



Penetrant Professor Approved



Met-L-Chek Company manufactures a complete line of penetrants used in the fluorescent (Type 1) and visible (Type 2) dye penetrant inspection process. All Met-L-Chek Company penetrants are qualified to AMS-2644 and are sold under the Met-L-Chek® and Pen-Chek® trademarks. Met-L-Chek Company products are manufactured under license in The Netherlands by NDT Europa.

FP-94 is approved to AMS-2644 as a fluorescent (Type 1); Methods “B”, “C”, and “D”; sensitivity level 1 post emulsifiable inspection penetrant. It is approved with Method “B” emulsifier E-57 and Method “D” emulsifier E-58D. For Method “C” applications it is used with E-59, E-59A, R-503, and R-504. FP-94 is applied by immersion, spray, or wipe on. FP-93A(M) meets requirements for low sensitivity aerospace applications.

FP-94 is listed on the Qualified Products List for AMS-2644. It meets the requirements of AMS-2647, ASME Boiler and Pressure Vessel Code Section V, ASTM E-165, and ASTM E-1417, for penetrant inspection materials. It is low in sulfur and halogens and is safe for use on all metal surfaces.

Guide to METHOD “B” (lipophilic) processing per ASTM E-1417

1. Part must be clean, dry and at a temperature of 4.4°-52°C (40°-125°F) before penetrant is applied.
2. Apply FP-94 using spray, immersion, or wipe on.
3. Wait a minimum of 10 minutes; 20 minutes if temperature is 4.4°-10°C (40-50°F).
4. Immerse part in and out of E-57 emulsifier, or flow on emulsifier; drain time < 3 minutes.
5. Wash part; water temperature 10°-38°C (50°-100 °F). Water pressure < 275kPa (< 40 psi); if a hydro-air nozzle used limit pressure to < 172kPa (<25 psi). Distance >30cm (>12 inches). Wash time- only long enough to remove surface fluorescence under UV-A .
- 6*. Dry part; temperature not to exceed 71°C (160°F), time - only long enough to dry surface.
7. Apply dry powder developer, form “a” (D-72A), by dusting, or non aqueous developer, form “d”(D-70), by spraying.
- 7A*. If water based developers forms “b “(D-76B) or “c”(D-78B) are used they are applied by immersion or spray, prior to step 6 drying.
8. Wait a minimum of 10 minutes before inspection. Maximum time is 1 hour for form “d ” (non aqueous), maximum 2 hours for forms “b & c” (aqueous), and maximum 4 hours for form “a” (dry powder). If times are exceeded, clean part and reprocess.
9. Use UV-A illumination of >1000 μw/cm² @ 15inches (38.1 cm) in a darkened area of <21 lux visible light (<2 foot candles).

Guide to METHOD “D” (hydrophilic) processing per ASTM E-1417

1. Part must be clean, dry and at a temperature of 4.4°-52°C (40°-125°F) before penetrant is applied.
2. Apply FP-94 penetrant using spray, immersion, or wipe on
3. Wait a minimum of 10 minutes; 20 minutes if temperature is 4.4°-10°C (40-50°F).
4. Pre-rinse part with water. Water temperature 10°-38°C (50°-100 °F). Water pressure < 275kPa (< 40 psi);only long enough to remove bulk of surface penetrant. This step may be skipped when emulsifier is applied by spray.
5. Immerse part in gently agitated E-58D emulsifier diluted to 17-20%. for 30 seconds to 2 minutes depending upon part roughness For spray applications emulsifier concentration should be 1-5% and spray contact for less than 2 minutes.
6. Wash part; water temperature 10°-38°C (50°-100 °F). Water pressure < 275kPa (< 40 psi); if a hydro-air nozzle used limit pressure to < 172kPa (<25 psi). Distance >30cm (>12 inches). Wash time- only long enough to remove surface fluorescence under UV-A .
- 7*. Dry part; temperature not to exceed 71°C (160°F), time - only long enough to dry surface.
8. Apply dry powder developer, form “a” (D-72A), by dusting, or non aqueous developer, form “d”(D-70), by spraying.
- 8A*. If water based developers forms “b” (D-76B) or “c”(D-78B) are used they are applied by immersion or spray, prior to step 6 drying.
9. Wait a minimum of 10 minutes before inspection. Maximum time is 1 hour for form “d ” (non aqueous), maximum 2 hours for forms “b & c” (aqueous), and maximum 4 hours for form “a” (dry powder). If times are exceeded, clean part and reprocess.
10. Use UV-A illumination of >1000 μw/cm² @ 15inches (38.1 cm) in a darkened area of <21 lux visible light (<2 foot candles).



Fluorescent Penetrant Indications Type 1 (FP-94 Method B (E-57), Level 1, form “a” (D-72A).



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FP-94

Fluorescent Penetrant

Typical Physical Properties

Form: yellow green liquid
 Density: 899 g/L
 Flash Point: > 93°C (> 200°F)
 Viscosity 5.8 mm²/s
 Fluorescent Brightness:(AMS-2644 requirement > 65 %) 67.6 %
 Corrosion of aluminum: none
 Corrosion of carbon steel: none
 Corrosion of magnesium: none
 Corrosion of stainless steel: none
 Corrosion of titanium: none
 Chloride content: < 100 ppm (0.01%)
 Fluoride content: < 50 ppm (0.005%)
 Sodium content: < 100 ppm (0.01%)
 Sulfur content: < 100 ppm (0.01%)
 Mercury: none
 VOC's: 0 g/L
 Ozone layer depleting substances: none
 PCB's: none

Product Availability

1 gallon (3.7L) metal can
 5 gallon (18.9L) metal pail
 55 gallon (208L) metal drum

NSN

1 gallon	6850-01-263-9776
1 gallon	6850-01-268-6692
5 gallon	6850-01-268-6693
5 gallon	6850-01-268-6708
55 gallon	6850-01-268-6699

The warranty shelf life of the product is 5 years from date of batch approval.

Specifications

AMS-2644
 ASME B & PV code Sec. V
 ASTM E-165
 ISO-3452

AMS-2647
 ASTM E-1417

GHS Information



Warning

GHS Hazard Statements:

H315: Causes skin irritation.
H319: Causes serious eye irritation.

GHS Precautionary statements:

P102: Keep out of reach of children.
P261: Avoid breathing dust/fumes/gas/mist/vapors/spray.
P280: Wear protective glove/clothing/eye protection/face protection.
P284: In case of inadequate ventilation wear respiratory protection.



GHS response statements:

IF INHALED: Remove person to fresh air and keep comfortable for breathing, get medical advice/attention if you feel unwell.
IF ON SKIN: Wash with plenty of water. If skin irritation occurs, get medical advice/attention.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easily to do. Continue rinsing, get medical attention.
IF SWALLOWED: Immediately call a poison center/doctor/physician. Do Not induce vomiting.
IF ON CLOTHING: Take off contaminated clothing and wash it before reuse.

Transport:

DOT- not regulated.
 IATA- not regulated.
 IMDG- not regulated.

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