2.7.4.2 Glass

Brine cheese is sometimes packed into jars with twist-off caps. Glass consists of silicate (~75%), sodium carbonate ~15%), limestone (~10%) and is molten at ~1 500 °C. It contains traces of aluminium-, potassium-, and magnesium salts. Additives to molten glass such as iron oxide, cadmium and phosphate provide colour to glass. It is resistant to chemical influences; further, it is water-, gas-, and flavour-tight; it has a solid, smooth and easy to clean surface. Glass containers have a high temperature and pressure performance. Its fragility, its relatively high weight (ρ = 2 400...3 000 kg/cm^3) and light transmission, specifically for white glass, is disadvantageous.

2.7.4.3 Aluminium

This material can be rolled to a gauge of ~9 µm, but then it shows pores. Aluminium laminate can be manufactured pore-free from a gauge of ≥20 µm. At this stage, it is absolutely light-, vapour- and gas-tight. In order to save material, aluminium laminate is preferably used in form of plastic-coated multiply laminate. Even at a purity of 99.5%, aluminium is not corrosion-proof. In general, aluminium laminate is coated with paint.

2.7.4.4 Cellophane = Cellulose-Hydrate

This natural product is obtained after treating wood or cotton cellulose with sodium hydroxide and carbon disulfide. This packaging material, used for decades, is resistant to ripping, flexible, clear, fat- and cold-resistant as well as water- and fat-proof. However, Cellophane is hygroscopic and swells at too high humidity. Lacquering with a nitrocellulose lacquer, resin or paraffin makes it weather- and humidity-proof. It can be sealed at 120 °C.

2.7.4.5 Polyethylene (PE) and Polypropylene (PP)

PE is manufactured in two variants, i.e.

- Low density = LDPE (ρ = 0.92 g/cm^3), softens at ~110 °C and can be sealed at ~120 °C
- High density = HDPE (ρ = 0.95 g/cm^3), softens at 130 °C and can be sealed at ~135 °C.

Fat resistance increases with increasing density, gas permeability decreases on the other hand. Laminates are manufactured with a gauge of 10...40 µm. This material is cold-proof, flavour- and taste-free, but not aroma-proof. There exists soft, elastic HDPE and a hard, rigid LDPE.

PP with a density of ρ = 0.9 g/cm^3 is brittle at <10 °C, but can be used up to 150 °C. Due to its high surface hardness it is less scratch-prone than PE, plus it is humidity- and fat-proof. Gas permeability of PP is only one third of PE. For processing of PP, tip-welding is required, as melting range is relatively narrow. It can be poured. Film gauges of 10...20 µm are common. PP in combination with PVDC is very tight. Vapour permeability is reduced to 50%; gas permeability is even reduced to 1/100...1/300.

2.7.4.6 Polyvinyl chloride (PVC) and Polyvinylidene chloride (PVDC)

PVC – at a density of ρ = 1.38 g/cm^3 and a softening point at ~60 °C- is taste- and flavour-neutral, solid, hard, fat- and flavour-proof.

PVDC – at a density of ρ = 1.68...1.78 g/cm^3 – has a high impermeability against water, flavour, gas and fat. It can be shrinked, but has inadequate welding performance. Sealing temperature is ~150 °C.

2.7.4.7 Polyethylene terephthalate (PETP) and Polyamide (PA)

PETP (= linear, saturated, thermoplastic polyester is obtained by condensation) has a density of ρ = 1.39 g/cm^3 and can be used in a temperature range of –50...+150 °C. High tear factor, transparency,