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Rapid assessment of the current price level of basic building materials and analysis of their dynamics

Successful implementation of investment and construction projects, including in housing construction, should take into account the results of monitoring prices for building materials with the possibility of forecasting in the short term. Obviously, modern conditions require better cost planning from construction organizations. The evaluated studies confirm the lack of information in the field of analyzing the dynamics of prices for basic building materials in order to define the relationship of various factors affecting the ability to predict and establish trends in costs change in the short and medium term. To eliminate subjectivity in the research, the authors provided an express analysis at various levels of generalization of statistical information on the cost indicators of building materials and considered a conjunctural analysis of the cost according to contractors. The study revealed that according to the manufacturers the shortage of building materials is not expected, but in conditions of work in the regime of sanctions pressure, the costs not only for construction materials, but also for the repair and maintenance of equipment can significantly increase. In addition, the problems may occur concerning the supply of technological equipment and disruption of logistics links. The authors made a rapid assessment of the current price level of the main price-forming building materials, as well as analysis and forecasting of their dynamics. The objectivity of the conclusions is due to the representativeness of information on the dynamics of price indicators, achieved through rapid analysis at various levels of generalization of statistical information, starting from Rosstat data and ending with the level of market analysis according to contractor construction organizations. The results of the study will allow us to determine the trends in the price dynamics of the cost of building materials and, accordingly, construction products.

Keywords: building materials, price, analysis, dynamics, forecast

The implementation of investment and construction projects, as well as the growth of housing construction in order to provide affordable and comfortable housing for citizens of the country, in modern conditions of geopolitical changes is directly dependent on the availability of housing and the level of prices for building materials. It should be noted that various studies interpret modern trends in the price dynamics of building materials in different ways [1–5]. Accordingly, there is a need for an express analysis of price dynamics in order to establish certain trends, cause-and-effect relationships, as well as the possibility of a certain forecast of trends in the short term. In order to ensure the objectivity of analytical conclusions and representativeness of data on the dynamics of price indicators, we consider it necessary to perform an express analysis at various levels of generalization of statistical information on the price indicators of building materials, as well as to consider the level of market analysis of the cost of building materials according to contracting organizations.

Monitoring of the price level for building materials is carried out at various levels: at the level of Rosstat, Pricing regional centers or Construction department of regions, enterprises when conducting market analysis. In order to predict the cost, we

consider it expedient to make a rapid assessment of the level and dynamics of prices for the studied building materials according to the data of the relevant above-mentioned services^{1, 2, 3, 4}.

Monthly monitoring reports of Rosstat are carried out in the context of average prices for basic materials purchased by construction organizations. It should be noted that there is no data on prices for a number of building materials for a number of periods, as a result of which such materials are excluded from the sample.

In this study, representative materials contained in the Rosstat database are selected for analysis www.fedstat.ru "Average prices for basic materials, parts and structures purchased by construction organizations", which are price-forming for housing construction projects⁵.

The analysis of the dynamics of prices for basic building materials in the Russian Federation as a whole is shown in Fig. 1.

Since the beginning of the year, the cost of building materials in the country, according to Rosstat estimates, has increased by an average of 6.7 %, in annual terms prices have increased by 4.5 %. In August, a number of materials fell in price. As can be seen from these figures, the price increase in March 2022, which occurred for

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1 Investment portal of the Moscow region. URL: https://invest.mosreg.ru/about_mo/regional_economics
2 Interfax. URL: <https://reality.interfax.ru>
3 Monitoring of prices of rolled metal and building materials. URL: <https://mc.ru/stats/stats>
4 RBC. URL: <https://chr.rbc.ru>
5 EMISS — state statistics. URL: <https://www.fedstat.ru>

