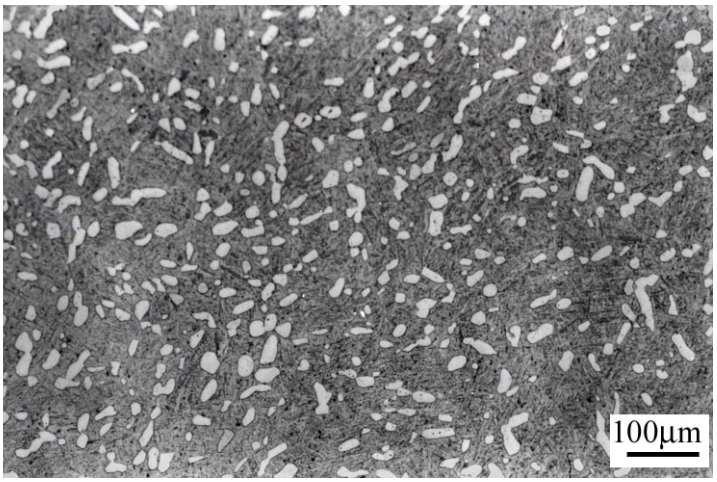

Fig.1 Stabilized microstructure of parent metal

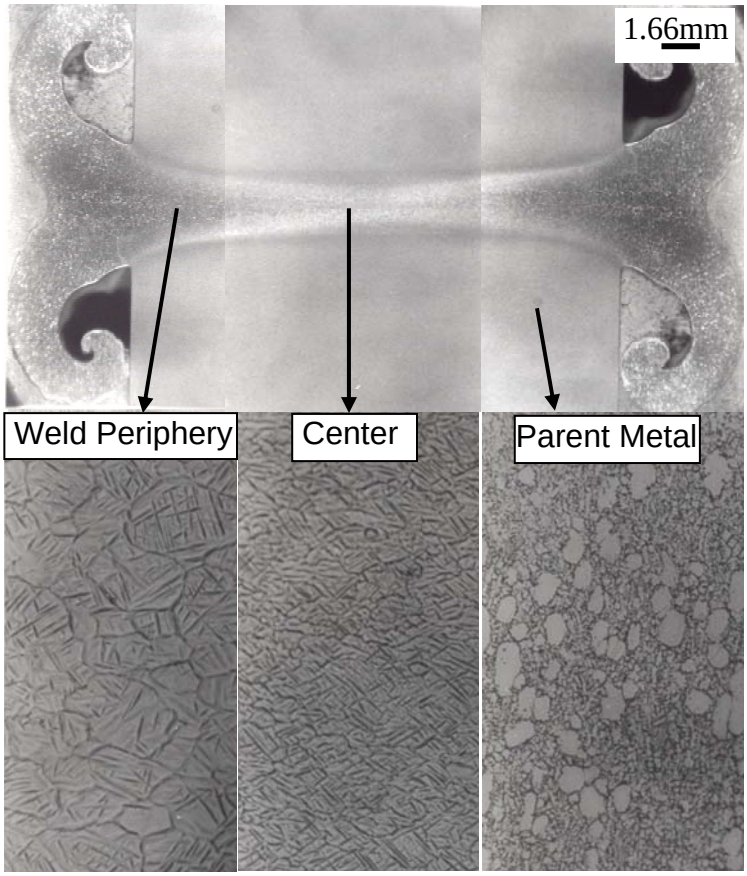

Fig.2 Microstructure of AR+AW of friction weld

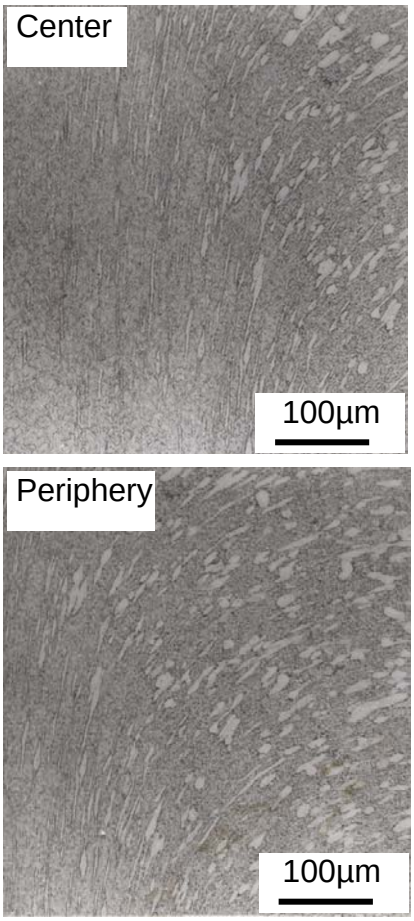

