

VESSEL/TANK HEADS

Tolerances

CMC Letco Ind. endeavors to provide heads with exacting tolerances. This enables our customers to spend less time at fit-up and fabrication.

Our standard tolerances, as shown below, shall apply to all head forming configurations as fabricated by CMC Letco Ind. with the exceptions of dished only or flanged only. Please keep in mind that **both** straight flanges and finished overall heights cannot be held. CMC Letco Ind. **recommends** that the finished overall height (**FOD**) be the head forming controlling factor and the straight flange length and tolerance be ignored.

Heads may be provided as outside (**OD**) or inside (**ID**) diameters with the ID being the preferred dimensioning method. It is also recommended that head edges be machined so as to lay flat. Heads under #7 gauge (3/16" Plate) are not available with a machined edge.

The dish radius of heads are measured inside (**IDR**) and are assumed to be as per standard ASME tolerances unless specified otherwise by customer for non-code heads.

Head circumference, overall height and toe-in or toe-out cannot be held simultaneously, therefore it is recommended that circumference and overall height only be the governing factors.

| FORMING TOLERANCES | | | | |
|--------------------|---------------|----------------|--------------------|------------------------|
| Head Diameters | Circumference | Overall Height | Inside Dish Radius | Out of Roundness |
| 16" - 72" | ± 1/8" | ± 1/2" | +1-1/4% / -5/8% | 1% Maximum of Diameter |
| 73" - 144" | ± 1/8" | ± 3/4" | +1-1/4% / -5/8% | 1% Maximum of Diameter |
| 145" - 168" | ± 1/8" | ± 1" | +1-1/4% / -5/8% | 1% Maximum of Diameter |

| FORMING MINIMUM THIN-OUT ALLOWANCES * | | | | | | | | | | | | | | |
|---------------------------------------|--------|--------|--------|--------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|------------|----------|
| Head Diameters | 12 Ga | 10 Ga | 8 Ga | 7 Ga | 3/16" Pl. | 1/4" Pl. | 5/16" Pl. | 3/8" Pl. | 7/16" Pl. | 1/2" Pl. | 9/16" Pl. | 5/8" Pl. | 11/16" Pl. | 3/4" Pl. |
| 16" - 72" | 0.022" | 0.022" | 0.022" | 0.022" | 0.022" | 0.022" | 0.025" | 0.030" | 0.035" | 0.040" | 0.045" | 0.050" | 0.055" | 0.060" |
| 73" - 144" | 0.030" | 0.030" | 0.030" | 0.030" | 0.030" | 0.030" | 0.032" | 0.038" | 0.044" | 0.050" | 0.057" | 0.063" | 0.069" | 0.075" |
| 145" - 168" | 0.038" | 0.038" | 0.038" | 0.038" | 0.038" | 0.038" | 0.038" | 0.045" | 0.053" | 0.060" | 0.068" | 0.075" | 0.083" | 0.095" |

| POLISHED MATERIAL THINNING ALLOWANCES * | | | | | | | | | | | | | | |
|---|--------|--------|--------|--------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|------------|----------|
| Polishing | 12 Ga | 10 Ga | 8 Ga | 7 Ga | 3/16" Pl. | 1/4" Pl. | 5/16" Pl. | 3/8" Pl. | 7/16" Pl. | 1/2" Pl. | 9/16" Pl. | 5/8" Pl. | 11/16" Pl. | 3/4" Pl. |
| ONE SIDE | 0.005" | 0.005" | 0.007" | 0.007" | 0.010" | 0.010" | 0.011" | 0.012" | 0.012" | 0.012" | 0.014" | 0.015" | 0.015" | 0.015" |
| BOTH SIDES | 0.010" | 0.010" | 0.014" | 0.014" | 0.020" | 0.020" | 0.022" | 0.024" | 0.024" | 0.024" | 0.028" | 0.030" | 0.030" | 0.030" |
| WITH HTS | 0.015" | 0.015" | 0.018" | 0.018" | 0.025" | 0.025" | 0.025" | 0.027" | 0.027" | 0.027" | 0.030" | 0.032" | 0.032" | 0.032" |

| GROUND WELDS ONLY THINNING ALLOWANCES * | | | | | | | | | | | | | | |
|---|--------|--------|--------|--------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|------------|----------|
| | 12 Ga | 10 Ga | 8 Ga | 7 Ga | 3/16" Pl. | 1/4" Pl. | 5/16" Pl. | 3/8" Pl. | 7/16" Pl. | 1/2" Pl. | 9/16" Pl. | 5/8" Pl. | 11/16" Pl. | 3/4" Pl. |
| ONE SIDE | 0.005" | 0.005" | 0.007" | 0.007" | 0.010" | 0.010" | 0.010" | 0.012" | 0.012" | 0.012" | 0.014" | 0.015" | 0.015" | 0.015" |
| BOTH SIDES | 0.010" | 0.010" | 0.014" | 0.014" | 0.020" | 0.020" | 0.020" | 0.024" | 0.024" | 0.024" | 0.028" | 0.030" | 0.030" | 0.030" |

* Thin-out and Thinning Allowances are based on normal materials under normal fabrication situation and may vary due to type, configuration and/or condition of some materials.