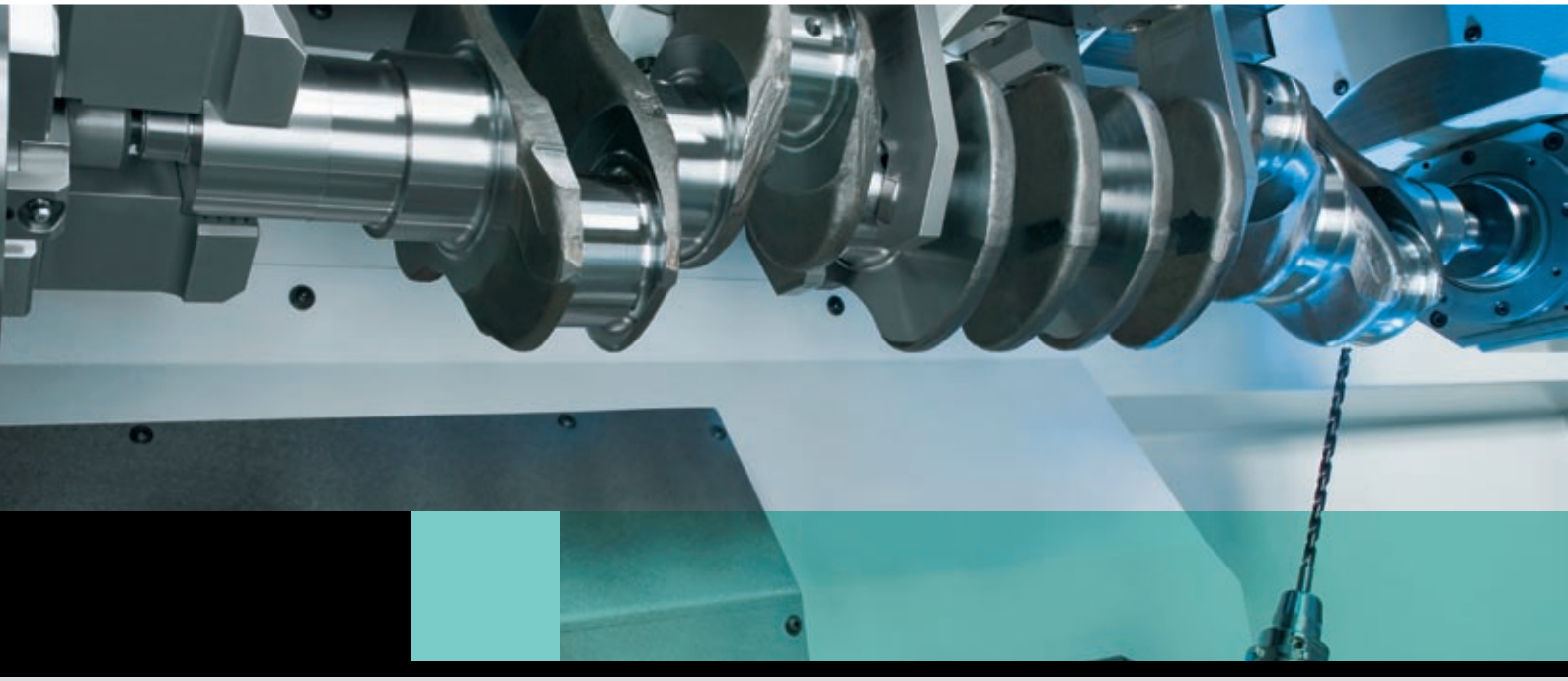
Oil hole drilling
HL 1000

Product information



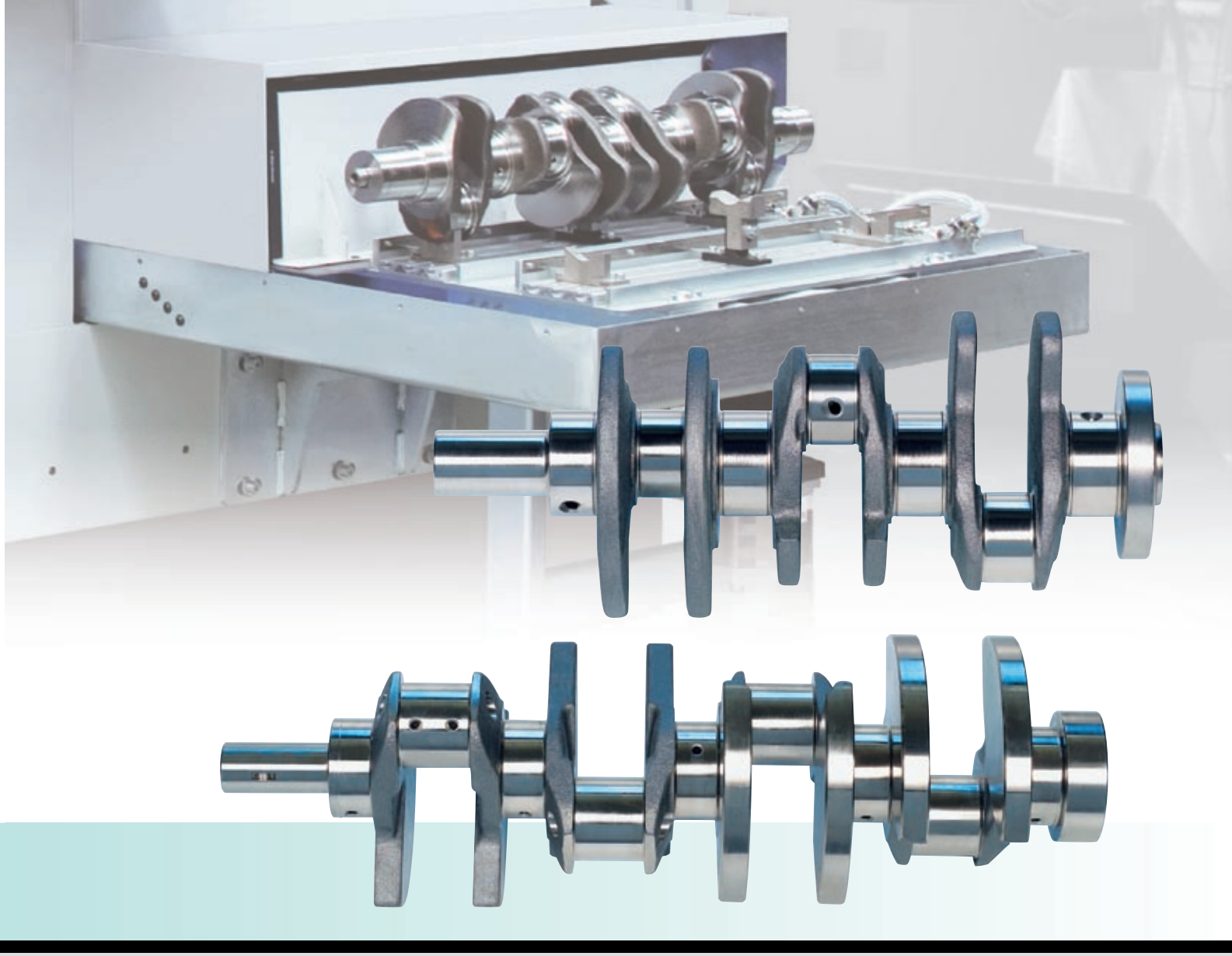
EMAG

HL 1000 – Drilling oil holes into hardened crankshafts

With the HL 1000 EMAG presents an oil hole drilling machine for soft and hardened crankshafts.
The advantages of hard machining: distortion of the shaft is prevented and the allowance for the hard machining operation can be reduced.

