

# Components and additives for **CUTTING AND FORMING FLUIDS**





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FORMING FLUIDS**



**Clariant is one of the leading suppliers of high-performance additives and components for cutting and forming fluids, offering a comprehensive range of specialties.**

**Clariant's industrial lubricant additives provide specific benefits, primarily in the areas of lubrication, emulsification, corrosion inhibition, anti-wear and preservation. Due to the multifunctionality of many of our components and additives, two or more properties can be achieved with one product.**

**As a key supplier to lubricant formulators, we understand our customers' needs. The quality of our products is the basis for the success of your formulation. Clariant understands that the only guarantee of long-term success is to deliver products that offer consistent quality and stable properties.**

**To deliver the right solution for cutting and forming fluids requires a deep understanding of customers' problems and requirements. A clear and detailed description of our products is the first step toward building a sustainable business relationship.**

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**Today, customers for cutting and forming formulations expect components and additives to provide a range of properties, including:**

- Easy and safe handling
- High biodegradability
- Low impact on the environment
- Global availability
- Excellent formulation properties (easy-to-formulate)
- Multi-functionality

**Our products will deliver all these and contribute significantly to the success of your formulation, meeting and exceeding your own customers' application requirements, for example:**

- Clean and efficient operation
- Long fluid lifetime
- Excellent lubricity and EP/AW properties for improved cutting performance and increased tool lifetime
- Improved surface finishes
- Assurance of employee safety
- Reduced complexity of raw materials

**We understand that meeting all these requirements will help your customers generate higher profits by:**

- Lowering maintenance costs
- Increasing productivity
- Improving quality
- Addressing new market opportunities

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**Our understanding of sustainability and quality assurance requires that we know everything about our products – where they come from and where they go.**

## 1 | Lubrication for cutting and forming fluids

The lubricant is the heart of any metalworking fluid, because it is responsible for reducing friction between the metal surfaces during operation.

The Clariant portfolio of polyol and complex esters and EO/PO copolymers is a powerful toolbox for formulating aqueous and oily fluids, as well as all kinds of emulsions. Besides providing the desired lubrication of the final product, our Hostagliss® and Genapol® products are easy to handle and formulate.

### 1 | LUBRICANTS

Product	Application				Chemical group	Acid value in mg KOH/g	Viscosity at 40°C in mm <sup>2</sup> /s	Viscosity at 100°C in mm <sup>2</sup> /s	Viscosity index	Four-ball wear test: DIN 1350/3	Special benefit
	Milky type	Semi- synthetic	Synthetic	Neat cutting							
Hostagliss® A	x	x		x	Complex ester, acidic	42-52	900-1100	80-120	180		easy to emulsify and C.I. properties
Hostagliss® L2	x	x			Complex ester, acidic	90-100	230	23	123		easy to emulsify and C.I. properties
Hostagliss® L4	x	x		x	Complex ester, acidic	50.5-55.5	400	45	170	0.30 mm	easy to emulsify and C.I. properties
Hostagliss® L6	x	x			Complex ester, acidic	32-36	830	85	188	0.25 mm	easy to emulsify and C.I. properties
Hostagliss® PA 135	x	x		x	Polymer ester, fully saturated	max. 2	270-330	31-37	120		liquid at low temperature
Hostagliss® PTO	x	x		x	Pentaerythol Tetraoleate	max. 1	61-75	13	186	0.33 mm	
Hostagliss® TPO	x	x		x	TMP-Trioleate	max. 2	45-50	10	184	0.54 mm	
Hostagliss® EFP	x	x		x	TMP-Tricocoate	max. 2	35-45	8	165	0.47 mm	
Hostagliss® NDC	x	x		x	NPG-Dicocoate	max. 2	16-40	5	163	0.43 mm	
Genapol® B			x		EO/PO Blockpolymer	-	-	-	-	-	defoaming properties
Genapol® PN 30			x		EO/PO Blockpolymer	-	-	-	-	-	defoaming properties
Genapol® PS			x		EO/PO Randompolymer	-	-	-	-	-	defoaming properties

## 2 | Specialized emulsifying systems for milky and semisynthetic cutting and forming fluids

Thanks to Clariant's long experience and expertise, our range offers a highly specialized system of emulsifiers, with excellent compatibility. These nonionic and anionic products, trademarked mainly as Emulsogen® and Genapol®, are tailor-made to provide the characteristics required of cutting and forming fluids.

### The quality of the emulsifier is crucial to achieving:

- a homogenous formulation with no turbidity
- excellent emulsion stability and spontaneous emulsion formation
- high electrolyte and hard-water stability
- improved wetting properties

