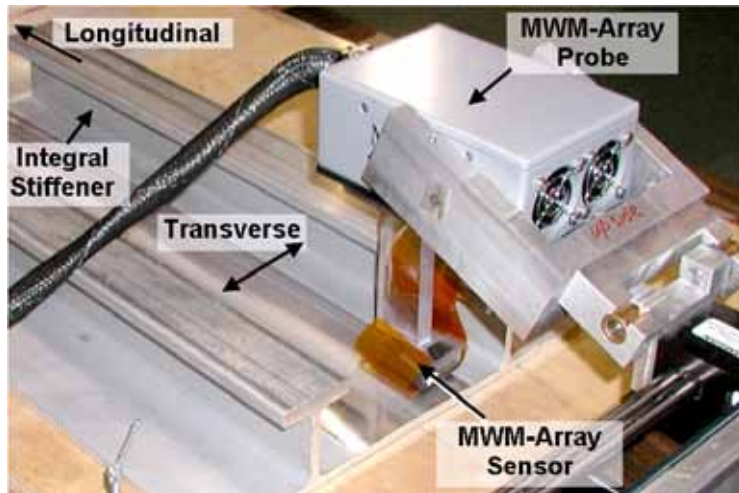
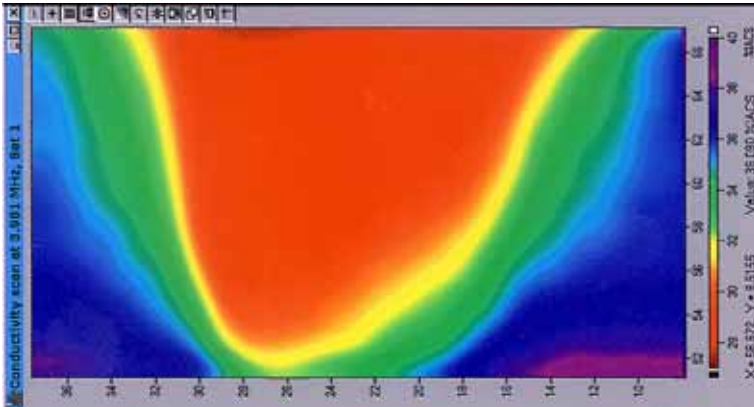


ASM 7th International Conference on Trends in Welding Research
Callaway Gardens Resort, Pine Mountain GA; May 16-20, 2005
POSTER SESSION

