

# The Penetrant Professor from Met-L-Chek®

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*SAE/AMS Committee K  
will meet  
Monday March 16, 2015  
at the  
ASNT Spring conference  
March 16 -19, 2015  
in  
Anaheim, CA*



**HAPPY ST. PATRICK'S DAY 17th**

## ASTM Meetings

**ASTM E-07** met in January in Ft. Lauderdale FL There were a number of agenda items for review but the intense discussions were focused on a new standard for measurement of LED UVA lamp emission characteristics. Chairman **George Hopman** did an outstanding job at keeping the discussions focused and moving. The technical contact for the work committee, **John Brausch**, presented his groups findings and data, which demonstrated significant effort by all the task force members.

The bottom line is that there will be new requirements on LED UVA light wave length emission between 360-370. Not every miniscule technicality, has been addressed, but the result will be a practical guide as it pertains to most inspection requirements.

**Spring Forward 1 hour  
March 8, 2015**

## What about inspecting equipment used in food preparation?

Met-L-Chek has customers who are in the business of processing food, including many dairies. These customers are regular users of penetrants in the maintenance of their processing equipment. Yet we frequently get questions from others who process food as to whether we have penetrant products that are approved for use in the food industry by the FDA. The answer to this question seems simple, since we are unaware of any penetrant inspection products that have, or could get, FDA approval. So how do the users of our products obtain the benefits of penetrant inspection without violating FDA rules?

The answer appears to be that the metal equipment that is inspected is thoroughly cleaned subsequent to the inspection process. A **Google** search confirms this, and the

following text is found at a web site that deals with plate heat exchanger maintenance:

“Plates are pressure-washed, rinsed and subjected to either hot caustic stripping and/or a manual procedure for gasket and scale removal. They are subjected to immersion in a variety of acids compatible with the plate material to remove the balance of any foulants. Cleaned plates are fully visually inspected and a 10 percent sampling of plates are dye-penetrant tested. Each tested plate is sprayed with dye and inspected under ultraviolet light to locate any pin-hole leaks or cracks. Following this procedure, plates again are pressure-washed and rinsed to remove all traces of the dye”.

It might be noted that visible penetrants are also used without the need of UVA or darkening the inspection area. The bottom line is **thorough post inspection cleaning**.



## Choosing a Solvent Cleaner/ Remover

There are solvent cleaners, cleaner/removers, and penetrant removers used in the *Method C*, wipe off technique. What is the difference? What is important?

These materials are used to either preclean the parts surface before penetrant application, to remove excess penetrant before developer application, or both. But the requirements for pre cleaning are very different from the requirements for excess surface penetrant removal and these differences should be understood to ensure good penetrant inspection results.

### Pre cleaning

Pre cleaning the inspection surface requires a powerful solvent which evaporates rapidly. It must be powerful enough to dissolve greasy or oily soils from the inspection area. It must evaporate completely leaving any crack in the part clean and empty so the penetrant can enter the crack easily.

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### Penetrant Remover

Penetrant removal, on the other hand, requires mild solvent action, and evaporation rate is less important. Mild solvency is required to prevent excessive penetrant removal from any flaws. Evaporation rate is less important because the remover is applied with a remover dampened cloth, wiping the penetrant from the surface. When wiping the penetrant residue from a rough surface the slower evaporating remover will keep the wiping media moist and more effective at helping the removal of the surface penetrant.

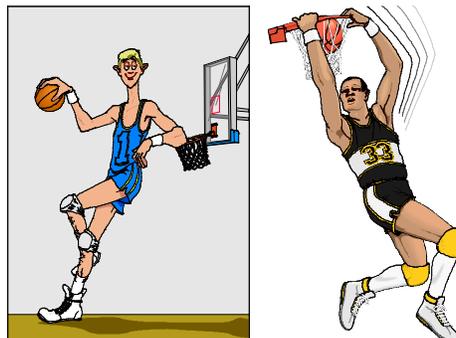
### Penetrant Indication Verification

In the case of verifying a fluorescent indication by wiping the indication with a cotton swab or brush moistened with the remover, the slow evaporating material will make the indications blurry and bleed excessively. In this case a very fast drying cleaner is the right choice.

### Other Considerations

The faster drying cleaners are generally better solvents for oils and greases, but are generally flammable and should not be used in confined areas without proper ventilation. They should not be used near open flames or sparks. Nonflammable solvents, have been used in past years, but have been found to be carcinogens or are banned as Ozone Layer Depleting Substances.

### March Madness 2015



Because there are different needs for cleaning and penetrant removal, Met-L-Chek offers several different materials suited for different inspection requirements. These materials are from nonvolatile to fast evaporating.

**R-502**- Special high temperature penetrant (**VP-302**) **remover only**.  
Evaporation rate: 0  
Flash Point: none

**E-59** -Slow evaporating used as a penetrant **remover only**.  
Evaporation rate: 0.04  
Flash Point: 63°C(145°F)

**E-59A** - Moderate evaporation, residue free, petroleum solvent, general purpose **cleaner/remover**.  
Evaporation rate: 0.9  
Flash Point: 20°C(68°F)

**R-503** - Moderate evaporation, residue free, non-petroleum solvent PMC # 9094 **cleaner/remover**.  
Evaporation rate:1.2  
Flash Point: 12°C(53°F)

**R-504** - Fast evaporating, residue free, indication verification solvent, PMC #9008 **cleaner/remover**.  
Evaporation rate: 5.6  
Flash Point: -10°C(14°F)

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