

### **What type of filter media is used in a HEPA Filter?**

Glass fiber is the industry standard.

Polytetrafluoroethylene (PTFE) membrane media is also available and is commonly used in the microelectronics industry where specific outgassing demands may be a concern.

### **What is your recommended factory and field-patching procedure?**

TripleAir follows the recommended practice of IEST RP-CC001.5 Section 8.3.2 and IEST RP-CC034.4 Section 6.2.2 e) 2) or EN 1822-4 for filters requiring patching at the factory. This is dependent upon customer requirements and Standard practices in effect at the filter manufacturing location. IEST RP-CC001.5 Section 8.3.2 states: "Unless otherwise specified, the medium of filter units to be used in cleanroom or clean air device applications may be patched with medium or adhesive, not to exceed an area of 13 cm<sup>2</sup> (2 in<sup>2</sup>) in any one patch, or a total of 1% of the area being patched." EN 1822-4, Section 8.5.4 states: "A filter may be repaired if necessary and shall then be retested" and further notes: "All repairs together (including those made by the

filter manufacturer) shall not block or restrict more than 0.5% of the filter face area (not including the frame) and the maximum length of each single repair shall not exceed 3.0 cm. Alternative repair criteria may be otherwise agreed between buyer and seller." TripleAir Technology recommends adherence to IEST RP-CC034.4 for field repairs.

IEST RP-CC034.4 in various sections states: "Field repair should not block or restrict more than an additional 3.0% of the filter face area, and no single repair should have a lesser dimension exceeding 3.8 cm (1.5 in.). ISO 14644-3, Section B. 6.6 allows for repairs and repair procedures "by agreement between the customer and supplier." FDA - Guidance for Industry, Sterile Drug Products Produced by Aseptic Processing – Current Good Manufacturing Practice, Section 4.D.2 allows HEPA filters to be repaired in (undefined) limited areas when appropriate. For field repairs, TripleAir Technology recommends the use of a tool similar to EFD's DispensGun (Syringe type). We recommend using a good quality viscous

Silicone caulking like RTV 162, RTV 108, Dow 732, Hot-Melt (same as the pleat separator) or other suitable alternative. Always test the filter after performing repairs both in the factory and in the field.

### **What is the industry stating about patches in HEPA filters (repairs)?**

TripleAir Technology follows the recommended practice by IEST and EN for Factory and field repair. There are a handful of companies globally that request 'patchless' filters. 99.9% of the filters TripleAir Technology produce for Life Science applications are not requested to be patch free. The typical price premium for patch free filters is a 20-25% premium, depending on the filter specification. Recently we have noted that more end users specify that no field repairs allowed in their Grade A space.

### **Does patching shorten the life of a filter?**

Factory patches do not shorten filter life. Field repairs should be performed by trained personnel using recommended methods and

materials. Repairs should meet IEST-RP-CC001 Section 8.3.2 or be approved by the end user. Filters should be retested after being repaired.

**What is the recommended filter patching material?**

A mixture of RTV160 and RTV162 cleanroom grade silicone caulk is used at the factory for media repairs. Dow Corning 732 silicone caulk is used for field repairs. TripleAir Technology does not use filter media for patches.