The complete process on a single machine

In the manufacture of crankshafts for passenger cars and trucks it is not only position, dimension and contour of the external geometry that have to be accurate. Generating the oil holes in the main and pin bearings is just as much of a precision job. It is those oil holes through which the lubricant is supplied to the contact point between con rod and crankshaft. They run in a diagonal direction, at right angles to the symmetry axis of the shaft, and are interconnected. Only accurate entry of the medium into and a precision exit from the oil hole guarantee the efficacy of the lubricating process. The generation of these oil channels is a highly demanding job in more sense than one. To drill the holes to the required precision and to chamfer them according to drawing tolerances is a decisive part of the process. An error at this stage would make of the already extensively machined workpiece an expensive lump of scrap. The oil holes are usually drilled into the crankshaft in its soft stage, i.e. before it is hardened. As they are drilled at very acute angles, their edges throw up a very thin projection of material. If the main and pin bearings are hardened after the oil holes have been drilled, the steel at this particular spot cools down too quickly and becomes highly porous. When the crankshaft is used, tiny particles of the protruding material could break off and impede the running of the bearings, even damage the engine. The hardening of crankshafts after the oil holes have been drilled could also cause quenching cracks to appear at the intersection points. Heavy duty usage can then cause the crankshaft to break. To eliminate these multiple sources of danger right from the start, EMAG has developed a process that allows for oil holes to be drilled into hardened crankshafts. The advantage: the shaft can be hardened before drilling takes place. The oil channels are only drilled after heat treatment – the way to safely avoid hardening cracks and fractures.



The HL 1000 is designed to machine crankshafts of up to 1000 mm length and 265 mm diameter. With bore diameters of between 4 and 8 mm and the use of minimum quantity lubrication, the HL 1000 achieves the kind of tool life that is far beyond the usual. Finally, all machining results – even those for truck crankshafts weighing up to 150 kg – are checked and logged by the control system while the workpiece is still clamped.
The machine base is of Mineralit® (reaction resin polymer concrete), offering excellent thermal stability and outstanding dampening properties. (In fact, the dampening properties of Mineralit® are 6 to 8 times those of cast iron.) At the top of the machine base – and outside the machining area – are two pre-loaded linear roller guideways for the compound slide. They guarantee the highest degree of accuracy and high dynamic rigidity at all speeds.

The compound slide is equipped with two axes (X vertical and Z horizontal). The axes are driven by pre-loaded ball screws and no-maintenance servomotors with built-in high-resolution rotary encoder. Cross slides and swivel axis (Y cross and B rotary) provide flexibility in the drilling of oil holes at variable angles. Rapid traverse speeds of up to 40 m/min reduce the idle times for tool change, workhandling and positioning. The B-axis is driven by a highly dynamic NC torque motor. A direct measuring system with high resolution guarantees the greatest accuracy in angular positioning. The 12-station disc-type magazine is equipped with HSK-A50 tools, which are changed on the pick-up principle, using the motor spindle. The magazine remains outside the machining area and is therefore well protected against contamination. The highly dynamic, compact construction ensures time-saving tool changes.

