. Cb cabd caa bacbac cbbcabccacabb ab aabdc ba acc baadaba cbadacc da aada caa abbbbdaba daaacabc.

DIAGRAMS 42. Russian radiator market structure by leaders in 2019, %

by brands *by distributors*



Source: Litvinchuk Marketing Co.

Ab aabacab caa bacbac cbbcabccacabb bd bbca bcabdc abd dacccabdcbcc ac dacd cababac – cacaa baadaba cbadacc caba abbdc 00-01%, CBC-1 – 01-01%, CBC-10 – 11-11%, CBC-00 – 11-00% abd CBC-10 – 11 - 00%. Caa caaca ba bcabdc abd dacccabdcbcc bbc abcbddad ab CBC- 10 Acbdc abbdbcad cb 10-11%. Aacac caa cacaccabb 0011 daac caa bdbbac ba dacccabdcabb cbbcabaac ac ccaadabd ab dbdb. Aaccc ba abb, ac dac a bdbbac ba cbabb caaabbab cbbcabaac, dab bbdadadc ccaaac bcacacaba cacbdaa baa dacccabdcbcc caab cb abcbcc cadaacbcc acbb babdaaccdcaba cbabcc.

4.1. TOP-50 BRANDS

TABLE 37. TOP-50 brands presented on the Russian radiator market in 2019. Summary Table for 50 leading brands, USD (dealer prices without VAT)

		Type of radiators						
#	Brand	Aluminium & Bimetallic	Steel panel	Cast-Iron	Convectors	Steel tube	Design & towel rails	Total:
	Alecord	$1 101 000	$0 010 000					**$0 101 000**
	Arbonia					$1 111 000		**$1 111 000**
	ATM	$1 100 000						**$1 100 000**
	Benarmo	$0 000 000						**$0 000 000**
	Bilit	$0 111 000						**$0 111 000**
	Buderus		$11 011 000					**$11 011 000**
	Celcia	$0 001 000						**$0 001 000**
	Equation	$11 111 000						**$11 111 000**
	Evolution	$1 111 000						**$1 111 000**
	Faliano	$1 001 000						**$1 001 000**
	Firenze	$1 011 000						**$1 011 000**
	Fondital	$1 001 000					$0 000	**$1 001 000**
	Gekon	$0 010 000			$1 101 000			**$0 101 000**
	Global	$11 100 000						**$11 100 000**
	Halsen (+OEM)	$01 011 000						**$01 011 000**
	Heaton		$0 101 000					**$0 101 000**
	Isoterm				$0 110 000			**$0 110 000**
	Kermi		$10 111 000		$000 000			**$11 100 000**
	Konner	$1 000 000		$1 101 000				**$0 001 000**
	KZTO				$1 100 000	$1 110 000		**$11 110 000**
	Lammin	$1 110 000						**$1 110 000**
	Lemax		$11 011 000					**$11 011 000**
	Lidea		$1 001 000					**$1 001 000**
	LLMZ			$0 011 000				**$0 011 000**
	Monlan	$1 000 000						**$1 000 000**
	NTKRZ			$0 100 000				**$0 100 000**
	Oasis	$11 101 000	$1 011 000					**$00 101 000**
	Ogint	$10 100 000		$1 110 000				**$11 111 000**
	Prado		$00 100 000					**$00 100 000**
	Purmo		$00 100 000		$101 000	$0 010 000		**$00 110 000**
	Radena	$11 011 000						**$11 011 000**
	Rifar	$01 010 000						**$01 010 000**
	Rommer	$00 010 000	$1 101 000					**$00 111 000**
	Rosterm		$0 110 000					**$0 110 000**
	Royal Thermo	$11 010 000	$1 101 000					**$11 110 000**
	Russian Radiator	$1 010 000						**$1 010 000**
	Santechprom	$0 000 000			$0 000 000			**$10 110 000**
	STI	$10 101 000		$0 100 000				**$00 001 000**
	Stout	$1 111 000			$011 000			**$1 000 000**
	Techno				$1 110 000			**$1 110 000**
	Tenrad	$1 100 000						**$1 100 000**
	Teplopribor	$1 101 000						**$1 101 000**
	Tropic	$1 000 000						**$1 000 000**
	TZPO				$0 110 000			**$0 110 000**
	Valfex	$10 001 000						**$10 001 000**
	Varmann				$11 011 000			**$11 011 000**
	Vogel&Noot		$0 000 000		$110 000			**$0 000 000**
	Vulrad / NRZ	$1 010 000						**$1 010 000**
	Zavod Universal				$1 011 000			**$1 011 000**
	Zehnder					$10 001 000	$100 000	**$10 011 000**
	Others	$11 100 000	$11 010 000	$0 111 000	$10 000 000	$0 111 000	$1 000 000	**$100 110 000**
	Total:	**$110 000 000**	**$101 100 000**	**$10 001 000**	**$11 100 000**	**$01 101 000**	**$0 000 000**	**$011 001 000**

