WELDABILITY OF ASTM A 1010

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Iowa DOT A1010 Steel Workshop
Ames, Iowa
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Fairview Road Bridge

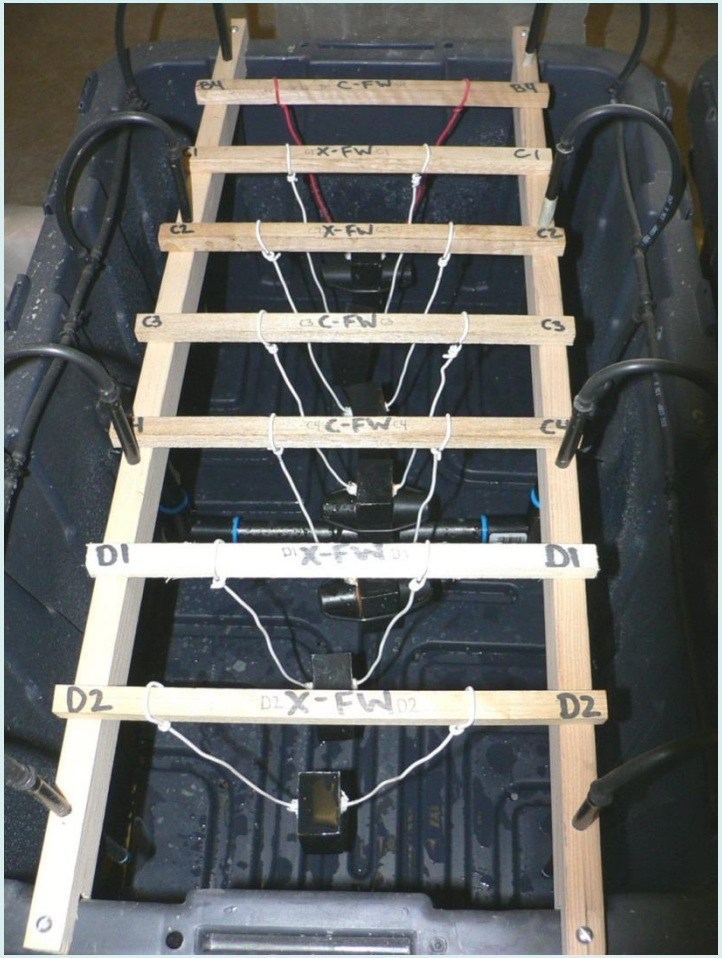
Waterville Bridge

A1010 vs. A 572 Grade 50, A 588 & HPS 70W

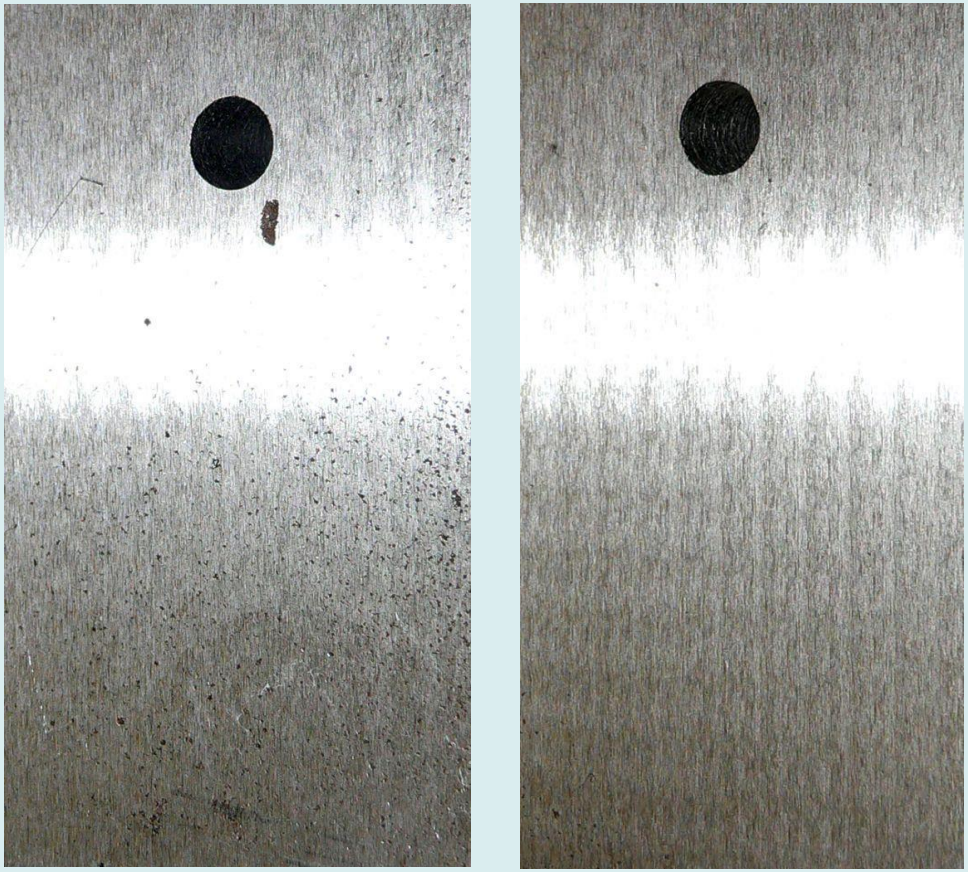
- (Machinability)
  - Drilling
  - Saw cut
  - Thermal Cut
- (Weld Feasibility)
    - Full penetration weld
    - Filet weld
        - »Single pass
        - »Double pass
- Accelerated Corrosion Test

