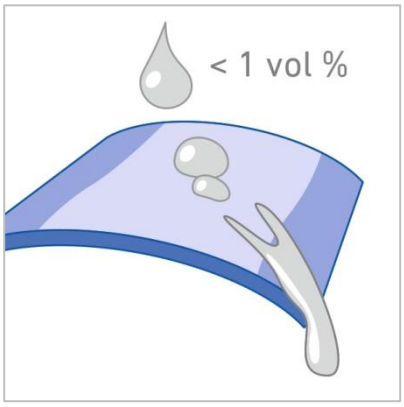
ALVEOLIT®

Sealing gaskets and -rings

General Properties Alveolit

Alveolit is closed cell, physically cross-linked polyolefin foam and has the following general properties:

- Excellent physical properties in static and dynamic range
- Smooth, uniform, closed cell structure
- Low water absorption
- Low water vapour permeability
- High chemical resistance
- Odourless
- Ecological and chemical neutral
- Excellent sealing performance
- Products for direct food contact available



Product description

Alveolit has proven itself in recent years as a very good product in gaskets and seals. Due to the excellent chemical resistance of Alveolit, it can be used under difficult conditions. For direct food contact, the special type Alveolit TA SF was developed.

Description Alveolit:

Alveolit foams are closed cell and physically cross linked polyolefin foams in rolls. Alveolit TA BR and Alveolit TA SF are the proven types over the recent years for gaskets and sealing's. The production of Alveolit is divided in three different steps:

- Extrusion
- Cross linking
- Foaming

For the extrusion process polyethylene and foaming agent are mixed, molten and extruded to a flat film in the extruder. The molecules are connected to each other by the cross linking process, which improves the chemical and physical properties of the polyethylene. During the foaming process the flat, cross linked film is heated and the foaming agent activated. Due to the activated foaming agent, the extruded film starts to expand in all directions and the film is converted to foam.
The difference between TA BR and TA vs TA SF in different expansions and thicknesses is mainly a different foaming agent which makes TA SF food contact compliant.

Chemical resistance Alveolit

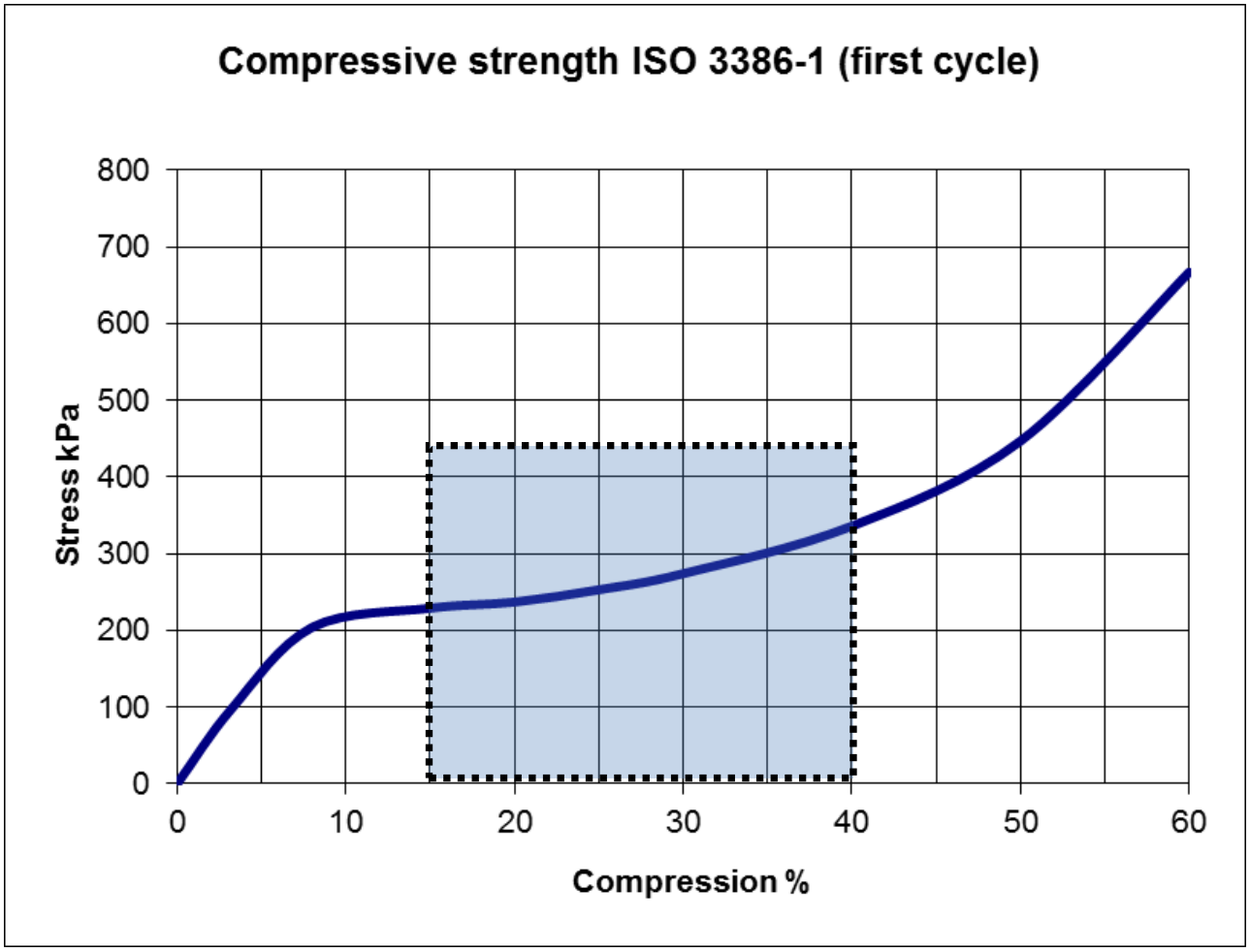
Alveolit is made with polyethylene which has an excellent chemical resistance. The chemical resistance is improved by the cross linking. Alveolit is resistant against many different chemicals at room temperature.
Water and inorganic substances which are dissolved in water (acids, caustics, salts) do not or only minor affect thermoplastic foams made of PE.
Organic media affect thermoplastics in another way compared to inorganic materials. Secondary effects at mixtures of different substances lead to a difficult classification of the chemical resistance of the foam.
After long-time exposure to chemicals Alveolit can show volume changes which are mostly reversible and seldom is a change of the physical properties behind. Due to the high variety of different chemicals available we recommend to check the chemical resistance individually.

