

## Processing Guidelines

### Removers mr-Rem 660, mr-Rem 400 and mr-Rem 500

#### Characteristics

**mr-Rem 660, mr-Rem 400** and **mr-Rem 500** are ready-to-use solvent based removers.

**mr-Rem 660, mr-Rem 400** and **mr-Rem 500** are designed for a clean scum-free removal and lift-off of resist films on a broad range of substrate materials (e.g. silicon, SiO<sub>2</sub>, glass, gold, silicon nitride, III/IV semiconductor, metals) used in microlithography.

**mr-Rem 660** (NMP based) is designed for effective and complete removal of conventional novolak based positive and negative resists, epoxy based resists, PMGI, PMMA and other resists films.

In 2009 the European Union reclassified N-Methylpyrrolidone (NMP, CAS [872-50-4]) to a category 2 reprotoxin requiring R61 "May cause harm to unborn child". NMP is listed as a Substance of Very High Concern (SVHC). NMP is a constituent of the remover **mr-Rem 660**. Already in 2010 micro resist technology developed the NMP-free alternatives – **mr-Rem 400** and **mr-Rem 500** - for the removal of photoresists.

**mr-Rem 400** (NMP-free) is designed for effective and complete removal of conventional novolak based positive and negative resists, PMGI, PMMA and other conventional resists films.

**mr-Rem 500** (NMP free) is designed for effective removal of strongly crosslinked negative resists, e.g. SU-8, EpoCore, EpoClad and mr-DWL.

#### Physical properties of the removers

	<b>mr-Rem 660</b>	<b>mr-Rem 400</b>	<b>mr-Rem 500</b>
<b>Colour, appearance</b>	Colourless – slightly yellow, clear, liquid	Colourless, clear, liquid	Colourless, clear, liquid
<b>Density</b> (20 °C) [g cm <sup>3</sup> ]	1.033 ± 0.002	0.988 ± 0.002	1.007 ± 0.002

#### Processing

When used in immersion mode, a two-bath system is recommended to reduce the possibility of re-deposition of removed resist. The first bath removes the bulk of the resist and the second, cleaner bath removes remaining traces of material.

Remover baths should be changed when removal rate drops significantly and may be measured by the number of wafers processed.

A third bath with a water miscible solvent, e.g. isopropanol (IPA), serves as a final solvent rinse prior to DI water rinse and drying (e.g. by spin drying or nitrogen blow).

The removal is done at room temperature. To improve removal and stripping performance the removal using **mr-Rem 660, mr-Rem 400** and **mr-Rem 500** can also be done at higher temperatures (40 – 60 °C) and ultrasonic assisted.

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### Storage

Storage at temperatures of 18 – 25 °C is recommended. Keep the bottle closed when not in use. Under these conditions a shelf life of 12 months from the date of manufacture is ensured.

### Disposal

Dispose waste according to your national regulations for halogen free solvent based solutions.

### Environmental and health protection

All removers contain solvents. Ensure that there is adequate ventilation while processing the removers. Avoid contact of the removers with skin and eyes and breathing solvent vapours. Wear suitable protective clothing, safety goggles and gloves.

### Equipment

Removers **mr-Rem 660**, **mr-Rem 400** and **mr-Rem 500** are compatible with glass, ceramic, polyethylene, high-density polyethylene, TEFLON, stainless steel, and equivalent materials.

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