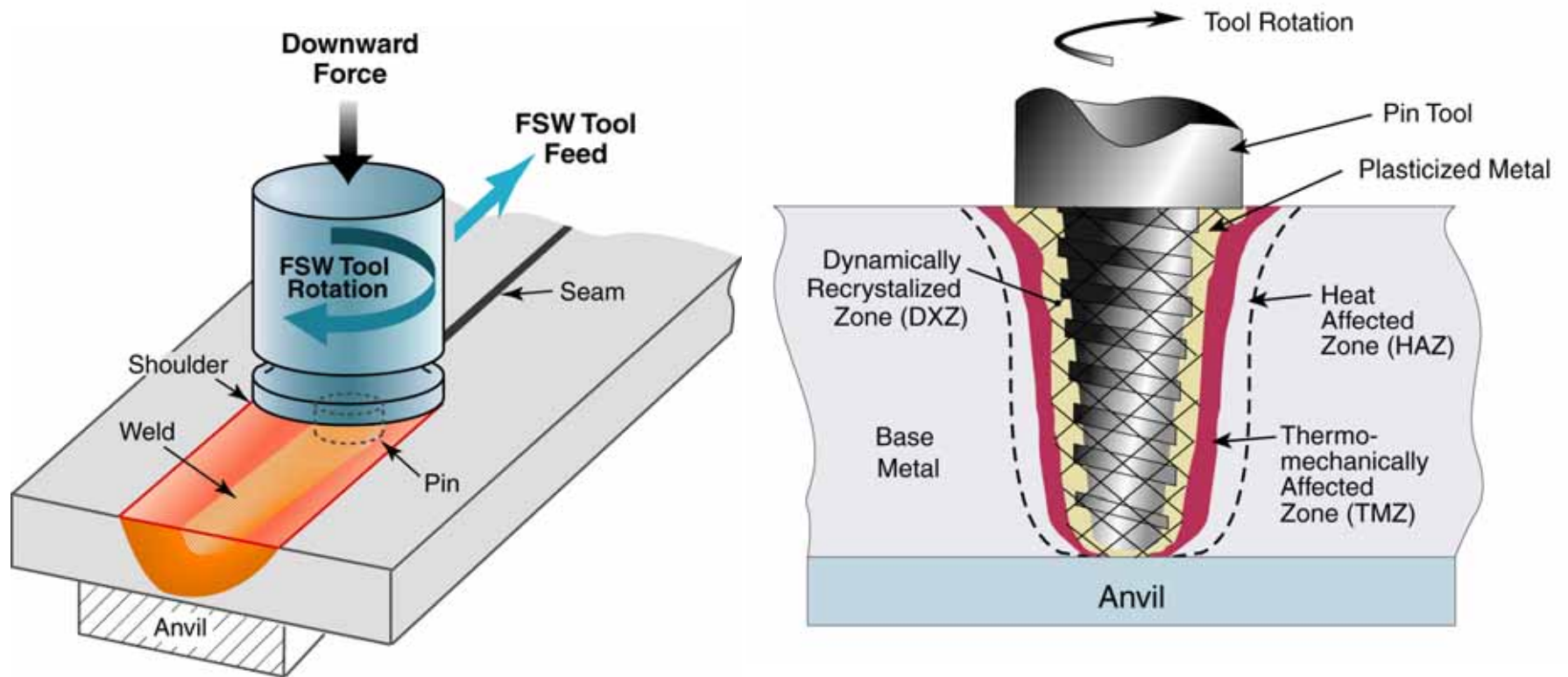


MWM[®]-Array Inspection for Quality Control of Friction Stir Welded Extrusion

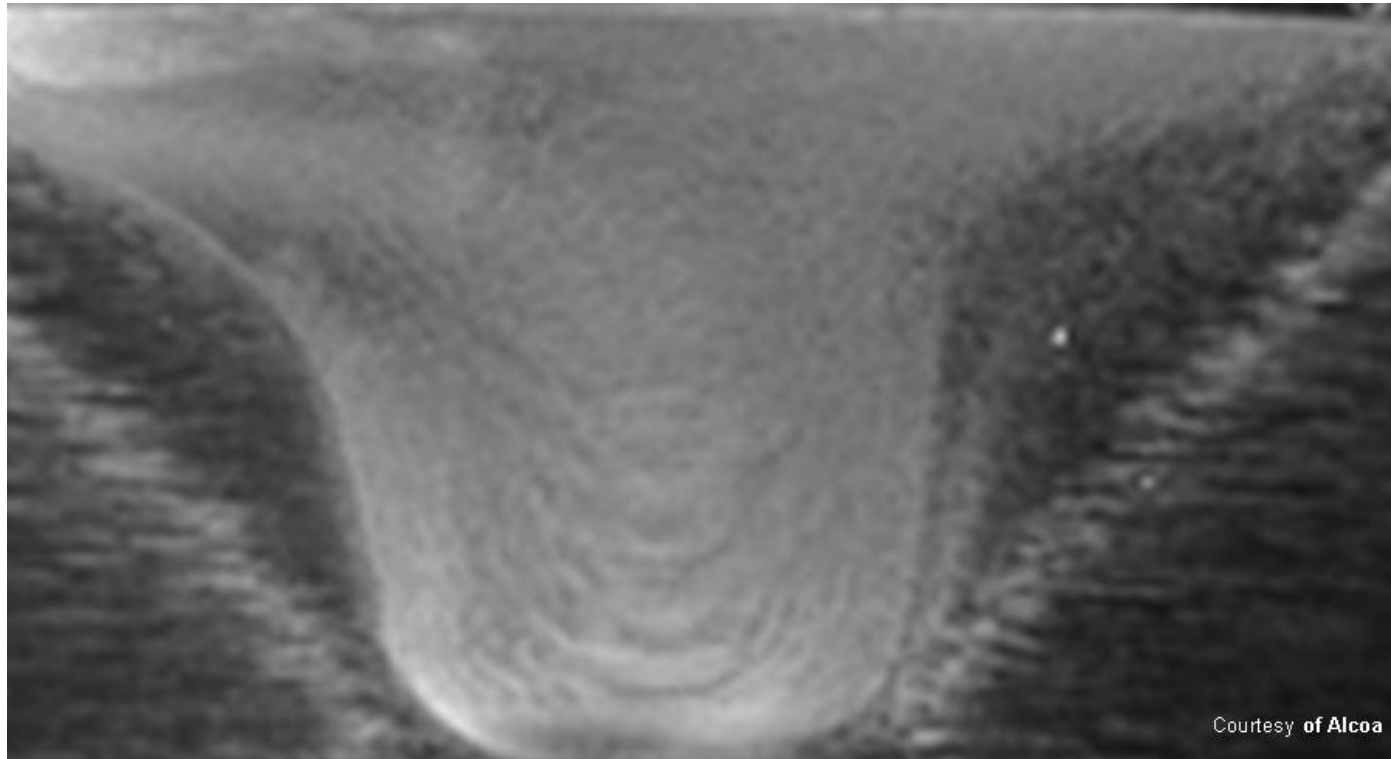
David Grundy, Vladimir Zilberstein,
and Neil Goldfine
JENTEK Sensors, Inc., Waltham, MA, USA
Phone: (781) 642-9666

