

## Introduction

Our 0.01mm 316L Precision Stainless Steel Foil represents the pinnacle of material science and manufacturing precision. Crafted with meticulous attention to detail, this ultra-thin foil combines the inherent corrosion resistance of 316L stainless steel with an unprecedented thickness of 0.01mm, making it ideal for applications demanding both structural integrity and extreme dimensional accuracy. Below, we delve into its composition, technical specifications, and diverse applications across industries.

## Material Composition and Properties

### 316L Stainless Steel: A Corrosion-Resistant Marvel

316L is a low-carbon Austenitic stainless steel renowned for its exceptional resistance to aggressive environments. Its chemical composition includes:

	Cr	Mn	Si	Ni	P	S	C	Mo
MIN	16.00	—	—	12.00	—	—	—	2.00
MAX	18.00	2.00	1.00	15.00	0.045	0.030	0.030	3.00

## Mechanical Properties

	Tensile Strength Min	Yield Strength Min.	Elongation Min.
Condition	(Mpa)	(Mpa)	%
Annealed	480	205	40
1/4 Hard	650	450	15
1/2 Hard	780	470	6
3/4 Hard	930	665	3
Full Hard	1130	880	-

## Technical Specifications

Parameter	Value
Thickness	0.01-0.05mm
Width	2.0–300mm
Tolerance	T: +/- 0.003mm, W: +/- 0.10mm
Forms	Coiled or cut-to-length
Surface Finish	BA, 2H or custom (e.g., PVD-coated for wear resistance)
Electrical Conductivity	≥1.4×10 <sup>6</sup> S/m
Magnetic Permeability	Non-magnetic (austenitic structure)

**Applications Across  
Industries****1. Medical Devices**

- **Implantable Components:** Used in stents, pacemaker leads, and orthopedic implants due to biocompatibility and resistance to bodily fluids.
- **Surgical Instruments:** High-strength, corrosion-resistant foil for scalpels and forceps, ensuring sterile performance under repeated autoclaving.
- **Respiratory Equipment:** Filters in ventilators and ECMO machines, providing particle retention down to 0.1µm while maintaining airflow.

**2. Electronics and Semiconductors**

- **Flexible Circuits:** Ultra-thin foil enables miniaturized, high-density PCBs for smartphones, wearables, and automotive electronics.
- **Heat Dissipation:** High thermal conductivity (16.2 W/m·K) supports efficient heat management in power modules and LED arrays.
- **EMI/RFI Shielding:** Conductive foil prevents electromagnetic interference in sensitive devices.

**3. Aerospace and Defense**

- **Lightweight Structures:** Reduces component weight by up to 40% while maintaining structural integrity in aircraft interiors and satellite parts.
- **Fuel Systems:** Resists corrosion from jet fuels and oxidizers in engine components.
- **Hermetic Seals:** Ultra-thin foil ensures airtight seals in pressure vessels and cryogenic systems.

**4. Automotive Engineering**

- **Exhaust Systems:** Withstands high temperatures (up to 800°C) and corrosive exhaust gases in catalytic converters.
- **Sensor Components:** Precision foil for strain gauges and pressure sensors, ensuring accurate readings in harsh environments.
- **Battery Components:** Used in lithium-ion battery tabs for high current density and corrosion resistance.

**5. Chemical and Marine Industries**

- **Corrosion-Resistant Liners:** Protects pipelines and vessels from aggressive chemicals (e.g., sulfuric acid, seawater).
- **Desalination Systems:** Resists chloride-induced pitting in reverse osmosis membranes.

**Quality Assurance  
and Compliance****1. Stringent Testing**

- **Chemical Analysis:** Verified via ICP-OES and XRF to confirm alloy composition.
- **Mechanical Testing:** Tensile, hardness, and bend tests ensure compliance with ASTM A240 and EN 10088 standards.
- **Surface Integrity:** Laser profilometry and SEM analysis ensure  $R_a \leq 0.8\mu\text{m}$  and defect-free surfaces.

**2. Certifications**

- **ISO 9001:2015:** Quality management system certification.
- **RoHS/REACH Compliance:** Safe for use in EU markets.