CORROSION STUDY

Corrosion Test Setup

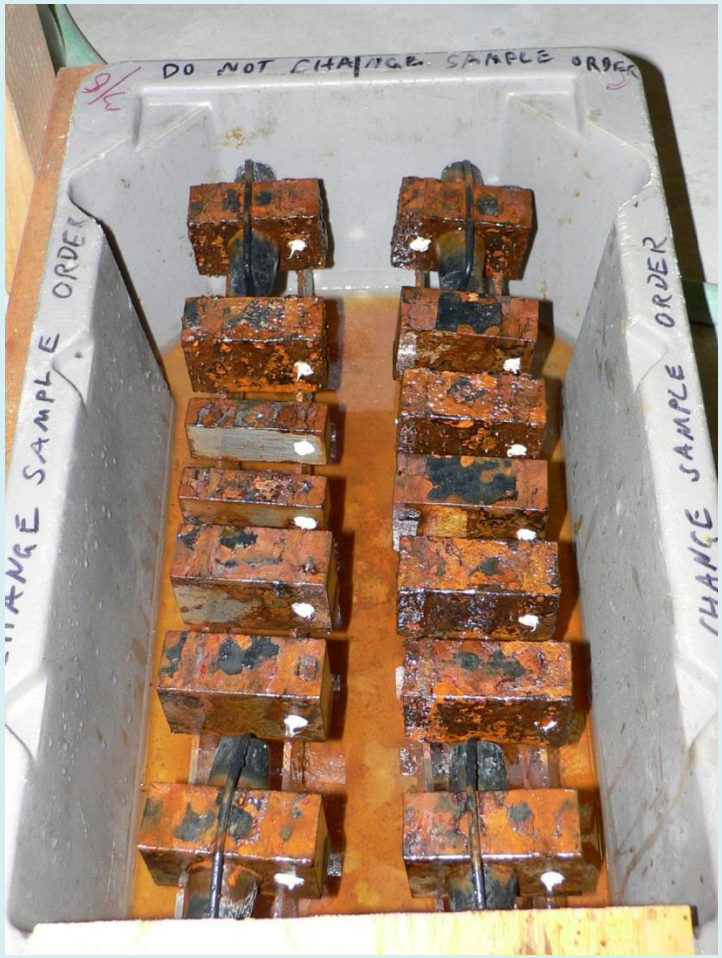


No environmental exposure



Corrosion Test Setup

Aggressive Corrosive Environment



16 Weeks Exposure

	Water 4/days	Water 4/day +Salt 2/week	Salt 2/week in Closed Container
A 588			
HPS 70W			
A 1010			

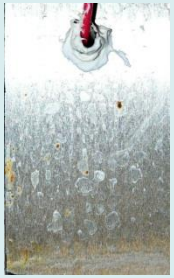
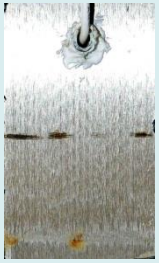
33 Weeks Exposure

	Water 4/days	Water 4/day +Salt 2/week	Salt 2/week in Closed Container
A 588			
HPS 70W			
A 1010			

1 Year Exposure.

A 588 **HPS 70W** **A 1010** **A 1010 Weld**



Fresh water exposure 4/day.



Fresh water 4/day + salt water 2/week




Sealed container with water reservoir and salt spray 2/week.

2 Year Exposure.

A 588 **HPS 70W** **A 1010** **A 1010 Weld**




Fresh water exposure 4/day



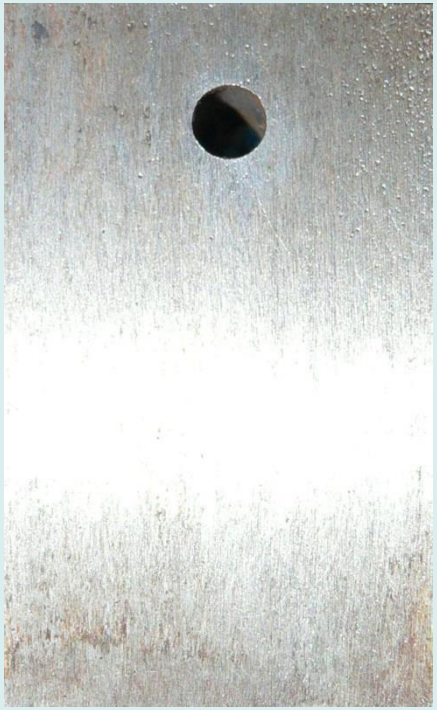
Fresh water exposure 4/day and salt spray 2/ week.




Sealed container with water reservoir and salt spray 2/week.