Jerrold Green and Israel Stol
Alcoa Technical Center, Pittsburgh, PA, USA

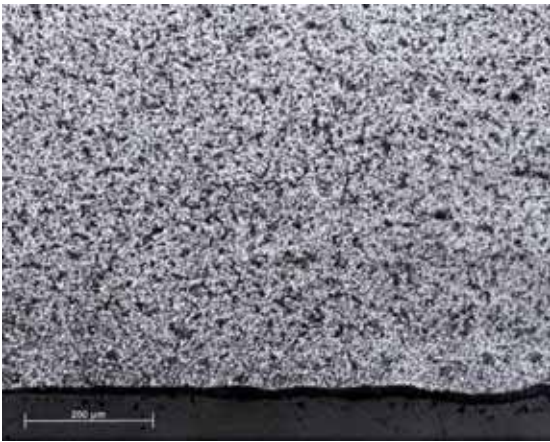
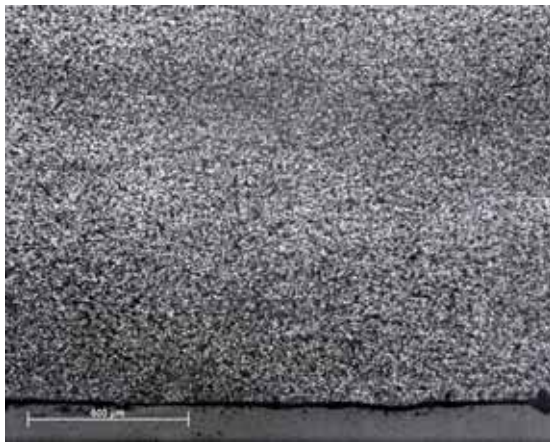
Schematics of FSW Process



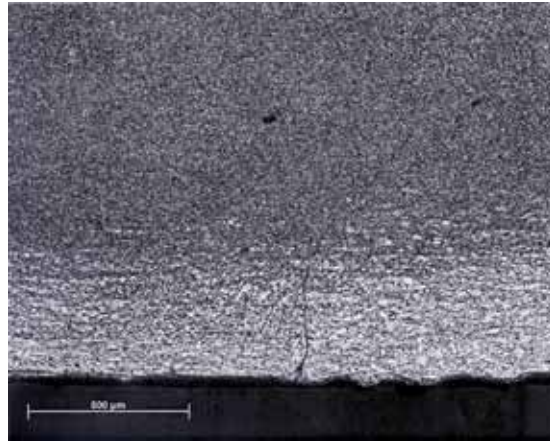
Cross Sectional Macrograph of a Full-Penetration FSW



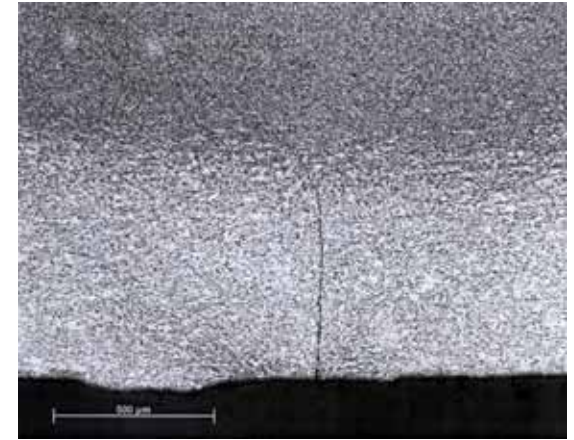
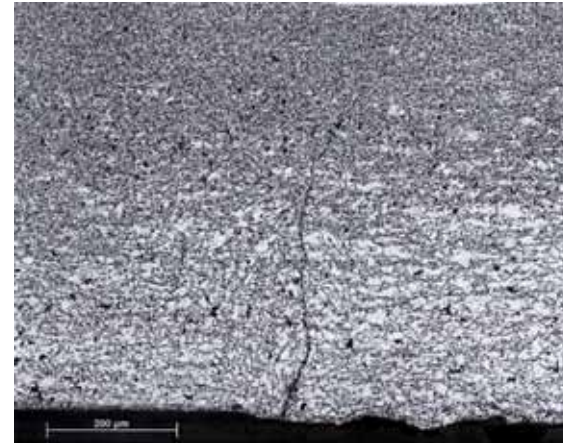
Photomicrographs of etched cross-sections of butt FSWs near the backside



