

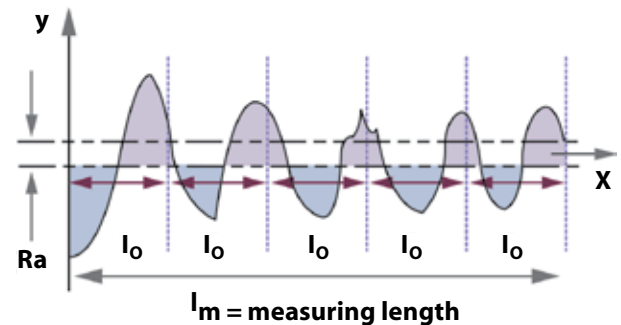
## Saunders<sup>®</sup> Surface Finish

Product contact surfaces are a critical attribute of process components used in the Life Science industries.

- 1 316L (DIN 1.4435) Stainless Steel is the standard material of construction for tube, fittings and valves.
- 2 316L (DIN 1.4435) Stainless Steel is strong and rigid, corrosion resistant and tolerant of high purity water, cleaning solutions and proteins. 316L is easily machined and welded and is relatively low in cost.
- 3 316L (DIN 1.4435) Stainless Steel is also easily polished. This includes both mechanical polish and electro-polishing to finishes as smooth as 10 Ra (0.25µM) and lower.

Very smooth product contact surfaces are essential in Life Science applications to reduce surface finish anomalies that can harbor microbes or permit growth of biofilm.

Life Science applications are generally subjected to Clean in Place (CIP) and Steam in Place (SIP) cleaning and sanitizing



**Arithmetic mean roughness value:**

$$Ra = \frac{1}{l_m} \int_{x=0}^{x=l_m} |y| dx$$

processes. These practices are dependent on smooth ID finishes to be effective.

Ra is the industry standard measure of surface finish. Ra value is measured in micro inches or micro meters and is defined as the average value of the departures from its center line through a prescribed sampling length.

# Saunders® Surface Finish

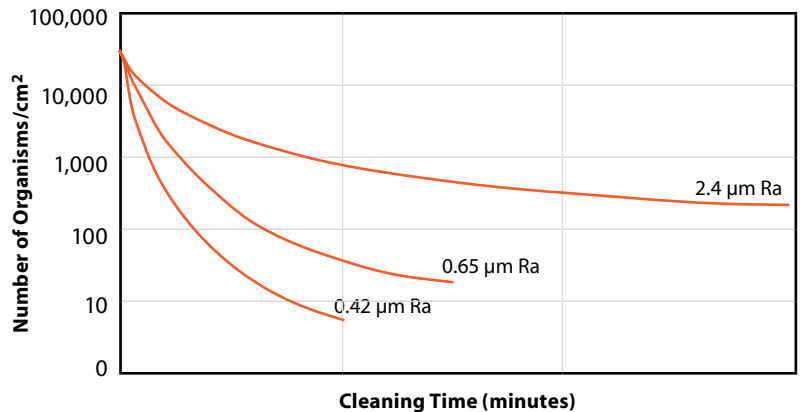
Saunders® offers a full range of surface finish options on 2-way, welded, and machined block bodies. This includes both mechanical polish and electro-polish over mechanical polish.

Finish	Product Contact (ID) Surface Finish Options						
	Measurement				Body Type		
	Ra (micro inch)	Ra (micro meter)	ASME BPE SF Code	Saunders Type	Forged	Wrought	Cast
Mechanical Only	30	0.8	SF3	N/A	Yes	Yes	Yes
Mechanical Only	25	0.6	SF2	N/A	Yes	Yes	Yes
Mechanical + EP	25	0.6	SF6	N/A	Yes	Yes	No
Mechanical Only	20	0.5	SF1	Satin	Yes	Yes	Yes
Mechanical + EP	20	0.5	SF5	Satin	Yes	Yes	No
Mechanical Only	15	0.4	N/A	N/A	Yes	Yes	Yes
Mechanical + EP	15	0.4	SF4	N/A	Yes	Yes	No
Mechanical Only	10	0.25	N/A	Mirror	Yes	Yes	No
Mechanical + EP	10	0.25	N/A	Mirror	Yes	Yes	No

All Saunders® finishes are measured in Ra maximum.

Saunders® offers both standard and upgraded OD (Outside Diameter) finishes. Polished OD finish offers a higher level of aesthetics and improves cleanability in sterile processing areas.

External Finish (OD)			
Body Type	Standard Finish	Optional Finishes	
		Mechanical Polish	Mech + EP Polish
Forged	As Forged	Yes	Yes
Wrought	As Machined	Yes	Yes
Cast	As Cast	Yes	Yes
20	0.5	SF5	Satin
15	0.4	N/A	N/A
15	0.4	SF4	N/A
10	0.25	N/A	Mirror
10	0.25	N/A	Mirror



\* Standard OD finish is bead blasted to provide surface consistency.

Please visit our Web-Based Drawing Library at: [www.saundersdrawings.com](http://www.saundersdrawings.com) for current database of drawings in PDF, 2D DWG, and 3D STP formats.



CRANE ChemPharmaFlowSolutions, Saunders® 9860 Johnson Road  
Montgomery, Texas, USA 77316 Tel: +1 936 588 8360 Fax: +1 936 588 8302



**CSI**  
417.831.1411  
csidesigns.com

IMPORTANT: CRANE Co. and its subsidiaries are not responsible for the accuracy, compliance, and legality of material contained in this datasheet offered in print, on the company websites, or via any external links, or third party sites.