

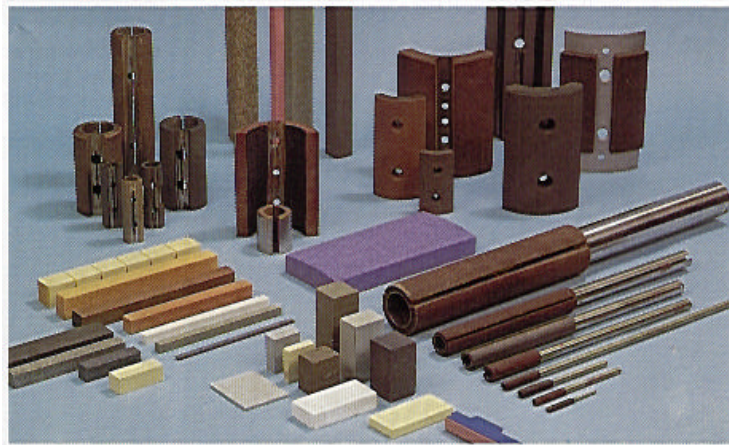


Honing

the manufacturing operation after grinding

Cono Balbo
FUCHS PETROLUB AG Mannheim

Tools from Nagel



Honing tools for different applications

Strategies of Machine Tool Manufacturers

➤ **Gehring**

Close cooperation since more than 25 years with Castrol in the field of honing oils. Some European customers use our ECOCUT S 104 from Spain as a better alternative to Castrol Honilo grades (Renault-Nissan Group). For DaimlerChrysler plant Bad Cannstadt, Gehring has accepted ECOCUT HFN 10 LE as honing fluid. At Ford Valencia ECOCOOL MS 54 is running for honing the conrod eye on the Gehring machine with Hydromation paper filter system.

➤ **Nagel**

Some common project together with FUCHS regarding watermiscible products like ECOCOOL HONO Aqua Plus 2 for AUDI Győr and some Korean customers.

ECOCUT SA 104

Product Information



ECOCUT SA 104

Heat cutting oil for super finish operations.

Application

- Heat cutting oil for grinding, interior cylinder honing, super finishing using diamond and belt polishing.
- The product's additives provide excellent lubrication of the part-tool assembly, achieving excellent surface finishes and longer life for tools and grindstones.

Properties and Advantages

- Good anti-corrosion power, which permits perfect conservation of machine-tools.
- Excellent cooling capacity, which permits fast heat removal from the contact zone.
- Minimum oil mist formation and therefore improved working environment conditions.

Technical Information

Specifications:	Unit	Value	Code
Appearance		Clear liquid	
Colour		Amber	
Viscosity at 40°C	mm ² /s@40	4.5 - 5.5	DIN 51562
Saponification index	mgKOH/g	30 - 35	DIN 51559
Flash point	°C	140	DIN ISO 2592
Copper corrosion		Negative	DIN 51759

1 of 2

Product Information



ECOCUT SA 104 (continuation)

2 of 2

How to Use

ECOCUT SA 104 is used pure, just as supplied without mixing with water or any other dilution liquids.

Before this product is first used with a machine, it is recommended that the tank and piping is thoroughly cleaned to eliminate the previously employed fluid.

Cautions

It should be stored under cover and away from heat sources.

In the case of spills, wash with abundant water and tensioactive agents.

Avoid splashing to the eyes. If this should occur, immediately rinse with abundant water.

Presentation

ECOCUT SA 104 is supplied in 200-litre drums.

