

from **Met-L-Chek®**



FIREMAN VISIT

Met-L-Chek prides itself on cooperation with City offices that affect our business. In the past, the Santa Monica Fire Department has used Met-L-Chek premises as a classroom to instruct HazMat teams. In addition, we are regularly visited and inspected by Fire Department representatives to see that all is in order from the standpoint of the ease of fighting a fire, should it ever occur. Recently we were visited by the entire fire fighting crew, who were given a tour of the facility and an explanation of what we manufacture and how this is done. The photo shows about half of those who participated. While Met-L-Chek has never had occasion to call on the fire department in over 55 years, we are pleased to have the close relationship with the good folks who will respond if we ever need them

Thank you to all who serve as first responders.

DEVELOPER CONCENTRATION

Our readers frequently send THE PENETRANT PROFESSOR comments. We particularly like feedback which gives us something else to write about. This month we will discuss several such topics. The first is the concentration of soluble and suspensible developers.

Previously, THE PROFESSOR reported that the correct way to measure the concentration is with a hydrometer. What THE PROFESSOR did not elaborate on, was that in order to be accurate, two readings must be taken. These are the hydrometer reading of the specific gravity, and the temperature of the solution. One needs both to be accurate. Why is this?



The specific gravity of liquid solutions changes as the temperature changes because the liquid expands or contracts. It also changes as the concentration changes. For many liquid solutions, the specific gravity changes so rapidly with concentration, that the effect of different temperatures is very small in comparison. But this is not the case with soluble and suspensible developers. With these, the specific gravity of the solution changes very slightly with the concentration, and so it is necessary to take the temperature into consideration to be accurate.

BACK to SCHOOL



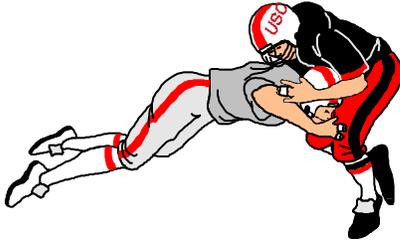
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For example, suppose you want to maintain a solution of D-76B soluble developer at a concentration of 2 pounds per gallon (240 g/l). At 60°F (15.5°C), the hydrometer will read 1.061. At a temperature of 80°F (27°C), the hydrometer will read 1.057. Suppose that when you first mix the solution, the temperature is 60°F, and the reading is 1.061. Now suppose that you take a hydrometer reading some time later, and you do not measure the temperature, which is actually 80°F. The reading will be 1.057, and you might incorrectly believe that the solution concentration has dropped from 2 pounds per gallon to 1.875 pounds per gallon. This is a change of about 6%, which may or may not be important in the particular process, or with regard to the particular specification which applies. But suppose that the temperature difference had been 60°F, such as between 40°F and 100°F. The reading would then be 18% incorrect, which is significant.

PERCENTAGES, PARTS per MILLION, etc.

Units that are used to report the amount of contaminating elements in penetrant products can be confusing. This can occur because the specification that governs the analytical procedure may produce values in percentage units, and the specification that is being used by the customer may require parts per million units (ppm). In these cases, one must know how to make the conversion. It is easy, and the following table explains the relationship when a 100 gram sample is analyzed:

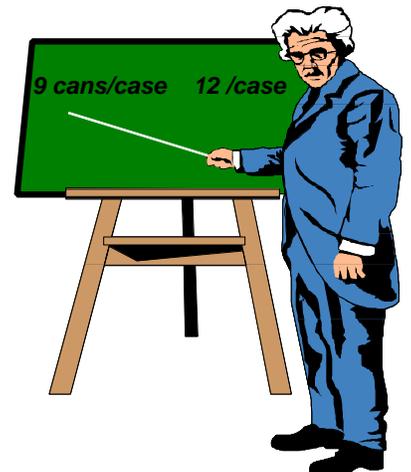
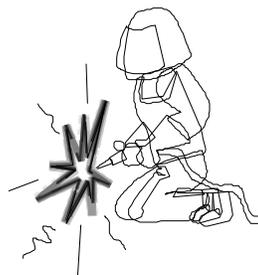
Reported amount of Contaminant	Percent	Parts per Million
1.0 gram	1.0%	10,000 ppm
0.1 gram	0.1%	1000 ppm
0.01 gram	0.01%	100 ppm
0.001 gram	0.001%	10ppm

It is just a numbers game, but is simple if you just keep the decimal points in the right place.

Met-L-Chek supplies the proper graph to use with each of these developers, so that the user has the tools available to measure the concentration accurately. If you need a spare chart, call us and request it. THE PROFESSOR will be happy to send one to you.

The Penetrant Professor

HAPPY LABOR DAY
to all those who work to make
America the best it can be.



The PENETRANT PROFESSOR is an occasional publication of the Met-L-Chek company. To receive it, call, fax or email Beverly Clarke