



# Dye Penetrant Testing

Product Data Sheet

## MR<sup>®</sup>311-R

**SOLVENT & WATER WASHABLE PENETRANT - RED**

## The Method

Dye penetrant testing (DPT) is a non-destructive inspection method used to detect surface flaws in materials. The process begins with surface cleaning to remove contaminants. A penetrant dye is then applied, allowed time to seep into any surface defects, and excess dye is removed. A developer is then applied, drawing the penetrant out of the flaws, making them visible against the background. The inspection can be conducted under UV light or with a contrasting colored dye, enhancing visibility. This method is effective for detecting cracks, porosity, and other defects in non-porous materials like metals, plastics, and ceramics. DPT is widely used in industries such as aerospace, automotive, and manufacturing for quality assurance purposes.

## Description

MR<sup>®</sup>311-R is a high-performance solvent and water washable penetrant designed for non-destructive testing (NDT) applications. It efficiently detects surface-breaking flaws in a variety of materials, including metals, plastics, ceramics, and composites. It's water-washable nature simplifies the cleaning process post-inspection, reducing environmental impact and minimizing waste.

This penetrant is formulated to provide exceptional sensitivity to minute surface defects due to its over-wash resistance feature while offering excellent washability characteristics, ensuring that residual penetrant is easily removed after inspection while allowing superior penetration into surface discontinuities, ensuring thorough flaw detection.

MR<sup>®</sup>311-R adheres to stringent quality standards, making it suitable for a wide range of industries, including aerospace, automotive, manufacturing, and engineering. It's compatibility with various application methods further enhances its versatility, making it a preferred choice for discerning inspectors seeking precision and reliability in their NDT processes.

MR<sup>®</sup>311-R is listed on QPL-AMS-2644.



## Benefits

- Reliable, easy to use
- Easy removability of excess penetrant using water
- Vivid colour contrast for clear indications
- Versatility across various materials
- Enhances quality assurance processes
- Meets and exceeds most industry standards

## Features

- Sensitivity Level 2
- Controlled/Optimal Bleed-out
- Instant Indications
- Over-wash resistance
- Low Surface Tension for quick penetration
- Excellent Surface Wetting
- Very Low odour
- NPE free. Contains no aromatic compounds.
- Very low-toxicity

## Applications

Defect Location: Surface Cracks

Test Surface Type: Semi-finished to unfinished

Defect Types:

Cracks	Weld porosity
Leaks	Incomplete weld penetration
Undercutting	Incomplete weld fusion
Slag inclusions	
Flux inclusions	

## Usage Instructions

NDT Method	Dye Penetrant Testing, visible
Type	Type 2
Method(s)	A/C
Sensitivity level (ISO 3452)	2
Recommended Usage	+5°C to +52°C 41°F to 125°F

## Compliances

QPL SAE AMS 2644

ASME Code V, Art. 6

DIN EN ISO 3452

ASTM E165

ASTM E1417

RCC-M

ASME

NPCIL

## Physical & Chemical Properties

Appearance	Dark red oily liquid
Chemical Composition	Red Dye, Oil & Surfactants
Basis	Hydrocarbon
Colour in visible light	Dark Red
Colour in UV light	Non-fluorescence
Odour	Characteristic
Flash Point (Slurry)	> 93°C / 200°F
Density	0.884 g/cm <sup>3</sup>

## Suggested Products

MR<sup>®</sup>79 - Special Cleaner (Non-Aqueous)

MR<sup>®</sup>85 - Remover (Non-Aqueous)

MR<sup>®</sup>70I - Developer (Non-Aqueous)

## Safety

Dye Penetrant Inspection (DPI) is generally safe when conducted by trained professionals who follow appropriate safety measures.

**Wear the appropriate safety gears while using the product. Use in a well-ventilated area.**

**Please read the Material Safety Data Sheet before use!**

(Available at: <https://www.3akchemie.com/resources-mrchemie>)

**Ingredients:** White Mineral Oil, Red Dye

**Storage Temperature:** 41°F to 113°F / +5°C to +45°C

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## Limitation of Remedies & Liabilities

If this product is proved to be defective, the exclusive remedy at 3AK CHEMIE's option shall be to refund the purchase price or to repair or to replace the defective MR® CHEMIE product. The company shall not otherwise be liable for loss or damages, whether direct or indirect, special, incidental or consequential regardless of the legal theory asserted including negligence, warranty or strict liability.

## Packaging & Order Instructions

SKU	Pack Size	Case
2511-0005	Aerosol - 400ml	10
2511-0044	Bulk- 1L	6
2511-0072	Bulk - 5L	-
2511-0095	Bulk - 25L	-



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