



SF1 (PL) AND SF4 (PM) BPE FITTINGS AND TUBING

When processing expensive medicines and ingredients, product holdup and contamination becomes a major concern. BPE fittings are manufactured to the ASME BPE Standards to achieve a certain degree of unity and an acceptable level of quality.

SURFACE FINISH AND ROUGHNESS AVERAGE

Surface finish is a critical characteristic in the BPE spectrum given the importance of cleanliness in bioprocessing applications.

Roughness Average (Ra) refers to how smooth or rough the stainless steel is. It measures the peaks and valleys of the surface of the steel in microinches. The lower the Ra, the smoother and more mirror-like the surface will be.

Ra of the interior surface of fittings and tubing is generally measured with a profilometer.

BPE fittings and tubing are typically offered in two finishes:

- SF1 20Ra Mechanical Polish (PL)
- SF4 15Ra Electropolish (PM)

DIFFERENCES BETWEEN BPE AND 3A STANDARD SANITARY FITTINGS AND TUBING

- BPE fittings are held to higher standards and traceability and require a cleaner interior surface finish than standard food-grade fittings.
- ASME-BPE fittings are required to have specific permanent markings on the outside of the fitting. This marking includes, but is not limited to, heat number, material type, company, country of origin, surface finish and “BPE.”
- Documentation and packaging are critical throughout the manufacturing process of BPE so that end-users can trace their products back to inception should anything go wrong in production.
- To comply with ASME-BPE Standards, all BPE fittings are dimensionally consistent regardless of manufacturer.

By selecting BPE tubing over its standard sanitary counterpart, customers gain peace of mind over the quality of their process equipment in highly sensitive systems.

As a full-service solutions provider for sanitary process customers, we provide a variety of ASME-BPE stainless steel tubing and fittings for food, beverage, personal care and biopharmaceutical applications.



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SURFACE FINISHES IN BPE TUBING AND FITTINGS

Surface finish (SF) 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 optimized to ensure that the resulting SF is usable. If necessary, additional processes will be added to modify the finish, e.g., mechanical or electropolishing.

SF1

SF1 products feature a 20 roughness average (Ra) inside diameter (ID) mechanical polish (PL).

There are two finishes for SF1 products: PL and PC. The only difference between the PL and PC is the outside diameter (OD) finish, which the ASME-BPE does not regulate.

- SF1-PL finish has a 32Ra OD.
- SF1-PC finish does not have an OD Ra requirement.

BENEFITS OF SF1 FINISH INCLUDE:

Improved surface smoothness:

The mechanically polished surface offers a smoother finish compared to basic unpolished tubing, which can help minimize the buildup of contaminants and bacteria.

Enhanced cleanability:

The reduced surface roughness of SF1 tubing makes it easier to clean and sanitize, making it suitable for applications in the food and beverage industry.

Cost-effectiveness:

SF1 finish provides a balance between improved surface quality and cost, making it an attractive choice for many applications where a high degree of cleanliness is required, but electropolishing may not be necessary.

SF4

SF4 products feature a 15Ra ID electropolish (PM).

There are two finishes for SF4 products: PM and PD.

- SF4-PM finish has a 32Ra OD.
- SF4-PD finish does not have an OD Ra requirement.

BENEFITS OF SF4 FINISH INCLUDE:

Superior surface smoothness:

The electropolished surface offers an even smoother finish than mechanically polished tubing, reducing the risk of contamination and making it ideal for applications with strict hygiene requirements.

Increased corrosion resistance:

Electropolishing removes surface imperfections and creates a chromium-rich passive layer, which enhances the tubing's corrosion resistance.

Reduced product adhesion:

The ultra-smooth surface of SF4 tubing reduces the adhesion of product residues, making it easier to clean and maintain.



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