BRITEMOR® 921(W)

Water Based, Water Washable, Fluorescent Penetrant

1. DESCRIPTION

Britemor 921(W) is a next generation water-washable, fluorescent penetrant, classified as level 1 according to EN ISO 3452-2. It is suitable for the detection of defects, which are open to the surface.

Britemor 921(W) is a blend of water, co-solvent and corrosion inhibitors, brought into a stable condition by using a patented micro-emulsion technology that provides many benefits.

- The amount of dye is increased as compared to other technologies enabling bright and crisp indications.
- Miscibility in water is outstanding, providing excellent removability and as a consequence minimal background fluorescence.
- Significant product consumption savings can be achieved by using electro-static application. Britemor 921(W) is highly compatible with electro-static application as their removability is not affected by this technique.
- The water content is increased for a reduced viscosity and carry-over. The rinse water load is reduced as well as product consumption with traditional spray and immersion applications.
- Higher water content also means with lower COD values. This adds up to a readily biodegradability and allows you to optimize your rinse water treatment costs. Depending on the local regulation and authorization, a direct draining into the sewage may be possible.

Britemor 921(W) can be used for metals and non-porous ceramic parts during production and maintenance work. Because of the corrosion inhibitor package Britemor 921(W) is also safe for use on sensitive metals such as aluminum, magnesium and steel.

2. PHYSICAL AND CHEMICAL PROPERTIES

PROPERTY	UNIT	TEST METHOD	BRITEMOR 921 (W)
Sensitivity Level	-	ISO 3452-2	1
Appearance	-	Visual inspection	Yellow liquid
Density at 20°C/68°F	g/cm³	ISO 12185	1.02
Flash Point	°C/°F	ASTM D 93	>100°C / >212°F

These are typical values only and do not constitute a specification.

3. OPERATIONS PROCEDURE

Britemor 921(W) may be applied by brush, spray, immersion or electrostatic spray. The following typical process sequence illustrates the recommended method of use for general industrial applications. However, where relevant, the process specifications of the approving authorities must be closely followed.

3.1 Pre-Cleaning and Drying

Surface contaminations such as rust, paint residues, grease, scale etc. must be fully removed. Chemetall can advise on suitable Gardo technologies. Ensure that the part is completely dry and not too hot or cold (5°-50°C / 40°-120°F).

3.2 Penetrant Application

Apply Britemor 921(W) to the surface and leave for a suitable dwell period. Allow components to drain as necessary. The combined application and drainage period should be at least 5 minutes (for ceramics it can be less).

3.3 Excess Penetrant Removal by Water Washing

Temperature: 15°–35°C / 59°–95°F
Duration: 30–60 seconds
Pressure: 0.8–1.7 bar / 10-25 psi

Make sure that one or a combination of the following methods is used:

- **a)** agitated water rinse tank (maximum load of penetrant in the final rinse: 1%
- **b)** spray rinse tank
- **c)** manual spray rinse

The times given are a guide only. Practical trials should be carried out to find the optimum.

3.4 Drying

Dry in air recirculating oven at 50°–60°C (122°–140°F), for 10 minutes max. Longer times may be required for larger components. To assist drying, either clean, filtered, low pressure, compressed air (1.7 bar/25 psi maximum) can be used prior to oven drying. Use the minimum oven time required to obtain thoroughly dry components.

3.5 Developing

Britemor 921(W) can be used in a self-developing process.

Britemor 921(W) can also be used with water-based developers however trials need to be conducted to define the proper process parameters and avoid any sensitivity loss due to over-wash.

The dry developer PD3 provides the highest sensitivity for a minimal consumption when electro-static application is selected. Developing time can be extended up to 10 minutes to achieve maximum sensitivity. Low pressure, clean filtered air at 0.3 bar / 5 psi (maximum) should be used to remove excess powder prior to inspection.

3.6 Inspection

Inspection must be performed under black (UV) light in a darkened area. The UV-A irradiance at the surface inspected shall be 10 W/m2 (1.000 µW/cm2) or greater. The total amount of visible light shall not exceed 20 lx. In this context, it is recommendable to use the following Chemetall NDT equipment: UVee Dual, Twin or Flood LED UV lamps and UVe/Lux Lightmeter.

4. METHOD OF CONTROL

Concentration of water shall be monitored as it can evaporate from the penetrant.

Required Equipment

Refractometer, such as the Bellingham & Stanley 'Eclipse' 45-03 hand held refractometer. We recommend calibrating the refractometer once a year in addition of intermediate checks using materials of known refractive index.

Measure

The reading from the refractometer, R (in brix), needs to be converted into a water content percentage, Wc. This is achieved by using the following equation.

Britemor 921(W): Wc = (R – 84.71) / (-0.801) / Target values 57-63% in use.

Initially, water content monitoring should be performed every day then the frequency of measurement should be adapted based on experience.

Correction

If water loss has occurred, additional water must be added. If too much water is present, additional penetrant must be added. To calculate the amount of water that is required use the following equation.

$$A = (Wi – Wc /100) \times V$$

where A = Amount of water needed in Litres
Wc = measured water content in %
Wi = initial water content in %
V = Volume of penetrant in Litres

The water used to dilute the penetrant must be deionized water. Tap water contains impurities that may impair the performance of the penetrant and shall not be used.

Water loss can be reduced by covering the tank when not in use, insulating the sides of the tank to protect against elevated temperatures or protecting the exposed surface of penetrant from drafts/air currents by raising the sides of the tanks.

5. EFFECTS ON MATERIALS

When Britemor 921(W) is used in the recommended manner, it will have no deleterious effects on commonly used metals. Equipment/tanks should be constructed of stainless steel. Some grades of plastic and rubber may be softened by prolonged contact with and it is advisable to check compatibility before using.

6. LABOR AND ENVIRONMENTAL PROTECTION

Before operating the process described it is important that this complete document, together with any relevant Safety Data sheets, be read and understood.

All local and national regulations on the transport, storage, use and waste treatment of chemicals in concentrated or diluted form and as working solutions must be obeyed.

7. GENERAL INFORMATION

Chemetall supplies a wide range of chemical products and associated equipment for cleaning, descaling, paint and carbon removal, metal working and protection. Sales Executives are available to advice on specific problems and applications.

8. SAFETY AND HANDLING

Prior to handling and use of any of the materials referenced in this document, the Safety Data Sheets should be read and understood by all personnel in contact with these materials.

KEEP OUT OF REACH OF CHILDREN

9. STORAGE

Dry indoor storage at temperatures between 40°F and 100°F (4.4°C and 37.8°C) is recommended, away from any incompatible materials referenced in the Safety Data Sheets. All containers should be tightly closed when not in use.

Store Britemor 921(W) at temperatures between +5° and +40°C (40-105 °F), in a dry place, away from oxidizing chemicals and from sources of heat. Avoid direct exposure to sunlight. Shelf life is 36 months.

10. DISPOSAL

Any disposal of the materials referenced in this document should be in accordance with all applicable federal, state, providential and local regulations. The process solution can contain components other than those present in the materials as supplied. Analysis of process solutions may be required prior to disposal.

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