1) This defect is known as Shrinkage which can happen when the metal cools & contracts. To decrease this defect one can ensure directional solidification. i.e. material at the most distant part of the supply freezes first. Another method could be to try and shove more material into the mold.

2) $T_{TS} = C_m \left(\frac{V}{A}\right)^n$

a) $T_{TSL} = .0287 \frac{min}{mm^2} \left(\frac{\pi(23)^2 \cdot 38}{\pi(23)^2}\right)^2 \frac{mm^3}{mm^2} = 41.44$ min

b) $T_{TSP} = .0287 \frac{min}{mm^2} \left(\frac{65 \cdot 50 \cdot 15}{65 \cdot 50}\right)^2 \frac{mm^3}{mm^2} = 6.4575$ min

c) $T_{TSS} = .0287 \frac{min}{mm^2} \left(\frac{4/3\pi(25)^3}{\pi(25)^2}\right) \frac{mm^3}{mm^2} = .956$ min

3) a) $41.44(.15) = .0287 \left(\frac{\pi(30)^2 \cdot h_a}{\pi(30)^2}\right)$; $h_a = 216.59$ mm

b) $6.4575(.15) = .0287 \left(\frac{\pi(30)^2 h_b}{\pi(30)^2}\right)$; $h_b = 33.75$ mm

c) $.956(.15) = .0287 \left(\frac{\pi(30)^2 h_c}{\pi(30)^2}\right)$; $h_c = 4.99$ mm

4) The original ring mold is plastered onto a tree, which will later melt out & leave a mold for metal. (lost wax casting)