

Filter-bond™

Material Systems
for
Filtration & Ultrafiltration



Potting
Bonding
Sealing
Encapsulating

FILTRATION & ULTRAFILTRATION APPLICATIONS:



...just to name a few

hapco has it!



Custom Materials
for YOUR
Filter or Ultrafilter application.



Custom equipment
to meet YOUR
processing needs!

Filter-bond E-Series

- elastomeric -

Filter-bond is a series of casting and potting compounds ideally suited for medical and food contact applications. This **Filter-bond E-Series** is manufactured to ultra-high quality standards using FDA approved components.

Filter-bond E-3264

Filter-bond E-3264 is a liquid, two component, flexible, extremely tough adhesive potting and sealing compound. **Filter-bond E-3264** has a long working life. It is also available with a 5 minute (E-5264-5) gel time. Both are excellent in aqueous environments, and are Hydrophobic.

Filter-bond E-3503 and E-3505

Filter-bond E-3503 and **E-3505** exhibit excellent bonding characteristics to various substrates, and are tough products with good physical properties. Users have completed extensive extractable testing and **Filter-bond E-3503** and **E-3505** have passed the most rigorous tests. A few of the most common applications for **E-3503** and **E-3505** are filtration & ultra-filtration potting and sealing.

Filter-bond E-3568

Filter-bond E-3568 is used in applications such as: ultrafiltration and filtration prepot and gasketing applications. **Filter-bond's** ability to be easily trimmed or cut is a decided advantage. Flexible gasketing applications are ideally suited for **Filter-bond E-3568**.

Filter-bond E-Series

- elastomeric -

	PHYSICAL PROPERTIES	TEST METHOD	E - 3264 E - 3264-5	E - 3503*	E - 3505*	E - 3568
PHYSICAL PROPERTIES	Mix Ratio by volume A:B by weight A:B	Calculation	100:300 100:360	100:20 100:24	100:17 100:14	100:100 100:88
	Gel time 100 grams @ 25°C	ASTM D-2971	180 min. 5 min.	23 min. ± 5	16 min. ± 5	5 min. ± 1
	Color (cured)	Visual	Translucent / white	Transparent / hazy	Transparent / hazy	Light Blue
	Hardness Shore	ASTM D-2240	53 A	65 D	90 A	65 A ± 5
	Viscosity mixed @ 25°C cps	ASTM D-4878	9,600	40,000 ± 5,000	50,000 ± 7,000	950
	Specific Gravity mixed @ 25°C	ASTM D-4669	0.97	1.13	1.13	0.93
	Shrinkage inch/inch See shrinkage paragraph	ASTM D-2566	.001-.003 .0005-.002	.0005-.002	001-.003	.0005-.002
	Demold time 1/8" thick	HAPCO TEST	2-3 days @ 21°C for -5 16 hrs. @ 80°C	2-4 hrs. @ 60°C plus 12 hrs. @ 21°C	2-4 hrs. @ 60°C plus 12 hrs. @ 21°C	40-90 min. @ 21°C OR 20-30 min. @ 68°C
Weight per cubic inch (lbs.)	Calculation	0.0350	0.0408	0.0408	0.0336	
PRODUCT PROPERTIES	Tensile Strength (psi)	ASTM D-638	200	2,000	1,500	125
	Elongation %	ASTM D-638	550	120	200	950
	Tear Strength (pli)	ASTM 624 Die C	33	NA	NA	10
	Modulus of Elasticity psi (000)	ASTM D-638	<300	14	3.1	<400
	Izod Impact (ft.lbs/in.) notched unnotched	ASTM D-256	NA	No break	No break	NA
	Heat Distortion Temperature (°C) 66 psi 264 psi	ASTM D-648	NA	54°C 47°C	50°C NA	NA
	Flexural Strength (psi)	ASTM D-790	NA	3,100	NA	NA
	Flexural Modulus psi (000)	ASTM D-790	NA	63.7	NA	NA
FDA Status (components may appear in one or more of these sections)	Uses all FDA approved components per: CFR 21.175.105 CFR 21.175.300 CFR 21.177.1680					Used as a prepot only

NOTE: Before use, reference material handling, processing, and safety notes located at the end of this brochure

Filter-bond R-Series

- rigid -

Filter-bond is a series of casting and potting compounds ideally suited for medical and food contact applications. This **Filter-bond R-Series** is manufactured to ultra-high quality standards using FDA approved components.