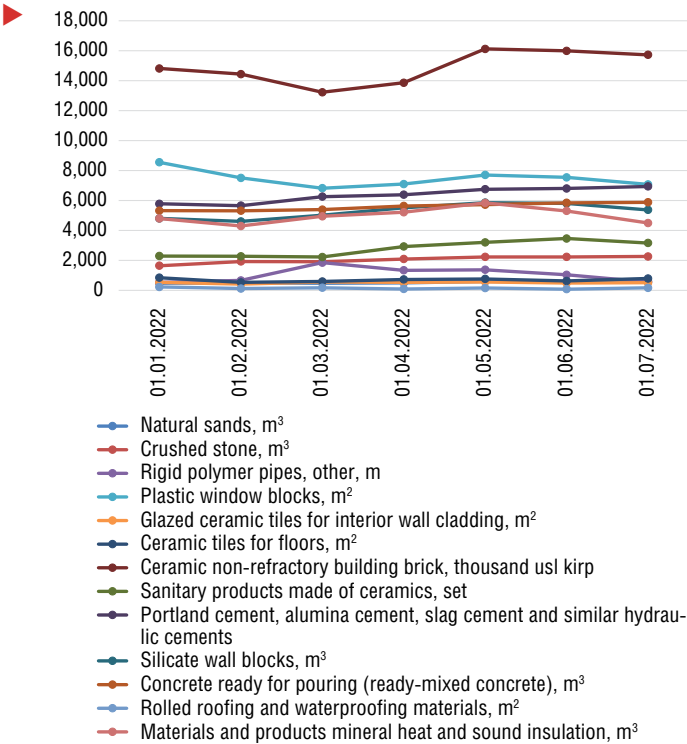


Fig. 1. Dynamics of prices for non-metallic building materials in the Russian Federation, RUB

geopolitical reasons, was later replaced by price stabilization with a slight jump due to the influence of the seasonal factor⁶.

A significant increase in prices is observed for exported goods^{7,8}. This is a large part of the finishing materials. Electrics and all materials related to engineering systems are becoming more expensive. We believe that these trends will continue.

It should be noted that such fluctuations do not significantly affect the cost of construction.

Monitoring of the main factors of pricing in construction, including monitoring of prices for: building materials, products, structures and equipment in the Moscow region is carried out by State Unitary Enterprise of the City of Moscow "Department of Economic Research, Informatization and Coordination of project work" (GAU "NIAC"), which is subordinate to the Moscow City Committee on Pricing Policy in Construction and state expertise of projects.

Monthly monitoring reports are carried out in the context of average selling prices for representative materials.

The dynamics of the price level of building materials in the Moscow region according to the GAU "NIAC" is shown in Fig. 2⁷.

Based on the analysis of the data of GAU "NIAC", there is a relative stabilization of price growth after the price jump due to the influence of both geopolitical factors in March 2022 and increased demand in the market along with high uncertainty, logistics component, rising cost of raw materials, the need for repair and maintenance of foreign equipment and its components. "Reaching

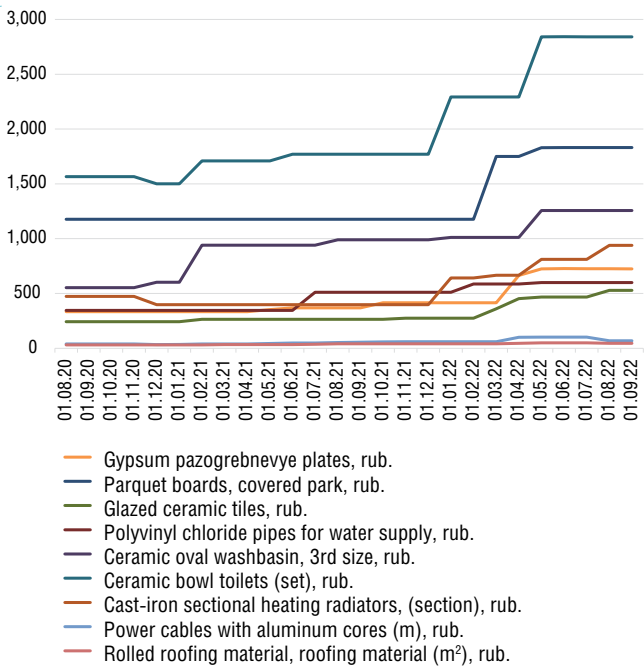


Fig. 2. Dynamics of the price level of building materials in the Moscow region according to the data of GAU "NIAC"

a plateau" and a slight decrease in the price after the jump in March 2022 is observed for a number of materials⁷.

However, the increase in prices for construction materials in almost all positions during the year compared to the data for January should be noted. A slight decline in prices in June caused by the strengthening of the ruble, we believe, was temporary due to further emerging risk-forming events and factors of geopolitical genesis. The increasing sanctions pressure contributes to the further reduction of raw materials, components and equipment elements necessary for the production of building materials in Russia.