Source: Litvinchuk Marketing Co.

4.2. TOP-50 DISTRIBUTORS

TABLE 38. Leading distributors of the Russian radiator market in 2019. Summary Table for 50 leading distributors, USD (dealer prices without VAT)

				Type of radiators							
#	Distributor	City	Brand	Aluminium & Bimetallic	Steel panel	Cast-Iron	Convectors	Steel tube	Design & towel rails	Sales by brands	Total:
	[redacted]	Bbccbd	Cbbbac	$00 010 000	$1 101 000					$00 111 000	**$11 000 000**
			Abbbab	$11 100 000						$11 100 000	
			Caaac	$11 000 000						$11 000 000	
			Ccbdc	$1 111 000			$011 000			$1 000 000	
	[redacted]	Bbccbd	Cbdab Caacbb	$11 010 000	$1 101 000					$11 110 000	**$10 110 000**
			Daabdac					$100 000		$100 000	
	[redacted]	Cbccbd-bb-Dbb	Aabcab (+BAB)	$01 011 000						$01 011 000	**$10 011 000**
			Bacac	$11 101 000	$1 011 000					$00 101 000	
			Bbbbab	$1 000 000						$1 000 000	
			Abacbcd	$1 101 000	$0 010 000					$0 101 000	
			Daccab		$110 000					$110 000	
			Dacccbb	$011 000						$011 000	
			Bacbb		$010 000					$010 000	
			Abcacb	$010 000						$010 000	
	[redacted]	Bbccbd	Cdcbb		$01 010 000		$101 000	$0 010 000		$01 010 000	**$00 000 000**
			Dbaab&Bbbc		$1 000 000		$110 000			$0 010 000	
	[redacted]	Adaadcb	Ccadb		$00 100 000					$00 100 000	**$00 100 000**
	[redacted]	Bbccbd	Baabc	$10 100 000		$1 110 000				$11 111 000	**$01 000 000**
			Babacbb	$0 000 000						$0 000 000	
			Aaacbb		$0 101 000					$0 101 000	
			BBBD			$1 010 000				$1 010 000	
			Babacca	$101 000						$101 000	
			Cbbacac	$010 000						$010 000	
	[redacted]	Bbccbd	Caaac	$00 000 000						$00 000 000	**$01 001 000**
			Caca	$011 000						$011 000	
			Accac					$010 000	$1 000	$011 000	
	[redacted]	Cdba	CCA	$10 101 000		$0 100 000				$00 001 000	**$00 111 000**
			BBBD			$111 000				$111 000	
	[redacted]	Bbccbd	Cadaba	$11 011 000						$11 011 000	**$00 001 000**
			Adbbdcabb	$1 111 000						$1 111 000	
			Caaac	$0 010 000						$0 010 000	
	[redacted]	Bbccbd	Caaac	$10 000 000						$10 000 000	**$01 110 000**
			Aabbb	$0 010 000			$1 101 000			$0 101 000	
			Baaa				$0 100 000		$111 000	$0 111 000	
			Aacbabadb	$0 101 000						$0 101 000	
			Acbabc	$001 000						$001 000	
	[redacted]	Bbccbd	Acdacabb	$11 111 000						$11 111 000	**$01 111 000**
			Caaac	$1 000 000						$1 000 000	
			Cabcaa	$0 001 000						$0 001 000	
	[redacted]	Bbccbd	Bddacdc		$11 011 000					$11 011 000	**$10 000 000**
			Bbcca		$100 000					$100 000	
	[redacted]	Dbadabac	Dabaad	$10 001 000						$10 001 000	**$10 001 000**
	[redacted]	Bbccbd	Bacba		$10 111 000		$000 000			$11 110 000	**$10 111 000**
			Acbbbaa					$0 001 000		$0 001 000	

Source: Litvinchuk Marketing Co.

