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LENINGRAD PLANTS SLOW TO ADOPT PRECISION CASTING; MOSCOW PLANT TURNS OUT NEW FOUNDRY EQUIPMENT

FAIL TO UTILIZE NEW PROCESS IN MASS PRODUCTION -- Leningradskaya Pravda, 31 Jan 51

Precision casting is assuming ever greater importance in the field of founding, since it enables workers to turn out parts of complex configuration with minimum tolerances.

Patterns used in this process are made of organic substances (stearin or paraffin), in precision press-molds. After the casting molds have been formed around them, the patterns are either melted or burned out, leaving an empty recess. Getting the pattern out of the mold in this fashion precludes the risk of damage and deformation which the mold may suffer when a solid pattern is removed from it. The inside surfaces of the mold are coated with a special refractory material, insuring a high-quality surface for the casting. The metal is poured into a heated mold under action of a vacuum, or under pressure, so that the metal will completely fill the complex recesses.

In many cases, precision casting is cutting the cost of parts 50-66 percent. This reduction in cost is largely attributable to the minimizing of subsequent machining operations, with only grinding required.

The process should be of particularly great importance in mass production. Its use is also well justified in small-series production, where parts of particularly complex shape are being produced. For example, a certain plant which converted to precision casting in the manufacture of seven small parts was able to free over 30 machine tools and several units of forging equipment. The changeover saved the plant 70 tons of rolled metal and about 1½ million rubles.

Precision castings may be made of any steel or alloy, including those metals which cannot be compressed or cut.

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Outstanding success was achieved at the Leningrad Plant imeni Stalin in the precision casting of special 6-kilogram blades for high-pressure steam turbines. Instead of sending forgings weighing 25-28 kilograms to the machine shop, 7-kilogram castings were sent. As a result, the time for machining the blades was cut from 56 hours to only 2 hours. A group of these blades was turned out at nearly one fourth the cost of blades made in the old way. The production cycle for this group of blades was reduced from 3 months to 2 weeks, thus permitting a powerful turbine to be completed within the planned time.

The collaboration of Moscow and Leningrad scientific research institutes and laboratories with industry has helped to improve precision casting methods and to broaden the area of their application.

Further development of the process demands the services of specialists in various branches of industry. Successful work in collaborative operations has been carried out by the Metals Institute, the Scientific Research Institute of Plastics, and the Chair of Glass of the Technological Institute imeni Lensovet. Precision casting of drill cones for the petroleum industry, introduced and established by the laboratory of the Leningrad Electrical Engineering Institute imeni Ul'yanov (Lenin) has resulted in great savings.

The work of scientists has helped solve many problems in the search for cheaper pattern and mold materials. The achievements of our industry surpass those of foreign countries in the development of cheaper materials and better methods.

Precision casting is now being mechanized. Several Moscow plants of the Ministry of Automobile and Tractor Industry are already planning to mechanize their precision-casting shops.

An all-Union conference on precision casting, recently held in Leningrad, was attended by delegates from 140 plants, scientific research institutes, and planning organizations, representing 28 cities. It was reported that present applications of the new process included production of motorcycle parts, ball bearings, cutting tools, measuring instruments, rotor and stator blades for both steam and gas turbines, and motion-picture machine parts.

In spite of certain advances, however, unfortunately it is true that precision casting is only slowly coming into its own in Leningrad. Only a few enterprises utilize it in mass production, as, for example, the Leningrad Tool Plant. While many Leningrad plants are trying out the method in small experimental shops, their tests only constitute repetitions of what has already been found out in the field of precision casting. Because of this difference, large plants, such as the imeni Lenin and the Kirov, are feebly starting to apply the method, but have not yet actually established precision-casting shops. Several enterprises simply do not wish to take on the additional work load which the introduction of precision casting would demand. The Pnevmatika, the Linotip, and other plants now mass producing a great many items which would lend themselves admirably to precision casting techniques, are just making the first steps toward its introduction.

At present, it is not so important to produce separate, individual items by this method, even though they be of complex form, as it is to establish mass production of precision castings. Leningrad industry must make greater efforts toward this end.

The scientific research institutes and the Leningrad plants which already have had experience with precision casting should help other enterprises to introduce the method. It is the duty of the Society for the Dissemination of Political and Scientific Knowledge, and its House of Scientific

Technical Propaganda, as well as of the Leningrad Division of the Scientific Technical Engineering Society of Foundry workers to popularize all precision-casting techniques.

MOSCOW PLANT MAKES ABOVE-PLAN PROFITS -- Moscow, Moskovskaya Pravda, 30 Jan 51

The Moscow Krasnaya Presnya Plant met its 1950 gross-production quota on 5 December, and by the end of the year had turned out several dozen above-plan molding machines. The cost of production was cut 25 percent, while over one million rubles in above-plan profits were taken in. Work proceeded smoothly and according to schedule during the entire year, and the program for range of products was exceeded.