Ref. 0311



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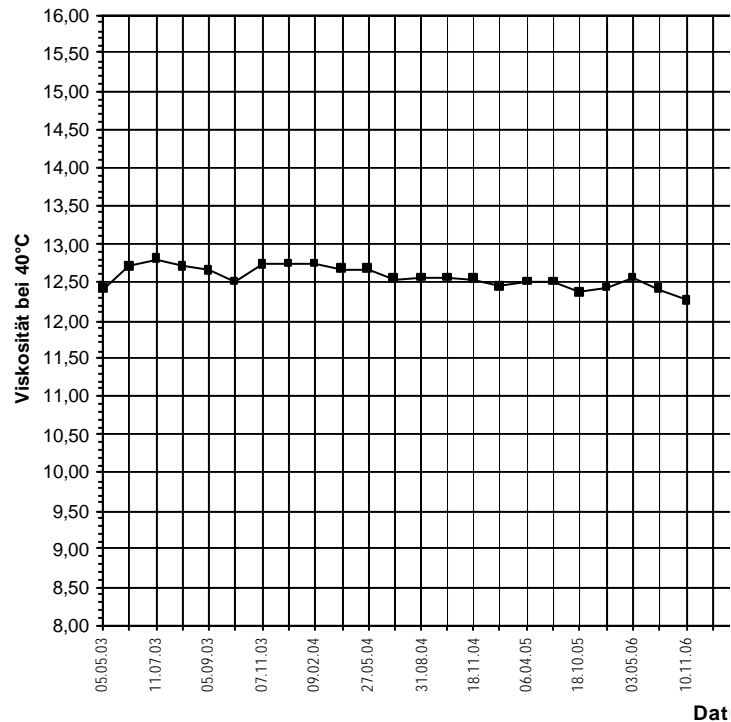
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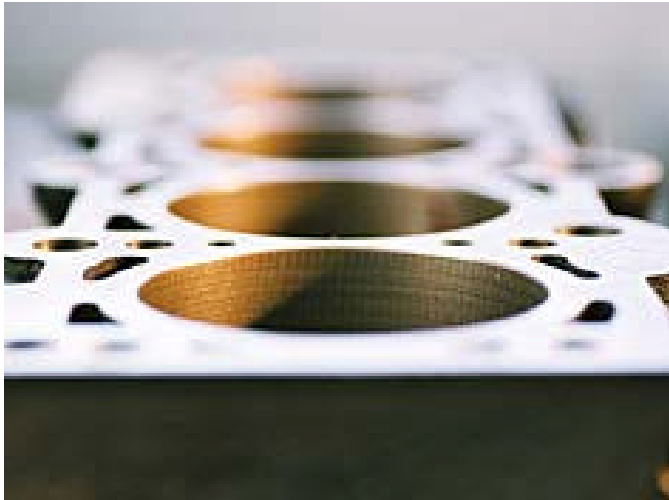
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DaimlerChrysler Plant Bad Cannstatt

Viscosity Ecocut HFN 10 LE, system 101.0 ASF1

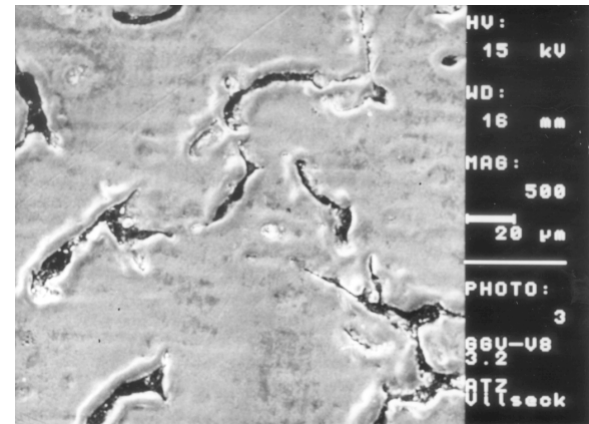


AUDI, GYÖR NAGEL-FUCHS Common Project



**Laser Honing of cylinder liners,
material GGV with vermicular
graphite precipitation, using a
biocide free watermiscible coolant
in 15 % concentration**

**ECOCOOL HONO Aqua Plus 2
with a concentration of 20 %
(instead of a neat oil based honing fluid)**



AUDI, GYÖR NAGEL-FUCHS Common Project

Product- INFORMATION



HONO AQUA PLUS 2 Water-Miscible Honing Concentrate

A joint development by FUCHS EUROPE SCHMIERSTOFFE GMBH and NAGEL Maschinen- und Werkzeugfabrik GmbH

Description

HONO AQUA PLUS 2 is a premium-quality, mineral oil-based, water-miscible cutting fluid.

HONO AQUA PLUS 2 produces an extraordinarily long-life, stable, milky-white emulsion when mixed with water. The use of high-quality and carefully matched base oils, emulsifiers, corrosion inhibitors and other additives give HONO AQUA PLUS 2 the following properties:

In addition, the use of special primary amines in HONO AQUA PLUS 2 offers good skin compatibility even at high pH values.

HONO AQUA PLUS 2 is totally free of bactericides and fungicides as well as from biocidal stabilizers.

Application

HONO AQUA PLUS 2 can be used for all roughing and final finishing operations on cast iron steel.

Recommended concentrations:

- Machining 3 - 10 %
- Grinding 3 - 5 %

As regards application, please observe VDI Guidelines 3035 and 3397, Sections 1-3.

Storage: Protect from frost!

Specifications

- HONO AQUA PLUS 2 is free of secondary alkanolamines and alkanolamides. It conforms to German TRGS 611, Points 3.1, 3.2 (1) and 3.2 (2).