Filter-bond R-30-6 Series

The **Filter-bond R-30-6 Series** feature 3 potting and adhesive systems specifically designed for potting and/or bonding Ultrafiltration products. The **Filter-bond R-30-6 Series** DO NOT CONTAIN AROMATIC AMINES or other carcinogenic or mutenogenic materials. In addition, the **Filter-bond R-30-6 Series** contain only FDA recognized compounds

Filter-bond R-36

Filter-bond R-36 can be used in ratios from 2:1 to 1:1, by volume or by weight, making it an ideal product for both field and production applications. **FILTER-bond R-36** is the "workhorse" of our polymer adhesive line and will bond most metals, plastics, ceramics, wood, fabrics, canvas, etc. As you increase the mix from 2:1 to 1:1, the cured product becomes semi-rigid and has lower heat resistance.

Filter-bond R-3738

Filter-bond R-3738 is a structural adhesive system specifically developed to bond filter media in Filter and Ultrafiltration applications. **Filter-bond R-3738** provides excellent adhesion to similar and non-similar substances. It is also chemically resistant and is manufactured only with components approved for FDA applications.

Filter-bond R-Series

- rigid -

PHYSICAL PROPERTIES	TEST METHOD	Filter-bond R-30-6	Filter-bond R-30-6-1	Filter-bond R-30-6-2	Filter-bond R - 36	Filter-bond R - 37-38	
PHYSICAL PROPERTIES	Mix Ratio by volume A:B by weight A:B	Calculation	100:28 100:33	100:20 100:20	100:25 100:22	100:46 100:50	100:33 100:31
	Gel time 100 grams @ 25°C	ASTM D-2971	43 ±5 min.	26 ±5 min.	35 ±5 min.	120 min.	44 ±8 min.
	Color (cured)	Visual	Colorless to slightly amber	Colorless to slightly amber	Colorless to slightly amber	Clear amber	Creamy white to amber
	Hardness Shore	ASTM D-2240	85 D ±5	85 D ±5	85 D ±5	80 D	84 D ±5
	Viscosity mixed @ 25°C cps	ASTM D-4878	11,000 ±3,000	14,000 ±3,000	8,500 ±2,500	19,000 ±4,000	11,000 ±3,000
	Specific Gravity mixed @ 25°C	ASTM D-4669	1.12	1.14	1.12	1.10	1.20
	Shrinkage inch/inch See shrinkage paragraph	ASTM D-2566	.0025-.004	.0015-.003	.0015-.0025	.0005-.002	.0005-.002
	Cure time 1/8" thick	HAPCO TEST	12-18 hours @ 100 °C	24 hrs @ 70°F or 80°C for 6-10 hrs	12-18 @ 70°F plus 80°C for 6-12 hrs	24 hours @ 70°F	24 hours @ 70°F
	Weight per cubic inch (lbs.)	Calculation	0.0404	0.0412	0.0404	0.0397	0.0433
PRODUCT PROPERTIES	Tensile Strength (psi)	ASTM D-638	12,000	12,400	12,900	8,250	10,279
	Elongation %	ASTM D-638	3.7	3.9	3.5	7.5	6.0
	Modulus of Elasticity psi (000)	ASTM D-638	397	450	420	290	345
	Izod Impact (ft.lbs/in.) notched unnotched	ASTM D-256	0.32 0.67	0.31 0.58	0.28 0.51	0.45	0.02 1.10
	Heat Distortion Temperature (°C)	ASTM D-648	173	152	161	75 62	100 96
	Flexural Strength (psi)	ASTM D-790	14,200	14,625	15,520	13,750	9,700
	Flexural Modulus psi (000)	ASTM D-790	433	487	451	255	265
	FDA Status (components may appear in one or more of these sections)	Uses all FDA approved components per: CFR 21.175.105 CFR 21.175.300 CFR 21.177.1680					

