

# HM-2D FLUORESCENT PENETRANT

Approved Type I, Methods A & C, Level 1  
MIL-I-25135 Rev. D & E, and AMS-2644



## PRODUCT INFORMATION

**Description:** HM-2D is a low sensitivity, water-washable fluorescent penetrant for inspecting castings, extrusions, and similar parts. A versatile, general purpose penetrant; may be used on a variety of materials, including aluminum and magnesium castings. Complies with low-sulfur and low-halogen requirements. OSHA Class IIIB material. Flash point over 200°F.

**Special Features:** HM-2D is fully approved. It has been formulated to meet the needs of the nonferrous metal casting industry.

HM-2D is an approved MIL-I-25135-D & E and AMS-2644 material. The Sherwin laboratory was the first to recognize the need for high flash point, stable, nonvolatile, low toxicity penetrants.

HM-2D is a production material with the following characteristics.

1. Low to near zero background for assured indication visibility.
2. Sharp, precise flaw indications for rapid interpretation.
3. Excellent electrostatic spray capability has been demonstrated.
4. Long material tank life due to formula stability and nonvolatility.
5. Low material consumption (low drag out) due to low viscosity.
6. Clean, relatively odorless product; vapor free atmosphere.
7. Recognized and accepted as a low toxicity material by health authorities.
8. Use without developers where specifications permit.

HM-2D meets all military and applicable commercial specifications. Full conformance certification documentation complying with MIL-STD-6866, ASTM E-1417 and other applicable specifications are provided with each shipment.

### Companion Materials:

|              |                                                                                                                                                                                                                                        |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Developers - | Sherwin <b>D-90G.1</b> Dry Powder (form a)<br>Sherwin <b>D-100</b> Nonaqueous (form d)<br>Sherwin <b>D-106</b> Nonaqueous (form d)<br>Sherwin <b>D-110A.1</b> Water Suspensible (form c)<br>equivalent MIL-I-25135/AMS-2644 developers |
| Removers -   | Sherwin <b>DR-60</b> (Class 2)<br>Sherwin <b>DR-62</b> (Class 2)<br>equivalent MIL-I-25135/AMS-2644 removers                                                                                                                           |

**Container Sizes:** one-gallon cans  
case of 4 one-gallon cans  
five-gallon pail  
55-gallon drum

**Basic Instructions:** (These instructions describe the basic process, but they may need to be amended by the user to comply with applicable specifications and/or inspection criteria provided by the contracting agency.)

1. **Application:** Apply HM-2D only to clean, dry surfaces by spraying, flowing, brushing or dipping.
2. **Dwell-Time:** A 10 minute dwell time is suggested, although in many cases five minutes will suffice. When particularly tight cracks are suspected, or the part is especially critical, the dwell time may be extended to 30 minutes, or longer.

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**Do not soak the part.** To increase sensitivity, as well as conserve material, allow the penetrant to drain from the part surface back into the penetrant tank.

3. **Removal:** Use a quick, ambient temperature water wash at tap pressure to rinse **HM-2D** from the part surface. To avoid washing entrapped penetrant from surface flaws, do not use high water pressures and temperatures, or prolonged washing and scrubbing.
4. **Drying:** A recirculating oven set no higher than 160°F (71°C) is suggested. Leave part in oven just long enough to evaporate surface moisture. Drying is improved by using pressurized air to disperse and remove as much excess water as possible before placing part in oven.
5. **Developing:** Normally, **HM-2D** is used with a developer. At the same time, **HM-2D** is self-developing. Flaw marks are visible under black light almost immediately after the part is free of moisture. However, two or more minutes should elapse before final inspection.

Flaw marks may be amplified using a developer such as **D-90G.1** (dry) or **D-100** (nonaqueous). Whether a developer is used to enhance visibility depends on the criticalness of the part, governing specifications, type of defect suspected, black light intensity, etc. (MIL-STD-6866 mandates, and ASTM E-1417 strongly recommends, using a developer.)

### **Applicable Specifications:**

MIL-I-25135-D & E  
MIL-STD-271 E  
RDT-F3-6T  
ASTM -E-1417

AECL  
MIL-STD 6866  
BAC 5423  
ASTM-E-165

ASME Code NDT, Sec. V  
Navships 250-1500  
AMS-2644

### **PRECAUTIONARY INFORMATION**

**HM-2D** is a combustible liquid. Use with adequate ventilation and away from sparks, fire or open flame. Avoid prolonged or repeated contact with skin. Do not take internally. Avoid prolonged or repeated breathing of vapors. Read the label on the container for additional precautionary information.