

## Materials

**FESTO**

excerpt from:

**FESTO**

**Expert knowledge and solutions**  
for the food and beverage industry



## Materials

### Selecting the material

In order to protect the food, the machine components must not deposit or take in any substances during the production process that are harmful to health or that impair the taste or aroma, through either

direct or indirect contact with the food. To make certain that the work carried out during the cleaning phase is safe, the materials used for the machine parts must not react with the cleaning agents or the

anti-microbial chemicals (disinfectants). They must therefore be corrosion-resistant and mechanically stable with a finish that prevents the surface from being negatively affected.

### Standard materials in the food industry

#### High-alloy stainless steel

High-alloy stainless steel is usually the logical choice of material for the construction of machines and units in the food industry.

#### High-alloy steels (RoHS-compliant)

AISI	EN10088-1	DIN	International	Suitable for contact with food products in accordance with	Corrosion Resistance Class CRC
AISI 304	X5CrNi18-10	1.4301	0Cr18Ni9 (China) SUS 304 (Japan) STS 304 (Korea) 08Ch18N10 (GUS)	ANSI/NSF 51	3 (4 with smooth surface, by electro-polishing for example)
AISI 316	X5CrNiMo17-12-2	1.4401	STS 316 (Korea) 08Ch16N11M3 (GUS) 0Cr17Ni12Mo2 (China) SUS 316 (Japan)	ANSI/NSF 51	3 (4 with smooth surface, by electro-polishing for example)
AISI 316L	X2CrNiMo17-12-2	1.4404	00Cr17Ni14Mo2 (China) STS 316L (Korea) SUS 316L (Japan)	ANSI/NSF 51	3 (4 with smooth surface, by electro-polishing for example)
AISI 316L	X2CrNiMo18-14-3	1.4435	00Cr17Ni14Mo2 (China) SUS 316L (Japan)	ANSI/NSF 51	3 (4 with smooth surface, by electro-polishing for example)
AISI 329	X3CrNiMoN27-5-2	1.4460	0Cr26Ni5Mo2 (China) 10Ch26N5M (GUS) SUS 329J1 (Japan)	ANSI/NSF 51	3 (4 with smooth surface, by electro-polishing for example)
AISI 316Ti	X6CrNiMoTi17-12-2	1.4571	0Cr18Ni12MoTi (China) 10Ch17N13M2T (GUS) STS 316Ti (Korea) SUS 316Ti (Japan)	ANSI/NSF 51	Titan increases the CRC to 4

### Aluminium

Aluminium materials are frequently used. It is affordable and easy to work with and process.

#### Aluminium alloys (RoHS-compliant)

Designation	Material number in accordance with EN	Suitable for contact with food products in accordance with	Corrosion Resistance Class CRC untreated	Corrosion Resistance Class CRC anodised
AlCuMg1, AlCuMg2	EN AW-2017A, EN AW-2024	–	0	1
Al99,5	EN-AW-1050A	ANSI/NSF 51	0 ... 1	2
AlMgSi0,5	EN-AW-6060	ANSI/NSF 51	1 ... 2	3
AlMgSi0,7	EN-AW-6005A	ANSI/NSF 51	1 ... 2	3
AlMgSil	EN-AW-6082	ANSI/NSF 51	1 ... 2	3
AlMg1, AlMg3, AlMg5	EN-AW-5005, EN-AW-5774, EN-AW-5019	ANSI/NSF 51	1 ... 2	3

## Materials

### Plastics

Plastics and elastomers permitted to come into direct contact with food must comply with Directive 1935/2004/EC or the Plastics Directive 10/2011 or the directives of the FDA.

In addition to resistance to stress, ease of cleaning is also an important factor in the selection of suitable plastic materials. They must not give off or absorb any hazardous substances.

#### → Note

The plastics listed are found in the food industry. A plastic from a group (e.g. PP) that is compliant with directives must always be checked on an individual basis to ensure conformity. A group of plastics is **never** inherently compliant.

Plastics and elastomers				
Designation	Code	Conformity within the group possible based on:	Resistant to diluted acids	Resistant to diluted lyes
Polypropylene	PP	FDA and/or 10/2011	±	+
Polyamide	PA	FDA and/or 10/2011	–	0
Polyvinyl chloride	PVC	–	±	±
Polyvinylidene fluoride	PVDF	FDA and/or 10/2011	±	±
Polyoxymethylene	POM	FDA and/or 10/2011	–	0
Polymethyl methacrylate	PMMA	FDA and/or 10/2011	±	±
Polycarbonate	PC	FDA and/or 10/2011	±	–
HD-polyethylene	PE-HD	FDA and/or 10/2011	±	±
Polyethylene terephthalate	PET	FDA and/or 10/2011	0	–
Polyether ether ketone	PEEK	FDA and/or 10/2011	±	±
Polytetrafluoroethylene	PTFE	FDA and/or 10/2011	±	±
Ethylene propylene diene terpolymer	EPDM	FDA	±	±
Fluoro elastomer	FKM/FPM	FDA	±	–

–: Not resistant; 0: Resistant to a limited extent; ±:Resistant

A comprehensive overview of the resistance of plastics and elastomers to acids, lyes and other substances can be found on the Festo homepage:

→ [www.festo.com/media\\_resistance](http://www.festo.com/media_resistance)

#### → Note

Festo products are not made of materials for contact with food. If permanent contact with food is planned, an individual test must be carried out in consultation with Festo.

The above-named plastics and elastomers are used in Festo products. To some extent, the materials used are compliant with FDA directives and/or the Directive 10/2011 EC. More information on this point can be found in the certificates for our products. For example, in the products NPQP, NPQH, CRDSNU, among others, components made from the above mentioned plastics and elastomers are used.

**The correct selection of a suitable plastic involves many parameters that are based on their design, functionality and area of application. The list shows an overview of possible products with the plastics mentioned.**