



# Penetrant Testing

## Product information

### MR® 311-R Penetrant red (AMS 2644) Method A/C

#### PRODUCT DESCRIPTION

- Red dye penetrant according to EN ISO 3452-1 and ASTM E1417
- Listed on QPL SAE AMS 2644 (QPL)
- Type II according to EN ISO 3452-2
- Type 2 - Method A and C according to AMS 2644, water washable and solvent removable
- Easy removing
- Good surface wetting
- High indications performance
- Free of NPe and Phthalate
- Aerosol can is overhead sprayable - 360°
- Suitable for all metals (suitability for plastics and ceramics needs testing prior to use)

#### PRODUCT CHARACTERISTICS

Form:	liquid
Colour:	red-violet
Basis:	oil
Flash point (bulk):	113 °C
Density	20°C: 0,895 g/cm <sup>3</sup> 38°C: 0,885 g/cm <sup>3</sup>
Kinematic viscosity	20°C: 8,900 mm <sup>2</sup> /s
Dynamic viscosity	38°C: 18,800 mm <sup>2</sup> /s
Sensitivity:	high
Surface wetting:	good
Removability from surface:	easy
Propellant (aerosol can):	propane/butane
Odour:	characteristic

#### FAMILY TESTING

##### acc. to EN ISO 3452-2:

- System **IIAe** and **IIIAe**  
Remover: Water  
Developer: MR® 70 I
- System **IIEe** and **IIIEe**  
Remover: Water + MR® 79, MR® 85, MR® 88  
Developer: MR® 70
- System **IICe** and **IIICe**  
Remover: MR® 79, MR® 85, MR® 88  
Developer: MR® 70 I

##### acc. to SAE AMS 2644 / ASTM 1417:

- Type 2 - Method A/C  
Remover: MR® 79, MR® 88  
Developer: MR® 70 I

#### FURTHER INFORMATION

- Process description according to EN ISO 3425-1 available on request or on [www.mr-chemie.de](http://www.mr-chemie.de).
- Process description according to ASTM E1417 see page 3.

#### PRESENTATION ON ASTM TEST BLOCK 30µm



#### APPROVALS/SPECIFICATIONS

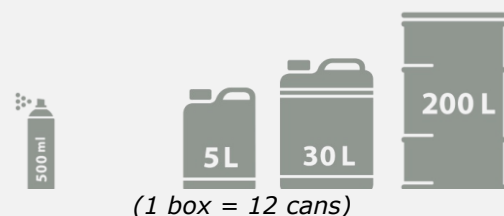
EN ISO 3452-2	✓
AMS 2644	✓
QPL SAE AMS 2644	✓
ASTM E1417	✓
ASTM E165	✓
ASME Code V Art. 6	✓
ASME	✓
RCC-M	✓

Low content of halogens and sulphur according to EN ISO 3452-2 and ASME Code, Section V, Article 6, T-641

#### MINIMUM SHELF LIFE

- Bulk: 4 years, stored at storage temperature
- Aerosol: 3 years, stored at storage temperature

#### DELIVERY FORM



#### TEMPERATURES

- Storage: +5 - +45°C
- Usage: +4 - +52°C



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## Product information

### MR® 311-R Penetrant red (AMS 2644) Method A/C

## Process description according to ASTM E1417

### SURFACE PREPARATION:



The surface to be examined shall be clean, dry and free of all material that could prevent the penetrant from entering discontinuities. One or more cleaning methods such as solvent cleaning, vapor degreasing, ultrasonic cleaning, aqueous-based cleaning can be used. Chemical or Mechanical cleaning shall be done if necessary.

### PENETRANT APPLICATION:



#### Type 2 - Method C:

MR® 62 Penetrant red (AMS 2644) - solvent removable

#### Type 2 - Method A/C:

MR® 311-R Penetrant red (AMS 2644) - water washable / solvent removable

#### Application:

By spraying, dipping, brushing or other method to provide coverage

#### Penetrant dwell time\*:

Minimum 10 min. for temperatures between 50 and 125 °F (10 to 52 °C)

Minimum 20 min. for temperatures between 40 and 50 °F (4 to 10 °C)

### PENETRANT REMOVAL:



#### Method A:

With water

Water-washable penetrants shall be removed with a manual or automated water spray, or a manual wipe, or an air agitated immersion wash.



#### Method C:

With MR® 79 Remover (AMS 2644) - Class 2 - Solvent

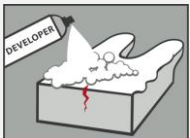
With MR® 88 Remover (AMS 2644) - Class 2 - Solvent

Water-washable or Solvent-removable penetrants shall be removed by first wiping the excess penetrant with a clean, dry cloth, then the remainder of the surface penetrant is removed with a solvent-dampened cloth or towel.

### DRYING:

The components shall be dried prior to the application of non-aqueous developer.

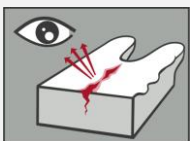
### DVELOPING



MR® 70 I Developer (AMS 2644) - Form e shall be applied over the entire surface to form a uniform white coating.

Development time\*: Minimum: 10 min. / Maximum: 60 min.

### EXAMINATION



Daylight: Examination surface shall be minimum 100 fc (1076 lx).  
All components shall be interpreted before the maximum developing time.

If necessary: recording, post-cleaning and protection