Cost effective selection of cleanroom wipes and mops

CONTEC

In today's current economic climate, pressure to minimise costs, increase bottom line profits or meet budget targets is more acute than ever. Even the smallest cleanroom facility will spend tens of thousands of pounds on cleanroom consumables in a year, in a large facility the consumable spend will run into hundreds of thousands of pounds. This spend is steadily increasing year on year. Gloves are the single biggest consumable purchase, closely followed by wipes.

The global spend on cleanroom wipes is currently estimated at $776 m. Wipes are used at all stages of the production process through all classes or grade of cleanroom including support areas. If we consider that mops are a special form of wipe used for cleaning large areas usually manufactured from similar fabrics, but with the addition of foam or lining to make them more sorbent, then this figure will be even higher.

Products available

Due to this demand for wiping products throughout a clean facility there are numerous wipe fabrics to choose from. These can range from heavyweight, double ply, laundered, knitted polyester, sealed edge wipes through to rayon and cellulose blends manufactured with binders. Invariably the higher the cost the lower the number of particles and fibres a wipe will generate. The options that are available just for cleanroom use are almost endless. The majority of fabrics mentioned can also be used to produce mop covers. Mops adapted for cleanroom use, include string or edgeless mops manufactured from low particulate materials. Flat mops are used in many cleanroom facilities and mop heads are available both sterile and non sterile manufactured from polyester/ cellulose, 100% knitted polyester, looped polyester, polyester covered foam, microfibre and looped microfibre. Unique flat mops based on hydrophilic PU foam coated with polyester have also been developed for cleanroom use.

Cost control

As consumables form such a significant part of the running costs of a facility it is an area that many facilities are looking at to reduce costs. However, careful consideration needs to be given as to where these consumables cuts should happen. A reduction in consumable quality, which leads to contamination of a final product or reduction in yields, could end up being dramatically more costly than the immediate savings. So the challenge is reducing consumable costs whilst maintaining environmental standards that maintain yield levels and do not create final product issues.

Two examples of cost reduction strategies highlight the benefits and risks of these efforts. The first is moving from single-use items to ones which are reusable, either through re-laundering, or re-sterilisation or both. This tactic is economically and environmentally appealing, however, it is difficult for a re-laundering operation to provide the same level of quality assurance as a specialist manufacturer providing single-use items. Usually, the more critical the application, the greater the risk.

Another cost reduction strategy is to use new or less established alternative suppliers who promote themselves as either manufacturers selling direct or as distributors handling large amounts of product at lower selling prices. This strategy can be appealing based on the initial purchase price of the product; however, there are often hidden costs in this approach which are not so obvious up front.

Fig 1: Real life examples of product reviews leading to cost reduction

Cleanroom Class	Application	Current product	Recommendation	Discussion
ISO 6 or 7	Wiping fused quartz	Heat sealed, laundered, 100% polyester knit 12"x 12" wipe	Heat sealed, laundered, 100% polyester knit 9"x 9" wipe	The PNHS-99 is the same as the wipe currently in use, except it is 9" x 9". This ensures the same performance with the cost savings associated with a smaller wipe. The wipe can be folded in half and used 4 times, similar to the current protocol.
ISO 7 or 8	Work surface cleaning	100% knitted laundered polyester with thermal sealed edges 9" x 9" wipe	Meltblown polypropylene presaturated with 70% IPA 9" x 11" wipe	This is a lower cost alternative to the wipes currently in use. They provide an adequate level of IPA with a clean wipe substrate to keep work surfaces clean. This substrate is clean enough for the grade of room.
ISO 5	Cleaning product contact surfaces	100% sealed-edge, two- ply, laundered knitted polyester 9"x 9" wipe	100% sealed edge, single ply, laundered, knitted polyester/microfibre 9" x 9" wipe	A unique combination of cleanliness and performance, the Goldsorb wipe contains 30% round microfibre yarn, providing exceptional surface cleaning performance, high sorbency, and excellent durability without the added bulk and expense of a two-ply wipe. The Goldsorb would be a very suitable alternative to the two-ply wipe providing improved performance, cost reduction, and SKU consolidation.

Global supply

In today's global age products can be easily sourced worldwide at the click of a button. It is very tempting to cut out the middle man and buy a cheaper wipe directly from a convertor. However, do you know exactly what you are buying? For instance; does the vendor really manufacture these products or are they manufactured at a number of different subcontractors, how robust are their quality systems and do the raw material suppliers have quality control processes in place? There could also be hidden costs; what are the minimum order quantities, how much inventory will you need to maintain and what are the freight and duty costs? This is before there is a quality problem, or a product changed without notice, or a supplier going out of business. When purchasing from a specialised cleanroom wipes supplier you are also investing in companies with a high degree of technical support and research and development skill. Consider how much testing has been done on the product both through the process and on the final product before it reaches you. Wipes that are manufactured in facilities without these controls in place, and with variable sources for the raw material, are unlikely to deliver wipes which always meet the expected specification.

Product reviews

One of the most effective ways of reducing consumable spend without compromising on contamination control is to carry out an in depth product review. For example, Contec will support customers with expert on-site advice on whether they are using the most suitable product in each area of the cleanroom. Figure 1 shows some real world cost saving examples from Product Application Reviews carried out at biotech, pharma and semi-conductor facilities.

If this seems a very simplistic approach to cost saving you will be surprised how many products have potentially been over specified over time. Also advances in product development could lead to alternative substrates or packaging formats becoming available which better suit an application at a lower cost. Very often the wipe which is used in the product contact areas or closest to the wafer gets used throughout the rest of the cleanroom to minimise suppliers or reduce consumable SKU's. These wipes will invariably be the highest specification wipes, 100% laundered polyester with sealed edges and low numbers of fibres which are not needed as you move away from the critical zone.

A Product Application Review would always take place on-site allowing observation of the cleanroom operations, the environmental classification required and the consumable products used. The scope should include all process consumables in the cleanroom and supporting areas. The goal is to identify product suitability for specific cleaning processes. Based on observations, recommendations can then be made as to product suitability and cost cutting opportunities which don't affect the overall levels of contamination. Considerations for cost cutting would include; what size wipes are being used, could a smaller size be used, could a lighter weight version of the same substrate be used or single ply instead of two-ply. Questions to ask are; can a non sterile product be used, how is the product packed, is there wastage, could a pack with more wipes per pack be used, pre-saturated wipes instead of separate wipes and spray bottles, bulk product in place of stacked, knife cut instead of sealed edge, non woven instead of knits?

Summary

Cleanroom consumable costs are a significant part of a cleanroom facility's running costs which must be controlled if budgets and profit targets are to be met. Support from specialist cleanroom consumable manufacturers can help identify cost cutting measures with no loss of quality or increased risk of contamination. Any cost saving measures should be carefully considered with a long-term view to ensure it is not a false economy or likely to compromise the consistency and repeatability of a product which, in turn, could impact production.