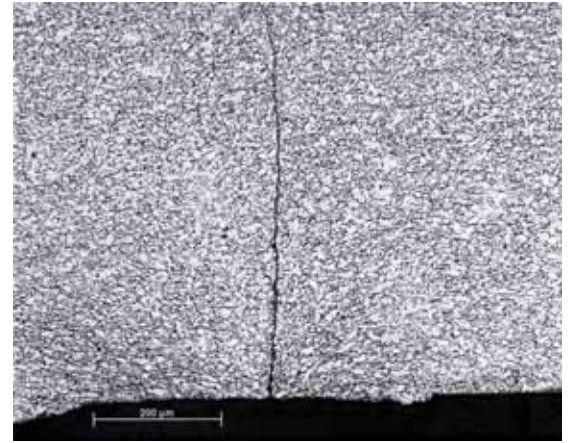
Without discrepant conditions



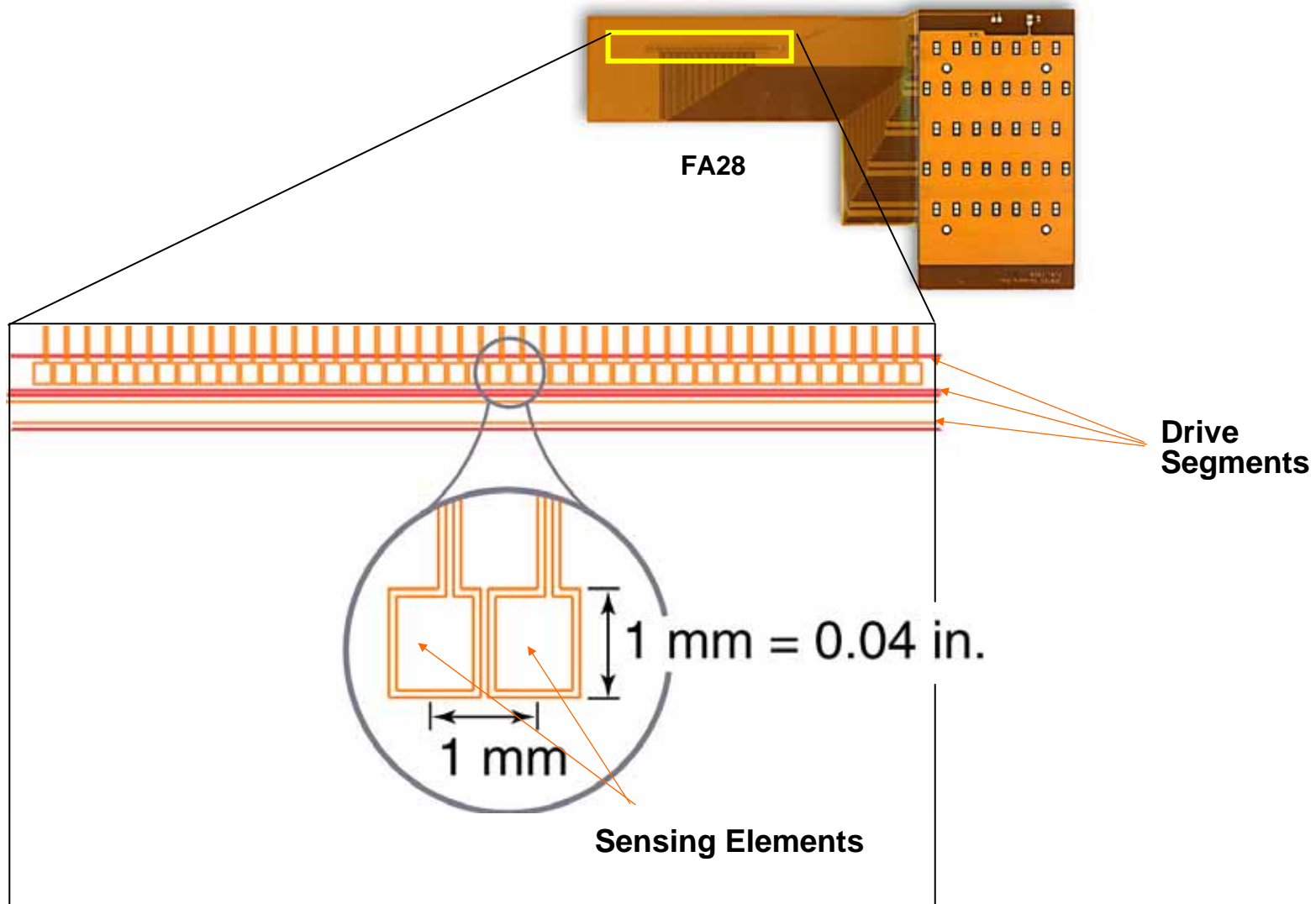
Kissing Bond