Crevice corrosion

Fresh water 4/day + salt water 2/week

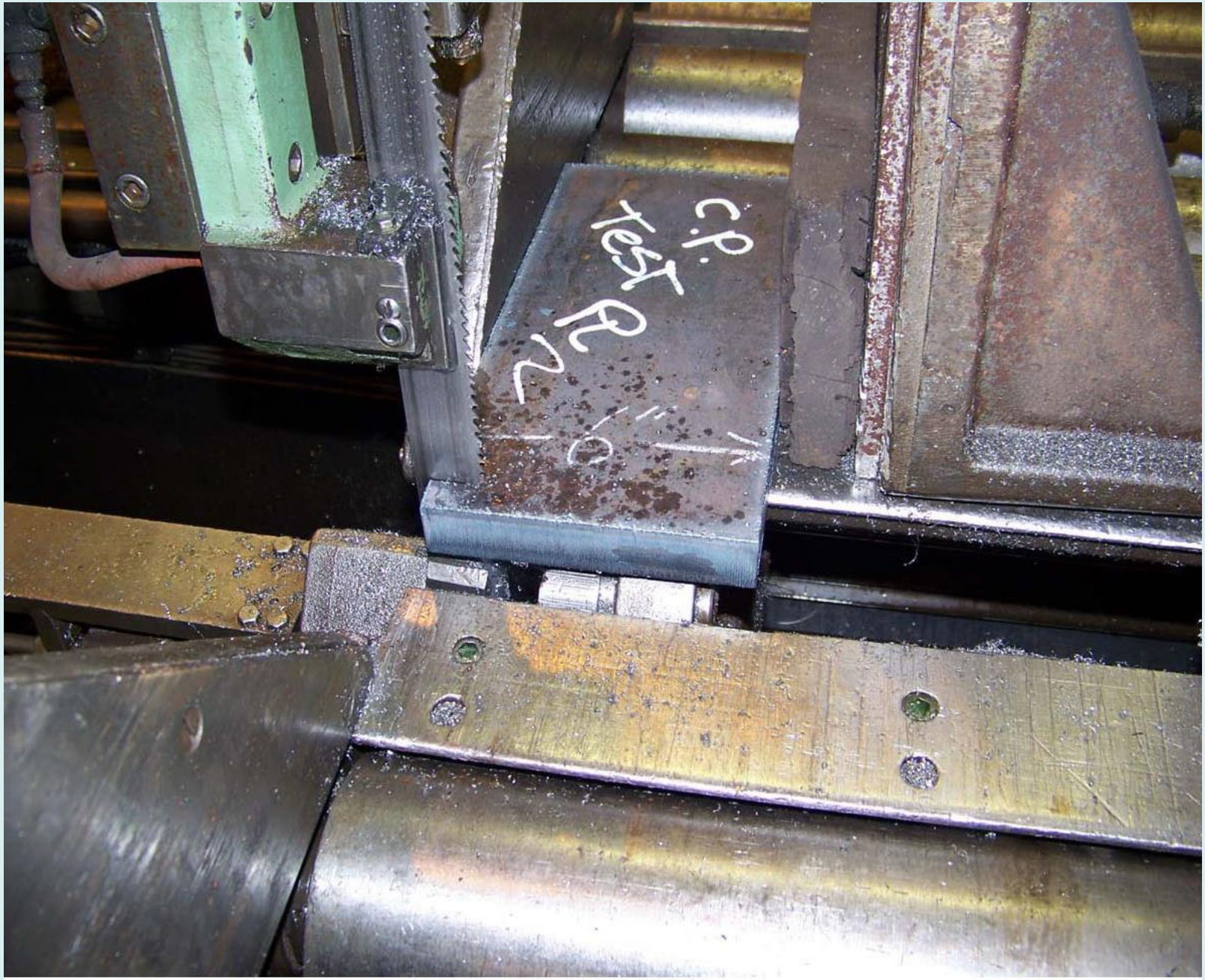


specimen, fresh water 4/day + salt water 2/week

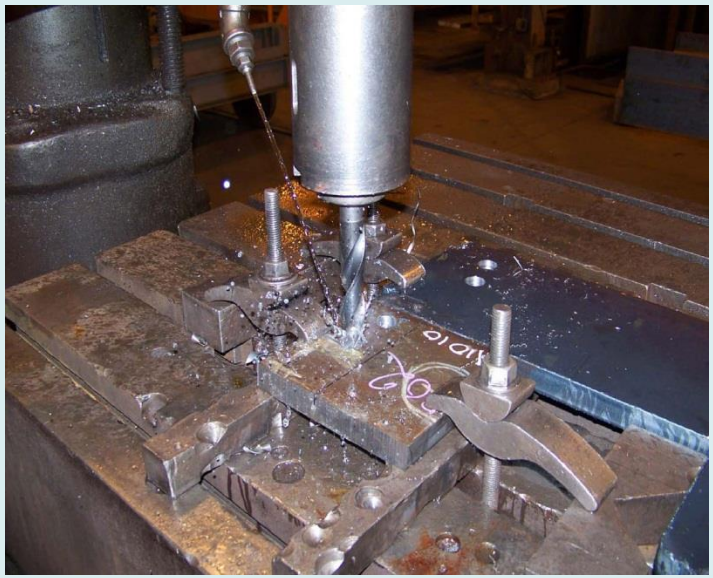
Salt water 2/week in sealed container

WELDABILITY STUDY

A572 Grade 50, **43 sec**. 6” cut vs. A1010, **49 sec**. 6” cut



Drilling 5/16” dia. twist drill.