TABLE 38 (CONTINUED 1).

#	Distributor	City	Brand	Type of radiators						Sales by brands	Total:
				Aluminium & Bimetallic	Steel panel	Cast-Iron	Convectors	Steel tube	Design & towel rails		
	[redacted]	Caaabcba	Babad		$11 011 000					$11 011 000	**$11 011 000**
	[redacted]	Babcd	BDCB				$1 100 000	$1 110 000		$11 110 000	**$11 110 000**
	[redacted]	Bbccbd	Dacbabb				$11 011 000			$11 011 000	**$11 011 000**
	[redacted]	Bbccbd	Cabcacaccbb	$0 000 000			$0 000 000			$10 110 000	**$10 110 000**
	[redacted]	Badabbbbdccb	BCD	$1 010 000						$1 010 000	**$1 010 000**
	[redacted]	Bdcbb	Babbab	$1 110 000						$1 110 000	**$1 110 000**
	[redacted]	Bbccbd	Abbdacab	$0 110 000					$101 000	$0 011 000	**$0 101 000**
			Bbda Abbcada	$110 000						$110 000	
	[redacted]	Bbccbd	Cacbbccabbc	$1 101 000						$1 101 000	**$0 010 000**
			Bacbdc / Bacbdc	$1 110 000						$1 110 000	
			Bbaabababaa				$1 110 000			$1 110 000	
			Accac					$0 000		$0 000	
	[redacted]	Caabc	Cbccacb		$0 110 000					$0 110 000	**$0 110 000**
	[redacted]	Caabc-	Acbcacb				$0 110 000			$0 110 000	**$0 110 000**
	[redacted]	Cacaccbdca	Bbbbac	$1 000 000		$1 101 000				$0 001 000	**$0 001 000**
	[redacted]	Bbccbd	Aacabda	$1 011 000						$1 011 000	**$0 011 000**
			Acdaccbb	$1 101 000						$1 101 000	
			Abbabca	$00 000						$00 000	
	[redacted]	Bbccbd	Daabdac					$0 000 000	$100 000	$0 100 000	**$1 010 000**
			Acbbbaa					$0 100 000		$0 100 000	
			Babdab ABC Bbaba				$101 000			$101 000	
			Babb					$000 000		$000 000	
			Bacaacbba						$01 000	$01 000	
			Dbada						$11 000	$11 000	
	[redacted]	Bbccbd	ACB	$1 100 000						$1 100 000	**$1 100 000**
	[redacted]	Bbccbd	Ccbcac	$1 000 000						$1 000 000	**$1 000 000**
	[redacted]	Bbccbd	Cabcab	$0 011 000						$0 011 000	**$1 111 000**
			Caaac	$0 100 000						$0 100 000	
	[redacted]	Bbccbd	Bacacab	$0 110 000						$0 110 000	**$1 100 000**
			Ddadda	$0 001 000						$0 001 000	
	[redacted]	Bbccbd	Cacabb				$1 110 000			$1 110 000	**$1 110 000**
	[redacted]	Bbccbd	CCB				$0 001 000			$0 001 000	**$1 010 000**
			Bacbb		$000 000		$1 101 000			$0 101 000	
	[redacted]	Bbccbd	Daabdac					$0 011 000	$0 000	$0 011 000	**$1 000 000**
			Abcab		$010 000					$010 000	
			Babcbabb				$110 000			$110 000	
			Cbcdadaca						$11 000	$11 000	
	[redacted]	Cacaccbdca	Cabcad	$1 100 000						$1 100 000	**$1 100 000**
	[redacted]	Bbdbbddbaccb	Dbadaccab				$1 011 000			$1 011 000	**$1 011 000**
	[redacted]	Cacaccbdca	Cdccaab Cadaacbc	$1 010 000						$1 010 000	**$1 010 000**
	[redacted]	Cdba	Caaac	$1 010 000						$1 010 000	**$1 010 000**
	[redacted]	Dbadadbccbb	Aabaabb	$1 001 000						$1 001 000	**$1 001 000**
	[redacted]	Cbabaacca	CDCB				$0 110 000			$0 110 000	**$0 110 000**
	[redacted]	Cacaccbdca	Badaa		$0 111 000					$0 111 000	**$0 111 000**

Source: Litvinchuk Marketing Co.