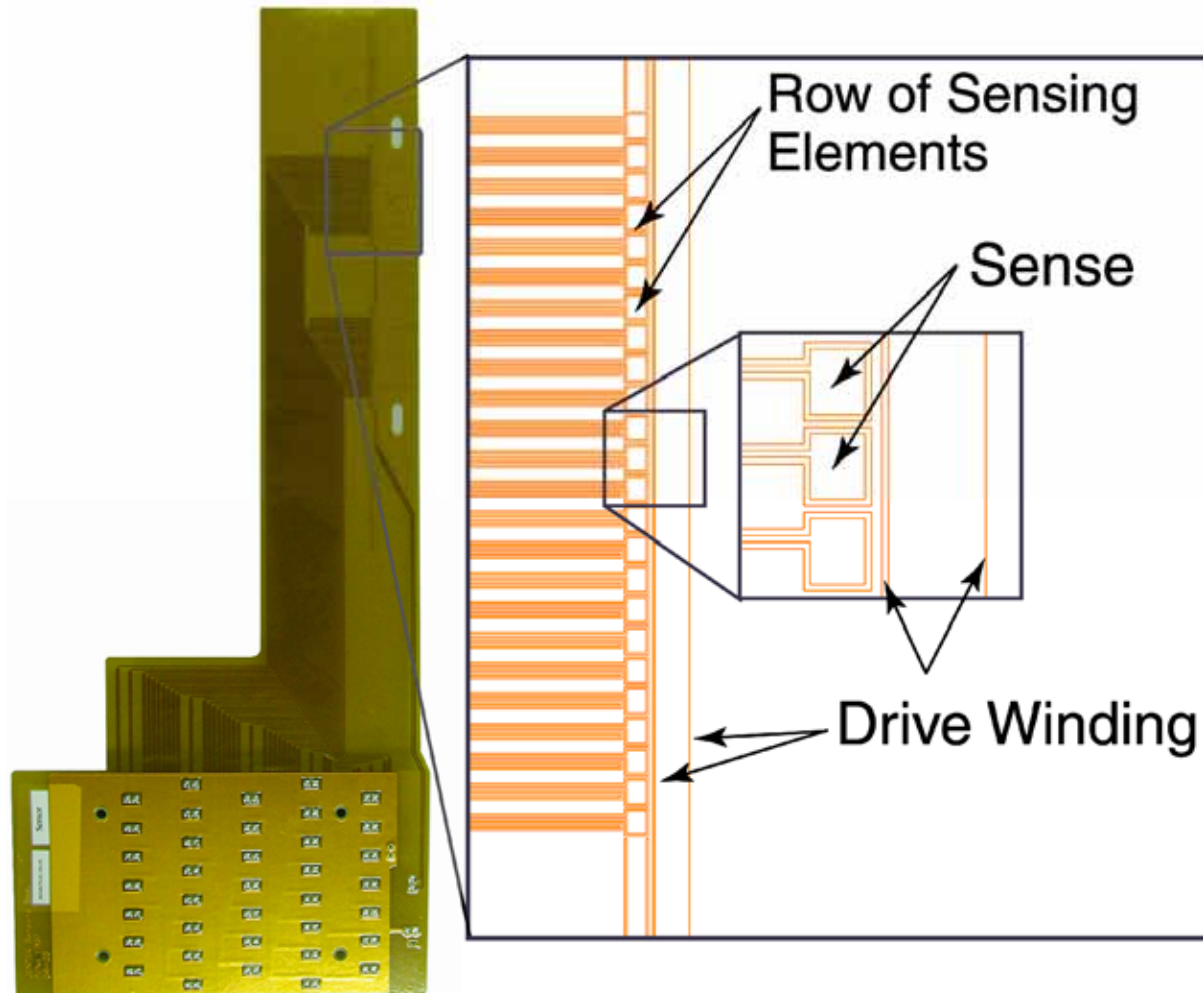
LOP



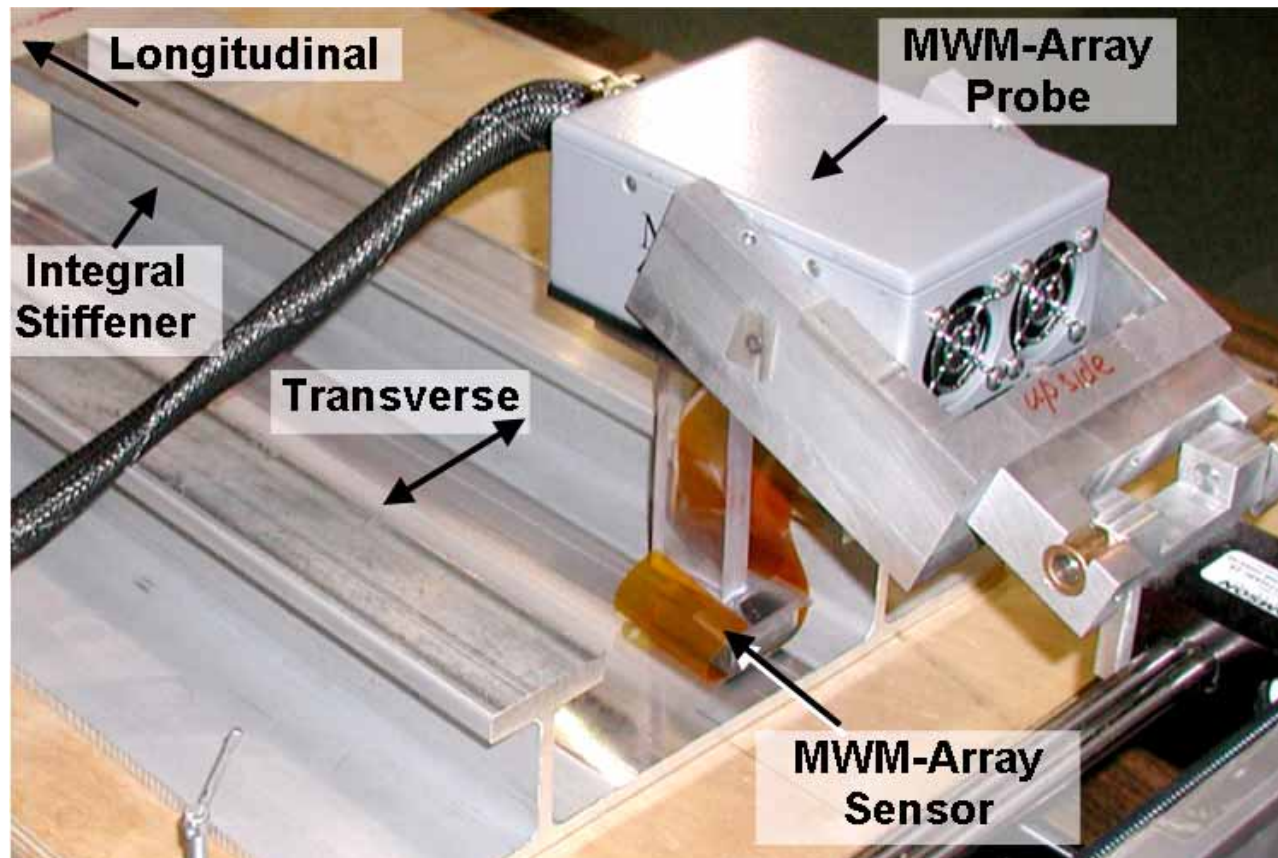
MWM-Array for Shallow Cracks – FA28



MWM-Array Sensor FA57

