

## **ACI Spring Convention**

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### **Research in Progress Session**

## **Coordinated Research on Bond of ASTM A1035 Reinforcement : First Progress Report**

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ASTM A1035 Reinforcement is characterized by a stress-strain relationship without a well-defined yield point. Its yield strength is about 100 ksi (700 MPa) as determined by the 0.2% offset method. It is more corrosion resistant and has higher chrome content than the conventional Grade 60 reinforcement. To make use of this reinforcement for structural concrete, a full understanding of the bond behavior of this steel to concrete is of paramount importance. This presentation reviews the preliminary findings of a comprehensive research program undertaken to investigate the bond characteristics of the commercially available high strength steel known as Micro-composite Micro-structural formable (MMFX) steel.

The first phase of the experimental program included major parameters that would affect the bond strength: concrete compressive strength, bar size, concrete clear cover, and confinement level. To expedite the overall research effort and to allow for cross checking of research data, this coordinated experimental program is being conducted at the University of Kansas, North Carolina State University, and the University of Texas at Austin. A total of sixty-six large-scale concrete beams with tension reinforcement lap splices have been tested. The conventional Grade 60 steel was used as web reinforcement, while the spliced tension reinforcement and the compression reinforcement were MMFX steel. Evaluation of the bond characteristics was based on the measured crack width, stresses in the spliced bars and the deflection. Test results are compared with the development length equations given in ACI 318-05 and ACI 408.