Fig.3 Material flow at center and periphery of friction weld

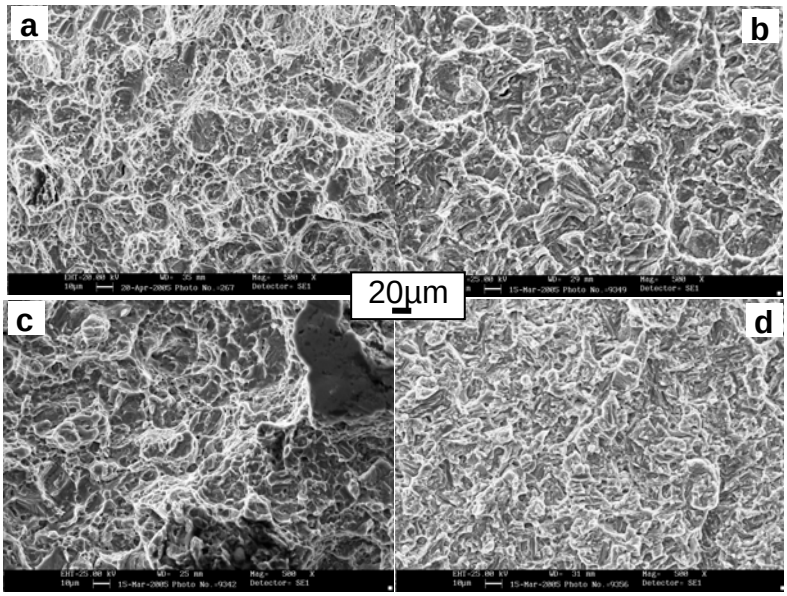

Fig.4. Fractographs of Friction welds a) STA (OQ) +AW Notch tensile b) STA (OQ) +PWA Notch tensile c) STA (OQ) +AW Impact toughness d) STA (OQ) +PWA Impact toughness