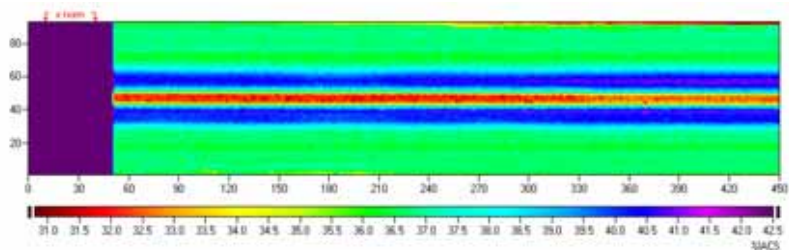


Scanning Set-up for FSW Study

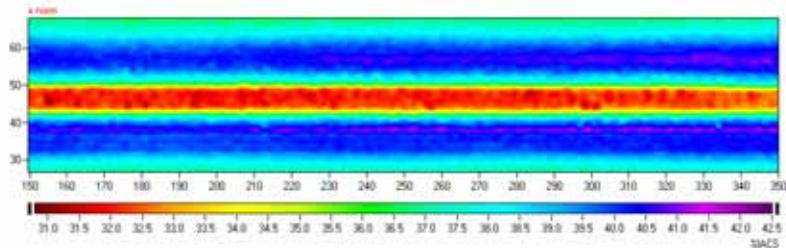


Friction Stir Welding (FSW)

