

Introduction

Motordetal-Konotop

Cylinder liner manufacturing plant



We know everything about cylinder liners





Total area – 20,2012 hectares Building area – 72,609 square meters Production buildings total area – 68,795 square meters Motordetal-Konotop is the largest fully integrated company in the CIS specializing in cylinder liner production





We use centrifugal casting method, induction melting from special wear-resistant cast iron.

Flexible production based upon highly adaptive manufacturing lines and cells.

We have well mastered a wide range of cylinder liners and sleeves for automotive, tractor, vessel, locomotive and stationary applications.

We conduct high-precision finish machining of cylinder liners using CNC turning and honing machines.





Technology: high-precision equipment, including casting carrousels, plateau honing, heat treatment, phosphatization of cylinder liners, induction hardening and plasma anticavitation of cylinder liners.

Use of state-of-the-art equipment combined with experienced and welltrained personnel makes it possible to reach high levels of product quality and protect the environment.





Date of establishment:

Motordetal-Konotop was established on the basis of the former national enterprise, whose activity started in 1943.

Production:

Main production technology – special gray iron casting.

100% of castings are produced by centrifugal casting method.

The minimum casting weight is 8 kg, the maximum casting weight is 400 kg. Casting inner diameters range from 50 to 350 mm. Casting length is from 250 to 1110 mm.

Manufacturing capacity:

56 200 tons of usable castings 4,63 million liners and sleeves per year



Foundry





Melting Casting Capacities





Melting



(1) Two-crucible medium frequency induction melting furnace Junker
2MFTGe 4000 (Germany). Crucible capacity – 4 tons.

(5) Commercial frequency induction crucible furnaces ИЧТ-10. Crucible capacity – 10 tons.

(3) Commercial frequency induction crucible furnaces ИЧТ-2,5. Crucible capacity – 2.5 tons.

Total production capacity – 5 270 tons per month.



Casting





Centrifugal casting process is used to produce cylinder lining tubes.

(1) Eleven-station rotary-hearth machine ККМ-11Л – 60 000 castings per month.

(3) Eight-station rotary-hearth machines ККУ – 105 000 castings per month.

(31) Single-station rotary machines РЛМ-260. Production capacity – 99 000 castings per month.

(2) Single-station rotary machines РЛМ-460. Production capacity – 500 largebore cylinder liner castings per month.

Total production capacity – 264 500 castings per month.



Machining



Machining cells

Phosphatization line

Induction hardening & heat treatment cell







Machining



(10) Cylinder liner finishing cells, Production capacity – 281 800 cylinder liners per month.

O.D. finishing – CNC turning machines Gildemeister CTX-400E, Takisawa TC-350L10, Bevers 1Π420ΠΦ40, 16A20Φ3.

I.D. finishing – CNC honing machines Gehring Z-NC-600-125, Nagel VS 10-60 RA, Nagel 2 VS10-80T, 3K83.





Machining



(3) Rough machining and semifinished cylinder liner manufacturing areas equipped with local-made specialized semi-automatic machinetools.

Combined production capacity – 98 000 semi-finished cylinder liners per month.

Marine and locomotive cylinder liner machining area. Production capacity – 6 000 cylinder liners per month.

Equipment: MaxMiller MD5S, EMCO Hyperturn 690MCPlus, PT755, 1740F3





Production of cast-in cylinder liners



Currently we are in process of installing the Gibson foundry complex for the production of tube castings with the length of 2 m. The estimated capacity is 2 million pieces of rough cast-in and dry liners for aluminum blocs annually.



We actually supply the cast-in and dry liners both to build and aftermarket in number of about 500K pieces per year.