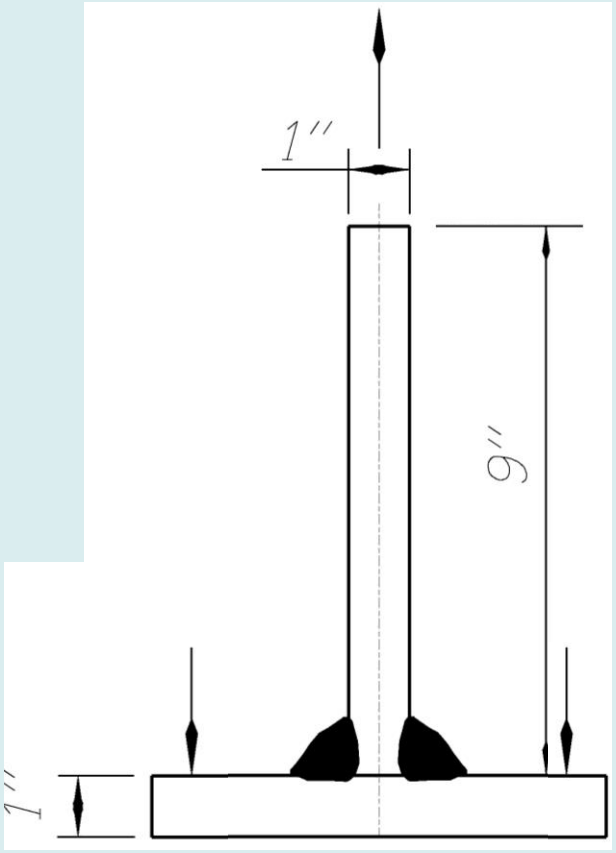


CHARCTERIZATION OF SUBMERGED ARC-WELDED 1-IN THICK DURACORR

- Heat inputs ranged from 25 kJ/in to 70 kJ/in with the latter an input commonly used for joining thicker plate.
- Thermal parameters
  - Flux baked at 400 ^{o}F, 8 hour minimum, unused flux recovered and rebaked for reuse.
  - Preheat temperature: Sufficient to remove surface moisture
  - Interpass temperature: 210-225 ^{o}F

Filet Weld

- FCAW single pass 5/16”
- SAW two pass weld 3/8”



Filet Weld

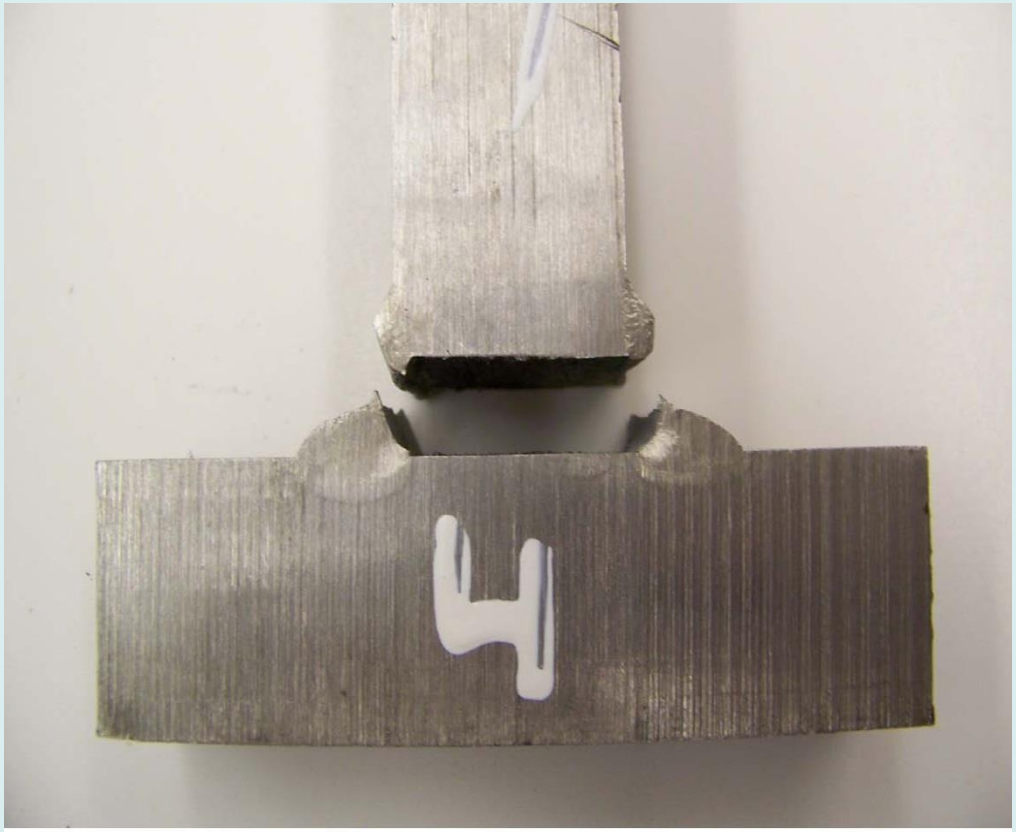
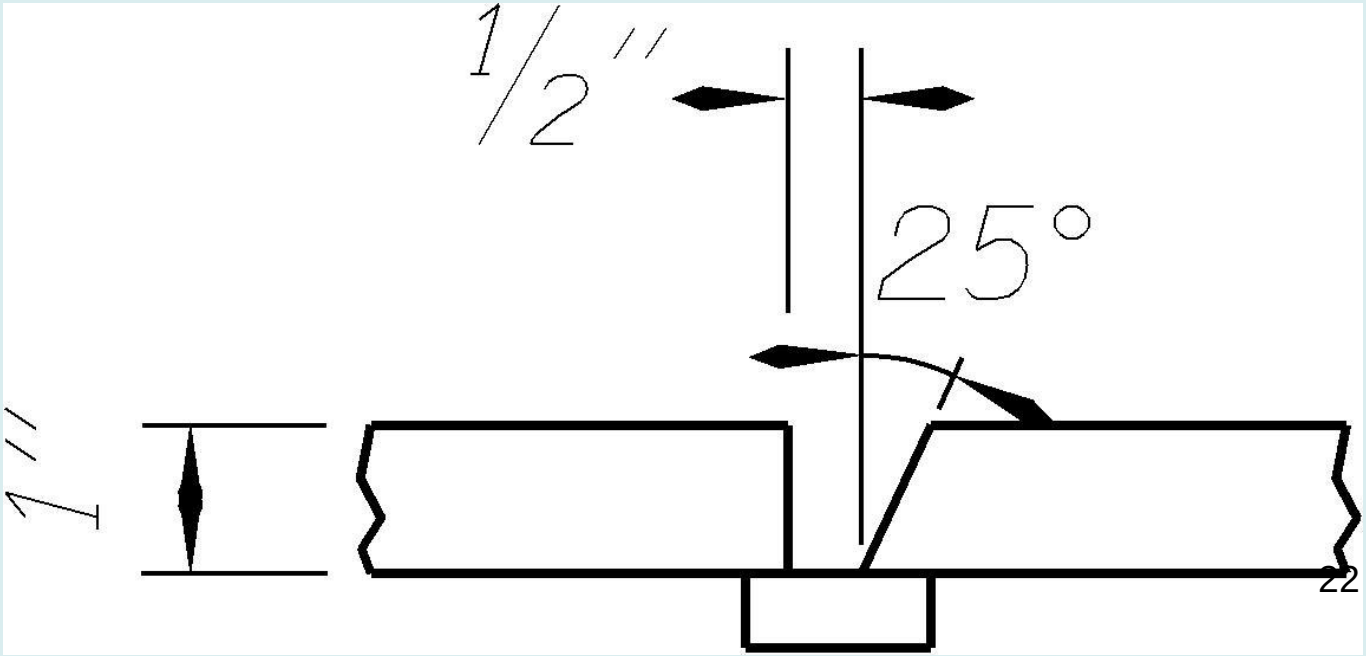