Good, Full Penetration

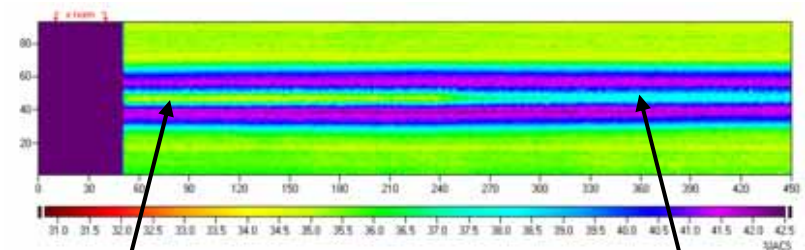


Full Scan



Close-up View

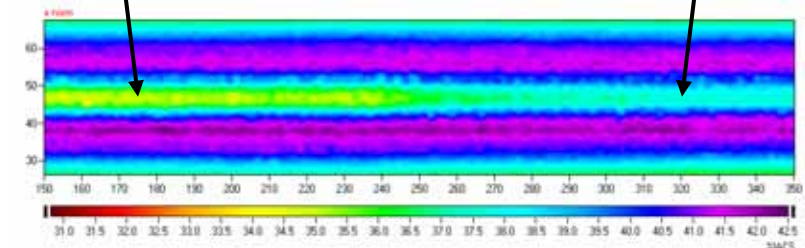
Kissing Bond and Lack of Penetration



Full Scan

Kissing bond

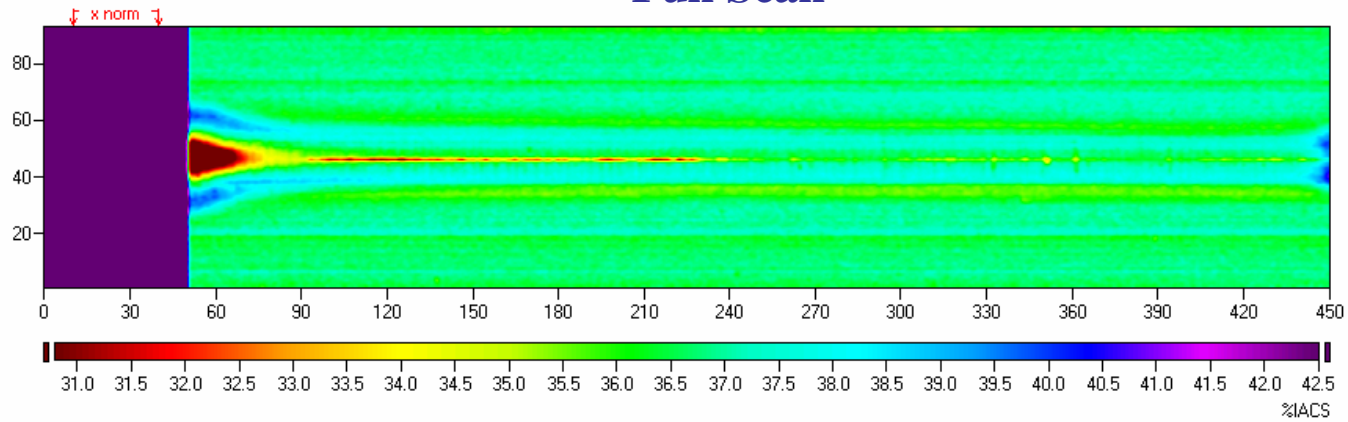
Lack of penetration



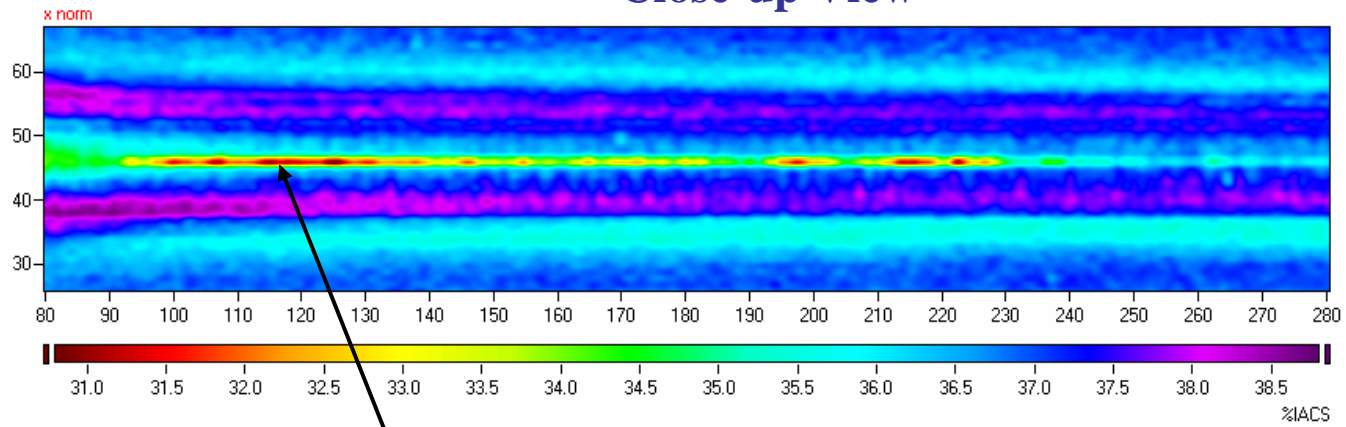
Close-up View

MWM-Array Longitudinal Scan

Full Scan

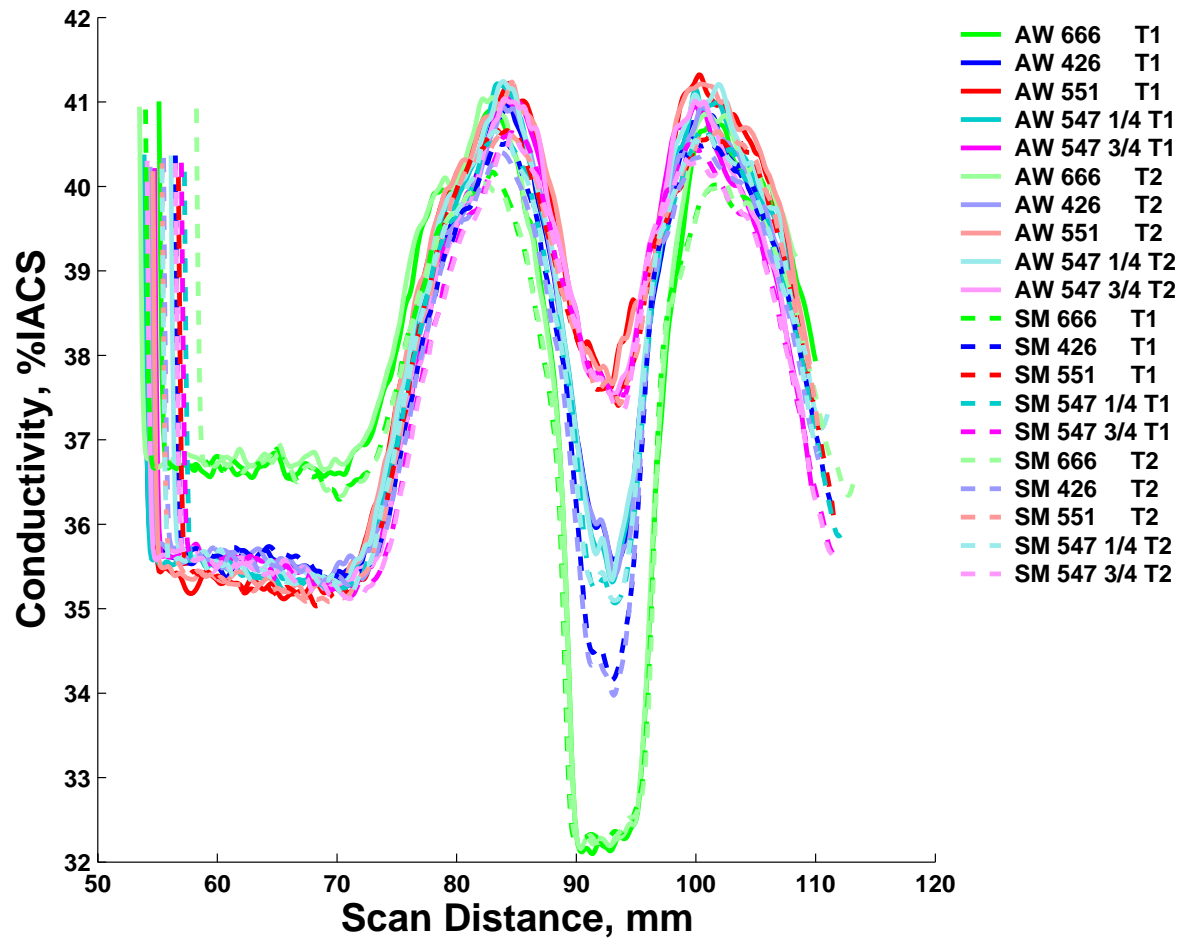


Close-up View