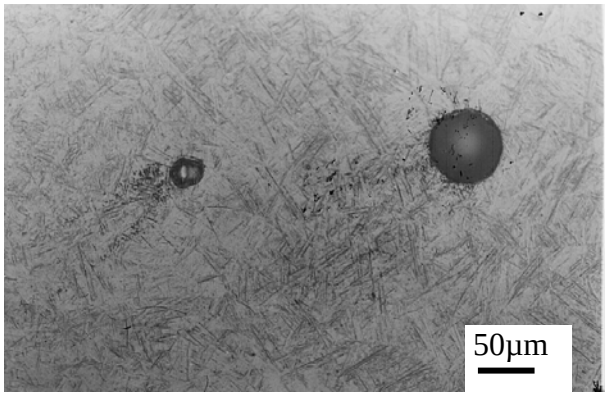

Fig.5. Microstructure of electron beam welded Joint showing micro porosity

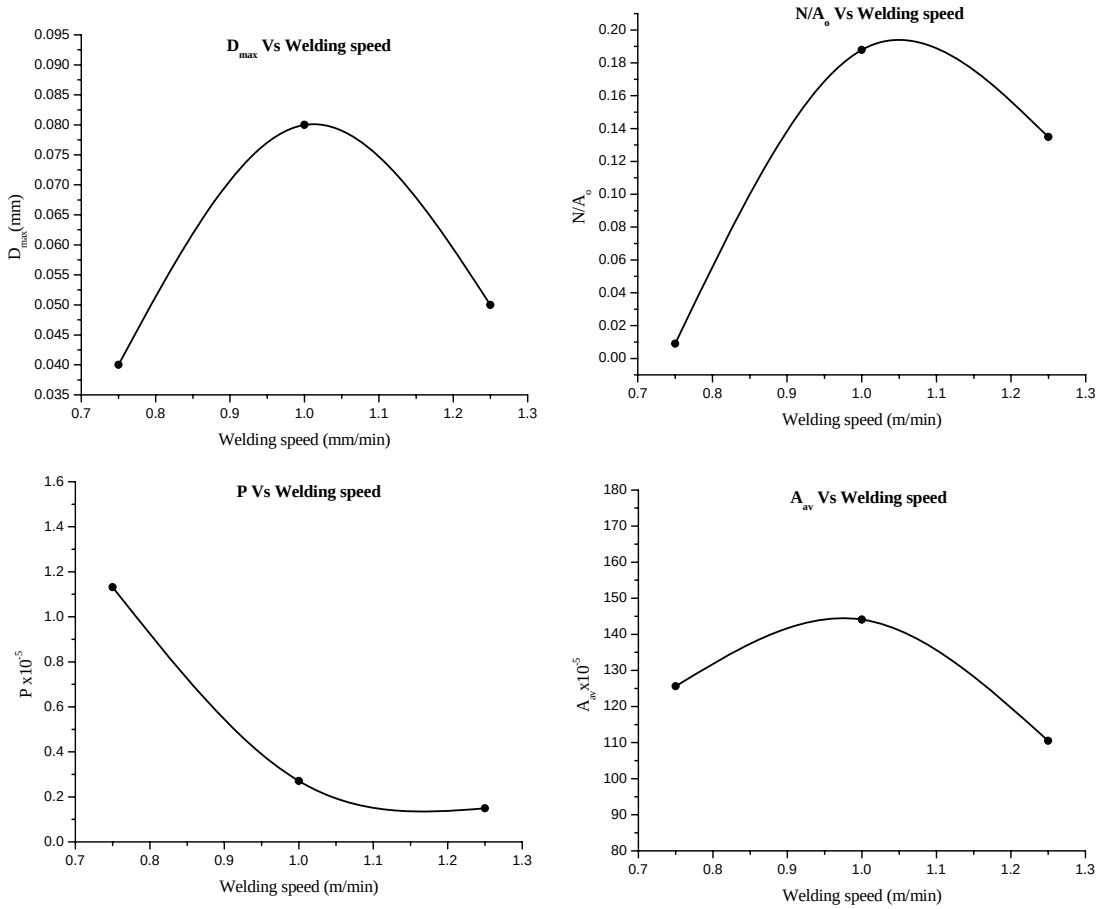

Fig.6 Effect of welding speed on porosity parameters of electron beam welded joints