The correlation analysis of the dynamics of the cost of building materials carried out by us according to the data of the GAU "NIAC" (Table) showed a direct relationship between the price level of reinforcement and steel prices; the dependence of the price of concrete on the price level of its components (sand, crushed stone, cement) along with the practical absence of correlation with the dynamics of the dollar^{7,8,9}.

The lack of correlation of the price level for the studied building materials with the dynamics of the dollar is explained by the domestic production of these materials from local raw materials. The need for technological renewal of foreign-made equipment characterizes precisely the existing level of interrelation of factor features.

Further, a conjunctural analysis of market prices for a number of building materials was carried out. To conduct a market analysis, data on the cost of fittings for several types for 2 weeks of May 2022 from several suppliers in the Moscow region were selected, for some types for 2 weeks of October 2021 and 2 weeks of November 2021 average values¹⁰.

6 Price monitoring . URL: <https://www.mcena.ru>
7 NIAC. URL: <https://niac.mos.ru>
8 Market news. URL: <https://cmp.pro.ru/rus/news/novosti-rinka>
9 The state and prospects of development of the industry of production of building materials and related industries, Investment portal of the Moscow region. URL: <https://investmoscow.ru/media/>
10 Soyuzcement: The cost of the basic building material lags behind the prices of other goods and services. URL: oyuztsment-stoimost-bazovogo-stroimateriala-otstaet-ot-tsen-na-drugie-tovary-i-uslugi.html

Results of correlation analysis of price dynamics according to the data of GAU "NIAC"

	Concrete mixes	Crushed stone	Cement	Enriched sand	Reinforcement workpieces	USD exchange rate	Alloy steel
Concrete mixes	1.00	–	–	–	–	–	–
Crushed stone	0.92	1.00	–	–	–	–	–
Cement	0.86	0.84	1.00	–	–	–	–
Enriched sand	0.71	0.85	0.60	1.00	–	–	–
Reinforcement workpieces	0.55	0.61	0.51	0.70	1.00	–	–
USD exchange rate	0.34	0.31	0.40	0.30	0.29	1.00	
Alloy steel	0.43	0.51	0.47	0.59	0.94	0.21	1.00

Based on the data analysis, the following assessment and conclusions can be made.

Average prices by types of fittings were determined based on the results of market analysis of data on the cost of fittings in

the Moscow region. The results of the analysis of the price dynamics of valve suppliers and calculated average prices are shown in the diagram below (Fig. 3).

According to the diagram, it can be concluded that the average cost of fittings in the Moscow region D 10 A500 in the summer of 2022 amounted to 61,200 rubles per ton, fittings D 12 A500 amounted to 56,200 rubles per ton, fittings D 16 A500 amounted to 55,867 rubles per ton, fittings D 20 A500 amounted to 55,700 rubles per ton. The minimum price of fittings in this period was observed at LLC "ASK" (3.5–4 % lower than the average price of the market analysis). The standard deviation of the market analysis sample data for a certain date is on average 1,500 rubles per ton.

According to the calculations, it can be concluded that the average cost of fittings in the Moscow region for the summer of 2022. D 10 A500 was 61,200 ± 1,915 rubles per ton, fittings D 12 A500 was 56,200 ± 1,473 rubles per ton, fittings D 16 A500 was 55,867 ± 1,644 rubles per ton, fittings D 20 A500 was 55,700 ± 1,473 rubles per ton.

The dynamics of average prices for fittings, calculated and constructed by us according to the data provided by the customer, for the period from October 2021 to May 2022, is shown in the diagram below (Fig. 4).

