

3M™ Form-in-Place Gasket (FIPG) 7103 HC B/A (Two Part System)

Product Description

3M™ Form-in-Place Gasket (FIPG) 7103 HC B/A is a two-part epoxy, elastomer material. It is designed for use on hard disk drive covers, serving as a reusable gasket and contamination barrier. The two-part system is meter/mixed, dispensed into a bead on the cover, and thermally cured. Part B is the epoxy or base material and Part A is the curative or accelerator material.

Product Availability

3M™ Form-in-Place Gasket 7103 HC B/A is a two-part system. Each part is supplied in 7 gallon pails, 17⁷/₈" tall x 11¹/₄" diameter. The pails are lined with silicone-free polypropylene bags, are vacuumed sealed, and are designed to be used with Ingersoll Rand IR-ARO® pumps.

Key Features

Features	Advantages	Benefits
Epoxy-based		Useful in critical environments
High purity material set	Low outgassing Low ionic contamination Halogen-compliant	Excellent reliability
Use with in-line dispensing equipment	Programmable gasket pattern	No die cutting (less waste) No additional assembly (lower cost) Inexpensive to change gasket pattern
Resilient	Cover can be reused after drive rework	No need to apply a new gasket to the cover



3M™ Form-in-Place Gasket (FIPG) 7103 HC B/A (Two Part System)

Typical Uncured Properties

Table I describes the typical properties of the uncured 3M™ Form-in-Place Gasket 7103 HC material.

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Table I. Typical Uncured Properties of 3M™ Form-in-Place Gasket 7103 HC with mix ratio 1.63 Part B (base): 1.00 Part A (accelerator) by weight at room temperature.

Property	Units	Part B Typical Value	Part A Typical Value	Part B + A Typical Value	Test Method	Notes
Mix Ratio B:A	By Weight			1.63:1.0		
Viscosity	cP	See Figure 1	See Figure 1	See Figure 1	Rheometric Dynamic Analyzer	1
Specific Gravity	g/cc	0.95	1.07		3M TM 7207 / MDI 2324	
Flow Rate	g/min			0.20	3M TM 7223 / MDI 2449	2
Slump	mil			<1.3	3M TM 7220 / MDI 2450	3

¹Viscosity is shear rate dependent.

²Weight of material dispensed in 60 seconds from an 18 gauge TT EFD needle (4 mm length) using 85 psi of air pressure.

³60 minute slump: difference in bead width from initial dispense measurement to 60 minute measurement.

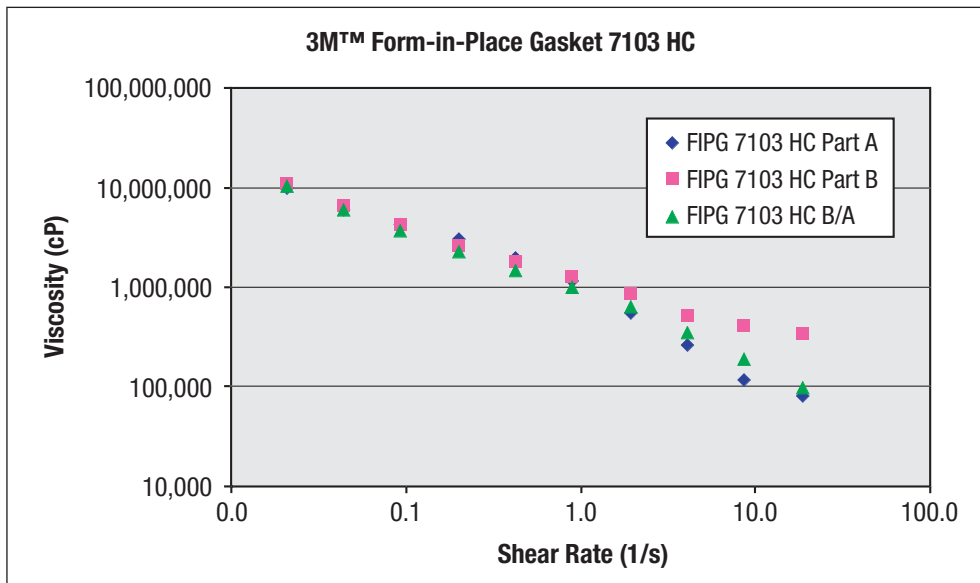


Figure 1. Viscosity vs. Shear Rate measured at 25°C.

3M™ Form-in-Place Gasket (FIPG) 7103 HC B/A (Two Part System)

Typical Cured Properties

Table II shows the properties once the 3M™ Form-in-Place Gasket 7103 HC material has been meter/mixed and cured as prescribed.

