



DYE PENETRANT
INSTRUCTIONS-FOR-USE
FOR CANTESCO®
SOLVENT REMOVABLE AND
WATER WASHABLE
DYE PENETRANTS SYSTEMS

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TYPICAL APPLICATIONS

CANTESCO® dye penetrant systems detect surface flaws and defects in nonporous metallic, non-metallic surfaces, ceramics and other suitable materials. They can be used to inspect engineered materials such as forgings, castings, weldments, tank seams, saw blades and other high stress areas. CANTESCO® dye penetrants are not suitable for underwater or immersion testing applications.

HOW IT WORKS

Following a simple six step process CANTESCO® red dye penetrant inspection systems indicate surface flaws in red against a white powder background. This process does not require any additional equipment or materials to provide visible indications under normal light conditions. After inspection the materials clean up easily with CANTESCO® cleaner. For additional information see THE DIRECTIONS FOR USE section of this booklet.

SPECIFICATION AMS 2644A

AMS 2644A is the aerospace material specification for INSPECTION MATERIAL, PENETRANTS used by all Departments and Agencies of the US Department of Defence. It is also commonly referenced by firms requiring standards and test methods. CANTESCO® dye penetrants are considered to be Type 2 Visible Dye penetrants.

SPECIFICATION ASTM E165-80 / ASME SE-165

Specification ASTM E165-80 / ASME SE-165 describes a STANDARD PRACTISE FOR LIQUID PENETRANT INSPECTION METHOD under Article 24-Liquid Penetrant Standards of the ASME code. This practise covers procedures for liquid penetrant inspection of materials.

ASME SECTION V NONDESTRUCTIVE EXAMINATION

Often referred to as Nuclear Industry Standards ASME SECTION V ARTICLE 6 covers LIQUID PENETRANT EXAMINATION (see also ASME SE-165). ARTICLE 6 specifies a requirement for CONTROL OF CONTAMINANTS which states that “The user of this Article shall obtain certification of contaminant content for all liquid penetrant materials used on nickel base alloys, austenitic stainless steels, and titanium.” Cantesco Corporation completes testing to these requirements as detailed in certificates of compliance.

CERTIFICATES OF COMPLIANCE

All CANTESCO® dye penetrant systems are lot numbered for complete traceability. As part of our QC system the lot number is printed as part of the aerosol can label, located on the bottom of the side panel in clear legible type. For bulk penetrants it is part of the product description label in both print and bar code format.

Certificates of compliance for halogen and chloride content can be provided at any time. To receive a copy contact customer service stating item and lot number. For a copy of ASTM test methods for halogen and chloride content (sulphur, fluoride and chloride) contact the ASTM at www.astm.org, or e-mail them webmaster@astm.org.

ABOUT CHLORINATED MATERIALS

Cantesco does not use chlorinated solvents in any of our dye penetrant aerosol products. These products include the aerosol penetrants, aerosol developers and aerosol cleaners. These chlorinated solvent free materials are designated as products ending with -A in the part number. See the section HOW DO CANTESCO PART NUMBERS WORK for complete part numbering information.

For safety purposes with respect to flash point considerations, the BULK DEVELOPER AND BULK CLEANER ONLY are methylene chloride based. For additional information see the individual MSDS's.

CANTESCO PART NUMBERS

There are three identifying steps to Cantesco dye penetrant inspection part numbers. The first letter indicates whether the product is a penetrant (P), developer (D) or cleaner (C). The letter S indicates a solvent based penetrant while a W indicates a water washable penetrant. See page 4 for additional product information.

All aerosols are designed with the ending -A while all sizes are listed by either ending in 1G (1 gallon) 5G (5 gallon) or DR for drums sizes. Therefore a typical code for an aerosol solvent removable penetrant (P101S-A) is as follows:

P101	S	-A
(P) penetrant	(S) solvent	(-A) aerosol

A typical code for a bulk 1 gallon container of nonaqueous developer (D1011G) is as follows:

D101	1G
(D) developer	(1G) 1 gallon

In addition all kits are designated with the prefix (K) and all display packs are designated with the prefix (DP). For a complete product listing see the WELDING PRODUCTS SELECTION GUIDE back of this booklet.

HOW TO TELL THE PRODUCTS APART

Our product labels are color coded for ease of use. All dye penetrants have blue labelled products, all developers have red labelled products and all cleaners have yellow labelled products.

In addition the instruction for each stage of use are printed on the can label. All bulk product contain the complete step by step procedures.

MIXING PRODUCTS FROM OTHER MANUFACTURERS

It is not recommended to mix products from different manufacturers in following the dye penetrant inspection process. All of our products have been evaluated and tested to work as a family of related penetrants, developers and cleaners. Mixing products from other manufacturers may not provide the same results due to chemical incompatibility, sensitivity, etc.

TYPES OF PENETRANTS ARE AVAILABLE

CANDESCO® red dye penetrants are available in two different base materials; either Method C solvent removable, which requires the use of a suitable solvent cleaner for the removable of the red dye; or Method A water washable penetrants which can be removed with either water or solvent cleaner.

CANDESCO® WATER WASHABLE PENETRANT

CANDESCO® water washable penetrant is a solvent based dye penetrant which includes an emulsifier, allowing the product to be washed away with water. IT IS NOT WATER BASED, it contains the same base materials as the solvent removable penetrant with the addition of the emulsifier for water removable purposes.