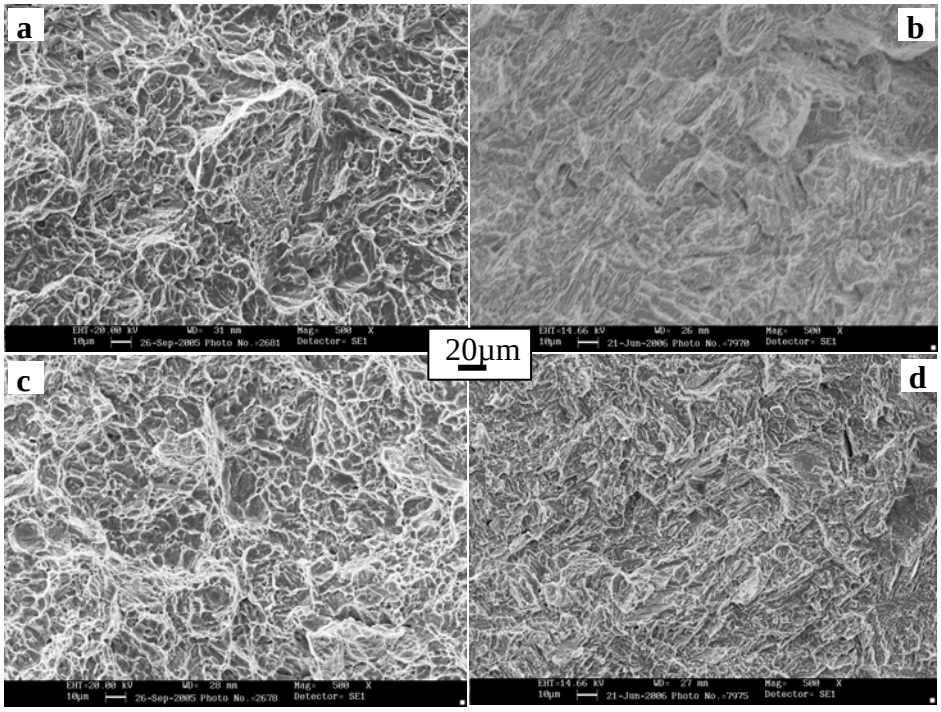

Fig.7. Fractographs of electron beam welded a) STA (OQ) +AW Notch tensile b) STA (OQ) +PWA Notch tensile c) STA (OQ) +AW Impact toughness d) STA (OQ) +PWA Impact toughness

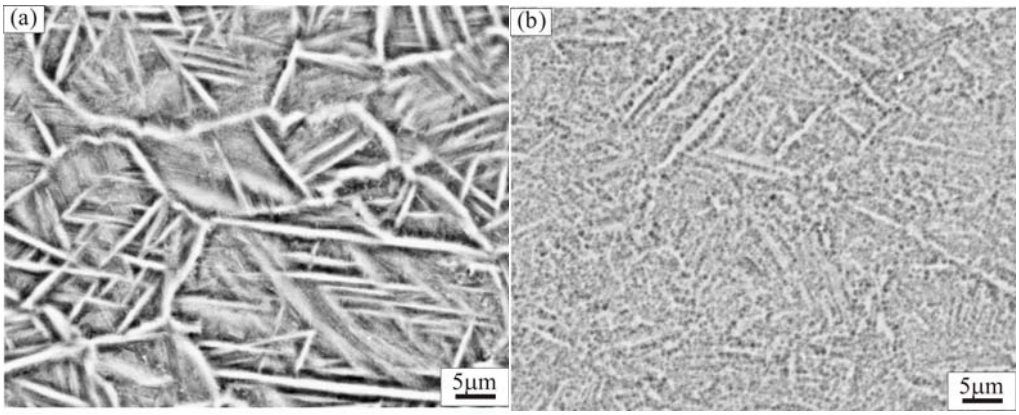

Fig.8. SEM,BSE (a) As-welded friction welds (b) post weld aged friction weld showing formation of precipitates along the lathe boundaries

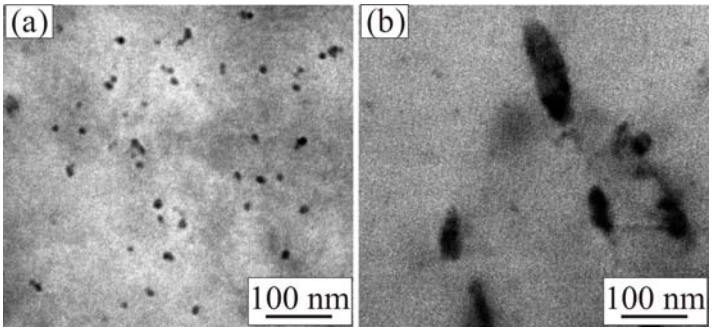

Fig.9. Transmission Electron Microscopy (TEM) of welds (a) As-welded showing fine precipitates (b) Post weld aged showing coarse precipitates

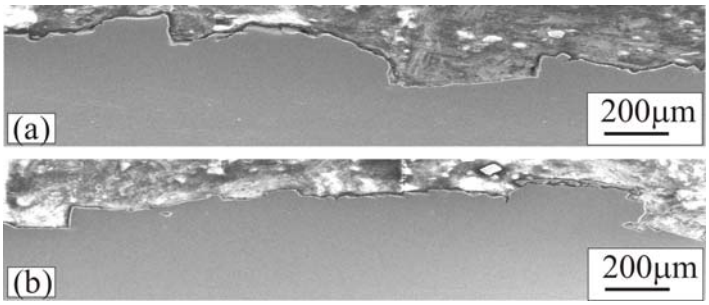

Fig.10. Typical crack path in impact toughness sample (a) As-Welded (b) Post weld aged.