

Experimental Investigation of Structural Steel Welds at High Temperature



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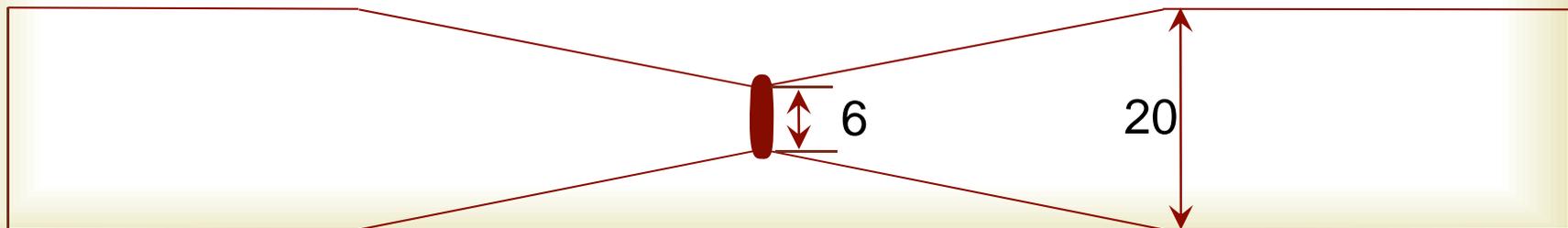
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Background

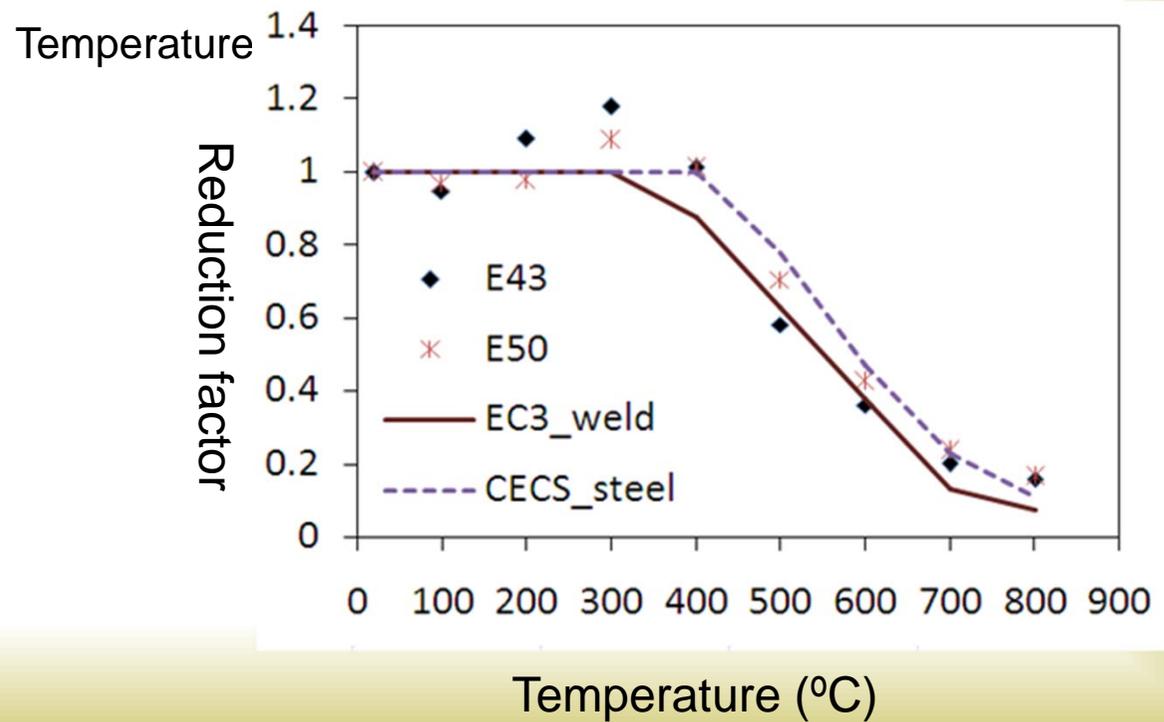
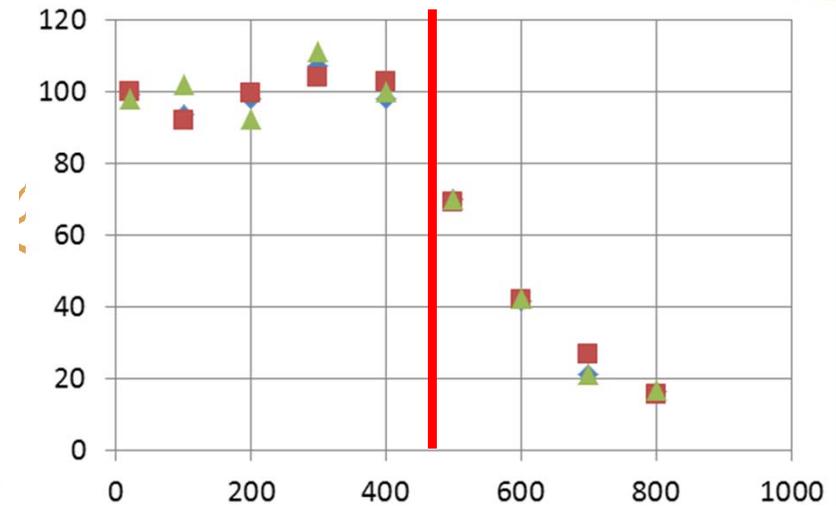
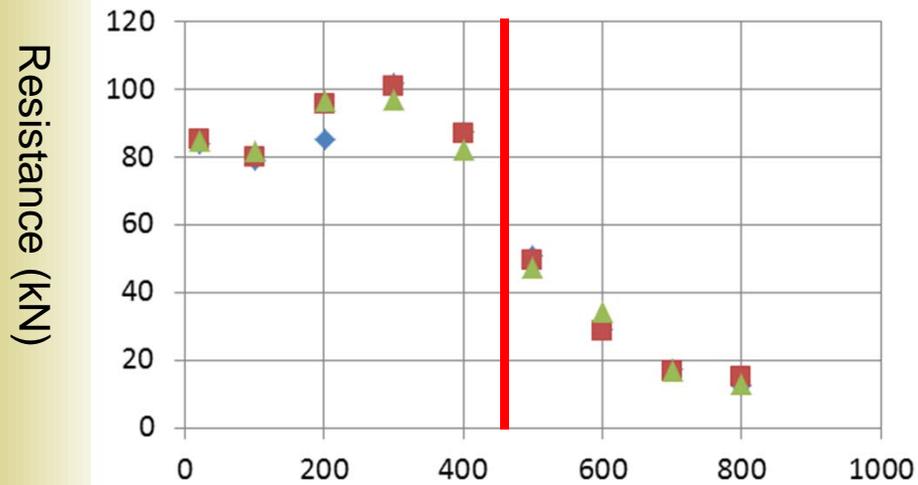