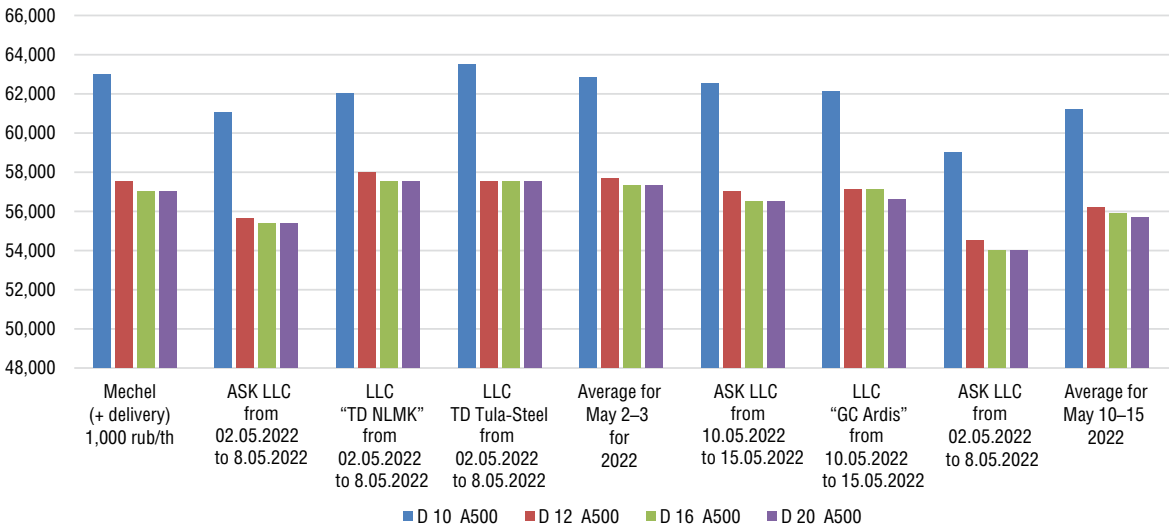


Fig. 3. Results of the analysis of the dynamics of supplier prices and calculated average prices for fittings in the Moscow region

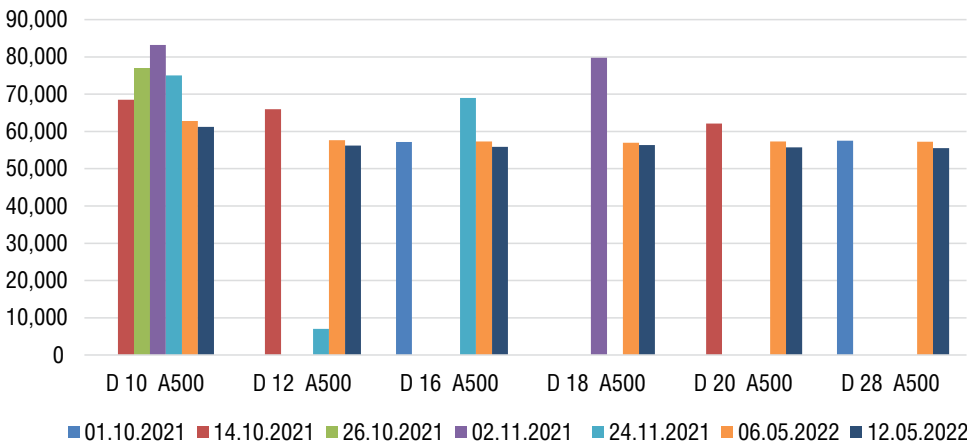


Fig. 4. Dynamics of average prices for rebar according to market analysis

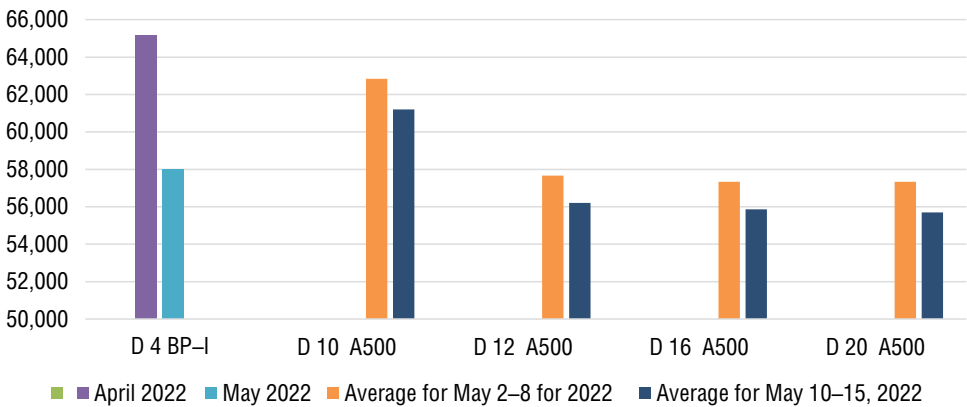


Fig. 5. Dynamics of average prices for rebar in the Moscow region in comparison with average prices according to GAU "NIAC"

Based on the analysis data, it can be concluded that prices for fittings are currently declining compared to the increase at the end of 2021, which is explained by the effectiveness of the antitrust policy. The measures taken by the Government of the Russian Federation limiting the growth of metal prices in the domestic market show their effectiveness. The price decrease is also caused by foreign trade restrictions, including a decrease in export volumes.