Photo 32
SAW Single Pass Fillet Fracture

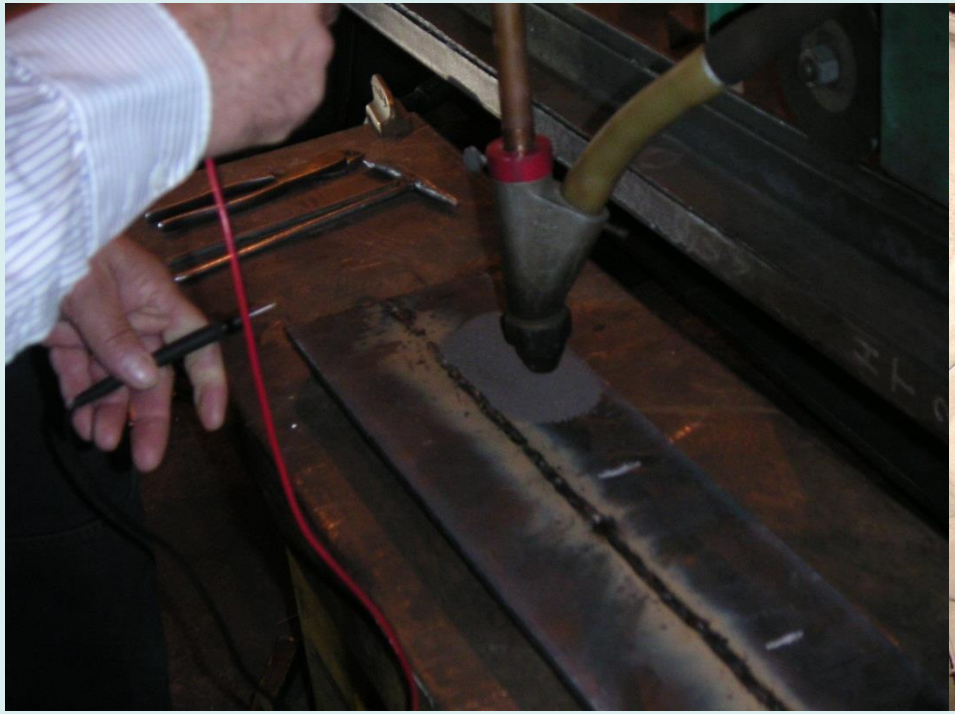
Weld parameters

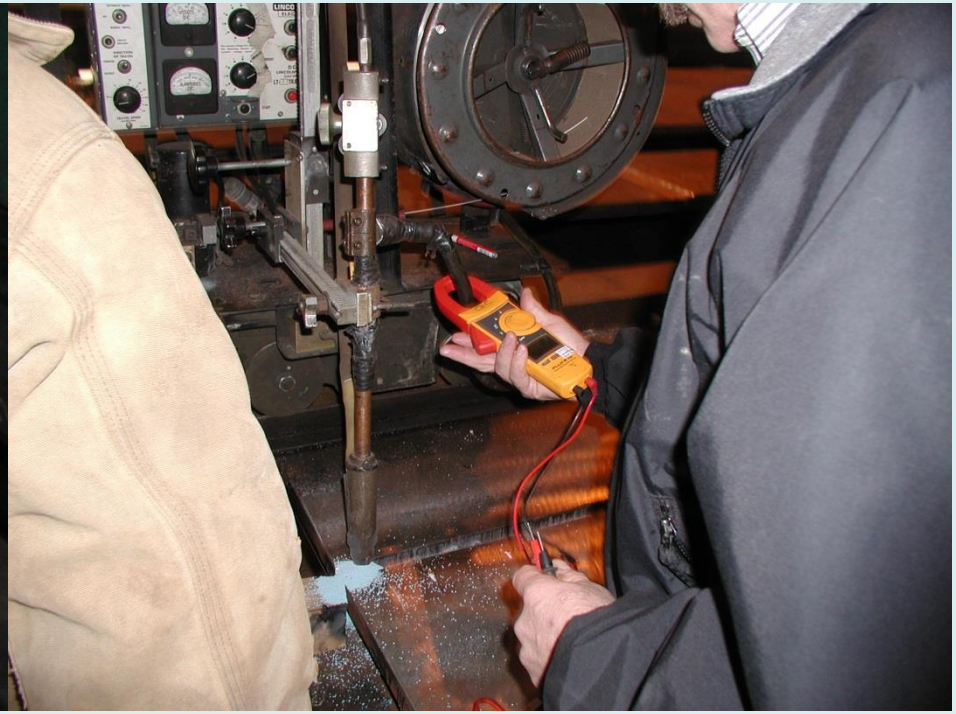
- **Amps=450**
- **Volts=34**
- **Travel=17 IPM**
- **Heat Input=54 kj/in**
- **Heat Input=0.06*V*I/T**
- **Preheat=Ambient**