Table of main materials

To produce the cylinder liners more than 140 material types are used depending on customer's specifications.

| No. | Material specification | Hardness, HB | Tensile strength, MPa | Description | Application |
|-----|------------------------|-----------------|-----------------------------|--|---|
| 1 | MC 05.007-1 | 217-269 | 210 | Cr, Cu alloyed pearlitic cast iron | Wet liners for passenger and light commercial vehicles engines |
| 2 | MC 01.001- 5.1P | 230-290 | 250 | Cr, Cu alloyed pearlitic cast iron | Dry cylinder liners engines |
| 3 | MC 01.001- 9.8 | 217-269 | 250 | Cr, Ni, Cu alloyed pearlitic cast iron | Cast-in liners for aluminum blocs |
| 4 | MC 04.006-4 | 217-277 | 250 | Pearlitic cast iron with low phosphorus content for induction hardening up to 42-52HRc | Truck and agricultural machinery engines |
| 5 | MC 02.007 | 230-280 | 250 | Cr, Mo, B alloyed wear- resistant pearlitic cast iron | Truck engine |
| 6 | MC 01.001 | 230-277 | 260 | Cr alloyed pearlitic cast iron with average phosphorus content | Truck and light commercial vehicle engines |
| 7 | MC 01.001-1 | 230-285 | 260 | Cr alloyed pearlitic cast iron with high phosphorus content | Trucks engines |
| 8 | MC 02.003 | 230-270 | 280 | Cr, Mo alloyed pearlitic cast iron | Heavy duty truck engines |
| 9 | MC 07.008 | 250-310 | 330 | Cu, Cr, Mo alloyed pearlitic cast iron | High loaded truck and locomotive engines |
| 10 | MC 04.006-6 | 270-330 | 380 | Pearlitic cast iron with high tensile strength | High loaded truck engines |
| 11 | MC 02.011 | 230-300 | 320 | Bainitic cast iron | High loaded truck engines |
| 12 | MC 07.005 | 270-330 | 400 | Bainitic cast iron | High loaded truck and locomotive engines |



Microstructure Typical microstructure on the working surface of cylinder liner



Graphite per ISO 945: predominantly type A, B is allowed. Size 4-6, size 7 is allowed.



Matrix: fine pearlite, ferrite up to 2%



Steadite: continuous network



Steadite: broken network



Steadite: isolated inclusions



Quality assurance



100% finish control of main cylinder liner parameters to ensure product quality.

Our test lab equipment: Spectrolab spectrometers, CS-200gas analyzer, Wolpert 971/3000, hardness meters, Tira 4000 tensile testing machine, sample preparation system, Olympus microscopes, IA-32 structure analyzer.

Central plant lab equipment: Mahr Perthometer Concept and S8P profilometers, a Carl Zeiss microscope, optical calipers.

Operational control and final acceptance equipment: air/electronic instruments, Mahr M2 and M4 profilometers, special fixtures and measurement tools.



Material inspection









Material inspection











Dimensional control











Quality assurance





Customers' awards & recognition



Motordetal-Konotop was honored as best supplier to MTU Friedrichshafen, Germany in 2014.

Motordetal-Konotop also got recognition from Perkins Engines Company, United Kingdom in 2012-2014 for its exemplary year-to-year performance in the supply of dry cylinder liners.





Main OEM customers





Main Aftermarket customers





















Advantages



Single specialization and focus on production of cylinder liners

Proximity to Western Europe, short order lead time

Fully integrated production: from production of castings to complete machining and all-round quality control

Highly skilled and motivated personnel

Access to local low cost raw materials and human resources

Timely delivery, production reserve capacity

Well developed customer communication practices, European culture and mentality of plant personnel

Certified quality assurance systems, environmental, health & safety management, health in conformity with international standards



Experiences



Almost a 50-year cylinder liner manufacturing tradition and experience

Stable quality and recognitions from the customers

80% of liner destined for truck applications

1 500 part numbers mastered ranging from 60 to 350 mm bore

140 material specifications developed including special materials with ultimate properties (pearlitic cast iron with high tensile, bainitic, etc)

Modern production technologies (centrifugal casting, CNC machining, plateau & slide honing capabilities, roller burnishing, statistic control and tracebility)

Original Equipment Manufacturer



Supply of European OEM and all Russian & Ukrainian engines plants

Strategical partnership with Kolbenschmidt



Strategy



To maintain the role of the biggest manufacturer of cylinder liners in Eastern Europe

Become a 1st tier OEM supplier for truck and tractor application

Ultimate customer satisfaction via the supply of high quality products, services and support

Motivation and satisfaction of the staff

Cost reduction initiatives to let customer become more competitive

Adoption of zero defect philosophy

Reasonable prices and affordable profit







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Many thanks for such an opportunity to present our company and your attention!