The corresponding dynamics of the average prices for fittings in comparison with the average prices according to the data of GAU "NIAC" is shown in the diagram (Fig. 5).

Based on the data of the figure, it can be concluded that the price indicators of fittings in the Moscow region are comparable according to market analysis with the results of regional monitoring of the GAU "NIAC"⁷. Therefore, since it is not possible to build a series of dynamics with subsequent trend formation due to the extremely small volume of price indicators of market analysis, the presence of a high level of correlation of price indicators with price indicators of official regional statistics allows us to conclude that the homogeneity of these samples and the expediency of using indicators of official regional statistics of prices for fittings to build a number of dynamics and forecast trend.

The dynamics of prices for concrete B 25 in the Moscow region is shown in the graph below (Fig. 6).

The increase in the price of concrete B25 for 2021 was 18 %, for 2022 (January–September) 16 %.

The dynamics of prices for concrete mixtures in 25 according to the market analysis of the contractor construction organization is shown in the diagram below (Fig. 7).

The increase in the price of concrete B25 in January 2022 to the initial price on the date of conclusion of the contract (February 2021) was 39 %.

The correlation analysis of the dynamics presented by the contractors with the data of the GAU "NIAC" showed the presence of a high level of correlation (the value of the pair correlation coefficient is 0.79), which indicates the homogeneity of the samples and the identity of the trends in price dynamics.

The results of the analysis indicate the uniformity of samples of prices for building materials according to Rosstat, GAU "NIAC" and market analysis data. Due to the volume of the sample data set, the data of Rosstat and (or) GAU "NIAC" can be considered a general data set. Accordingly, the construction of a trend line and price forecasting by methods of economic and statistical modeling is possible and reliable. The results of forecasting the price of commercial concrete are shown in Fig. 8.

In the course of the study, it was revealed that there is no shortage of the studied building materials on the part of manufacturers, however, due to the influence of the sanctions regime, not only the costs of repair and maintenance of equipment of manufacturing plants of building materials increase, but also problems with