Alveolit can be used with the chemical substances mentioned in the following table. For the tests Alveolit was immersed into the chemical substance for one week at 23°C. A volume change below 10% is judged as resistant.

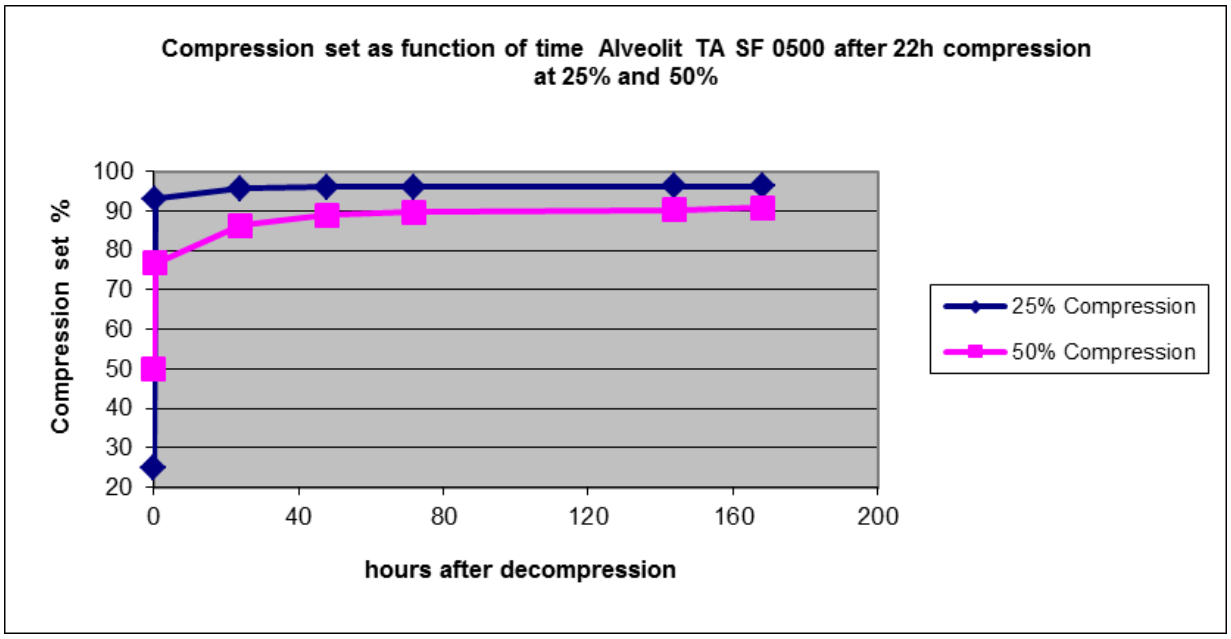
Group	Substance
Solvents	Water
	Ethanol 5%
	Ethanol 50%
	Ethyl acetat
	Toluene
	1,2-Dichloroethan
	Tetrachloromethan
	Heptane
Acids (aqueous)	Carbondioxide 10%
	Acetic acid 5%
	Nitric acid 10%
	Sulfuric acid 3%
	Sulfuric acid 30%
	Citric acid 10%
	Hydrochloric 10%
	Oleic acid
Bases (aqueous)	Ammonium hydroxide
	Calium hydroxide 10%
	Sodium hydroxide 1%
	Sodium hydroxide 10%
Salt solutions (aqueous)	Sodium chloride 10%
	Sodium silicat <40%
Oxidants	Hydrogen peroxide 3%
	Nitric acid 10%
Alcohols	Ethanole
	Methanole

Recommendations for the usage of Alveolit

Alveolit foams have closed cells and therefore compressions above 60% of initial thickness are not recommended. Such high compressions can damage the cells and the sealing is no longer guaranteed. For a long lasting and reliable sealing performance Alveolit foams we recommend to compress the material between 15% and 40%.