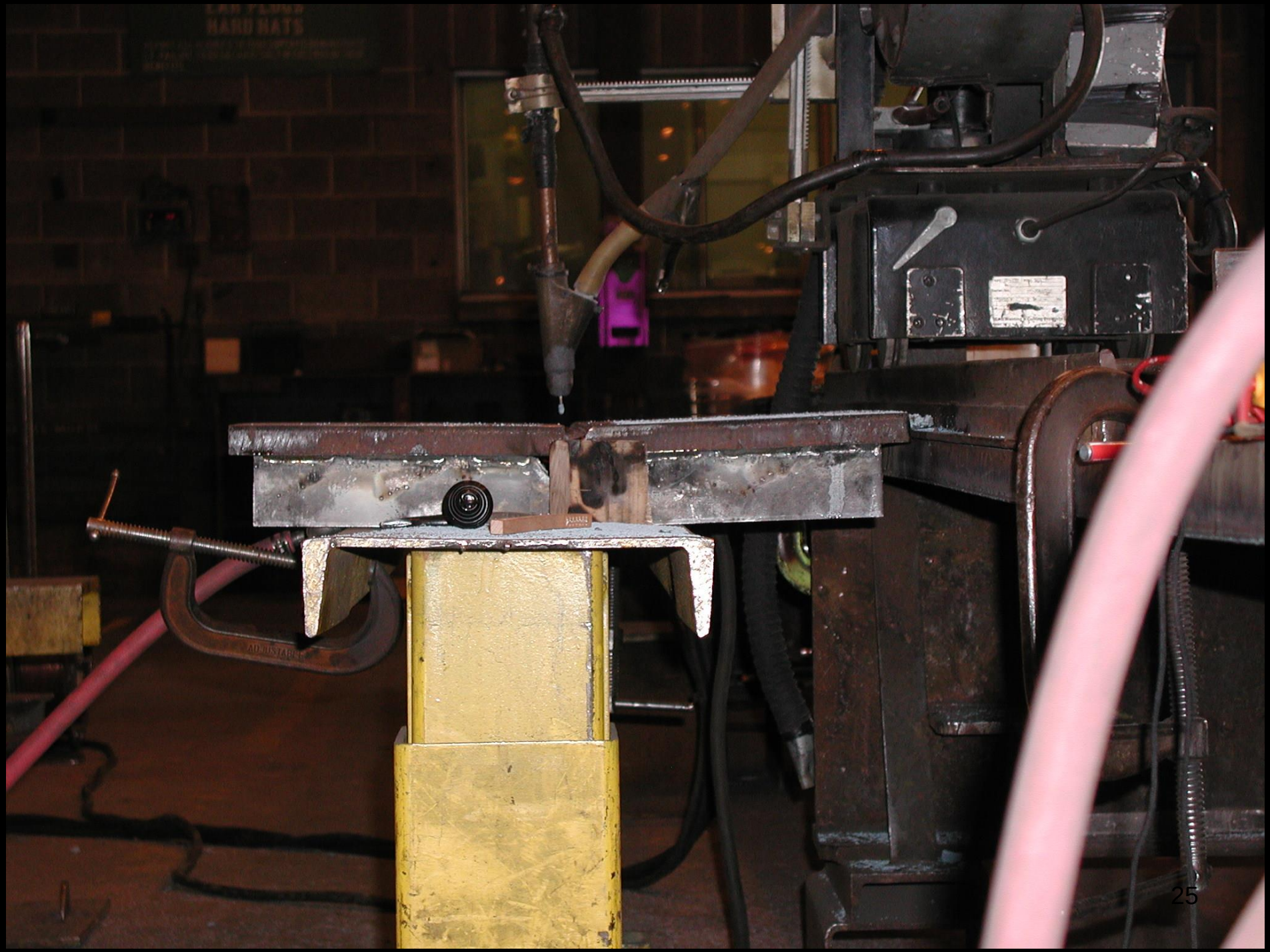
- **Lincoln Blue Max ER309L, 3/32” dia.**
- **Lincoln Blue Max 2000 Flux.**



