

# MATERIALS OF CONSTRUCTION FOR FOOD PROCESSING EQUIPMENT AND SERVICES: REQUIREMENTS, STRENGTHS AND WEAKNESSES

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## Abstract

Worldwide international and national legislative and standardization bodies have laid down laws, regulations, standards and guidelines with requirements that food contact materials must meet when they are used in direct contact with food. However, most of them are written from a “packaging material” rather than a “material of construction for food processing equipment and services” perspective. Materials of construction are usually selected based on their strength, elasticity, hardness, toughness, sensitivity to wear, corrosion and fatigue resistance, ease of fabrication, availability and cost price. However, in the construction of food processing equipment and services, the focus of materials of construction for food processing equipment and services also lays on the prevention of food contamination with microorganisms, dirt, chemicals and physical substances during the short period of contact between the product and equipment surfaces.

Materials of construction must be: physical durable and mechanical stable (strong, hard, tough, impact and crack resistant, resistant to wear, tear and abrasion), easy to machine (in specific sizes and shapes) and to join (continuous hygienic bonding or welding), compatible with other materials of construction (no metal-to-metal corrosion) and/or functional substances (lubricants, refrigerants, etc.), inert (no adulteration of the food with deleterious substances), chemical resistant (to the food, cleaning agents and disinfectants), heat and/or cold resistant, and last but not least hygienic (smooth, not sensitive to fouling, and easy to clean and decontaminate). To select the most appropriate materials of construction for use in either the food contact, or the non-food contact area, the equipment manufacturer must have knowledge of the physical, chemical and thermal behaviour of an as large as possible range of market available materials of construction, must be familiar with their hygiene characteristics, and must have insight in the laws, regulations, standards and guidelines applicable to the materials of construction used in the design and manufacturing of his food processing equipment.

This text gives an overview of the regulations and hygienic requirements that materials of construction commonly applied in the manufacturing of food processing equipment and services must meet, with further emphasis on their suitability in either the food-contact or non-food contact zone, in an environment where harsh chemicals are used to clean and disinfect. For different materials of construction, specific problems with respect to their hygiene, inertness, physical characteristics, and chemical and thermal resistance will be discussed.

**Key words:** *Food contact materials, Materials of construction, Legislation, Resistance.*