Benefits

- High emulsion stability
- Excellent corrosion protection
- Low foaming
- High cutting performance
- Good cooling, wetting and flushing
- Free of chlorine, nitrite and zinc

Product- INFORMATION



HONO AQUA PLUS 2 Water-Miscible Honing Concentrate

A joint development by FUCHS EUROPE SCHMIERSTOFFE GMBH and NAGEL Maschinen- und Werkzeugfabrik GmbH

Typical chemical and physical properties:

Properties	Unit	Value	Test method
Mineral oil content	%	ca. 40	-
Viscosity at 40 °C	mm ² /s	55	DIN 51 562-1
Corrosion test, chip-filter test, ≥ 2 % emulsion	degree	0-0	DIN 51 360-2
Babcock flask test factor		1,5	FLV-B 7 *)
Hand refractometer factor (Testrd)		1,2	FLV-T 5 *)
pH value, 5 %		9,7	DIN 51 369

FLV *) = Test procedure of FUCHS EUROPE SCHMIERSTOFFE GMBH

Joint venture development of Nagel and Fuchs for CGI (GJV) cast iron

Products Used for Honing at Schaeffler, Brazil

SCHAEFFLER GROUP



FAG

- **Ecocut HFN 8 LE**, consumption 180.000 l/year for Honing application at Schaeffler, Sorocaba plant, Brazil
- **Ecocut 104**, consumption 100.000 l/year for Honing application at Schaeffler, Sao Paulo plant, Brazil
- **ECOCUT HFN 8 LE** has achieved global approval from Schaeffler



Products Used for Honing at Automobile Manufacturers in Germany

- **Ecocut HFN 5 LE, for truck engines**
Daimler plant Mannheim
Daimler plant Berlin
Daimler plant Untertürkheim (car engines, Smart)

DAIMLER

- **Ecocut HFN 10 LE, for truck engines (cast iron)**
Daimler plant Mannheim

- **Ecocut HFN 5 LE ZF for automatic gear boxes,**
ZF plant Saarbrücken

Antriebs- und Fahrwerktechnik



Products Used for Honing at Automobile Manufacturers in Italy

➤ **Ecocut HFN 5 LE**
for automatic gear
boxes at **GETRAG**
in Bari (Italy)



Precision. Passion. Partnership.

Quelle: Nagel, Nürtingen

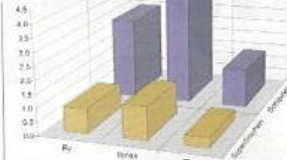
Seite 2

SUPERFINISH

Superfinishen von Getriebewellen

Durch das Superfinishen der Lagerlaufbahnen wird neben der Verbesserung der Oberflächenrauheit eine weitere Korrektur der Rundheit nach dem Schleifen erreicht. Dies führt zu einer wesentlichen Geräuschverringerng, besonders bei den immer höher werdenden Getriebedrehzahlen.

Je nach den geometrischen Verhältnissen der Getriebewellen und den Längen- und Positionstoleranzen der Lagersitze kann eine Ausrichtung der Lagersitze zu den oszillierenden Superfinishsteinen mittels Meßfühler und NC-Achse erforderlich werden. Der Prozeß wird wahlweise mit Superfinishsteinen bzw.



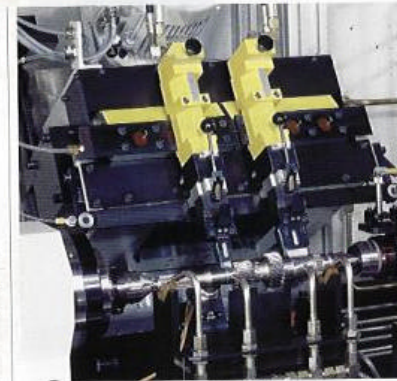
Finishband zeit- oder maßgesteuert durchgeführt.

Die Be- und Entladung der Maschine kann manuell oder automatisch erfolgen mittels Linearportal von einem einzelnen, umlaufenden Werkstückträger bzw. aus einem Palettenstapel.



Antriebswellen und Zwischenwellen

Einsatz Getrag, Bari



Superfinishen der beiden Lagersitze der Antriebswelle.

Bearbeitungsdaten:

Material:	20 MoCr S4
Härte:	80,5 +2,5 HRA
Kühlmittel:	Ecocut HFN 5 LE
Taktzeit:	21 s
Be- und Entladen:	manuell und automatisch
Rauheit	Schleifen: Rz 3,0 µm; Rmax 4,5 µm
	Superfinishen: Rz 0,9 µm; Rmax 1,2 µm
Rundheit	Schleifen: □ 1,4 µm
	Superfinishen: □ 0,35 µm
Materialabtrag:	0,004 – 0,006 mm

Products Used for Honing at Automobile Manufacturers in China

- **Ecocool 700 NBF**, is used for engineering of cylinder blocks at FAW-VW Automobile Co. Ltd. China on Nagel machines



- **Ecocool RM 838**, is used for engineering of cylinder blocks at Dongfeng Peugeot Citroen Automobile Co. Ltd., China on Gehring machines, China



- **Ecocut HFN 5 LE**, is used for gear hole honing at Volkswagen Transmission (Shanghai) Co. Ltd., China on Gehring machines



Products Used for Honing at Scania, Brazil



- **Ecocut HON 3 BR**, is used at Scania, Brazil for honing on Nagel machines

