



EDMfluid 113-S and 115-S

Special synthetic fluids for die-sinking type electric discharge machining *for roughing*

Description

EDMfluid 113-S and **115-S** are two special synthetic, medium high viscosity fluids formulated with hydrocarbons that undergo a double final hydrogenation process. They have been developed to meet the requirements of new metal working technologies using die-sinking type electric discharge machining in applications requiring very high erosion speeds.

EDMfluid 113-S and **115-S** are odorless, with a more or less nil content of aromatic hydrocarbons, colorless, non-toxic, with a very limited distillation range, excellent filterability even in the presence of diatomaceous earths and with a very limited tendency to produce foam.

The viscosimetric rating is much lower, in the case of **113-S**, and slightly lower, in the case of **115-S**, than that of conventional fluids for roughing out in that it has been demonstrated that no benefits are obtained as regards reduction of erosion times in the case in which the barrier of 5.5 cSt at 20°C viscosimetric grade is exceeded. On the contrary, problems such as inadequate flushing of the gap may arise in the case of complex volumetric shapes or more difficult and precarious functioning of the filtering sectors. The high level purity of these fluids, to be ascribed to the use of hydrocarbon substances that undergo a double hydrogenation process, and the limited distillation range for a medium high range of viscosity, mean that variations in viscosity during use are minimum, thus assuring stability of machine calibration parameters and general performance levels of the erosion process together with excellent flushing power.

Properties and advantages

Taking into account all the requirements to be met by a modern EDM fluid with high erosion performance during the roughing phase, **EDMfluid 113-S** and **115-S** have the following properties and advantages:

- Excellent dielectric strength and high ability to concentrate the energy of the discharges in the erosion area. This property, together with the possibility of operating at high frequencies, means that **EDMfluid 113-S** and **115-S** guarantee top flight performance as regards:
 - speed of erosion
 - reduced specific consumption of tool electrodes
 - no bridging and voltaic arcs that interrupt production and lead to loss of efficiency
 - greater resistance to the striking of voltaic arcs
- Medium high viscosity but lower than that of conventional roughing out fluids, such as to guarantee smooth, constant circulation of the fluid in the gap between workpiece and electrode (as in in-depth machining) also in the case of reduced Gaps. This permits constant flushing of the erosion area, facilitating removal of particles and metal scrap.
- Effective cooling capability in relation to the high electrical power installed
- High flash points such as to eliminate any danger of fire due to autocombustion
- Very limited evaporation which can be assessed as 2 to 4 times lower than a conventional finishing fluid.
- Reduced emission of fumes.
- Absolute transparency of the colorless fluids assures excellent visibility of the work area.
- High level filterability, an important characteristic in that it extends the service life of the filter sections and also facilitates separation from the fluid of any scraps that may impair machine efficiency, protecting the electrode as regards volumetric shapes and product stability.
- Chemically inactive to metals and the seals of the machine in view of the almost complete absence of PNA.



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- Excellent resistance to downgrading caused by oxidation due to high level of refining and addition of a specific anti-oxidation additives. These factors guarantee constant performance in time and extend the service life of the charges used compared with conventional fluids.

Applications

EDMfluid 113-S is recommended in particular for applications requiring high erosion efficiency, with complex shapes such as, for example, in the production of molds for pressure casting of light alloys. **EDMfluid 115-S** is recommended for the production of dies where very low roughness levels are not necessary (for example dies for hot forging of metals, those for production of tires etc.) but where a fluid with the following characteristics is required: high level filterability, no foaming, more or less nil content of aromatic hydrocarbons, excellent flushing capabilities and non-toxicity. This is where **EDMfluid 113-S** and **115-S provide a forefront, up-to-date response as regards formulations able to meet the needs of die makers.**

Specifications

EDMfluid 113-S and **115-S** comply with and exceed the requirements of the main plunge type EDM machine manufacturers such as: AGIE, CDM, CHARMILLES, CORMAC, ELOTHERM, EROTECH, FANUC, INGERSOLL, Makino, MITSUBISHI, ONA, Sodick as well as those of major filter manufacturers.

Storage conditions and safety

EDMfluid 113-S and **115-S** do not entail any specific risks under normal conditions of use. Even if fume emission is very low, it is good practice to provide efficient fume aspiration and extraction systems. Information regarding health and environmental safety is available on request. It is advisable to store the fluids under cover. If outdoor storage cannot be avoided, keep the drums horizontal to avoid any infiltration of water which is not compatible with the electro-erosion process in that even minor quantities would affect the die-electric strength of the contaminated fluid.

In the case of storage outdoors, make sure that ambient temperature is at least 5°C above product freezing point.

Typical characteristics

EDMfluid			113-S	115-S
Characteristics	Test method	Unit of measure	Values	
Appearance			Clear, colorless	Clear, colorless
Density at 15°C	ASTM D4052	kg/l	0.783	0.786
Kinem. viscosity at 20°C	ASTM D445	cSt	4.2	5.1
Flash point (PM)	ASTM D93	°C	112	123
Pour point	ASTM D97	°C	-2	-1
Start of distillation	ASTM D86	°C	250	260
End of distillation	ASTM D86	°C	300	305
Color	ASTM D156		+30	+30
Odor			None	None
Aromatic hydrocarbon content	UV spectrum	%	More or less nil	More or less nil
Neutralization No.	DIN 51558/1	mg KOH/gr	0,01	0.01
Doctor test	DIN 51765		negative	negative

The above data are typical production data and are not specifications ⁽¹⁾

⁽¹⁾ 08-00/Rev 1