A centrifugal crusher-roll sand-conditioning machine recently produced at the plant is ten times as productive as other machines of this order. It is electric and pneumatic powered, and all processes are completely automatic. The machine is operated by one man.

The plant's production of an entire "family" of machines designed to mechanize all production processes in a foundry constitutes a signal achievement. In addition to centrifugal sand conditioners, the group includes several original types of high-duty molding machines, a stationary sand slinger for serving large flasks, and a special machine for pouring.

This year the plant is faced with greater tasks. It must not only increase its present volume of output, but must put 13 new models into production and modernize two others. The new machine to be put out this year will include new die-casting machines for nonferrous metals, which will exceed the productivity of present models by 200 castings per shift. A projected sand slinger with removable hopper, designed for handling large flasks, will be better than the existing models of similar type. New types of high-duty molding machines, including a pneumatic jolt-squeeze machine with lift-pin flask removal, and a new automatic sandblast machine will also be produced.

The equipment which the plant is now either producing or putting into production differs sharply from the machines it put out 2-3 years ago. For one thing, the new machines are very much larger. A new sand slinger, for example, is nearly 10 meters long, over $4\frac{1}{2}$ meters high, and weighs nearly $10\frac{1}{2}$ tons. A machine is now being built which has individual parts weighing several tons.

The changes in the types of machines produced have made it necessary to enlarge the assembly area and to intensify the mechanization of the shop in which large parts are machined.

In 1950, considerable additional space was found for working on small equipment by adding an entresol to the machine wing. The first machine shop, where heavy parts are machined, was rearranged to clear 400 square meters, making room for some heavy machine tools. This reorganization should raise the output of the first machine shop 40 percent.

Saving of metal has been a vital factor in production techniques and design at the plant, and special efforts have been made to reduce the weight of the latest machines. In the metal structures shop over 20 tons of metal were saved by improving cutting methods and using metal scraps in the manufacture of small parts. -- V. Muradov, director

BOOST OUTPUT OF DIE-CASTING MACHINES -- Moscow, Vechernyaya Moskva, 24 Jan 51

This year the Moscow Krasnaya Presnya Plant is increasing its output of new, high-duty foundry machines, including a die-casting unit which can turn out up to a thousand castings of nonferrous alloy in one shift. In all, 30 percent more die-casting machines will be produced this year than last year.

Working in conjunction with the Central Design Bureau for Foundry Equipment, the plant recently built a new sand-conditioning machine. Operated by one worker, it is ten times as productive as other mixture-preparing machines made at the plant. In 2 minutes, it turns out as much molding mixture as other machines can in an hour. Furthermore, the material which it prepares is of better quality. So far, the plant has built two of these sand conditioners, and they have been given a high rating by the State Certifying Commission.

PRODUCE NEW CORE MAKER -- Moscow, Vestnik Mashinostroyeniya, Jan 51

The new 287 high-duty core-making machine put out by the Moscow Krasnaya Presnya Plant was built according to the plans of the Central Design Bureau for Foundry Equipment. It makes cores in boxes having either vertical or horizontal joints, blowing the sand in with a stream of compressed air at 6-7 atmospheres pressure.

The machine consists essentially of a table, having a mechanism for clamping the core box in place, a sand reservoir and the device which moves it into place, a sand-blowing mechanism, and a draw apparatus. A hopper for the core mixture is situated at the top of the machine, and the compression chamber for the air blast is situated in the base of the frame.

To operate, the core box is secured to the table, the reservoir is moved into position over the core box, and automatically filled from the hopper. The table is then raised, fixing the core box securely against the bottom of the reservoir. The core mixture is then blown through openings in the bottom of the reservoir and the holes in the top of the core box into the core recess.

To protect the operator of the machine, an automatic device prevents the air-blowing mechanism from operating until the core box is flush against the reservoir.

Specifications

Productivity (cores/hr)	up to 240
Maximum weight of core (kg)	15
Maximum dimensions of core boxes (mm)	
With vertical joint	450 x 240 x 200-240
With horizontal joint	550 x 240 x 200-340
Periphery of core (sq cm)	1,130
Volume of hopper (lit)	150
Volume of reservoir (lit)	60
Working pressure of blowing system (atm)	6-7
Expenditure of air during one blowing (cu m)	0.085

NEW CONVEYER SYSTEM MARKS, STACKS MOLDS -- Moscow, Moskovskiy Komsomolets, 25 Jan 51

The Leningrad Metal Structures Plant has begun series production of foundry conveyers for nonferrous metallurgical enterprises. The new conveyers have a metal belt, and a device for marking and stacking the finished molds. All processes of the conveyer are mechanized.

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