Heat input checked periodically

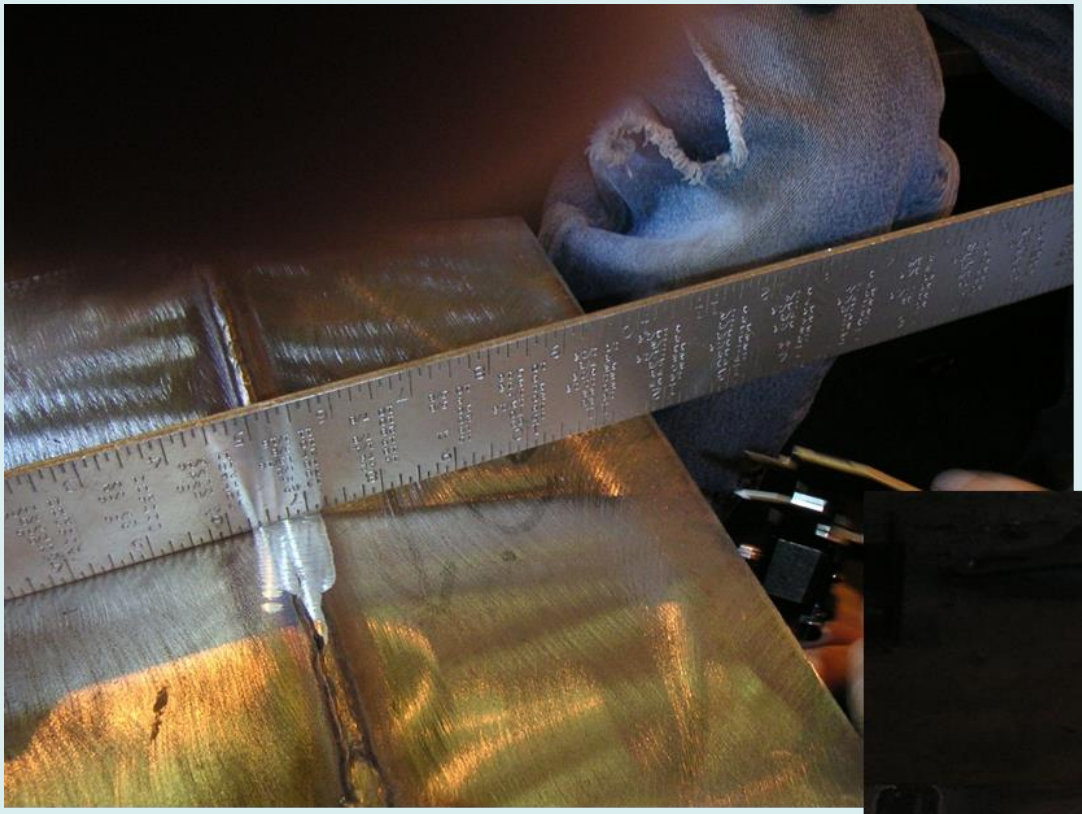




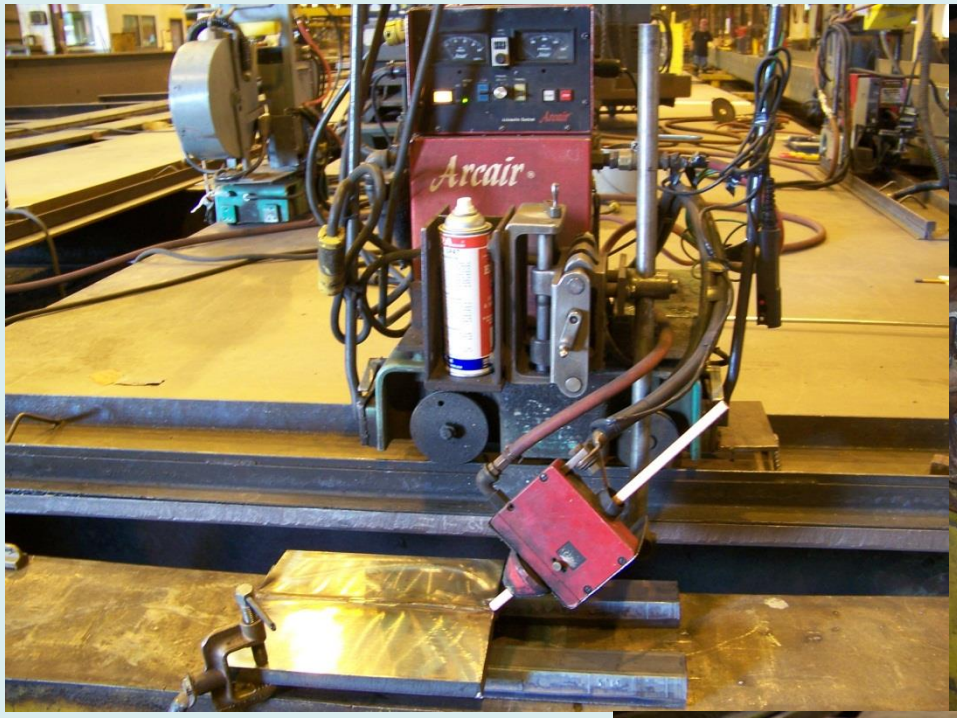

HARD HATS

Distortion

Distortion



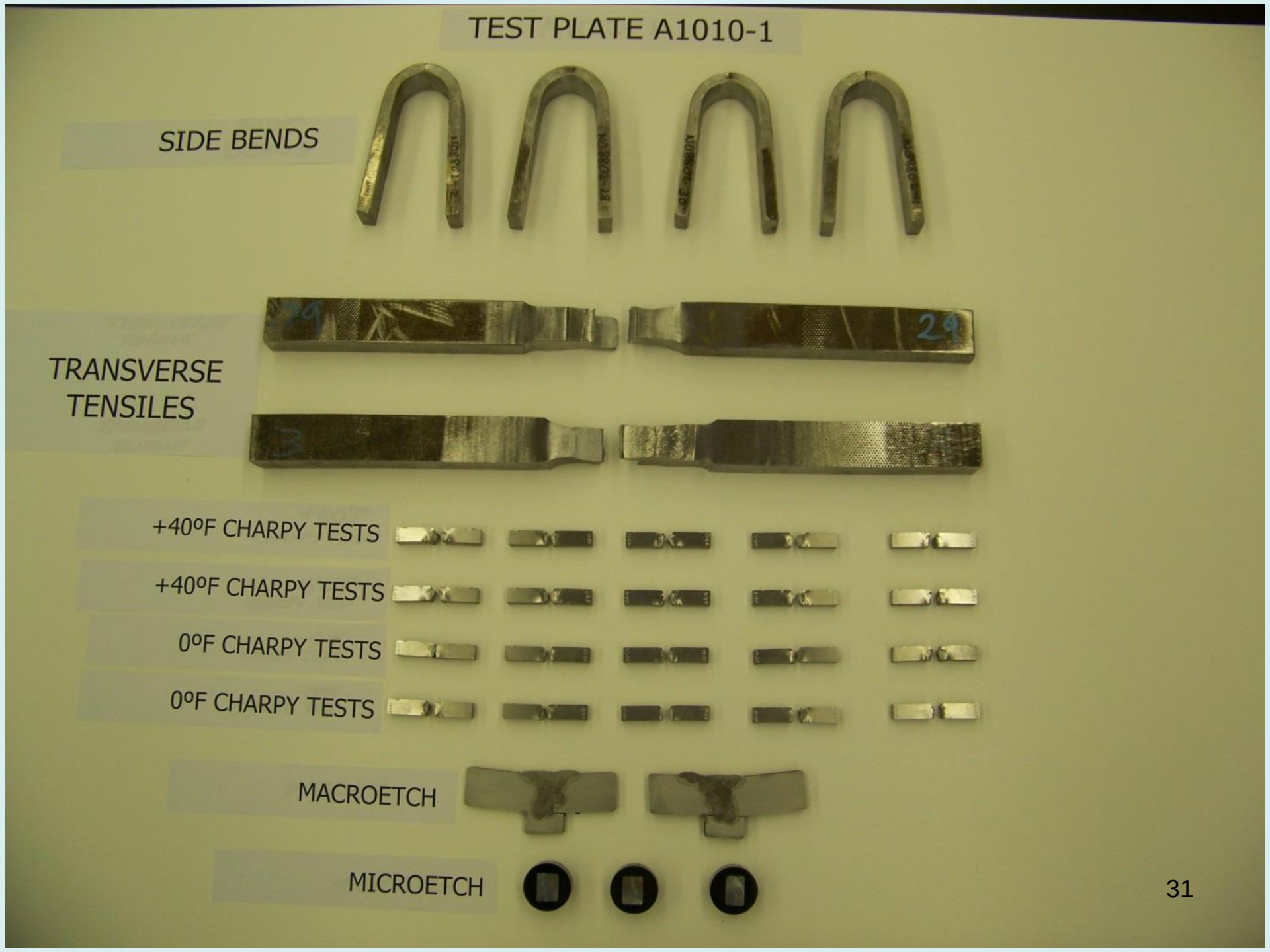
Distortion



Distortion


11/08/2011 12:46

