hapco inc.
FORMULATING THE FUTURE™

PRODUCT DATA SHEET

Di-Pak E-4565 FR

80 SHORE A POLYURETHANE ELASTOMER

Product Description

DI-PAK E-4565 FR is an elastomeric urethane designed for high strength and extreme conditions.

- UL 94V-0
- ROHS Compliant
- Low Viscosity

UL LISTED RoHS

Recommended Uses

Rapid Prototyping, industrial, tooling and foundry, orthotics, hobby and model making, potting and encapsulation, and medical device manufacturing.

This product is well suited for applications where durability and strength in a flexible rubber are required.

Performance Characteristics

PHYSICAL PROPERTIES	TEST METHOD	POST CURED PROPERTIES*
Tensile Strength (psi)	ASTM D-638	900
Elongation %	ASTM D-638	500
Tear Strength (pli)	ASTM 624 Die C	82
Modulus of Elasticity psi (000)	ASTM D-638	0.60
Izod Impact (ft.lbs/in.) notched unnotched	ASTM D-256	No Break
Service Temperature	ASTM D-648	125˚C
Flexural Strength (psi)	ASTM D-790	NA
Flexural Modulus psi (000)	ASTM D-790	NA
FR Rating	94-V	V-0
Dielectric Strength (volts/mil.)	ASTM D-149	≥ 350
Dielectric Constant 1 KHz 100 KHz	ASTM D-150	2.5 2.4
Volume Resistivity (ohm-cm)	ASTM D-270	8.9 x 10^{16}
Dissipation Factor 100 KHz @25°C	ASTM D-150	.023
Thermal Conductivity (BTU)(in)/ (hr)(ft^2)(°F)		1.6

Product Characteristics

HANDLING PROPERTIES	TEST METHOD	A/B Mixed
Mix Ratio by volume A:B	Calculation	100:85
by weight A:B		100:100
Gel time 100 grams @ 25°C	ASTM D-2971	20 min.
Color (cured)	Visual	Black
Hardness Shore	ASTM D-2240	80 A
Viscosity mixed @ 25°C cps	ASTM D-4878	670
Specific Gravity mixed @ 25°C	ASTM D-4669	1.05
Shrinkage inch/inch **See shrinkage paragraph**	ASTM D-2566	.002-.004
Demold time @ 70°F 1/8" thick	HAPCO TEST	4-6 hrs.
Cubic Inches/lb.	Calculation	26.4

PACKAGING	WEIGHT	CUBIC INCHES
QUART	4 lbs	105
GALLON	16 lbs.	422
5 GAL. PAIL	80 lbs.	2,112
55 GAL. DRUM	800 lbs.	21,120

**Note: These results are based on test specimens cured 1-3 hours at room temperature then 16 hours at 175˚F(80˚C) The above technical data is true and accurate at the date of issuance but is subject to change without prior notice.*

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MATERIAL HANDLING & SAFETY NOTES

SURFACE PREPERATION

TO PREVENT ADHESION:

To prevent adhesion to the mold, use a GREASE-IT release agent.
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.

TO PROMOTE ADHESION:

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.

MIXING

Components may separate and should be mixed separately 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.

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.

POSTCURE

Postcure Heat: 100-175°F (38-79°C) for a *minimum* of 6-12 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).

DE-MOLD & CURE TIMES

De-mold and final cure time can be accelerated with the addition of 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 de-mold and cure times by up to 50%. For full cure polymers require at least 7-10 days. Please be aware that size and mass effect de-mold and cure times.

HARDNESS

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.

SHRINKAGE

The values in the brochures are for comparative reference only, using ASTM testing procedures. Shrinkage or dimensional variation is largely influenced by mass (total volume and thickness), temperature (material and mold), and mold material. 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.

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MATERIAL HANDLING & SAFETY NOTES

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 molded parts. This process extends mold life.

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.

COLD TEMPERATURES

CAUTION - Part A may freeze or crystallize in cold temperatures. Part A may appear to be striated 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 125-150°F (51-65°C) for 3-8 hours or 8-12 hours for drums. Reseal, allow to cool, and then mix thoroughly.

CAUTION - Part B may freeze or crystallize in cold temperatures. Part B may turn thicker, appear to be striated, thicken, or solidity. **To prevent this see storage.**

This situation can be easily corrected. To reverse crystallization, loosen the cover on Part B and heat to 170-180˚F (77-82˚C) for 3–6 hours, drums, 6–12 hours. Allow to cool before using. If contents are pigmented, mix thoroughly.

MACHINE MIXING AND DISPENSING

Use Hapco's ***RAPID***FIL, ***MINI***FIL, and/or ***RAPID***SHOT dispensing machines for fast, reliable, and efficient mixing without the air entrapment, measuring, or mess associated with hand processing.

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.

RE-SEALING

Many polymers are moisture sensitive, reseal, using one of the following two (2) methods:

1. Blanket with nitrogen or Argon
2. 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, eye protection, and face masks 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.

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