

ER-83A HYDROPHILIC EMULSIFIER

Approved Method D, Type I, MIL-I-25135 Rev. D & E, and AMS-2644
Approved Group V & VI of MIL-I-25135 Rev. C



PRODUCT INFORMATION

Description: ER-83A is a concentrated "detergent" used diluted with water to emulsify Sherwin's fluorescent penetrants, such as the company's "RC-" designated products. ER-83A removes surface, non-water-washable penetrants by spray or immersion following a pre-wash step. The product meets low-sulfur, low-halogen, and low-sodium requirements, has a flash point over 200°F, and is an OSHA Class IIIB material. ER-83A meets MIL-I-25135 and AMS-2644 requirements.

Special Features: ER-83A is low in solvent properties and relies primarily on surfactants (surface active agents) for its removal action. This minimizes the risk of "over-emulsification," or dissolving of flaw-entrapped penetrant, due to extended emulsifier dwell times, or to over concentration arising from water evaporation.

ER-83A works well on smooth or rough surfaces as well as on machined or coated surfaces.

Companion Materials:

Penetrants -	Sherwin RC-29 Sherwin RC-50 Sherwin RC-65 Sherwin RC-77
Developers -	Sherwin D-90G.1 Dry Powder (form a) Sherwin D-100 Nonaqueous (form d) Sherwin D-106 Nonaqueous (form d) Sherwin D-110A.1 Water Suspensible (form c) Sherwin D-113G.1 Water Soluble (form b) equivalent MIL-I-25135/AMS-2644 developers

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. They may need to be amended by the user to comply with applicable specifications and/or inspection criteria provided by the contracting agency.)

There are two ways to apply ER-83A: by direct spraying or by immersing the part in a diluted emulsifier solution. Either method is employed after the part has been drained of as much penetrant as possible and has undergone a pre-wash step. Pre-washing removes most excess, undrained penetrant, thereby permitting lower strength solutions and shorter dwell times as well as reducing penetrant carry-over to the emulsifier tank.

Pre-wash Step: Once the penetrant dwell and drain step is complete, and prior to applying the ER-83A solution, spray the part at an angle with plain, ambient temperature water to mechanically remove ninety to ninety-nine percent of the remaining surface penetrant. Do not use hot water. A coarse spray of 20-40 p.s.i. is preferred. Perform this operation under black light to insure that **only** a microscopic film of penetrant continues to adhere to the part surface before spraying or immersing the part in the emulsifier solution. Do not over wash.

Spray Application: Use very dilute solutions when spraying ER-83A Emulsifier, since spraying in itself helps remove the penetrant. The solution strength, which may vary from as low as 0.1% to as high as 5.0% is regulated by several factors: (1) pre-wash thoroughness, (2) surface texture, (3) force of the spray, and (4) solution contact time during and following spray application. A solution strength less than 0.2% (i.e., 1 part emulsifier to 500 parts water) may suffice for parts having smooth surfaces, even when using a brief spray cycle.

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Maintaining the strength of **ER-83A** spray solution is not as critical as with competitive hydrophilic emulsifiers which rely on solvent action; nevertheless, in order to minimize over-emulsifying, an upper concentration limit should be established and the solution checked regularly with a refractometer. Excess foaming indicates increased solution concentration.

For economy as well as maximum sensitivity, use the lowest strength solution that is consistent with reasonably brief application time. Excessive background fluorescence or the need for prolonged spraying indicate the need to increase the solution strength.

Prolonged water scrubbing, with or without emulsifier, can erode penetrant from wide flaws. If possible, the emulsifier should be rinsed under black light to insure against over-washing.

Immersion Application: The immersion technique for applying **ER-83A** requires a stronger solution — 20% to 30% — than the spray technique. On particularly difficult parts, accelerate the solution's action with **mild** agitation by moving the parts up and down in the solution or by using devices such as mixers or air stirrers.

A thorough, clear-water rinse follows the immersion. An inadequate final rinse will interfere with developer action; emulsifier solution should not be allowed to dry on the surface.

Use a refractometer to monitor the **ER-83A** solution for evaporative water loss, which can occur rapidly in hot, dry conditions. Water loss leads to an over-active emulsifier solution. Restore proper solution strength by simply adding water.

The **ER-83A** solution must also be monitored for penetrant contamination. While the pre-wash step minimizes carrying penetrant to the solution tank, eventually penetrant contamination will require recharging the solution tank.

Applicable Specifications:

MIL-I-25135 Rev's. C & D & E
ASME B & P Vessel Code
Navships 250-1500
Snecma
AMS-2644

ASTM-E-165
MIL-STD-271 E
AMS-2647
Rolls Royce
ASTM-E-1417

AECL
MIL-STD 6866
RDT-F3-6T
P & W FPM

PRECAUTIONARY INFORMATION

ER-83A is a combustible liquid as supplied. 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. Highly Detergent. **DANGER!** Causes eye burns. **First Aid:** flush eyes with water; call a physician. Read the label on the container for additional precautionary information.