WHAT DOES NONAQUEOUS DEVELOPER MEAN

A nonaqueous developer means that there is no water in the formulation. Cantesco developers are Nonaqueous Type 2 Visible Dye solvent based Developers.

CAN ANY CLEANER BE USED FOR THE CLEANING APPLICATIONS

It is strongly recommended that only the cleaner supplied in Cantesco's dye penetrant inspection process be used in each of the three cleaning steps.

Some industrial cleaners, if used in the precleaning process, may leave a film or residue which could affect the later application of penetrant and developer and hinder test results. CANTESCO® cleaners are designed to provide effective cleaning solvency with fast evaporation and little or no residue.

In addition CANTESCO® cleaners are designed to effectively remove the penetrants and developers from the surface area. Other industrial cleaners may not fully remove all traces of the penetrants and developers which may lead to later stage production problems.

HOW TO APPLY CANTESCO INSPECTION MATERIALS

For ease of application aerosol containers provide the most effective means to applying the inspection materials. For larger application or more permanent type inspection, bulk application may be more suited.

For product sizes see the WELDING PRODUCTS SELECTION GUIDE at the back of this booklet. Before using bulk sprayers please ensure that the intended equipment is compatible with CANTESCO® dye penetrant systems. If you have any questions about material compatibility contact our office prior to use.

HOW MUCH INSPECTION MATERIAL IS REQUIRED

The following are estimated coverage's for penetrants and developers only, actual amount used will vary depending on type and condition of surface being inspected, temperature use, method of application, etc.,:

On rough surface applications a 1 gallon can OR 12 aerosol cans will provide approximately 140 sq. ft of coverage.

On smooth surface applications a 1 gallon can OR 12 aerosol cans will provide approximately 300 sq. ft of coverage.

Cleaner requirements will depend on number of cleanings, amount of penetrant and developer applied to surface area, condition of surface (amount of dirt and scale to be removed in the precleaning stage), etc.

Considering that the cleaner is recommended to be used in three of the six dye penetrant inspection steps the amount of cleaner estimated per application should be two to three times the amount of penetrant and developer required.

SHELF LIFE

The shelf life for CANTESCO® dye penetrants is a minimum of 12 months for aerosols and a maximum 36 months for bulk dye penetrants when kept in sealed containers and used as directed.

And to ensure your satisfaction all Cantesco aerosol products come with a 100% aerosol spray out guarantee.



ADDITIONAL INFORMATION

For additional information on each specific product request the **TECHNICAL INFORMATION - TYPICAL ANALYSIS** form for each material(s) you are considering using.

For health and safety information request the specific material safety data sheet for each product(s) you are considering using.

As with all flammable materials make sure that appropriate precautions are taken to eliminate potential sources of ignition during product use. Cantesco Corporation recommends the use of static grounding and bonding equipment to eliminate static control problems.



DIRECTIONS FOR USE

STEP 1 - PRECLEANING

Parts should be free from rust, scale, flux and other contaminants which will provide false indications. Use appropriate CANTESCO® cleaner for effective precleaning results. Parts and materials are to be completely dry before application of penetrant.

STEP 2 - APPLICATION OF PENETRANT

CANTESCO® dye penetrants may be applied by dipping, spraying, brushing or other means which effectively covers area. After applying penetrant, position parts to allow excess to drain from surface. Refer to formula label for minimum dwell times.

STEP 3 - REMOVAL OF PENETRANT

After appropriate dwell time remove penetrant. For solvent based penetrants remove excess penetrant by wiping with lint free cloth. **DO NOT FLUSH THE PENETRANT FROM SURFACE WITH SOLVENT.** For water washable penetrants remove with steady stream of water. **DO NOT FLUSH SURFACE TOO LONG OR VIGOROUSLY.**

STEP 4 - APPLICATION OF NONAQUEOUS WET DEVELOPER

Prior to use agitate developer thoroughly. CANTESCO® nonaqueous wet developer may be applied by spray or brush to surface area in a manner which provides a thin, even developer film.

STEP 5 - INSPECTION

As dwell times vary according to the type of developer and surface defect, sufficient dwell time is required to allow indication to form. Minimum dwell time for nonaqueous wet developers is **TEN MINUTES.** Inspection should be made before penetrant bleeds into developer (maximum dwell time **SIXTY MINUTES**) causing loss of definition.

STEP 6 - FINAL CLEANING

Once areas containing flaws have been analysed and recorded, use CANTESCO® cleaner to remove developer and penetrant residue from surface area. Make sure all materials are removed before further processing.

WELDING PRODUCTS SELECTION GUIDE

Available by the case of 12 cans per product; 8 can test kits containing two penetrant, two developer and four cleaner; and a 12 can display pack featuring four penetrant, four developer and four cleaner.

ITEM NUMBER	PRODUCT SELECTION GUIDE	STANDARD GRADE	NUCLEAR GRADE
P101S-A	Penetrant-Red Dye-Solvent Removable	•	•
P301W-A	Penetrant-Red Dye-Water Washable	•	•
D101-A	Developer - Nonaqueous - Wet	•	•
D2000-A	Developer - Nonaqueous - Wet	•	•
D101NFA	Developer - Nonflammable - Wet	•	•
C101-A	Cleaner - Standard	•	•
C901N-A	Cleaner - Nuclear	•	•
C101NFA	Cleaner - Nonflammable	•	•