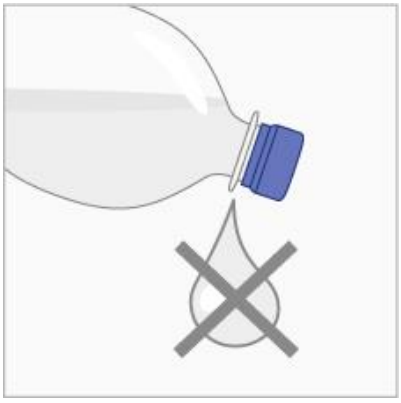


Alveolit foams have a good static pressure performance. It is important that a sealing shows a good recovery after a certain period of compression. When the closure is opened the sealing should come back to the initial thickness to get a reliable and good sealing performance after the next closing. In the following graph it can be seen how Alveolit foams recover after a compression of 25% and 50% of initial thickness for 22h. It is visible that Alvelit recovers at a compression of 25% quickly, but needs a longer time if compressed by 50%.



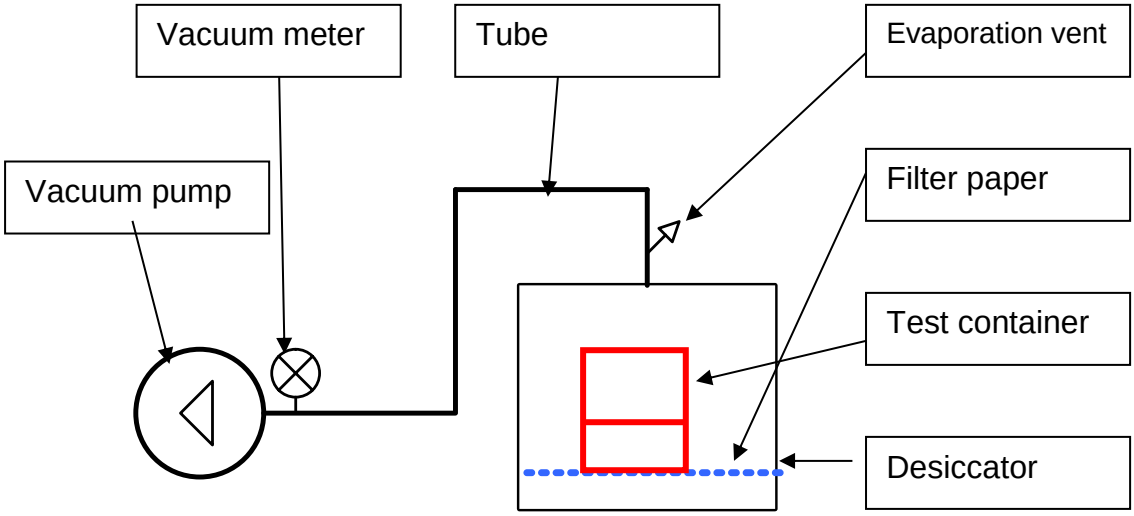
In Sekisui Alveo's application service laboratory several tests regarding sealing and gaskets on customer samples can be made like:

- Measurement of density and thickness.
- Identification of melting point and used polymer type
- Material coating identifications
- Tests regarding sealing performance



Sealing test

With a special developed vacuum test we can determine in our Application Development Laboratory if the seal is properly made. Therefore the closure, the container and the suitable sealing have to be available. For the test, the container is filled with water incl. a food contact colour. Afterwards the container will be closed together with the sealing. The test container is placed in a vacuum chamber and tested for leakage.



Declaration of conformity

Alveolit TA SF foams are produced according the following regulations regarding food contact:

- **Regulation (EC) No 1935/2004** and its amendments of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with food. This regulation is the basis for creating a high level of protection of human health and consumers' interests. Article 5 of that regulation provides that, inter alia, for plastics (Annex I, No 10), individual measures may be adopted.

- **Commission Regulation (EU) No 10/2011** of 14 January 2011 on plastic materials and articles intended to come into contact with food, including any changes up to and including Regulation (EU) No 1282/2011, will set specific requirements for the manufacture and placing on the market of those products.

- **FDA 21 CFR** requirements are fulfilled with Alveolit TA SF:
  - § 177.1210 - Closures with sealing gaskets for food containers
  - § 177.1520 - Olefin polymers
  - §178.3010 - Adjuvant substances used in the manufacture of foamed plastics

Up to date official certificates are available under www.sekisuialveo.com/download