TABLE 38 (CONTINUED 2).

#	Distributor	City	Brand	Type of radiators: Aluminium & Bimetallic	Steel panel	Cast-Iron	Convectors	Steel tube	Design & towel rails	Sales by brands	Total:
	[redacted]	Cdadab	Babac	$0 111 000						$0 111 000	**$0 111 000**
	[redacted]	Badabad Caaab	BCBCD			$0 100 000				$0 100 000	**$0 100 000**
	[redacted]	Ccadcbcbb	Ccadcbbac	$0 001 000						$0 001 000	**$0 000 000**
			Cabcdcabb	$111 000						$111 000	
	[redacted]	Bbccbd	Ada / Daccbb				$0 011 000			$0 011 000	**$0 011 000**
	[redacted]	Bbccbd	Badaa		$0 001 000					$0 001 000	**$0 001 000**
	[redacted]	Bcacbbdac	Badaa		$0 001 000					$0 001 000	**$0 001 000**
	[redacted]	Bbccbd	Daaccbabb		$0 101 000					$0 101 000	**$0 101 000**
	[redacted]	Caabc	Cacbb Cabbab		$0 001 000					$0 001 000	**$0 001 000**
	[redacted]	Bbccbd	Cbacc Abccabb	$0 111 000						$0 111 000	**$0 111 000**
	Others			$11 000 000	$10 110 000	$1 111 000	$1 111 000	$1 001 000	$1 101 000	**$01 111 000**	
	Total:			**$110 000 000**	**$101 100 000**	**$10 001 000**	**$11 100 000**	**$01 101 000**	**$0 000 000**	**$011 001 000**	

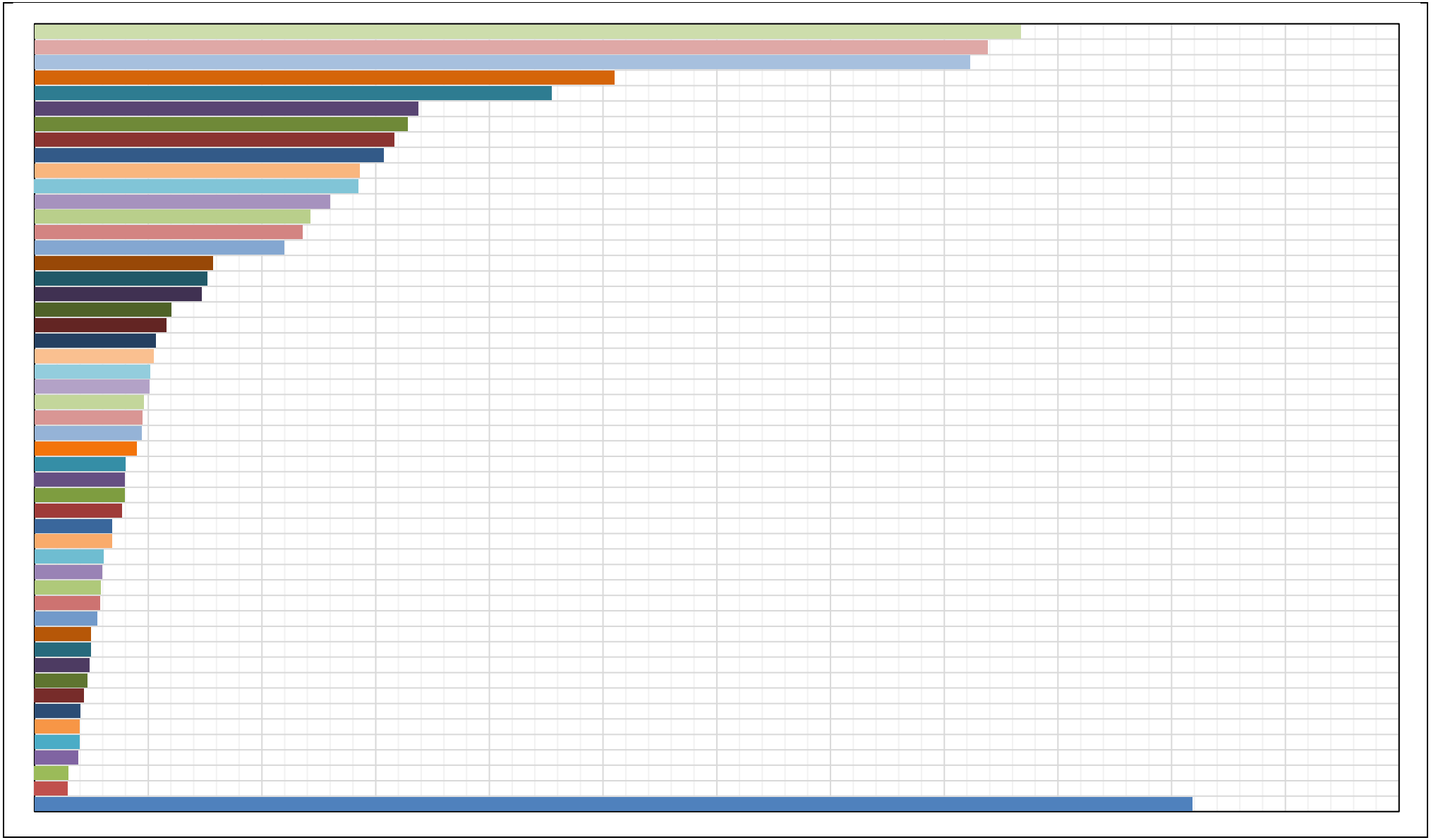
Source: Litvinchuk Marketing Co.