TEST PLATE A1010-1




TRANSVERSE
TENSILES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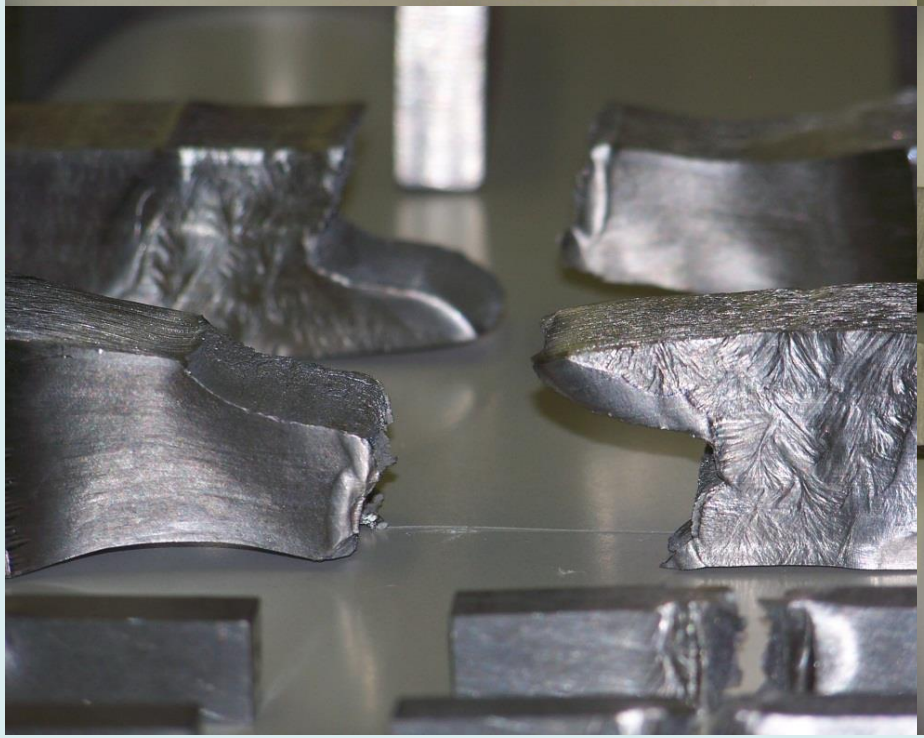
TENSILES




TRANSVERSE
TENSILES


MICROETCH


MACROETCH


SIDE BENDS


SIDE BENDS


SIDE BENDS


SIDE BENDS