NOTE: Before use, reference material handling, processing, and safety notes located at the end of this brochure

FILTER-BOND SERIES

MATERIAL HANDLING, PROCESSING & SAFETY NOTES

POSTCURE:

Postcure Heat: 100-176°F (38-80 °C) for 8-24 hours. Properties increase with heat acceleration. Izod impact and heat distortion properties increase with postcure heat. The lower the temperature the longer the post-cure (8-24 hrs). It is suggested to post cure E-Series @ 100-140°F and R-Series @ 140-176°F .

DEMOLD & CURE TIMES:

Demold and final cure time can be accelerated with the addition of postcure heat 100-175°F (38-79°C) . To retain working life, heat the mold not the material for best results. Increasing the mold temperature to 80-100°F (26-38°C) will accelerate demold and cure times by up to 50%. For full cure polymers require at least 7-10 days. Final cure for faster gel materials (3-6 minute gel) is 3-7 days. Please be aware that size and mass effect demold and cure times. Many Filter-bond materials are used at 85-90°F to lower viscosity, but gel time is reduced. The customer and geometry will ultimately determine demold time.

HARDNESS NOTE:

The hardness progresses more slowly in the longer working life systems. The hardness progression can be accelerated by using the faster version or by curing with mild heat. Hardness and cure progress will be retarded, slowed down, when the temperature falls below 70°F.

SILICONE MOLDS:

Silicone molds should be post cured overnight, 16-24 hours, in an oven at 120°F (48°C). When using a tin based silicone mold, make sure the mold is open when it is in the oven during postcure. Improperly cured silicone can cause a sticky surface on E-Series Filter-bond molded parts. This process extends mold life.

RELEASE FOR FOOD & DRUG GRADE MATERIALS:

To maintain / obtain the food and drug grade level, *Filter-bond* must be used with Grease-It FDG Food & Drug grade mold release. It is up to the customer to obtain FDA approval for the finished product.

FDA STATUS OF FILTERBOND PRODUCTS

The FDA requires the submission of the final product made up of all its components. It is the customer's responsibility to have their final product submitted and approved from the FDA for its particular use. Hapco's Filter-bond products have been successfully submitted and approved many times, but the process of submission and approval must be followed by the customer. Hapco uses ingredients that are listed in the guidelines outlined in CFR 21 as shown in the Hapco brochures.

SURFACE PREPARATION TO PREVENT ADHESION:

To prevent adhesion to the mold, use a GREASE-IT release agent. The following are recommended: GREASE-IT II or GREASE-IT FDG when a Food & Drug grade release is required. For best results, apply in a few thin coats, drying between coats. Porous surfaces, i.e. wood, plaster, etc, must be sealed thoroughly before release is applied. Use multiple coats of a good coating, such as: a high grade lacquer or urethane lacquer.

SURFACE PREPARATION FOR ADHESION:

For applications where adhesion is desired, the surface must be cleaned, abraded and dried. Sandblasting and mechanical roughing are the preferred ways of abrading surfaces to be bonded. For added adhesion to metals, use Primer 200 and for added adhesion to plastic, use Primer 810. Make sure all surfaces are clean, dry, and free from moisture.

COLD TEMPERATURES:

USE THIS METHOD FOR E-3568

CAUTION - COLD TEMPERATURES -Part A may freeze or crystallize in cold temperatures. Part A may appear to be striated, thicken, or solidify. This situation can easily be corrected. Place the cover on the Part A loosely (do not seal) and place in an oven set at 150-175°F, for 3-6 hours or 8-12 hours for drums. Reseal, allow to cool.