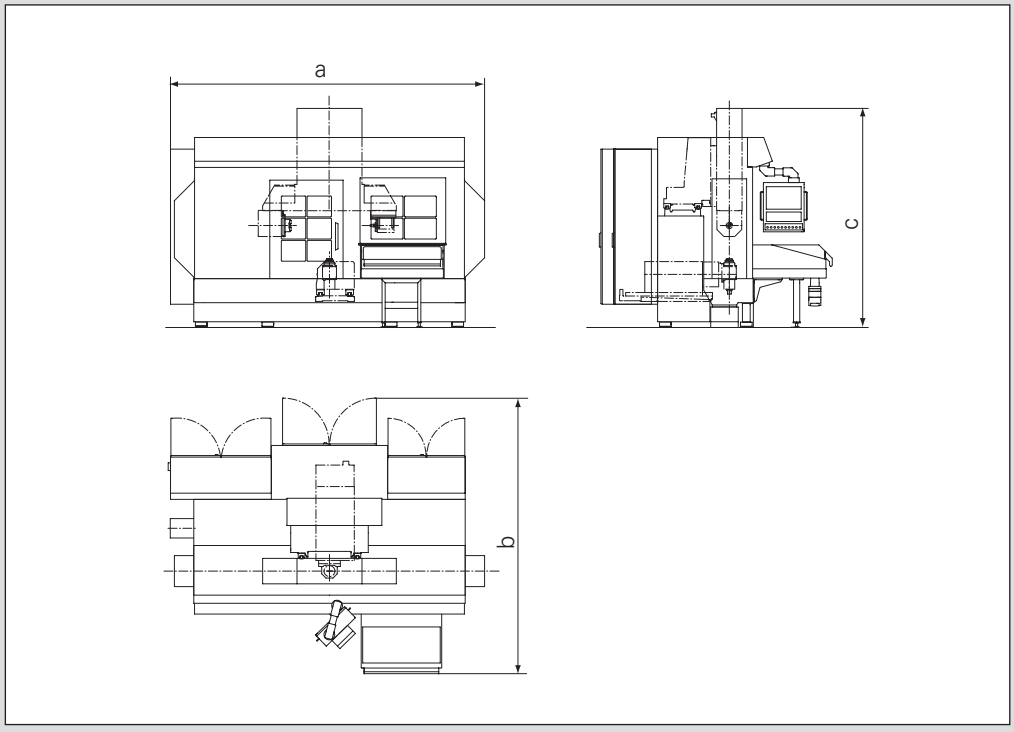
Technical data.

Capacity		HL 1000
Max. workpiece diameter	mm	265
Max. workpiece length	mm	1,000
Max. workpiece weight	kg	150
X-, Y- and Z-axis travel	mm	420 / 325 / 1,785
Max. rapid traverse speed in X, Y and Z	m/min	30 / 30 / 40

Motor spindle		
Tool receptor	HSK-A	50
Max. speed	rpm	10,000
Power rating, motor S1	kW	10
Torque S1	Nm	16
Max. drilling diameter	mm	12

Tool magazine		
Magazine locations	Qty	12
Tool length	mm	280

Weights and measurements		
Length a (excluding chip conveyor)	mm	4,050
Width b	mm	3,560
Height c	mm	2,830
Weight	approx. kg	11,000



Subject to change without prior notice.

At home in the world.

EMAG
Gruppen-Vertriebs- und Service GmbH

Salach
Austrasse 24
73084 Salach
Germany
Phone: +49 (0)7162 17 0
Fax: +49 (0)7162 17 820
E-mail: info@salach.emag.com

Frankfurt
Orber Strasse 8
60386 Frankfurt/Main
Germany
Phone: +49 (0)69 40802 0
Fax: +49 (0)69 40802 412
E-mail: info@frankfurt.emag.com

Köln
Robert-Perthel-Strasse 79
50739 Köln
Germany
Phone: +49 (0)221 126152 0
Fax: +49 (0)221 126152 19
E-mail: info@koeln.emag.com

Leipzig
Pittlerstrasse 26
04159 Leipzig
Germany
Phone: +49 (0)341 4666 0
Fax: +49 (0)341 4666 114
E-mail: info@leipzig.emag.com

Herford
Arndtstrasse 8
32052 Herford
Germany
Phone: +49 (0)5221 9333 0
Fax: +49 (0)5221 9333 25
E-mail: info@herford.emag.com

München
Zamdorferstrasse 100
81677 München
Germany
Phone: +49 (0)89 99886 250
Fax: +49 (0)89 99886 160
E-mail: info@muenchen.emag.com

Dänemark
Horsvangen 31
7120 Vejle Ø
Denmark
Phone: +45 75 854 854
Fax: +45 75 816 276
E-mail: info@daenemark.emag.com

Schweden
Glasgatan 19B
73130 Köping
Sweden
Phone: +46 (0)221 40305
E-mail: info@sweden.emag.com

Österreich
Dorfstrasse 343
5423 St. Koloman
Austria
Phone: +43 (0)6241 640
Fax: +43 (0)6241 26204
E-mail: info@austria.emag.com

Contact us. Now.

