

FoodPro® EPDM Materials

A NEW GENERATION OF FOOD CONTACT POLYMERS



Ensure Safe Sealing in Food Processing

The food and beverage industry is broad and very specialized. Each application and its location has its own unique demands and challenges, from fish farming in Norway, grain processing in the US, and dairy farming in India, to breweries in China, wineries in France, and vegetable processing in Italy. Ensuring consumer safety and high quality standards around the world, as well as making sure production processes are as efficient and sustainable as possible, are key priorities.

SEALING FOOD PROCESSING EQUIPMENT

Sealing technology plays a critical role in meeting these priorities. Compliance with food contact regulations is a must. Seal materials need to be compatible with a wide variety of food types, as well as harsh Cleaning in Place (CIP) and Sterilization in Place (SIP) processes, which can quickly damage incorrectly specified seals. By preventing contamination and leakage, high performance sealing solutions minimize downtime for maintenance and enhance the efficiency of processing equipment, while contributing to food safety.

Involved in sealing food and beverage applications since the 1960s, Trelleborg Sealing Solutions focuses on meeting new challenges with revolutionary products and materials. The majority of our formulations are proprietary and specifically engineered to meet the extremely high consumer safety demands of the food and beverage industry.



Engineered
for aseptic
technology

Full global
compliance

Good
manufacturing
practices

Compatible
with CIP/SIP
processes

Static and
dynamic
sealing

THE FOODPRO® EPDM MATERIAL RANGE

The Trelleborg Sealing Solutions FoodPro® range is a comprehensive collection of polymer-based materials specifically designed to meet the unique requirements of the food and beverage industry. The range includes a new generation of FoodPro® Ethylene Propylene Diene Rubber (EPDM) materials that provide full compliance with global food contact regulations and demonstrate unparalleled performance in processing applications.

FEATURES

- Compression and injection moldable; suitable for O-Rings, static seals and engineered molded parts
- Good dynamic properties; improved tensile strength, elongation, tear and wear resistance
- High chemical compatibility; suitable for use with a wide variety of food types and cleaning media
- Good Manufacturing Practice (GMP) implemented in manufacturing and compounding to ensure the ultimate in production efficiency and safety
- Suitable for multicomponent parts including rubber-to-metal, to facilitate hygienic design and more robust components

STANDARDS AND REGULATIONS

FoodPro® EPDM materials comply with all major food contact material regulations and industry standards globally, including:

- US FDA CFR 21, Section 177.2600 (E75F1 meets infant formula requirements)
- European Union Regulation (EC) 1935/2004
- European Union Regulation (EC) 2023/2006 GMP
- Rubber specific EU member state regulation:
 - Dutch Regulation on packing and consumer articles
- People's Republic of China: GB 4806.1-2016, GB 4806.11-2016, GB 9685-2016
- 3-A Sanitary Standard Class I low fat tolerance rubber
- USP 87 & USP 88 (E75F1)
- REACH Regulation (EC) 1907/2006
- ADI – No animal derived ingredients in material recipe

APPLICATION EXAMPLES

- Separators
- Decanters
- Valves
- Pipe couplings
- Filling machines
- Seat valves, double-seated valves
- Aseptic flange connections
- CIP/SIP cleaning equipment
- Kitchen appliances

SUITABLE FOR USE WITH DIFFERENT FOODS, INCLUDING:

- Alcoholic beverages, including beer, wine and mixed drinks
- Soft drinks, including carbonated and water based flavored drinks
- Fruit and vegetable juices, smoothies and concentrates
- Dairy products with low to medium fat content*
- Protein drinks or dairy replacement drinks
- Infant formula (specifically E75F1)

CONTACT YOUR CUSTOMER SOLUTION CENTER

Does your application have unique requirements? Is the operating environment of your application especially challenging or does it need to comply with multiple food contact regulations?

Reach out to your local Trelleborg Sealing Solutions Customer Solution Center for support with material selection to meet your specific requirements.



* Not recommended for high fat products, such as oil or butter

The FoodPro® EPDM Family

Specifically engineered for use in virtually all food and beverage processing applications, our range of FoodPro® EPDM materials demonstrates compliance with the most comprehensive list of global food contact material regulations. These materials are suitable for use with virtually all food and beverage products and are resistant to harsh cleaning and sterilization processes.

E75F2

For universal use

Ideal for universal use in a full range of processing environments, the 70 Shore FoodPro® E75F2 maximizes the usability of EPDM in static and dynamic applications.