## 2 | EMULSIFIERS

Product	Chemical group		Special benefit						
	Nonionic emulsifier	Anionic emulsifier	pH (1% in water)	Cloud point in butyl diglycol solution	HLB	Acid value mg KOH/g	Lime soap dispersing power		
Emulsogen® A	x		Fatty acid ethoxylates	7	47°C	-	-	low	oil-soluble
Emulsogen® ELO 200	x		Fatty acid ethoxylates	7	32°C	-	-	high	recommended for veg. oils
Emulsogen® MTP 070	x		Fatty alcohol ethoxylates	5.0-7.0	67°C	11	-	excellent	low foaming, oil-soluble
Emulsogen® LP	x		Fatty alcohol ethoxylates	7	70°C	10	-	high	oil-soluble
Emulsogen® M	x		Fatty alcohol ethoxylates	7	66°C	9	-	high	oil-soluble
Emulsogen® MS12	x		Fatty alcohol ethoxylates	7	75°C	11	-	high	
Emulsogen® OG	x		Fatty acid ester	7	-	-	-	low	paraffinic oils
Genapol® O 020	x		Fatty alcohol ethoxylates	7	36°C	5	-	low	
Emulsogen® 4617		x	Ether carboxylates	3	-	-	83-90	excellent	low-foaming
Emulsogen® CIO 050		x	Ether carboxylates	2.0-3.5	-	12	95-115	low	low-foaming
Emulsogen® COA 070		x	Ether carboxylates	2.0-4.0	-	12	70-85	excellent	medium foam
Emulsogen® CNO 080		x	Ether carboxylates	1.5-3.0	-	16	95-105	low	
Emulsogen® COL 020		x	Ether carboxylates	2.0-4.0	-	6	65-95	low	medium foam and C.I. properties
Emulsogen® COL 050		x	Ether carboxylates	2.0-4.0	-	10	75-85	medium	C.I. properties
Emulsogen® COL 080		x	Ether carboxylates	1.5-3.0	-	12	68-78	excellent	
Emulsogen® COL 100		x	Ether carboxylates	2.5-3.5	-	13	64-78	excellent	
Emulsogen® T		x	Formulated product	6	53°C	-	-	-	recommended for veg. oils and C.I. properties

### 3 | Corrosion inhibitors for cutting and forming fluids

Clariant's range of corrosion inhibitors comprises products for formulating all kinds of cutting and forming fluids. Excellent anti-corrosion results can be achieved, even under challenging conditions. The recommended products are free of nitrites and boron. Both DEA-containing and DEA-free products are available.

#### 3 | CORROSION INHIBITORS

Product	Application				Chemical group	pH (1% in water)	DEA content	Boron content	Special benefit
	Milky type	Semi- synthetic	Synthetic	Neat cutting					
Hostacor® IS	x	x	x		Isononanoyl amido caproic acid	-	free	free	low-foaming
Hostacor® 2732	x	x	x		Isononanoyl amido caproic acid	-	free	free	low-foaming
Hostacor® IT			x		Isononanoyl amido caproic acid salt	8	free	free	low-foaming
Hicor® C	x	x		x	Fatty acid alkanomides	5-7	5-7%	free	
Hostacor® DT	x	x		x	Fatty acid alkanomides	10	30%	free	
Hostacor® MT	x	x			Fatty acid alkanomides	9.5	free	free	
Hostaphat® OPS 100	x	x	x		Octylphosphonic acid	-	free	free	Al/Zn protection



#### 4 | Extreme pressure / anti-wear additives (EP/AW)

Phosphoric acid esters are effective EP/AW additives, enhancing the cutting and forming fluid by providing protection under extreme friction, especially when combined with Hostagloss® types – the perfect solution to replace chlorinated paraffins.

#### 4 | EXTREME PRESSURE / ANTI-WEAR ADDITIVES (EP/AW)

Product	Application					Four-ball test DIN 51350			Special benefit
	Milky type	Semi-synthetic	Synthetic	Neat cutting	Phosphorous content in %	Acid value mg KOH/g	Wear test: load 500 N, hour/X% in mineral oil	Seizure and welding load in N/X% in mineral oil	
Hordaphos® 145	x	x		x	5.0	160	0.31 mm (10%)	3800/4000 (10%)	
Hordaphos® MDAH				x	11.5	308	0.35 mm (5%)	1700/1800 (5%)	suitable for prelubes
Hordaphos® MDB			x		17.2	470	-	-	
Hordaphos® MDGB			x		19.5	548	-	-	
Hordaphos® MDHX				x	13.1	375	0.41 mm (5%)	1600/1700 (5%)	suitable for prelubes
Hordaphos® MDIT				x	8.5	230	0.41 mm (5%)	1600/1700 (5%)	suitable for prelubes

#### 5 | Biocides and neutralizing agent

Cutting and forming fluids are sensitive to attack by bacteria and fungi. The appropriate biocide is essential to control the presence of micro-organisms and the formation of biofilms in order to maintain the performance and lifetime of the fluid. As neutralizing agent, we recommend Genamin® CH 020, a low-volatile tertiary amine with low leaching capacity.

#### 5 | BIOCIDES AND NEUTRALIZING AGENT

Product	Chemical group	Function	Free of secondary amines	Formaldehyde releaser	pH (1% in water)
Nipacide® BIT20	Benzisothiazoline	biocide	yes	no	8-9
Nipacide® BK	THT	biocide	yes	yes	10-11
Nipacide® MBM	N,N-Methylene bis morpholine	biocide	no	yes	10
Genamin® CH 020	Amines	neutralizing agent	yes	no	10.5-11.5

## TECHNICAL, COMMERCIAL AND REGULATORY SUPPORT

As one of the world's largest specialty chemical companies, with global strength and local resources, we are committed to the industrial lubricants market and have the depth and product diversity to satisfy customers' needs. Through a dedicated sales force, strong local supply chain and local manufacturing sites, we are close to our customers, wherever they are.

Our R&D group has deep application expertise to assist our customers in formulation development, addressing technical questions as well as regulatory and labeling issues. Besides supporting our customers with guideline recipes, we can also deliver solutions on more specific questions thanks to dedicated and well-equipped laboratories.

This application brochure contains a representative selection of our products. For specific needs and requirements, alternative specialties may be provided. To discover our full range of products, please consult your local Clariant representative, contact us by e-mail at [industriallubricants@clariant.com](mailto:industriallubricants@clariant.com) or visit our website [www.industriallubricants.clariant.com](http://www.industriallubricants.clariant.com)

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