
 <p>G.I.S.D.Co.</p>	<h2>KOWSAR GISD MEGA MODULE PROJECT</h2>		 <p>MMTE</p>
<b>DOCUMENT TITLE</b>	<b>Document No:</b>		<b>Rev.</b>
<b>TECHNICAL SPECIFICATION FOR GENERAL REQUIREMENTS FOR VESSEL FABRICATION</b>	Client Document NO:	GISD7-211910027AA05M001	DATE: Apr.2014
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## ATTACHMENT #1

### VESSEL TOLERANCE GUIDELINES

A = Out of roundness,  $\pm 1\%$  between max. I.D. and min. I.D., per ASME Code UG-80.

The **outside circumference** of shell shall be within the following:

$\pm 10$  mm for nominal diameters 1200 mm and under

$\pm 13$  mm for diameters over 1200 mm through 2440 mm

$\pm 19$  mm for diameters over 2440 mm

B = Minimum Knuckle Radius =  $.06 \times$  (head O.D.) per ASME Code UG-31(e)

C = Distance between support to head - shell joint  $\pm 7$ mm

D = Shell length =  $\pm 1$  mm per 750 mm length but shall not exceed 10 mm, whichever is smaller.

E = From head-shell joint to face of flange  $\pm 4$ mm

F = With respect to reference plane, dimensions may vary  $\pm 13$  mm for manholes,  $\pm 5$  mm for nozzles, unless noted otherwise on attached sketches.

G = Head - Inner surface of head shall not deviate outside of the specified shape by more than 1.25% of "A", per ASME Code UG-81.

H = Outside surface of cylinder may be out of alignment not more than 7 mm at any point along straight line 7000 mm long, but not more than 19 mm for any length.

J = Horizontal or vertical deflection of nozzle flange face (or nozzle with welded ends) or support from planes normal to nozzle centerlines or parallel to vessel centerline shall not be more than  $\pm 1/2$  degree.

K = Circumferential deviation from true orientation of nozzles, man ways, and supports shall not exceed  $\pm 4$  mm measured along perimeter of shell.

L = Bolt hole orientation of nozzles  $\pm 2$  mm at bolt circle.

M = Distance between centerline to centerline of bolt holes in supports for horizontal vessels varies  $\pm 4$  mm.

N = Distance between centerline of horizontal vessel and bottom of support  $\pm 7$  mm.

O = For fabricated flanges the clearance between the inside diameter of the flange and outside diameter of nozzle or shell shall not exceed:

$\pm 2$  mm for nozzle size 300 mm or less

$\pm 4$  mm for nozzle size over 300 mm but less than size 1200 mm

$\pm 5$ mm for nozzle size over 1200 mm

P = Tolerance on the outside diameter of nozzles under 618 mm rolled from plate and welded shall be  $\pm 2$  mm. For nozzles larger or equal to 610 mm, see "A".