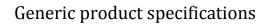


2013-2014

Generic product specifications



Squall International 27-9-2013

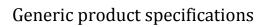




Introduction

1

In our continues effort to supply our customers with the best possible materials and information we hereby supply you with our material specification. The listed specification are our standard specification. If agreed upon between Customer and Squall International BV. tubes may have other tolerances.





Index

Intro	duction	1
Inde	X	2
	Visual Characteristics	
	Dimensional Tolerances	. J



1 Visual Characteristics

Standard Inspection Lighting:

The term "visible" is used for flaws (typically > 0.25 mm) that can be seen under general overhead inspection illumination. The light source is typically 0.75 - 1.25 m above the piece, with the tubing viewed at a distance of 0.3 - 0.6 m from the inspector, with a white/black background. All inspections are performed with conditioned lighting but without magnification. Defects that are too small to discriminate with the unaided eye, are not considered to be a defect. Identified defects can be measured with a magnifier, ruler, vernier caliper, and polariscope.

Below the types of deviations are listed including the guidelines and methods of checking the tolerances.

Cracks

Definition: A thin break line in the wall which is readily visible and extends through part or all of the wall is not allowed. The line may also be circular as from impact damage.

Chip

Definition: A void with a sharp edge with a diameter > 1.0 mm caused by a mechanical impact knocking out part of the quartz material is not allowed.

Airline (enclosed)

Definition: A void, completely within the tube wall including those bumping up the surface. Limits: Airlines with a length of ≥ 50mm

Airlines (open)

Definition: A void, open to the ID or OD surface, which has sharp, knifelike edges is not allowed.

Scratch

Definition: A narrow line abrasion of the surface (over 0.3 mm wide). *Limits:*

- No scratches adding up to half the tube length in the longitudinal direction;
- No single scratch exceeding 150 mm;
- No scratches on the inside surface;
- No scratches around the tube adding up to twice the tube circumference.
- Density: Total length of scratches maximum 25% of tube length.

Scuff

Definition: A broad abrasion visible under general lighting.

Limits:

- Scuffmarks wider then 15mm and/or longer then 100 mm are not allowed.
- Density: Total area may not exceed 5% of the tube surface.

Dirt

Definition: Removable foreign material adhering to the tube surfaces.

Limits:

- None permitted on the ID;
- No obvious fingerprints;
- Readily apparent, non-uniform graphite on the OD is not permitted.
- No spot larger than 2.0 mm in diameter or smaller spots adding to 2.0 mm diameter within any 300 mm of length.

Vapor

Definition: A haze of silica deposited on the tube surface seen when viewed with the unaided eye.

Limits:

- -Reject any degree having a color other than white;
- -Reject if more than 10 % of either the ID or OD surface contains the haze.

Inclusions

Definition: Foreign matter, with a diameter ≥0.5mm of any color baked to surface (exposed) or fully enclosed (not exposed) in the quartz material.

Limits:

- Individual inclusion (spot): ≥ 0.5 mm diameter;
- Long length (> 300 mm): Colored or black line – Max length of 25 mm;



- Short length: (≤ 300 mm): Colored or black line – Max length of 1.0 mm;

- Cluster: Long length (> 300 mm): Max of 2 clusters in any 300 mm of tubing length; Short length: (≤ 300 mm): Max of 1 cluster per tube.

Note on inclusion clusters:

Consider a cluster to be 3 or more individual inclusions with each inclusion within a millimeter

of the next inclusion, with each inclusion visible to an unaided eye, and with each individual inclusion passing the max size specification for an individual inclusion.

Devitrification

Definition: A white crystallization spot due to alkaline contamination.

Limits: Spots with a diameter > 1.0 mm are not allowed.

Striations

Definition: Circumferential surface variations resulting in optical distortions, over the full length of the

tube.

Limits:

 Accept light striations uniformly distributed around either a portion or the full circumference of the tube.

2 Dimensional Tolerances

Standard Tubing - Tolerance guidelines

Outer diameter	[mm]	>5 ≤40	>40 ≤50	>50 ≤60
Diameter tolerance	± %	2	3	4
Wall thickness	± %	10	10	10
tolerance				
Ovality	≤ %	2	2	2
Wall siding	≤ %	12	12	12
Bow	≤	2	2	2
	mm/m			

Outside Diameter (OD)

Definition: All diameters in all cross-sectional planes along length ("all points in").

Inside Diameter (ID)

Definition: Minor axis diameter at the tube ends (as measured by plug gages). ID is not a criteria unless specifically given in print, order or standard.

Wall Thickness (WT)

Definition:

All wall thicknesses on the circumference of both ends.

Ovality

Definition: Out of Round Diameter (circular

run-out tolerance).

Expressed as a percent = (Max OD - Min OD) /

Specified Nominal OD x 100 %

Expressed as an amount = Max OD - Min OD

Siding (Eccentric wall)

Definition: Difference between greatest and least wall thickness, at either tube end.

Expressed as a percent = (Max Wall - Min Wall) / Specified Nominal Wall x 100 %

Expressed as an amount = Max Wall - Min Wall

Bow

Definition: Amount of deviation to a straight edge, usually a curve.

Measurement = Max Gap to a Straight Surface / Length of Tube

Note: Bow is often specified as a maximum amount over a given length (such as per 1000 mm). The maximum deviation per tube is prorated for the actual length of the tube.