

# PSM-5 INDICATION SIZING AND PHOTO PACKAGE



## PRODUCT INFORMATION

Conforming to Pratt-Whitney drawing "TAM-146040," Sherwin Incorporated's PSM-5 Test Panel is the industry standard for daily tests of in-use penetrant systems.

Sherwin Incorporated always takes care to insure, and certify, that its PSM-5 panels meet specifications.

However, the industry has evolved, and some users, in addition to the certification normally provided, desire documentation, based on precise measurements that a particular test panel's flaw indications meet the original drawing's specifications. Other users require a visual record, i.e., a photograph, of a panel's original indications against which to compare that panel's current performance.

Both of these requirements are met through Sherwin Incorporated's "PSM-5 Indication Sizing and Photo Package." What is involved, and how the requirements are met, is explained below.

### **MEASURING FLAW INDICATIONS**

It is important to note that what is verified during PSM-5 manufacture is the size of the fluorescent flaw indications, not the actual flaws. This is always done by a trained technician using DUBL-CHEK RC-77 penetrant, ER-83A emulsifier, D-90G developer, using appropriate measuring tools, UV-light, and the unaided human eye. The conditions are similar to those in which the panel actually would be used. PSM-5 Panels determined by the technician to meet the specifications are accepted.

For users requiring greater precision, or further documentation, Sherwin Incorporated takes an additional step of using a digital micrometer and a dedicated computer to measure precisely the fluorescent flaw indications of a panel already accepted by the technician. The digital micrometer system, usually used to calculate the size of objects visible only through a microscope, has been adapted to measure flaw indications on PSM-5 panels.

Measuring flaw indications in this fashion requires the technician to take into account that flaw indications, particularly the smallest, often are shaped irregularly. Thus, when measuring the relevant dimensions of an actual flaw indication as it appears enlarged on a computer screen, the operator may specify which of the dimensions shall be taken into account.

The final measurement values for a particular panel are provided in documentation given to users, along with other information, such as a panel's identification number. The information is also recorded in a database for future reference.

It must be remembered that, for several reasons, the same panel may not yield precisely the same size, or shaped, flaw indications each time it is processed. This is particularly true for the smallest indications, and when a panel is processed by different technicians working at different locations. Despite every attempt to control the many variables which affect penetrant processing during panel verification, experience reveals that such variables as ambient temperature, the cleaning process, as well as developer application and performance, vary when panels are processed. So, while conditions are controlled as much as possible, and while test results are replicable, results are never exactly the same from one test to the next, even on the same panel.

### **VISUAL RECORD**

Precisely documenting indication sizes can be accomplished with the digital micro-measuring device described above. However, it is another matter to provide users with a visual record, or reference, of a panel, something for which digital imaging is not appropriate. Here there must be an image, which in terms of color and size is a close facsimile of what the human eye perceives.

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To satisfy this requirement, Sherwin Incorporated has refined a process to capture photo images of processed PSM-5 Panels under UV-light. Here, again, the image is of flaw indications, not the actual flaws. The process requires using film, which yields high-resolution images for printing on photo paper.

It is a print from film that users of the Indication Sizing and Photo Package normally receive. However, from high-resolution film it is also possible to obtain high-resolution digital images. For those who require them, Sherwin Incorporated will provide digital, or additional print images, of a particular PSM-5 Panel's indications.

When comparing a photo image to the indications on an actual panel, as viewed in an inspection booth under UV-light, users must bear in mind several caveats. The most important is that UV-light is processed differently by the human eye than by film. When viewing penetrant flaw indications under UV-lighting, the human eye sees the indications as "fluorescent yellow/green." Meanwhile, film is not optimized to interpret objects under UV-light, which normally is not photographed. Thus, fluorescent indications on film appear "fluorescent blue/white."

Given the technology involved, it is not possible to provide a photo image that, in terms of color, is a one-for-one transformation of what the human eye sees under UV-light in an inspection booth. It must also be remembered that, even in the inspection booth, an image of fluorescent indications printed on photo paper, and viewed under UV-light, will not appear the same alongside actual indications exposed under UV-light.

### ***DOCUMENTATION INCLUDES DATA TABLE AND PHOTO IMAGE***

Those using the Indication Sizing and Photo Package will receive two important "documents," referencing a particular PSM-5 Panel.

The first document contains the results of the flaw indication measurement procedure, indicating flaw sizes and verifying that the flaws, as measured, fall within the specified parameters. The second document is a photograph taken under UV-light, and processed as described above.

### ***DOCUMENTING RE-CERTIFIED PANELS***

The same Indications Sizing and Photo Package as Sherwin Incorporated offers for its new PSM-5 Panels is also available for re-certified, in-use panels. Thus, there is the option of receiving documentation concerning the precise flaw indication sizes of a re-certified, in-use panel, as well as a photo of that panel's indications.

### ***DIGITAL IMAGE, AN OPTION***

While film photography is the means for capturing PSM-5 Panel images, those images can be digitized at a sufficiently high level of resolution to allow magnified viewing up to 400x before the image breaks down into individual pixels. For a slight additional charge, some users may want to order a digitized image of their panel.

### ***PRICING***

Pricing information is available through a separate price sheet.

