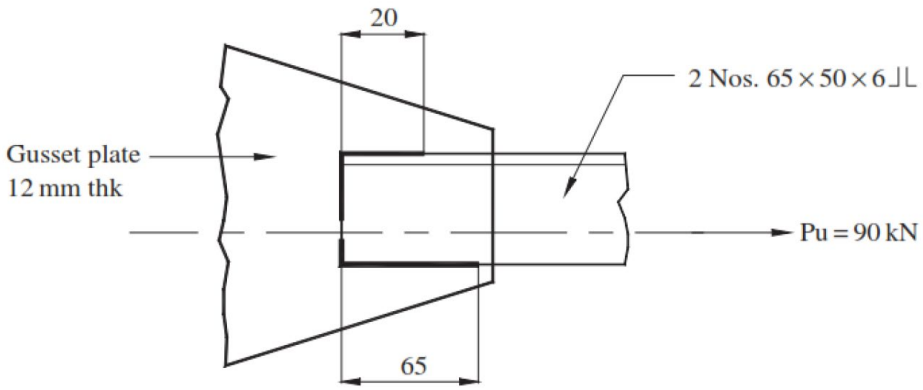
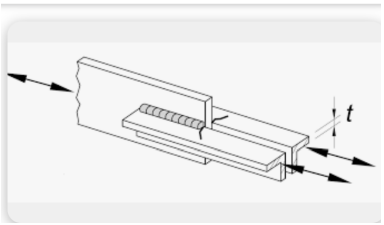
Lec 4 Example 3 welded connection in shear

The welded connection for a tension member in a roof truss is shown. Using Class 42 electrode on Grade S275 plate, determine the minimum leg size of the welds if the ultimate tension in the member is 90kN.





Solution

1) *From the data above with electrode 42 and steel grade S275 see arrow pw =220kN/mm2 from table below*
2) *Length of weld =(20+65)x2 = 170mm (the weld will be in double angle)*
3) *Shear developed by the Pu=90 kN = 90 /170 = 0.53 kN/mm*
4) *Capacity of weld = throat x pw =0.7leg x pw ≥ shear by load*
5) *Try 6mm weld leg Then throat =6x0.7=4.2 mm*
6) *Capacity of 6mm weld =4.2x220=924 kN/mm/meter run*
7) *Capacity of 6 mm /mm=924/1000=0.924 kN/mm >0.52 kN/mm*
8) *Try 4.5 leg fillet weld*

Table 10.4 Design strength of fillet welds p_w (kN/mm^2)

Steel grade BS EN10025	*Electrode classification (BS EN499, BS EN440)*		
	35	*42*	*50*
S275	220	(220)	(220)
S355	(220)	250	(250)
S460	(220)	(250)	280

Note: bracket values are under or over matching electrodes

If we use 4.5 mm leg capacity

=4.5x0.7x220/1000=0.639 kN/mm > 0.53kN/mmm

For economy use weld with leg =4.5 mmm