

Node 120 Branch Welded-on fitting per B31.1 Table D-1  
 Header  $D_o = 12.75 \text{ in.}$   $t_h = .25 \text{ in.}$   
 Branch  $D_{ob} = 6.625 \text{ in}$   $t_b = .432 \text{ in}$

Header SIF:  $h = \frac{3.3 t_h}{r}$   $r = \text{mean radius} = \frac{D_o - t_h}{2}$   
 $r = \frac{12.75 - .25}{2} = 6.25 \text{ in.}$

$h = \frac{3.3(.25)}{6.25} = .132$   $i = \frac{0.9}{h^{2/3}} = \frac{0.9}{(.132)^{2/3}} = 3.472$

$i = 3.472$  is what Caesar II calculated

Branch SIF:  $i = 1.5 \left( \frac{R_m}{t_{nb}} \right)^{2/3} \left( \frac{r'_m}{R_m} \right)^{1/2} \left( \frac{t_{nb}}{t_{nh}} \right) \left( \frac{r'_m}{r_p} \right)$  See fig. D-1

$R_m = 6.25$   $t_{nh} = .25$   $r'_m = \frac{D_{ob} - t_{nb}}{2} = \frac{6.625 - .432}{2} = 3.0965$

$t_{nb} = .432$   $r_p = 6.625/2 = 3.3125$

$i = 1.5 \left[ \frac{6.25}{.25} \right]^{2/3} \left[ \frac{3.0965}{6.25} \right]^{1/2} \left[ \frac{.432}{.25} \right] \left[ \frac{3.0965}{3.3125} \right]$

$i = 14.582$

This is what Caesar II calculated.