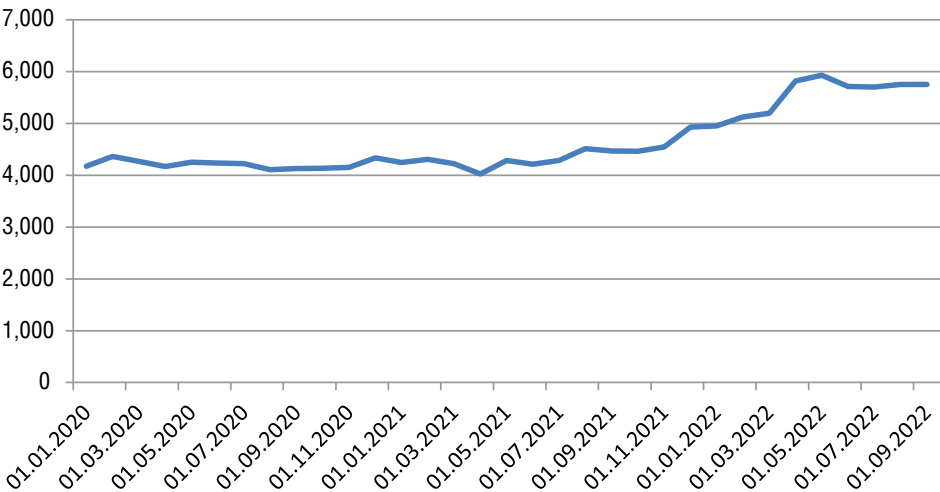


Fig. 6. Dynamics of prices for concrete B25 in the Moscow region, rub

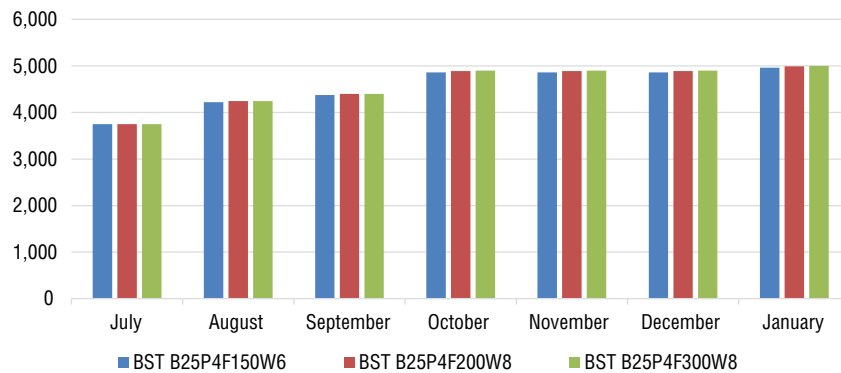


Fig. 7. Dynamics of prices for concrete mixtures B25 in the Moscow region, rub.



Fig. 8. Forecast of prices for concrete B35 in the Moscow region, rub

the supply of technological equipment and logistics appear; accordingly, the following cost dynamics is available and expected:

- relatively stable moderate positive dynamics of prices for concrete mixtures in all the studied regions is determined by the dynamics of prices of the main components of the concrete mixture;
- the dynamics of rebar prices after the jump at the end of 2021 is decreasing due to the measures taken by antimonopoly regulation; according to the forecast results, the dynamics of rebar prices are expected to stabilize with a subsequent slight increase (excluding the influence of geopolitical factors);
- correlation analysis of the dynamics of the cost of building materials showed a direct relationship between the price level of reinforcement and steel prices; the dependence of the price of concrete on the price level of its components (sand, crushed stone, cement), along with the practical absence of correlation with the dynamics of the dollar;
- prices for building materials (rebar and concrete) are not expected to decrease in 2022;
- the growth and subsequent stabilization of concrete prices is expected, which is explained by the multiplicative influence of both the increasing price dynamics of the components of the concrete mixture, the seasonal increase in demand for concrete mixtures

and their components, and the increase in the cost of maintenance of technical equipment of production facilities.

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Экспресс-оценка текущего уровня цен на основные строительные материалы и анализ их динамики

Успешная реализация инвестиционно-строительных проектов, в том числе в жилищном строительстве, должна учи-

тывать результаты мониторинга цен на строительные материалы с возможностью прогнозирования в краткосрочном периоде. Необходимость планирования строительными организациями своих затрат обретает особую актуальность в современных условиях.

Проанализированные исследования подтверждают нехватку

информации в области проведения анализа динамики цен на основные строительные материалы в целях установления взаимосвязи различных факторов, влияющих на возможность прогнозирования и установления трендов изменения стоимости в краткосрочной и среднесрочной перспективе.

Для устранения субъективности при проведении исследования авторами был проведен экспресс-анализ на различных уровнях обобщения статистической информации о ценовых показателях строительных материалов и рассмотрен конъюнктурный анализ стоимости по данным подрядных организаций.

В ходе исследования выявлено, что дефицит строительных материалов по данным заводов-изготовителей не ожидается, но в условиях работы в режиме санкционного давления могут существенно возрасти затраты не только на строительные материалы, но и на ремонт и техническое обслуживание оборудования. Кроме того, возможно появление проблем, связанных с поставками технологического оборудования и нарушением логистических связей. Авторами произведена экспресс-оценка текущего уровня цен основных ценообразующих строительных материалов, а также анализ и прогнозирование их динамики. Объективность выводов обусловлена репрезентативностью информации о динамике ценовых показателей, достигаемой за счет проведения экспресс-анализа на различных уровнях обобщения статистической информации, начиная от данных Росстата и заканчивая уровнем конъюнктурного анализа по данным подрядных строительных организаций. Результаты исследования позволят определить тенденции ценовой динамики стоимости строительных материалов и, соответственно, строительной продукции.

Ключевые слова: строительные материалы, цена, анализ, динамика, прогноз

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