

Review of Cleaning Operations Involving VOCs

04/04/2011

BAE Systems Submarine Solutions (BAESSS) currently uses various solvents containing volatile organic compounds (VOCs) for the purpose of cleaning. This review looks at the processes and substances used and tries to identify ways of BAESSS decreasing its solvent emissions. There are two main processes that require the use of cleaning solvents they are the casting/tiling process and the painting process.

BAESSS is authorised to use Methylene Chloride which is a designated risk phrase material (R40) as part of the cleaning process. It is used to remove residues of polyurethane from the casting machines. Alternatives to Methylene Chloride have been looked at in the past but BAESSS are bound by Ministry of Defence (MoD) technical specifications and at this moment no suitable alternative has been identified. Within the last year an improvement in the accuracy of reporting of the amount of Methylene Chloride used has been possible. In previous years an estimation of the amount used was issued as a number of assumptions were made in the calculation. The figure produced for the 2010 usage was an absolute figure made possible by adapting a calculation used to calculate the evaporation of the rocket fuel Hydrazine. This showed that the estimation of Methylene Chloride being emitted to the atmosphere had been overestimated.

Dissolvit FD1000 is a citrus based degreasing agent that has started to be used more widely on site in the last couple of years. It has been brought into the degreasing process as a result of trying to reduce the use of Bostik M501. Bostik M501 is highly volatile and as a result highly flammable. From both a fire safety point of view and environmental view it made sense to try and reduce use of this product. It is not possible to use Dissolvit FD1000 for all applications as the citrus content leaves a residue that is not permitted in some quality aspects.

18/09/11

A review of the previous two years solvent emissions was carried out at this meeting and was discovered that for the 2009 and 2010 submissions the VOC numbers had increased on previous years, although the ratio of solvents to solids was still well within the permitted limits. After looking into the information with Redhall IOP the actual amount of painting that had been carried out had increased greatly due to some rework that was required. An initial review of this year's data appears to indicate that the amount of VOCs emitted is decreasing from the previous two years results; this can be confirmed during the next meeting which should be sometime in November/December. What also became apparent was that the amount of thinners used over this period had also increased greatly. This led to Matt Roskell investigating what the thinners are actually used for because if BAE Systems were to apply more than 2 tonnes of VOC for the purpose of surface cleaning we would have to vary the permit to reflect this. Upon investigation it was discovered that although BAE Systems do apply some thinners to the surface of the product it is only small amounts on specific parts of the product. The wipes used to apply thinners can leave fibres behind on the surface of the product that would raise quality failures hence they are not widely used to clean the surface of the product. The vast majority of the thinners are used to clean the equipment used to apply the paint such as spray guns, brushes and rollers hence when the painting requirements increase so does the amount of thinners required.

7/12/11

At this meeting it was discussed what measures could be taken in 2012 to further reduce solvent emissions from the cleaning process. John Hargreaves stated that there was another Dissolvit product he was looking at that had a much lower volatility than the one that was brought in to replace some of the jobs Bostik M501 previously did. The lower volatility will reduce the emissions of the solvent; however tests still need to be carried out to prove the effectiveness of the product. Many of the cleaning solvents used are required by MoD specifications so there is little room for changing them. As there is little scope for changing the solvents that are being used we must look at the way in which they are being used and make sure that we are using them as efficiently as possible. In order to do this it is important that the workforce that are using the solvents are educated in the reasons why it is important to use them

sparingly. In last years audit it was discovered that the painters and tilers had not had any specific training on their duties under the Part B permit. The course has now been developed and is ready to be rolled out in the New Year. In this course the requirement for efficient use of VOC cleaning solvents will be stressed along with inviting ideas from the shop floor on how to reduce solvent consumption.

In 2012 the quarterly cleaning review meetings will continue as BAE Systems continues to try and find ways of reducing its solvent emissions through reviewing cleaning techniques.