

CiM & CiM-Like

Sintering process

Sintering can be defined as the set of transformations that occur in a material, under the action of heat, by heat treatment and without total melting, leading to the consolidation of an assembly of disjoint grains (the sintered part). The weight of the sintered part may or may not be affected by the sintering process. The sintering process is characterized by the growth of the grains. We can distinguish several types of sintering:

- consolidation sintering (the most frequent)
- densification sintering (used for ceramic filters)
- diffusion sintering (used for ceramic filters)
- reactive sintering (used for ceramic filters)

Sintering is the most frequent process used in the field of ceramic filters.

If no liquid phase appears, the sintering is said to be "in solid phase" with two types of sintering:

- non-reactive sintering: a chemical constituent at the start, a part composed of the same constituent at the end,
- reactive sintering: densification is accompanied by one or more chemical reactions between the constituents.

If a liquid phase appears, the sintering is said to be "in the liquid phase": the liquid phase (minority to maintain the mechanical strength of the part) can come from the simple fusion of a second constituent present (addition of sintering or impurity) or of an eutectic reaction between different constituents. Depending on whether an external mechanical stress is applied or not, a distinction is made between natural sintering and sintering under load.