

# The Summertime Penetrant Professor



from Met-L-Chek



## PEOPLE ARE FUNNY

We'll start this discussion by observing that people are funny - by that we mean that people are peculiar, and that sometimes they do not do what one might expect. But we will not dwell on that theme, because all of us know that it is true. We see examples of it every day, and each of us probably wonders about the peculiar actions (or inactions) of those around us. But each of us is also guilty of the same failings. As once was said by a comic book character, "We have met the enemy, and it is us".

## THE PROBLEM

So what is this leading up to? In the April and the May issues of THE PENETRANT PROFESSOR, we discussed two new cleaners, R-503 and R-504. These two cleaners were developed by us to solve some problems which had been brought to the attention of the NDT community by Al Broz, of the FAA, and by Terry Kessler, of GE. Each of these folks had discussed the problems which they identified by inspectors performing a "redevelopment" of a fluorescent indication with solvents which had no control exercised over them. The problems included having open containers of solvent which could become contaminated

because they were open, and they included the practice of the inspector leaving his small brush or Q tip in the container of solvent after it had been used, thereby contaminating the solvent with fluorescent penetrant.

## THE SOLUTION

Met-L-Chek provided a solution to some aspects of these problems through the development of R-503 and R-504. These solvents are fast evaporating, and non petroleum solvent based. They are packaged in aerosol cans with an actuator which has a delivery tube on it, like WD-40 has. Since the solvent is in an aerosol can, it cannot evaporate, and nothing can get into it. Also, it is not possible to leave a brush or Q tip in the solvent. The delivery tube allows the inspector to apply just the right amount of solvent to the Q tip or to a small brush, with no waste, and without allowing excessive vapors in the inspection booth. It is a neat setup, and works well.

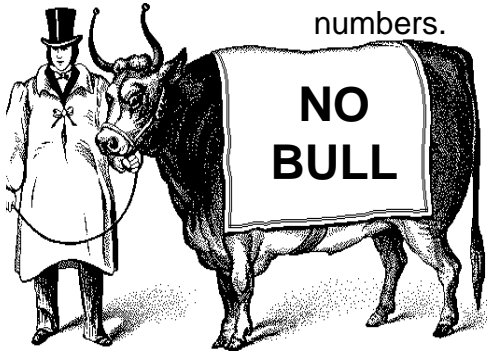
## THE POINT

So what is the point? The point is that one might reasonably expect that these new products would be met with enthusiasm, particularly since they could help an inspector through an audit. The April issue

of THE PENETRANT PROFESSOR described how one could get a free can to try, yet we were not overwhelmed with answers to this offer. Just think - audits are a pain, and almost everyone wants to get through them with ease. Now here is a product which not only improves the inspection process, but which will meet with favor by the auditor. You would think that people would jump at the chance to have the product, especially since auditors are focusing on the redevelopment step, and how it is done. But the expected flood of inquiries was not that great, and in our naivete, we thought that the reason was that people sometimes just don't seem to respond to a good thing when it shows up. However, we soon found that although many NDT personnel were eager to try these new products, they held back because the products did not have the "stamp of approval" of the aircraft turbine engine manufacturers. We can now report that both Met-L-Chek R-503 and Met-L-Chek R-504 have been assigned PMC numbers by Pratt & Whitney, and that the products are available with full certifications to that effect.

## THE OFFER

Have you held back? Do you want a can to try? Give us a call, and give us a chance to show you how to improve life, both on the job, and during an audit, with these new products which are not only approved for listing on AMS-2644, but which also have PMC numbers.



## EMULSIFIER CONCENTRATION

Hydrophilic emulsifiers are mixed with water to a concentration which is specified by the manufacturer, or listed in the user's process specification. For Met-L-Chek E-58D, this concentration is usually 20% by volume. The user checks this concentration by using a refractometer, and interpreting the readings with a chart which is also supplied by the manufacturer. Questions occasionally arise about whether there is some latitude in the concentration, or whether it must be scrupulously maintained at the specified concentration.

Of course, for process consistency, the closer the concentration is to the specified value, the more consistent the process will be. There is simply no argument with this fact. But

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maintaining a perfectly constant bath at all times can be both difficult and time consuming. For this reason, at least one aircraft engine manufacturer has established an upper and a lower limit of 3% variation from the specification. For Met-L-Chek E-58D, the allowable limits are 17% to 23% by volume. These limits are shown on the Met-L-Chek chart, together with the recommended concentration.

How does one correct the concentration? There is a simple way to do this. Suppose that the concentration is too low. For each percent that the concentration is too low, add one gallon of E-58D for each 100 gallons in the tank.

Example: In a 300 gallon tank, the concentration is measured to be 18%, instead of 20%. How much E-58D must be added? The concentration is 2% low. Therefore, add 2 gallons of E-58D for each 100 gallons in the tank, or  $2 \times 3 = 6$  gallons of E-58D.

Suppose that the concentration is too high. For each percent that the concentration is too high, add four gallons of water for each 100 gallons in the tank.

Example: In a 300 gallon tank, the concentration is measured to be 22% instead of 20%. How much water must be added? The concentration is 2% high. Therefore, add  $2 \times 4 = 8$  gallons of water for each 100 gallons in the tank, or  $8 \times 3 = 24$  gallons of water.

Note: These examples assume that the tank actually contains 300 gallons. If the amount in the tank is less than this, or more than this, it will affect the accuracy of the calculation. If

you are not sure of the actual content of the tank, it is better to use the calculation as a guide, and to add perhaps one half as much as calculated, and then to retest the solution. When the retest results are known, it will be a reliable guide to how much more material must be added.

## TRUTH IS STRANGER THAN FICTION

We never know what kind of a call for help we will get, and it would make an interesting book if we could gather together all of the unusual problems that we have been asked to solve. Recently we received a call from a person who was trying to make up a tank of water soluble or water suspendible developer. (We never did find out which it was.) We were told that the problem was that the developer powder was floating on the surface of the water, and would not mix. By now you should have the solution (pun intended) to this puzzle. The developer powder was our D-72A dry powder developer, which will not willingly mix with water, and which is only intended for use as a "form a" dry powder developer. Someone (we tactfully never inquired) had told this person to mix up a batch of developer, and he was really trying, but frustration got the better of him, and he phoned us. Good thing, too.

The Penetrant Professor



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