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Table II. Typical Cured Properties (Mixed at a weight ratio of 1.63 Part B (base) to 1.00 Part A (accelerator); gasket cured with a step profile described in Processing Section).

Property	Units	Typical Value	Test Method	Notes
Hardness	Shore A	59	Based on ASTM D2240	
Compression Set	%	6	TM-0024 / MDI 2323	1
Cycling Compression Set	%			2
Day 1		5		
Day 2		7		
Day 3		8		
Tg	°C	2	Dynamic Mechanical Analysis	3
Outgassing	µg/g	45	IDEMA	4

¹Compressed 25% for 70 hours at 70°C.

²Compressed 40% for 3 days cycled each day for 8 hours at -40°C and 16 hours at 80°C.

³DMA scan at 1°C/minute and 1 Hz.

⁴DHS testing at 85°C /3 hours. See Curing Section on page 4 for cure profile.

Processing

Thawing: From frozen storage, 3M™ Form-in-Place Gasket 7103 HC must first be allowed to equilibrate to room temperature. This is accomplished by placing the pail at room temperature for a minimum of 24 hours. Never attempt to reduce thawing time by heating the pail above room temperature.

Pail Unloading: Use 3M™ Form-in-Place Gasket 7103 HC material directly from the pail. After removing the lid, the polypropylene bag should be unsealed, folded over the edge of the pail, and secured. Pumping equipment such as an Ingersoll-Rand IR-ARO® pump with follower plate or a gear pump can be used. If pails are resealed, they should be purged with dry nitrogen before sealing

Pot Life: Once mixed, the 3M™ Form-in-Place Gasket 7103 HC material will gradually increase in viscosity. The product should be dispensed as soon as possible and no more than 6 hours after mixing. After dispensing, gaskets should be cured within 10 hours.

Dispensing: 3M™ Form-in-Place Gasket 7103 HC should be dispensed onto the substrate using a programmable dispensing machine. Substrates must be clean and dry. The gasket geometry can be changed by altering the following dispensing process parameters: dispense rate, x-y translation speed, needle diameter, and height of needle above substrate. The user will need to adjust these parameters to obtain the desired gasket height and width. To minimize the slump, the bead translation rate is equal to the flow rate of the material out of the tip such that the bead width matches the tip diameter. If dispensing with a heated needle tip, do not exceed 70°C tip temperature for more than one minute.

3M™ Form-in-Place Gasket (FIPG) 7103 HC B/A (Two Part System)

Processing *(continued)*

Cleaning: To clean uncured 3M™ Form-in-Place Gasket 7103 HC from a substrate, first remove as much material as possible by scraping or wiping then use heptane or other solvents* and lint-free wipes as the final cleaning step.

***Note:** When using solvents, extinguish all ignition sources and follow the manufacturer's precautions and directions for use.

Curing: Cure 3M™ Form-in-Place Gasket 7103 HC using a temperature step profile as shown in Figure 2. The cure profile consists of a step of 120°C for 1 hour, a ramp at 2-5°C /min to 150°C, and a step of 150°C for 1.5 hours. Alternate step cure profiles can be used, but any change will affect the physical properties of the cured material. Do not open curing enclosure following cure cycle until enclosure has been adequately ventilated to minimize exposure to any resulting vapors.