USE THIS METHOD FOR R-3000 SERIES, & R-3501, E-3505, & E-3503

CAUTION - COLD TEMPERATURES - Part A may freeze or crystallize in cold temperatures. Part A may appear to be striated, thicken, or solidify. This situation can easily be corrected. Place the cover on the Part A loosely (do not seal) and place in an oven set at 100°F (38°C) for 3-6 hours or 8-12 hours for drums. Reseal, allow to cool before using and then mix thoroughly.

FILTER-BOND SERIES

MATERIAL HANDLING, PROCESSING & SAFETY NOTES (cont.)

MIXING:

IMPORTANT: Components may separate and should be mixed before each use. Mix, only when ready to use, by adding the curing agent to the resin portion and blending together thoroughly. Be sure to scrape and stir in all material sticking to the sides and bottom of the mixing container. Do not use paper containers or wooden mixing sticks. They may contain moisture. For best results, use plastic or coated containers, and metal or plastic sticks.

MACHINE MIXING AND DISPENSING:

Use Hapco's **RAPIDFIL**, **MINIFIL**, and/or **RAPIDSHOT** dispensing machines for fast, reliable, and efficient mixing without the air entrapment, measuring, or mess associated with hand processing.

CASTING:

Pour in a thin unbroken stream into the lowest point in the cavity or mold. This will help break up some of the air entrapped during mixing. For best results, Hapco recommends meter mix dispensing, vacuum degassing and/or pressure casting at 70-80 PSI.

SHRINKAGE:

Shrinkage or dimensional variation is largely influenced by 5 factors:

1. Mass (total volume and thickness)
2. The temperature of the material
3. Maximum temperature reached during the exotherm (reaction).
The faster the gel time, the higher the exotherm, the greater the shrinkage.
4. The temperature of the mold
5. The thermal properties of the mold material. (Insulator vs. Conductive)

Geometry, part thickness, and total volume vary in each design, therefore, the customer is responsible to test and determine the shrinkage factor to be used. The values in the brochures are for comparative reference only, using ASTM testing procedures.

AIR RELEASE:

Use HAPCO'S ANTI-AIR to aid in air release (see Technical Bulletin). In some products, ANTI-AIR can cause a slight haze to cloudiness. This has no effect on properties.

CLEAN UP:

Cured polymers are difficult to remove. It is best to clean tools and equipment immediately after use. For best results use Hapco's A-TAK.

STORAGE:

Store both components in an area with a temperature range of 68-90°F (20-32°C). Store in a dry place off of cement floors and on shelving if possible. Containers should be kept tightly closed.

SHELF LIFE:

The shelf life on Hapco products begins from the date of invoice for that product shipment. Hapco's shelf life only pertains to containers that are unopened and in their original condition. Once the container is opened Hapco has no control or responsibility for the shelf life.

RESEALING:

Many polymers are moisture sensitive, reseal, using one of the following two (2) methods: blanket with nitrogen or use a hair dryer for 30 seconds to cover with dry air.

PRECAUTIONS:

CAUTION: The MSDS should be read thoroughly before using this product.

Skin or eye contact with polymers should be avoided. The use of gloves and eye protection are strongly recommended. All polymers, as a general practice, should be used in well-ventilated areas. Spot ventilation is most effective. Contaminated clothing should be removed immediately and the skin washed with soap and water or waterless skin cleaner. Should accidental eye contact occur, wash thoroughly with water and consult a physician.

The information presented here is based on carefully conducted laboratory tests and is believed to be accurate. However, results cannot be guaranteed and it is suggested that customers confirm results under their conditions and in their applications before production use.

Important: Hapco Inc. makes no warranty, whether expressed or implied, including warranties of merchantability or of fitness for a particular purpose. Under no circumstances shall Hapco Inc. be liable for incidental, consequential, or other damages from alleged negligence, breach of warranty, strict liability, tort contract, or any other legal theory, arising out of the use of handling of this product. The sole remedy of purchaser and sole liability of Hapco Inc. shall be for the purchase price of the product which is the subject of the claim.