NZTM-Q12E - Austenitic Stainless Steel (Round) Annealed Tube to ASTM A269 / A249

General Information

Specification Scope : *This specification applies to tube used in the **high temperature** service and food / milk processing industry.*

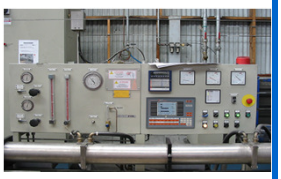
Equivalent standards : ***ASTM A269 & ASTM A249** - High Temperature Application*

Available sizes : ***Selected Tube sizes** only annealed - Refer **NZTM-Q08B***

Grades of Material : *304, 316L Stainless steel.*

Manufacture : *Automatic Tig welding with no addition of filler metal.*

Heat treatment : *Tube is online **bright annealed** in a continuous induction furnace by maintaining the temperature to 1040 ^{o}C min*



Raw Material

Chemical Composition (Coil)

Unless specifically requested otherwise chemical tests are from coil manufactured to ASTM A240 / A480

Grades	C max	Mn max	P max	S max	Si max	Cr	Ni	N max	Mo
TP 304	0.07	2.00	0.045	0.03	0.75	17.5 - 19.5	8 -- 10.5	0.10	--
TP 304L	0.03	2.00	0.045	0.03	0.75	17.5 - 19.5	8 -- 12	0.10	--
TP 316	0.08	2.00	0.045	0.03	0.75	16 -- 18	10 -- 14	0.10	2 -- 3
TP 316L	0.03	2.00	0.045	0.03	0.75	16 -- 18	10 -- 14	0.10	2 -- 3

Mechanical Tests (Coil)

Yield Stress (Coil)

TP 304 & TP	205 MPa min
TP 316L &	170 MPa min

Tensile Stress (Coil)

TP 304 & TP 316	515 MPa min
TP 316L & TP 304L	485 MPa min

Elongation (Coil) *40% Minimum (50mm test piece)*

Hardness (Coil)

TP 304 & TP	92 HRB / 202 HB30 max
TP 316L & TP	95 HRB / 217 HB30 max

Tube Weld Integrity Tests

➔ **Reverse Bend** : *Bend to 2 times material thickness.*

➔ **Flare / Cone** : *Minimum 1.2 tube diameter (60 deg included angle).*

➔ **Flange** : *Minimum 1.2 tube diameter.*

➔ **Flattening** : *Flatten to 2 times material thickness.*

➔ **Reverse Flattening** : *Reverse flatten the half section of tube with weld seam.*

➔ **Eddy Current** : *100% eddy-current tested.*

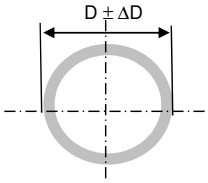
➔ **Hardness** : *Max 90 HRB*

➔ **Tensile** : ***Selected samples** from tube batches made to **ASTM A249** are tensile tested.*

Dimensional Tolerances

➔ **Outside diameter (OD)**

O/D (D)	Tolerance (v)
25.4 ≤ O/D ≤ 31.8 mm	± 0.13 mm
31.8 < O/D ≤ 63.5 mm	± 0.25 mm



➔ **Availability Sizes** Diameter :- 25.4 (not cold worked), 31.75, 38.10, 44.45, 5.80 & 63.50 mm
Thickness:- 0.90, 1.00, 1.20, 1.60 & 2.00 mm

➔ **Ovality** : *Ovality to be within max & min sizes as above*

➔ **Thickness tolerance** : *±10% of nominal tube thickness*

➔ **Weld Bead** : *Weld bead of tube without cold work controlled to 110% of wall thickness*

➔ **Straightness** : *Maximum of 1.0 mm / metre*

➔ **Length tolerance** : *Standard length 6 metres +35 mm / -zero*
Cut to exact length jobs, by agreement (+3.0 /- 0.0 mm)

Finish

End finish : *Both ends are in cut condition.*

Finish internal : *Tubes with diameter greater than or equal to (≥) 38.1 & 31.75 are internally cold worked (Internal weld beaded to tube surface).*
Tubes with diameter less than (<) 38.1 are in as welded condition and internal weld height is controlled to a minimum height.
Note: As a requirement from ASTM A249 only cold worked tubes are supplied to ASTM A249.

Finish external : *Available as follows:*
*1) **As welded** condition (external weld bead removed).*
May have forming, straightening & weld polish cross hatch marking.
2) If requested by the customer the Standard Polished equivalent to 320 Grit - typical Ra = 0.25 to 0.5µm also available.
Minor form marks may be visible.

Documentation & Packaging

Packaging : As welded tube is packaged in a bundle with corrugated steel protection.
Polished tube is individually plastic sleeved in a bundle with corrugated steel protection.

Traceability : *SAP controlled batch traceability from raw material to finished tube.*
*For traceability purpose the tube is **inkjet** marked with sizes ,batch, trace & heat numbers and date & time of manufacture .*

Test certificate : *Raw material test certificates are available on request.*
Certificate of test of finished tube is provided for the tube dispatched.