Because of its versatility, manufacturers of processing equipment can look to FoodPro® E75F2 to meet their customers' requirements globally. Equipment developers no longer need to specify sealing materials dependent on geographical use, or different process media and cleaning regimes. This saves significant time, reduces complexity and simplifies manufacturing processes.

Advantages: Extremely versatile – Good dynamic properties – Suitable for wide range of applications

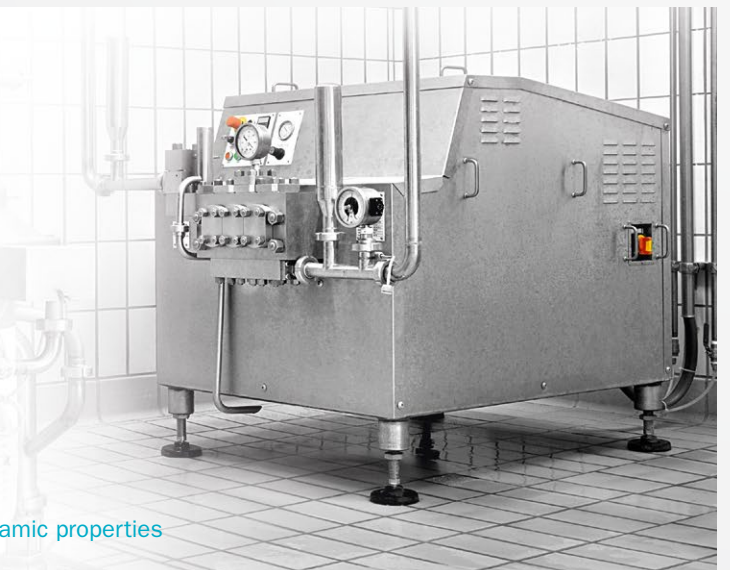


E85F2

Designed for high pressure applications

FoodPro® E85F2 is an 80 Shore EPDM material for static and dynamic applications that demonstrates similar properties to FoodPro® E75F2. The material's increased hardness offers enhanced extrusion resistance and makes it the optimum compound for high pressure applications.

Advantages: Enhanced extrusion resistance – Good dynamic properties



E75F1

Suitable for use with infant formula

FoodPro® E75F1 is a 70 Shore EPDM sealing material for static and semi-dynamic applications. The material meets all relevant global food contact regulations, and due to its low levels of carbon black, it meets the strict US Food and Drug Administration (FDA) requirements for use in equipment processing infant formula.

Advantages: For infant formula applications – Meets strictest regulations



MATERIAL DATA

General data	E75F2	E85F2	E75F1
Basic polymer	EPDM	EPDM	EPDM
Color	black	black	black
Hardness	70 +/- 5 Shore A	80 +/- 5 Shore A	70 +/- 5 Shore A
Temperature range	-45 °C to +150 °C -49 °F to +302 °F	-45 °C to +150 °C -49 °F to +302 °F	-45 °C to +150 °C -49 °F to +302 °F

Properties	Standard	Specification			Unit
		E75F2	E85F2	E75F1	
Density	DIN EN ISO 1183-1	1.09 +/- 0.02 0.039 +/- 0.0007	1.13 +/- 0.02 0.041 +/- 0.0007	1.20 +/- 0.02 0.043 +/- 0.0007	g/cm ³ lb/in ³
Tensile strength		≥ 10.0 ≥ 1,450	≥ 8.0 ≥ 1,160	≥ 10.0 ≥ 1,450	MPa psi
Elongation at break		≥ 125	≥ 125	≥ 150	%
Compression set 24h/+150 °C, 24h/+302 °F	DIN ISO 815-1 B	≤ 25	≤ 25	≤ 25	%
Low temperature behavior Tr 10 point	TBS 00036	< -40 < -40	< -40 < -40	< -40 < -40	°C °F

Proven Performance

Using extensive in-house facilities, Trelleborg Sealing Solutions material engineers conduct tests to demonstrate the resistance of FoodPro® materials to the harsh chemicals used in CIP and SIP cleaning regimes.

Rigorous testing ensures the broadest possible use of FoodPro® EPDM materials in the food and beverage industry, including tests to verify compatibility with the harshest chemicals in cleaning processes according to DIN ISO 1817.

- To test compatibility with Clean-in-Place (CIP) media, material samples are placed in special jars and fully covered with CIP fluid. The jars are placed in an oven and stored for several weeks at a defined temperature.
- Autoclaves are utilized to test materials for suitability with Sterilization-in-Place (SIP) processes. Material specimens are subjected to hot liquid or gaseous media, such as steam, to replicate typical SIP processes.

