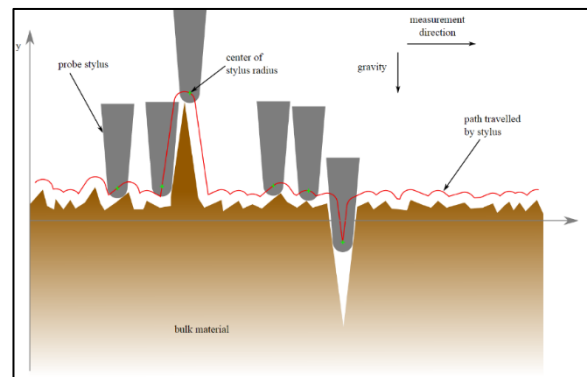


SVF is a recognized leader in providing the pharmaceutical market with hygienic valves for a range of different applications. A common requirement is to provide our valves with various levels of surface finish to meet design specifications.

Surface finish is the nature of the surface as defined by three characteristics: lay, waviness and surface roughness. Each manufacturing process produces a surface texture. The process is usually optimized to ensure that the resulting surface finish is usable. If necessary, additional processes will be added to modify the finish, i.e. mechanical or electro polishing

What is surface finish and how is it measured? Surface finished can be measured in two ways: Contact and non-contact methods. Contact method involves dragging a measurement stylus across the material's surface. These instruments are called profilometers. Profilometers provide the Ra (Roughness average) of the surface's peaks and valleys. This is usually measured in μin . The most common non-contact methods is visual inspection with a borescope.

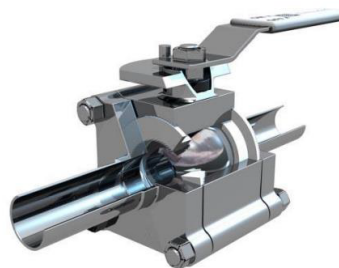


How a profilometer works

ASME BPE (American Society of Mechanical Engineers: Bioprocessing Equipment) calls out a Surface Designation to indicate the required Ra for process contact surfaces. These surfaces are inside the valve flow path.

ASME also states that the surface finished are examined through one or more of the following procedures.

- Visual examination (direct or indirect with a borescope)
- Liquid penetrant testing
- Surface roughness measurement device (profilometer)



All of the SVF high purity CleanFLOW valves are tested with a profilometer for surface roughness as well as a visual inspection with a borescope to ensure compliance with ASME BPE.

Table SF-2.4-1 R_a Readings for Metallic Process Contact Surfaces

Surface Designation	Mechanically Polished [Note (1)]	
	R_a Max.	
	$\mu\text{in.}$	μm
SF0	No finish requirement	No finish requirement
SF1	20	0.51
SF2	25	0.64
SF3	30	0.76
	Mechanically Polished [Note (1)] and Electropolished	
	R_a Max.	
	$\mu\text{in.}$	μm
SF4	15	0.38
SF5	20	0.51
SF6	25	0.64

GENERAL NOTES:

- (a) All R_a readings are to be in accordance with ASME B46.1.
- (b) All R_a readings are taken across the lay, wherever possible.
- (c) No single R_a reading shall exceed the R_a max. value in this table.
- (d) Other R_a readings are available if agreed on between the owner/user and supplier, not to exceed values in this table.

NOTE:

- (1) Or any other finishing method that meets the R_a max.

Visit www.asme.org for more information on the Surface Finish standards of equipment for the pharmaceutical market.