SANITARY ELBOWS & TEES

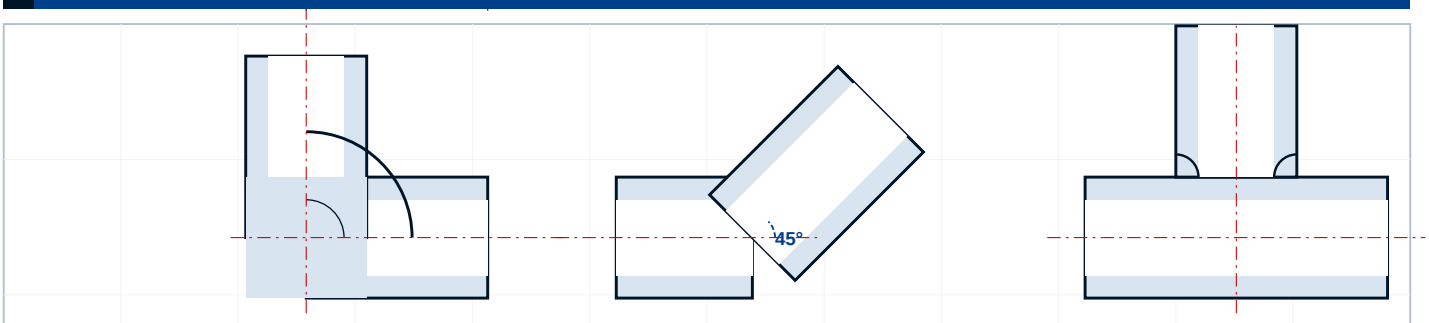
90° / 45° LONG RADIUS — EQUAL & REDUCING TEES

Long-radius elbows (90° and 45°) and tees (equal and reducing) for sanitary process line routing. Long radius (1.5×D) design minimizes turbulence and pressure drop while maintaining cleanability. All product-contact surfaces are mill-polished or electropolished to specification. ASME BPE compliant variants available for pharmaceutical applications with full traceability.

MATERIAL	SIZE RANGE	BEND RADIUS	SURFACE	CONNECTION	STANDARD
316L SS	DN15 – DN100	1.5 × D	Ra ≤ 0.8 µm	Tri-Clamp / Weld	3-A / BPE

TECHNICAL DRAWING

DWG: CE-ELB-001



90° LONG RADIUS | 45° ELBOW | EQUAL TEE

CASPIAN EDGE INC. NORTH YORK, ON, CANADA	
DWG NO: CE-ELB-001	SCALE: NTS
UNIT: mm	VIEW: COMPARISON

IN THIS DATASHEET

SANITARY ELBOWS & TEES — 90° / 45° LONG RADIUS — EQUAL & REDUCING TEES

DESIGN SPECIFICATIONS — SECTION 1

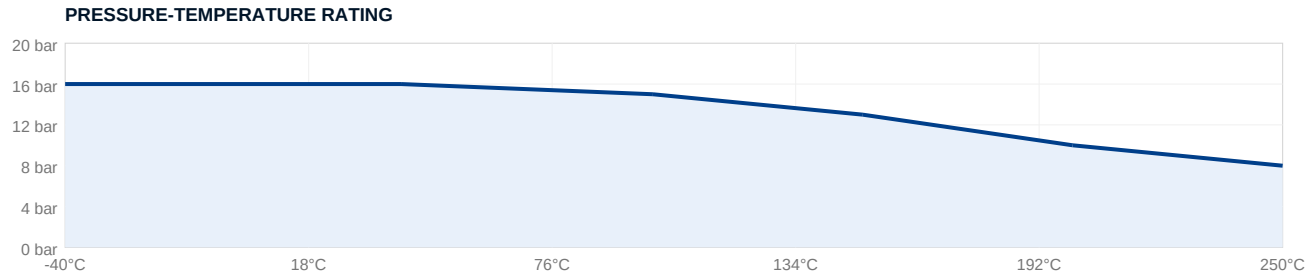
Elbow Types	90° / 45° / 180°
Tee Types	Equal / Reducing / Cross
Bend Radius	1.5 × D (Long Radius)
Body	One-piece formed/welded
Internal Finish	Ra ≤ 0.8 µm (BPE: ≤ 0.5 µm)
Connection	Tri-Clamp DIN 32676 / Weld
Wall Thickness	1.6 – 2.0 mm
Hydrotest	100% inspection

OPERATING CONDITIONS — SECTION 2

PRESSURE RATING		
Working Pressure	16	**bar**
Burst	>60	**bar**
Vacuum	-0.95	**bar**
Test	1.5×WP	**bar**

TEMPERATURE RANGE		
Cryogenic	-196	**°C min**
Steam SIP	+135	**°C**
Continuous	-196 to +400	**°C**
Process	-29 to +180	**°C typ.**