NODIER EMAG INDUSTRIE S.A.
Service commercial Unital:
38, rue André Lebourblanc - B.P. 26
78592 Noisy le Roi
France
Phone: +33 1 30 80 47 70
Fax: +33 1 30 80 47 69
E-mail: info@nodier.emag.com

EMAG MAQUINAS HERRAMIENTA S.L.
Pasaje Arrahona, No.18
Centro Industrial Santiga
08210 Barberà del Vallès (Barcelona)
Spain
Phone: +34 93 719 5080
Fax: +34 93 729 7107
E-mail: info@emh.emag.com

ZETA EMAG SpA
Viale Longarone 41/A
20080 Zibido S.Giacomo (MI)
Italy
Phone: +39 02 905942 1
Fax: +39 02 905942 21
E-mail: info@zeta.emag.com

EMAG (UK) Ltd.
Chestnut House,
Kingswood Business Park
Holyhead Road
Albrighton
Wolverhampton WV7 3AU
Great Britain
Phone: +44 1902 376090
Fax: +44 1902 376091
E-mail: info@uk.emag.com

KP-EMAG
ul. Butlerova 17
117342 Moscow
Russia
Phone: +07 495 3302574
Fax: +07 495 3302574
E-mail: info@kp.emag.com

EMAG L.L.C. USA
38800 Grand River Avenue
Farmington Hills, MI 48335,
USA
Phone: +1 248 477 7440
Fax: +1 248 477 7784
E-mail: info@usa.emag.com

EMAG MEXICO
Colina de la Umbria 10
53140 Boulevares
Naucalpan Edo. de Mèxico
Mexico
Phone: +52 55 5 3742665
Fax: +52 55 5 3742664
E-mail: info@mexico.emag.com

EMAG DO BRASIL Ltda.
Rua Schilling, 413
Vila Leopoldina
05302-001 São Paulo
SP, Brazil
Phone: +55(0)11 3837 0145
Fax: +55(0)11 3837 0145
E-mail: info@brasil.emag.com

EMAG Machine Tools (Taicang) Co., Ltd.
Room 2315 B, Far East International Plaza
No. 317 Xianxia Road
200051 Shanghai,
P.R. China
Phone: +86 21 62 35 15 20
Fax: +86 21 62 35 01 18
E-mail: info@china.emag.com

EMAG INDIA Private Limited
#12, 12th Main Street, 17th Cross
Malleswaram
Bangalore - 560 055,
India
Phone: +91 80 2344 7498
Fax: +91 80 2344 7498
E-mail: info@india.emag.com

EMAG KOREA Ltd.
Lotte IT Castle 1st B/D, Rm 806
550-1, Kasan-dong
Kamchun-gu
153-803 Seoul
South Korea
Phone: +82 2 2026 7660
Fax: +82 2 2026 7670
E-mail: info@korea.emag.com

TAKAMAZ EMAG Ltd.
1-8 Asahigaoka Hakusan-City
Ishikawa Japan, 924-0004
Japan
Phone: +81 76 274 1409
Fax: +81 76 274 8530
E-mail: info@takamaz.emag.com

EMAG SOUTH AFRICA
P.O. Box 2900
Kempton Park 1620
Rep. South Africa
Phone: +27 11 3935070
Fax: +27 11 3935064
E-mail: info@southafrica.emag.com

223-1-GB/09.2008 · Printed in Germany · © Copyright EMAG ·

www.emag.com

EMAG