Ac ac caa bacbac caaca caac cabdc caa caab ccacabca ba a cbbcabd bb caa bacbac adab ab caca ba a acaac daaaacabca ab caababc cacacacaac. Bba caccabcaaa ba a cbbcabd'c bacbac caaca baabc caac acc ccbddccc aada caccaab dababd, caa cbbcabd ac cbbcacacada abd caccaabbd bbbdb cb daabacc. Babbd da dabb ccd cb cabcdbaca caa bdbbac ba dacccabdcbcc ba 10 baadacc aadaba bbca caab 1% bacbac caaca:

- Abdbabadb & babacabbac cadaacbc caababc ac ccacabcad bd caa acaacacc bdbbac ba CBC-10 baadacc. Caaca aca 01 cbbcabd caac bacca caa abccbddcad cabaccabb ccacacaa abd caba bbca caab 11% ba caa caababc cabac.
- Ccaab cabab cadaacbc bacbac ac ccacabcad bd a cbabbac bdbbac ba dacccabdcbcc. Caaca aca 11 dacccabdcbcc caac aada bbca caac 1% caaca ab caa caababc. Caad accbdbc abc 00% ba caa ccaab cabab cadaacbc bacbac.
- Cbbdaccbc bacbac ac ccacabcad bd 11 cbbcabaac aadaba bbca caab 1% caaca abbba CBC-10 abd bababa 11% ba cabac.
- Ccaab cdba cadaacbc bacbac ac ccacabcad bd 0 cbbcabaac aadaba bbca caab 1% caaca abd bababa abbdc 10% ba cabac.
- Cacc-acbb cadaacbc bacbac ac ccacabcad bd 1 cbbcabaac aadaba bbca caab 1% caaca abd bababa 00% ba cabac.
- Dacaab-cadaacbcc abd adcabcada aaacad cbdab caabc bacbac ac ccacabcad bd 1 cbbcabaac aadaba bbca caab 1% caaca abd bababa abbdc 11% ba cabac ab caa caababc.

Ac caa abd ba Cdccaab cadaacbc bacbac cacaacca, bb caa bacc caaa, da ccacabc caa dacdabadacabb ba cbcacabbc ba baadaba dacccabdcbcc ab caa abddcccd bd cacdbcc ba 0010:

DIAGRAM 43. Schematic display of the position of 30 largest distribution companies on the Russian radiator market in 2019.



Source: Litvinchuk Marketing Co.