

Class Assignment -1

- 1) Find w and d for symmetrical weld bead as shown in figure.
- 2) Find the width of HAZ (phase transition temp = 730 C)

Material steel with $T_m = 1510$ C

$E = 20$ V

$I = 200$ A

Welding speed (v or U) = 5 mm/s

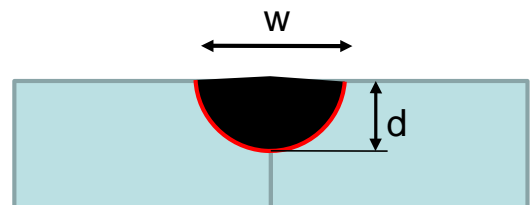
$T_0 = 25$ C

Arc efficiency $\eta = 0.9$

$K = 40$ W/mK

$\rho C = 0.0044$ J/mm³. C

$t = 5$ mm



Assignment 2

A single full penetration weld pass is made on steel using the following parameters.

$T_m = 1510\text{ C}$, $E = 20\text{ V}$, $I = 200\text{ A}$, Welding speed (v or U) $= 5\text{ mm/s}$, $T_0 = 25\text{ C}$, Arc efficiency $= 0.9$, $\rho C = 0.0044\text{ J/mm}^3 \cdot \text{C}$, $t = 5\text{ mm}$, $H_{\text{net}} = 720\text{ J/mm}$

- a) Calculate the peak temperatures at distances of 1.5 and 3.0 mm from the weld fusion boundary
- b) Calculate the width of HAZ if the recrystallization temperature is 730° C
- c) Find the influence on the width of HAZ if a preheated sample is used (Assume preheat temp $= 200^\circ\text{ C}$)
- d) Find the influence on the width of HAZ if the net energy is increased by 10%
- e) Find the influence on the width of HAZ if the velocity is increased to 10 mm/s