Test arrangements

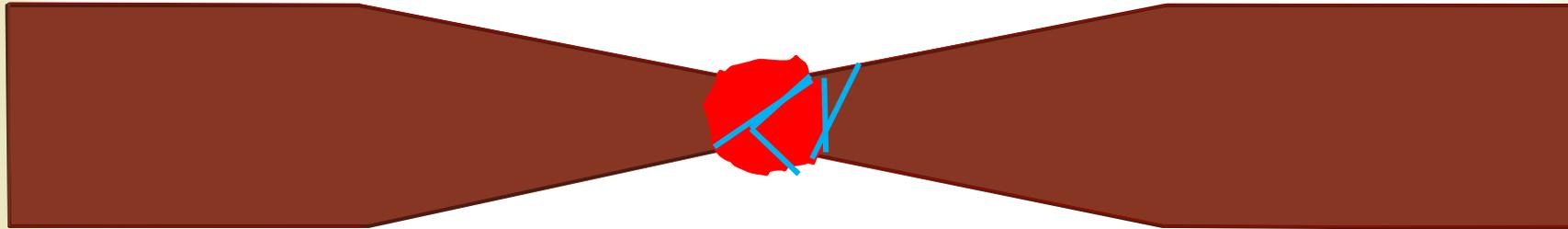
- ☞ Two sets of specimens,
 - ☞ Q235 steel with E43 electrode
 - ☞ Q345 steel with E50 electrode
- ☞ Temperatures
 - ☞ 20, 100, 200, 300, 400, 500, 600, 700, 800
- ☞ Total arrangements
 - ☞ Three specimens for each temperature, 54 specimens in total



Test Results



Failure Modes



400°C and below could be any of the three

500°C and above

Major conclusions

1. Strength should generally not be concerned.
2. However, the weld and its surrounding area is brittle at 400°C and below, but the ductility starts to increase from 500°C.