PRESSURE-TEMPERATURE RATING CHART — SECTION 3



SURFACE FINISH OPTIONS — SECTION 4

DESIGNATION	RA (µM)	RA (µIN)	METHOD	APPLICATION
Standard	≤ 0.8	≤ 32	Mechanical polish	Food, dairy, beverage
Premium	≤ 0.5	≤ 20	Mech. polish + buff	Pharmaceutical
EP (BPE SF4)	≤ 0.38	≤ 15	Electropolish	Biotech, high-purity
Mirror	≤ 0.25	≤ 10	EP + final buff	Critical bioprocess

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MATERIALS OF CONSTRUCTION — SECTION 5

PART	STANDARD	OPTIONAL	SPEC
Elbow Body	316L SS	304/904L	ASTM A403 WP316L
Tee Body	316L SS	304 SS	ASTM A403 WP316L
Welds (welded)	TIG inert gas	Auto orbital	AWS D18.1
Heat Affected Zone	Pickled/passivated	EP	ASTM A967
Surface ID	Mill polish	EP	ASME BPE SF4

316L CHEMICAL COMPOSITION — SECTION 6

ELEMENT	SYMBOL	MIN %	MAX %	FUNCTION
Chromium	Cr	16.0	18.0	Corrosion resistance
Nickel	Ni	10.0	14.0	Ductility, toughness
Molybdenum	Mo	2.0	3.0	Pitting resistance
Carbon	C	—	0.03	Low carbon (L grade)
Manganese	Mn	—	2.0	Deoxidizer
Silicon	Si	—	0.75	Deoxidizer
Phosphorus	P	—	0.045	Impurity (limit)
Sulfur	S	—	0.030	Impurity (limit)

SIZE CHART & DIMENSIONS — SECTION 7

NOM.	DN	OD	BEND R (MM)	TEE CENTER (MM)	TYPE
½"	15	12.7	38	38	LR
1"	25	25.4	38	38	LR
1½"	38	38.1	57	57	LR
2"	50	50.8	76	76	LR
2½"	63	63.5	95	95	LR
3"	76	76.2	114	114	LR
4"	100	101.6	152	152	LR

STANDARDS & CERTIFICATIONS — SECTION 8

STANDARD	DESCRIPTION	STATUS
3-A 63-04	Sanitary fittings	Compliant
ISO 2037	Sanitary tubing	Compliant
ASME BPE-2022	Bioprocessing	Compliant (option)
DIN 32676	Tri-clamp dimensions	Compliant
ASTM A403	Wrought stainless fittings	Compliant
ASTM A270	Sanitary tubing base material	Compliant

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TYPICAL APPLICATIONS SECTION 9

FOOD & BEVERAGE	DAIRY	PHARMA & BIOTECH
• Filling line shut-off	• Pasteurization circuits	• WFI distribution
• Product transfer lines	• Cheese processing	• Purified water systems
• CIP/SIP circuits	• Yogurt production	• API manufacturing
• Storage tank outlets	• Milk separators	• Bioreactor connections
• Sampling stations	• Cream lines	• Sterile filling
• Mixing & blending	• 3-A compliant systems	• Process skids

INSTALLATION GUIDELINES SECTION 10

Caspian Edge sanitary tubing is supplied in standard 6-meter (20 ft) lengths with bevel ends ready for orbital welding or tri-clamp connection. Follow these guidelines: **1. Storage:** Store tubing horizontally on padded supports. Keep end caps in place until installation to prevent contamination of internal surfaces. **2. Cutting:** Use orbital or band saw with cutting fluid. Avoid abrasive cutting which contaminates internal surface. After cutting, deburr inside and outside edges. **3. Welding:** Orbital welding recommended for hygienic joints. Use 100% argon purge inside and outside. Weld discoloration must be within ASME BPE limits. **4. Surface Inspection:** Verify internal surface finish meets specification using profilometer at random points. Document Ra readings for QA records. **5. Passivation:** After fabrication, passivate per ASTM A967 (typically nitric acid solution). Rinse with DI water and verify no chloride residue.

MAINTENANCE SCHEDULE SECTION 11

INTERVAL	ACTION	NOTES
Daily	Visual inspection	Check for leaks at joints
Weekly	CIP cycle verification	Verify cleaning effectiveness
Monthly	Joint torque check	Re-tighten tri-clamps if loose
Quarterly	Surface inspection	Spot-check Ra at sampling points
Annually	Passivation review	Re-passivate if surface degradation
As needed	Riboflavin test	Verify drainability per ASME BPE

REQUEST A TECHNICAL QUOTATION

Send your specifications and we will respond with detailed pricing, lead time and documentation.

INCLUDE IN YOUR RFQ:
Quantity · Size (DN) · Material grade · Seal material · Surface finish · Required certifications · Delivery date

SUBMIT RFQ →
caspianedge.com/rfq

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