**Intermittent Planar
Discontinuities**

Plots of conductivity acquired during transverse scans of panels in the as-welded (solid lines) and skim-machined (dashed lines) surface conditions



MWM-Array measured lift-off acquired during longitudinal scanning of two different FSW panels

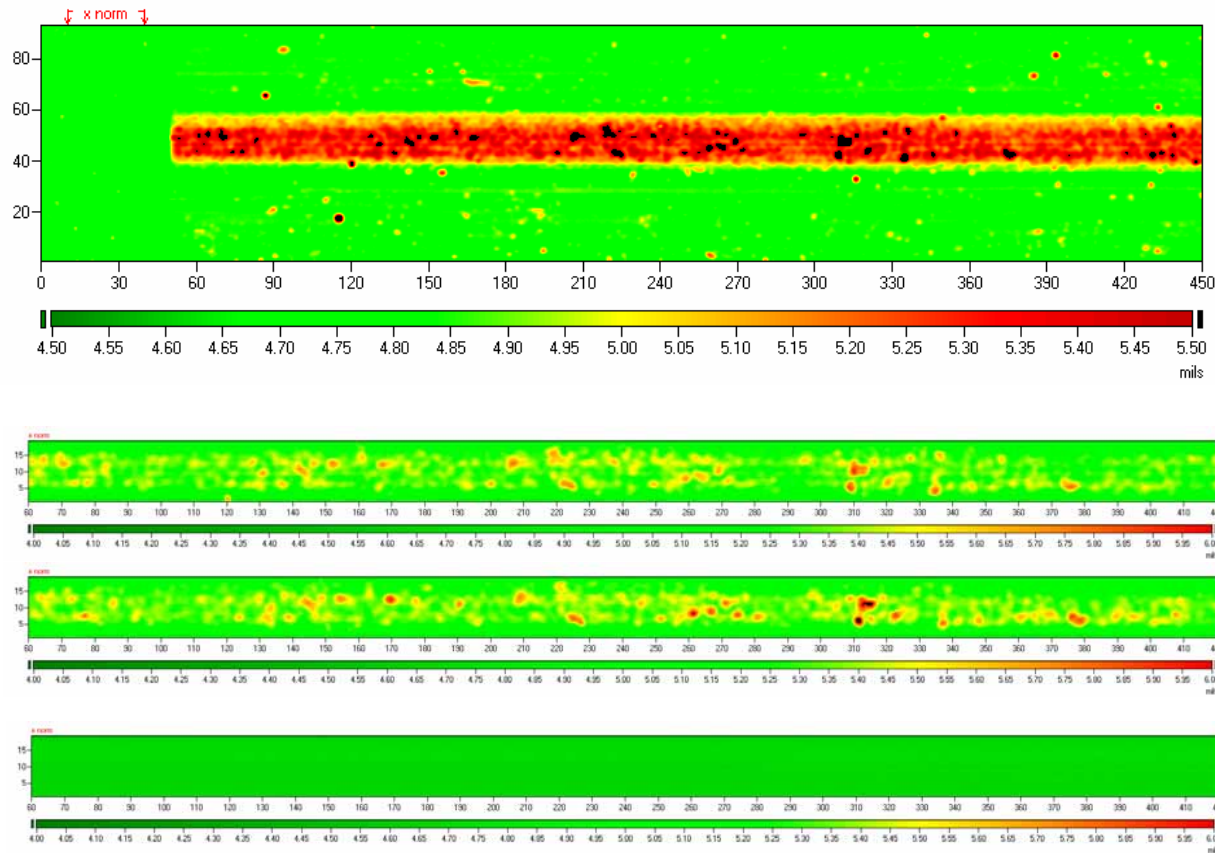


Image of electrical conductivity revealing the nugget, TMZ, HAZ and base metal

