ASTM B564 UNS N10276 (Hastelloy C-276) Flange Specification

ASTM B564 UNS N10276 Flange refers to a **forged flange made from Hastelloy® C-276**, a **nickel-molybdenum-chromium alloy** known for its **exceptional corrosion resistance**, especially in harsh chemical environments.

Property	Details
Standard	ASTM B564 / ASME SB564
Material Grade	UNS N10276
Trade Name	Hastelloy® C-276
Alloy Type	Nickel-Molybdenum-Chromium Superalloy with Tungsten
Form	Forgings: Flanges, Rings, Discs, Forged Bars, Fittings
Condition	Typically supplied in solution-annealed and pickled condition

Chemical Composition (% by weight) *(As per ASTM B564 / ASTM B574 for forging stock)*

Element	Content (%)
Nickel (Ni)	Balance
Molybdenum (Mo)	15.0 – 17.0
Chromium (Cr)	14.5 – 16.5
Iron (Fe)	4.0 – 7.0
Tungsten (W)	3.0 – 4.5
Cobalt (Co)	≤ 2.5
Manganese (Mn)	≤ 1.0
Vanadium (V)	≤ 0.35
Silicon (Si)	≤ 0.08
Carbon (C)	≤ 0.010
Sulfur (S)	≤ 0.03
Phosphorus (P)	≤ 0.04

Mechanical properties(Minimum value at 20℃)

Tensile Strength σb/MPa	Yield Strength σp0.2/MPa	Elongation σ5 /%
690	283	40

Flange Types Available

Hastelloy C-276 flanges to ASTM B564 are available in the following types:

- Hastelloy C-276 **Weld Neck Flanges (WN)**
- Hastelloy C-276 **Slip-On Flanges (SO)**
- Hastelloy C-276 **Blind Flanges (BL)**
- **Socket Weld Flanges (SW)**
- **Threaded Flanges (TH)**
- **Lap Joint Flanges (LJ)**

Dimensions: As per below standard

- **ASME B16.5** (for NPS ½″ to 24″)
- **ASME B16.47 Series A/B** (for NPS 26″ to 60″)
- **MSS SP-44, DIN, EN 1092-1,** or **customer drawings**

Dimensions and Tolerances

Parameter	Standard
Dimensional Tolerances	ASME B16.5 / B16.47
Facing Types	RF (Raised Face), RTJ (Ring Type Joint), FF (Flat Face)
Pressure Ratings	Class 150, 300, 600, 900, 1500, 2500

Heat Treatment

- Solution Annealed at 1121° C (2050° F) followed by rapid cooling
- Required for optimum corrosion resistance and mechanical properties

Corrosion Resistance

UNS N10276 is highly resistant to:

- **Strong oxidizers and reducers**
- **Chloride-induced pitting and crevice corrosion**
- **Sulfuric, hydrochloric, phosphoric, and nitric acids**
- **Hypochlorite, ferric and cupric chlorides**
- **Stress Corrosion Cracking (SCC)** under both oxidizing and reducing conditions

Complies with **NACE MR0175 / ISO 15156** for sour gas environments.

8. Marking Requirements

Each flange shall be marked with:

- ASTM B564 N10276
- Heat Number
- Size & Pressure Rating (e.g., 2″ 300#)
- Manufacturer’s logo or code
- Heat treatment condition (if required)

9. Testing Requirements

Test	Notes
Visual & Dimensional	As per drawing and ASME B16.5
Chemical Composition	Verified against ASTM B564 limits
Mechanical Testing	Tensile, Yield, Elongation
Intergranular Corrosion (IGC)	As per ASTM A262 (Practice E, optional)
NDT (optional)	UT, RT, PT or MT if required by project spec
PMI Test	Positive Material Identification for alloy verification

10. Applications of N10276 Flanges

- Chemical processing (acid recovery, SO_2 scrubbers)
- Pollution control (waste treatment)
- Pharmaceutical and food industries
- Marine engineering
- Pulp and paper bleaching systems
- Nuclear fuel reprocessing