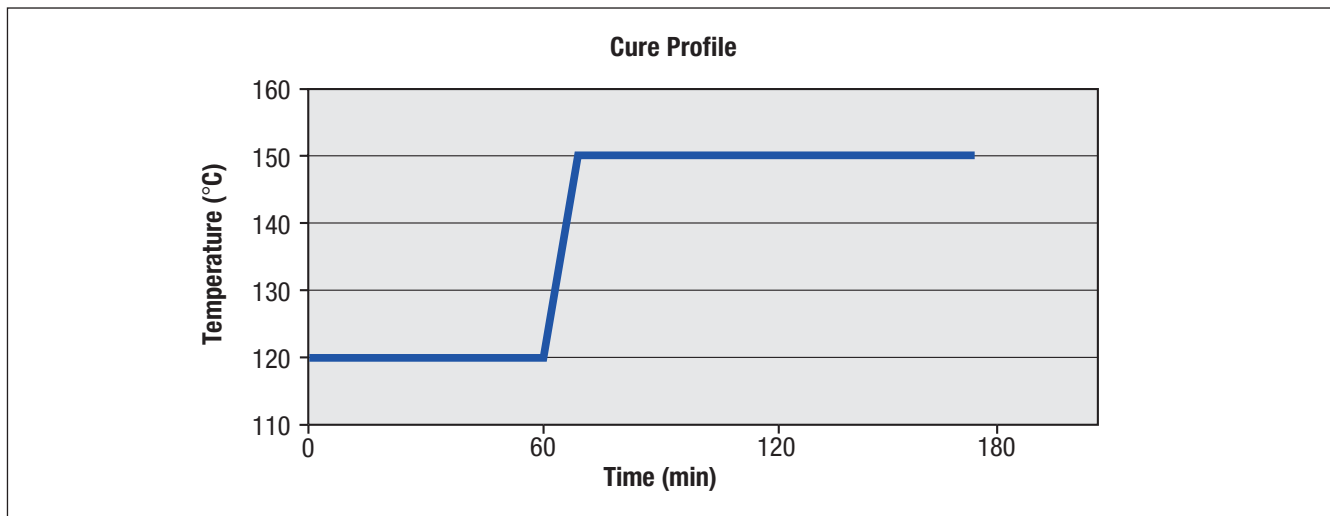


Figure 2. Recommended cure profile for 3M™ Form-in-Place Gasket 7103 HC.

Pre-mixed and Frozen: If desired, after the meter/mix operation, the material may be filled into syringes or cartridges for dispensing at a later time. In this case, the 3M™ Form-in-Place Gasket 7103 HC material must be flash frozen and stored at -40°C.

Syringes may be stored for up to 6 months at -40°C. Prior to dispensing, the pre-mixed and frozen material must be thawed and allowed to equilibrate to room temperature. The syringe should be oriented vertically with the dispense tip downward to minimize air entrapment during thawing. The material should be used within 6 hours of thawing.

3M™ Form-in-Place Gasket (FIPG) 7103 HC B/A (Two Part System)

Storage

Part B (base)

3M™ Form-in-Place Gasket 7103 HC Part B must be stored at -20°C (-4°F) or below in the original container to maintain rheological properties. The bag liners must be nitrogen purged and sealed tightly to exclude moisture.

Part A (accelerator)

3M™ Form-in-Place Gasket 7103 HC Part A can be stored at ambient conditions, but storage in the original container at -20°C (-4°F) or lower is recommended to maintain rheological properties. The bag liners must be nitrogen purged and sealed tightly to exclude moisture.

Pre-mixed and Frozen

Pre-mixed and frozen syringes or cartridges of 3M™ Form-in-Place Gasket 7103 HC must be stored at -40°C (-40°F) or below in the original container to maintain rheological properties.

Shelf Life

Part B (base)

The shelf life of 3M™ Form-in-Place Gasket 7103 HC Part B is 6 months when stored at -20°C (-4°F) or lower.

Part A (accelerator)

The shelf life of 3M™ Form-in-Place Gasket 7103 HC Part A is 6 months when stored at 27°C (80°F) and 12 months when stored at -20°C (-4°F) or lower.

Pre-mixed and Frozen

Pot life upon removal from -40°C (-40°F) freezer and fully thawed to room temperature is 6 hours.

Temperature	Part B	Part A	Pre-mixed
27°C (80°F)	1 month	6 months	6 hours
-20°C (-4°F)	6 months	12 months	
-40°C (-40°F)			6 months

3M™ Form-in-Place Gasket (FIPG) 7103 HC B/A (Two Part System)

Precautionary Information

Refer to Product Label and Material Safety Data Sheet for Health and Safety Information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.

For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-251-8634. Address correspondence to: 3M Electronics Markets Materials Division, Building 225-3S-06, St. Paul, MN 55144-1000. Our fax number is 651-778-4244 or 1-877-369-2923. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

Important Notice

All statements, technical information, and recommendations related to 3M's products are based on information believed to be reliable, but the accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use. Any statements related to the product which are not contained in 3M's current publications, or any contrary statements contained on your purchase order shall have no force or effect unless expressly agreed upon, in writing, by an authorized officer of 3M.

Warranty; Limited Remedy; Limited Liability.

This product will be free from defects in material and manufacture at the time of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. **Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.**



Electronics Markets Materials Division
3M Center, Building 225-3S-06
St. Paul, MN 55144-1000
1-800-251-8634 phone
651-778-4244 fax
www.3M.com/electronics

3M is a trademark of 3M Company.
IR-ARO is a registered trademark
of Ingersoll-Rand
Please recycle. Printed in U.S.A.
©3M 2009. All rights reserved.
60-5002-0398-3