FoodPro® EPDM materials demonstrate long life in polar media and excellent compatibility with alkaline cleaning agents, retaining hardness and tensile strength, while exhibiting little volume change.



Ovens in the Trelleborg Sealing Solutions Material Laboratory are used to test materials for compatibility with CIP media.

Compatibility with CIP / SIP media

E75F1 E75F2 E85F2



168 hours

Sodium hydroxide 2%
(+85 °C / 185 °F)

504 hours

Sodium hydroxide 2%
(+85 °C / 185 °F)

Cleaner containing peroxide
(+90 °C / 194 °F)

Sodium hydroxide 2%
(+140 °C / 284 °F)

Cleaner containing peroxide
(+90 °C / 194 °F)

Sodium hydroxide 2%
(+140 °C / 284 °F)

Acidic cleaner
(Phosphoric acid)
(+60 °C / 140 °F)

Nitric acid 2%
(+85 °C / 185 °F)

Acidic cleaner
(Phosphoric acid)
(+60 °C / 140 °F)

Nitric acid 2%
(+85 °C / 185 °F)

Water
(+150 °C / 302 °F)

Water
(+150 °C / 302 °F)

Ensuring Compliance

The FoodPro® range of EPDM materials has gone through extensive testing to ensure they are compliant with global food contact regulations, prior to being released for use in food and beverage processing equipment.

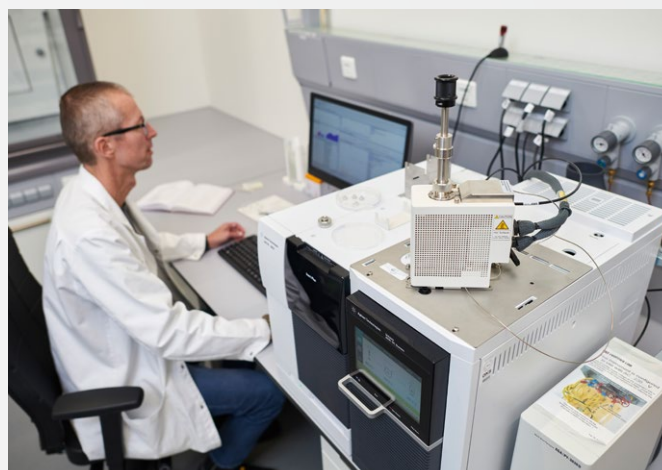
Based on a food contact compliance assessment of the compound recipes, Trelleborg Sealing Solutions experts design a test program for materials, which covers all requirements of relevant food contact regulations.

Tests are conducted at Trelleborg Sealing Solutions state-of-the-art R&D facilities, as well as external laboratories with relevant accreditations. Tests to demonstrate compliance with Chinese food contact regulations are performed at accredited laboratories in China.

MIGRATION AND EXTRACTION TESTING

Migration from food contact materials is typically tested using food simulants, under conditions resembling the worst-case scenario that can occur in the real application. Migration conditions are chosen according to relevant food contact regulations.

TESTING FOR SPECIFIC SUBSTANCES



Gas chromatography-mass spectrometry equipment in the Trelleborg Sealing Solutions Materials Laboratory identifies different migrating substances in samples.

To test materials for specific substances, a targeted analysis uses advanced analytical techniques. Depending on the migrants under examination, liquid chromatography, gas chromatography and mass spectrometry devices are used in different combinations.

Detailed information about the conditions of use covered by the assessment can be found in our Declaration of Compliance for Food Contact Materials that is available from your local Customer Service Center.

WATCH THE VIRTUAL CONFERENCE SESSION ON FoodPro®



Virtual Conference 2021
The Future of Manufacturing

At the Virtual Conference 2021 – the Future of Manufacturing, Trelleborg Sealing Solutions experts gave viewers a behind the scenes look at our material laboratory in a session titled **Food contact regulations – how to ensure compliance.**



Watch the session recording to learn more about the tests we perform on food contact materials.

Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative solutions accelerate performance for customers in a sustainable way.

Trelleborg Sealing Solutions is a leading developer, manufacturer and supplier of precision seals, bearings and custom-molded polymer components. It focuses on meeting the most demanding needs of aerospace, automotive and general industrial customers with innovative solutions.

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If you'd like to talk to Trelleborg Sealing Solutions, find your local contact at: www.trelleborg.com/seals/worldwide