

# ISORAPID 459

HIGH-SPEED QUENCHING OIL WITH EXCELLENT EVAPORATION STABILITY

## APPLICATION

ISORAPID 459 is a quenching oil with extremely short vapour phase but a reduced final quenching rate. It is the best compromise between fast quenching oil, which are applied at normal temperature, and a hot quenching oil. Due to its quenching characteristic it allows to minimize distortion on sensitive parts.

ISORAPID 459 is applied in the manufacturing industry as well as in commercial heat treatment shops.

## BENEFITS

- extremely high evaporation stability
- short vapour phase
- high cooling rate
- especially suitable for batch-quenching

It can be used for quenching alloyed as well as low-alloyed or plain carbon steel. The reduced final quenching speed however sets limits in regard to cross-sections of steels with a lower hardenability when maximum core-hardness shall be obtained.

ISORAPID 459 can be used in all kind of furnaces as well as for quenching from salt baths. It is preferably applied in integral-quench-furnaces with protective atmosphere as e.g. universal chamber- or pusher-furnaces.

## PHYSICAL DATA

Appearance	dark brown
Density/20 °C (DIN 51757)	approx. 0,857 g/cm <sup>3</sup>
Flash point (EN ISO 2592)	> 220 °C
Fire point (EN ISO 2592)	approx. 275 °C
Viscosity/20 °C (DIN 51562)	approx. 130,0 mm <sup>2</sup> /s
Viscosity/40 °C (DIN 51562)	approx. 47,4 mm <sup>2</sup> /s
Viscosity/50 °C (DIN 51562)	approx. 31,5 mm <sup>2</sup> /s
Neutralisation number	0,0 mg KOH/g
Saponification number	0,0 mg KOH/g
Ash (EN ISO 6245)	0,30 %
Conradson-Test (DIN 51551)	1,05 %
Evaporation loss (DIN 51581) Noack Test (1 h/150 °C)	0,45 %

## QUENCHING PROPERTIES

ISORAPID 459 is a fast quenching oil. The short vapour phase provides a high rate of cooling in the initial stage of quenching. This means a fast and uniform cooling of the complete work surface by preventing the formation of stable vapour blankets. In combination with the lower quenching speed in the martensite formation temperature range, it guarantees minimum distortion.

## EVAPORATION STABILITY

Due to its excellent evaporation stability, it prevents moreover the formation of stable vapour pockets inside densely packed batches of small workpieces so that also here uniform cooling conditions will be achieved and different hardness will be avoided.

## AGING STABILITY AND SERVICE LIFE

ISORAPID 459 possesses an extraordinarily good aging and oxidation stability. It forms no sludge after extensive use and the quenching speed remains stable.

To obtain maximum service life of the quenching bath, the following hints should be taken into account:

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Heating elements should not provide a strain of more than 1 W/cm<sup>2</sup>.

Do not use copper for the cooling components or other attachments in the bath, copper accelerates the aging speed of mineral oil products significantly.

When applied in an open quenching tank, avoid incorporation of air by too vehement agitation.

### **CLEANING OF WORKPIECES AFTER QUENCHING**

Furnaces as described above, in which ISORAPID 459 is mostly applied, are usually equipped with washing machines.

Residues from ISORAPID 459 can easily be removed in soaking or spray washing machines with aqueous hot cleaners (e.g. FEROCLEAN N-SF). It can also be removed with all kinds of solvents.

### **CONTROL**

The recommended temperature range for ISORAPID 459 is 50 – 100°C. It may be applied at temperatures up to 140°C under protective atmosphere. If constantly high temperatures are required, the application of a MARQUENCH hot-quenching oil is preferable.

Oil temperatures below 40°C (due to poor agitatability) and above 150°C should be avoided.

Take care: Keep the oil always free from water!

### **HANDLING AND STORAGE**

Always observe the recommended use by date on the container.

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