Chemical Clothing Cup Testing Method

With the availability of so many chemicals and proprietary products comprising multiple chemicals, it is impossible for protective clothing manufacturers to test their products against every chemical hazard.

Should customers require garments to be tested against specific chemicals or proprietary chemical cocktails, Alpha Solway can submit garments for official testing by a notified body for a set fee per test, customers may prefer however, to conduct a simple “Cup test” to determine the effectiveness of chemical clothing to protect the wearer.

- What is a Cup Test?

A cup test is a method of testing a garment or fabric against a chemical by stretching a section of the garment to be tested over a laboratory cup, exposing it to a chemical on the outside of the fabric and looking for signs of permeation on the underside of the fabric.

- How is it carried out?

1. Prepare for the Cup Test by marking the reverse side of a sample of the test fabric with a black felt marker and add a couple of drops of the test chemical to it to see if there is a reaction i.e. the ink disperses. It is this reaction that will indicate permeation has occurred when the garment fabric is exposed to the test chemical from the protective side. If there is no reaction try another marker or pen until a reaction occurs. Litmus paper can also be used and is ideal when testing the fabric for chemical resistance from acids or alkalis. Also look for degradation and swelling of the test fabric. Once satisfied that a reaction to the ink occurs, the actual test can be carried out.

2. Using a new test sample of fabric, mark the back side with the same marker and flip over and push into the cup/beaker so that the protective side is uppermost. Tape the fabric in to prevent it springing up. When firmly fixed, expose the protective side of test fabric to 5 – 10 ML of chemical and leave until the maximum use time required has been reached. It is advisory to build in a safety margin by doubling or even trebling the contact time as laboratory tests do not reflect real workplace conditions or take account of material flexing or abrasion.

3. Once complete safely view the underside of the fabric to see if a reaction has occurred. If it has, then the chemical has permeated. If not then the fabric would appear to offer chemical resistance and protection against the chemical tested against the parameters of the test.

Important Note:

Cup Testing is not a substitute for the far more accurate Gas Chromatograph Testing method and cannot be assumed to be an exact science, but the method is regularly used by many chemical , oil, and gas industry professionals as a basic way of checking the resistance of a fabric or splash suit against chemicals. Test results should not be relied upon as a safe use time for a garment, as there are many contributing factors, which may affect the level of protection a garment provides. The Cup Test should be regarded as merely an indication of the fabrics properties, and resistance to permeation and degradation. Always use data obtained in association will a full risk assessment. Always wear appropriate PPE when performing a Cup Test.