TWIN NICKEL CHROME CONSTANT THICKNESS SENSITIVITY PANELS

DUBL-CHEK PENETRANT PROCESS

Use a set of Twin Nickel Chrome Constant Thickness Sensitivity Panels to evaluate the sensitivity of inspection penetrant systems; both fluorescent and visible. They are especially effective in evaluating a penetrant system's ability to delineate shallow flaws.

Made by plating a brass panel first with brittle nickel, then with chrome. The panels measure about 1.5" (36 mm) in width by 4" (101mm) in length. Variations in the plating bath composition, as well as plating techniques and thickness determine the type and size of the panels' cracks. After plating, the panels are bent over an arbor and then straightened to produce uniform horizontal cracks.

Three Panel Grades: There are three grades of Nickel Chrome Test Panels.

	Crack Depth	Crack Width
Coarse	±50µ	±2.5–3.5µ
Medium	±20µ	±1.0–2.0µ
Fine	±10µ	±0.5–1.0µ

Choose the panel appropriate for the penetrant grade being tested.

Coarse ... visible dye penetrants (Type II), and low sensitivity (Type I, Level 1/2 & 1) fluorescent penetrants.

Medium ... higher sensitivity (Level 2 & 3) fluorescent penetrants.

Fine ... high sensitivity and ultra-high sensitivity fluorescent penetrants (Level 3 & 4), especially systems using nonaqueous developers.

Comparison Tests: Twin Nickel Chrome Panels can be used to perform several comparison tests.

A single panel can be used to test two penetrant systems by comparing the carefully recorded results of testing one system against the carefully recorded results of testing a second system.

A set of panels can be used to compare the effects of varying processing times and techniques, or side by side sensitivity comparisons.

When properly maintained, a set of twin NiCr sensitivity panels will give several years of repeated use.

Notes:

1. Compare penetrant systems not only for how completely they reveal cracks, but also for how brightly and legibly they reveal cracks.
2. Nickel Chrome Sensitivity Panels must be cleaned carefully and thoroughly between tests. See cleaning instructions below. Cleaning methods may affect test results.
3. Because the Nickel Chrome Sensitivity Panels' cracks are shallow, penetrant and emulsifier dwell times, as well as water wash pressures must be carefully controlled.
4. The panels' chrome surface is highly reflective. Hold the panel at an angle under black light to avoid reflections. Because of the chrome surface, a developer should be used; comparing self-developing properties is difficult.
5. To avoid additional, uncontrolled cracking, do not flex or bend the panels.

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Cleaning: It is important to clean a Nickel Chrome Sensitivity Panel after each use. A suggested procedure follows.

1. Lightly scrub the panel with a soft cloth or towel saturated with a mild detergent solution. Sherwin Incorporated's Dubl-Chek ER-83A Hydrophilic Emulsifier is suitable for this purpose. Avoid scratching the panel's surface. Rinse the panel thoroughly with a water spray. This removes the developer and some penetrant.

2. Dry the panel thoroughly. The panel may be air dried, or a heat blower or oven may be used to accelerate drying. Do not overheat. Avoid thermal shock.

3. To remove flaw entrapped penetrant, immerse the panel in acetone, methylene chloride, isopropyl alcohol, 1,1,1-trichloroethane, or similar volatile solvent for several minutes with some agitation. To retard corrosion, do not soak the panel for long periods. Replace the solvent frequently.

4. Dry the panel thoroughly as in Step 2 above.

Other Panels: *Sherwin Incorporated offers other penetrant testing panels:*

PSM-5 Panel	Conforms to P&W TAM 146040; used for routine testingof in-use penetrants. Annual recertification required by P&W specifications provided by Sherwin Incorporated's USAF-approved QC Laboratory.
Cracked Aluminum Blocks	Also referred to as ASME "Penetrant Comparator," conforms to MIL-I-25135C, usually used to compare visible penetrants and/or in teaching environment.
Twin Tapered NiCr Panels	Tapered NiCr plating on matched panels; generally used to compare in-use penetrants with lab samples.
Wash Test Panel WTP-1	A stainless steel panel having two grit blasted strips and a smooth strip for testing penetrant washability and background fluorescence in conformance with MIL-STD-6866 and other specifications.