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Directions for Use

DIFFU-THERM®

FLUORESCENCE Method for nondestructive testing

FLUORESCENT PENETRANT UVF-5 und UVF-6 (post-emulsifiable)

According to DIN 54 152 part 2 corresponding to MIL-I-25135C
Product family to DIN 54 152 part 1 = **ADB** + **AEB** + **AAB** + **AAA** + **ADA** + **AEA**
Sensitivity level 3-4 DIN 54 152 part 3
Free of chlor, fluor and sulphur to ASTM - Code Section V

Scope

Fluorescent penetrant inspection techniques are capable of locating discontinuities such as cracks, pores, laps, micro-contractions, bonding-faults and similar defects which have an opening to the surface of materials.
The method is applicable to finished or semi-finished products as well as to used metal or metalloid parts. The DIFFU-THERM UV fluoresces pale-green under black light.

Sequence of operations

1. Pre-cleaning
2. Penetration
3. Emulsification
4. Rinsing
5. Drying
6. Developing
7. Evaluation of the results
8. Cleaning and re-greasing

Preparation of the pieces to be inspected

The work pieces under test should not be exposed to the following processes: dry-blasting, wet-blasting, grinding by abrasive paper with a coarseness lower than 150, processing with fast-rotating grinding wheels or grindstones.
Prior to testing, all types of engine varnish or electro-platings must be taken off. Oil films, grease, dirt and scale have to be removed with a **Cleaner BRE**, **BRE-2**, **BRE-3** or **BRE-S**. Parts to be inspected which have been treated with acids or alkaline solutions, must be neutralized and carefully rinsed.

Dipping into DIFFU-THERM FLUORESCENCE

The parts to be inspected should be dipped into **UVF-5** or **UVF-6** in such a way that the entire surface is wetted. For local tests, it is preferable to use the spraying method.
To ensure proper penetration with DIFFU-THERM **UVF-5** or **UVF-6**, the following penetration times should be observed:

for light metals	10-30 min.
for steels and austenitic steels	15-30 min.

During the last 5 minutes of penetration time, the parts should be taken out of the bath to allow the penetrant to drip off.

p.t.o.

Excess penetrant removal with UV-Emulsifier UEM-H (hydrophilic)

As **UVF-5** and **UVF-6** are water washable, it is necessary that the parts under inspection are dipped into the Emulsifier **UEM-H**, or they are wetted or sprayed with this agent. The penetration time of the Emulsifier is of great importance for spotting faults. The length of time should be kept down to a minimum to ensure that the surface of the parts under inspection can be easily washed off with water. Guidelines for **UEM-H** are 1,50 min. to 4 min. The exact times vary with material to be inspected and the type of discontinuities. Impurities contained in the Emulsifier should not exceed 20%. The solution should be checked for impurities at regular intervals.

Intermediate cleaning (removal of penetrant)

The parts under inspection should be carefully cleaned with cold water or water that has been heated to 30°C or 40°C. The cleaning is done with the help of a rose or nozzle under a hydro-static pressure of approx. 42 or 56 p.s.i. All DIFFU-THERM **UVF-5** or **UVF-6** must be rinsed off, so that the surface is scrupulously clean. The cleanliness should be checked under black light.

Drying of the parts

The cleaned pieces are preferably dried in a thermostatically controlled hot-air drying apparatus with circulating air, at a temperature of 50°C.

Developing with DIFFU-THERM UVP (Developer Powder) or Developer UVE and UVE-W

The dried parts must be slightly sprinkled with Developer-Powder, or they can be dipped into the powder. Developer-Powder should be visible on the surface of the work piece as a wafer-thin layer. The time of development is normally 2-10 min. If the defects are extremely fine, the time can be prolonged up to 20 min.

Evaluation of the results

The parts under inspection should be placed under black light and should be checked for discontinuities.
Any faults that may be present fluoresce pale-green, whilst the inspected part remains dark.

Cleaning after inspection

After inspection, the pieces should be cleaned. In general, fanning with compressed air is sufficient.
Where necessary, the cleaned work pieces should be treated with an anti-corrosion agent.