HTHA *Advanced back scattered ultrasonic testing*

High temperature hydrogen attack (HTHA) is observed in steels exposed to high temperature above 200 deg. C. At high temperature atomic hydrogen diffuses in steel. This hydrogen reacts with Carbon of steel and forms CH4. This bubble's at grain boundary and forms voids at grain boundary.

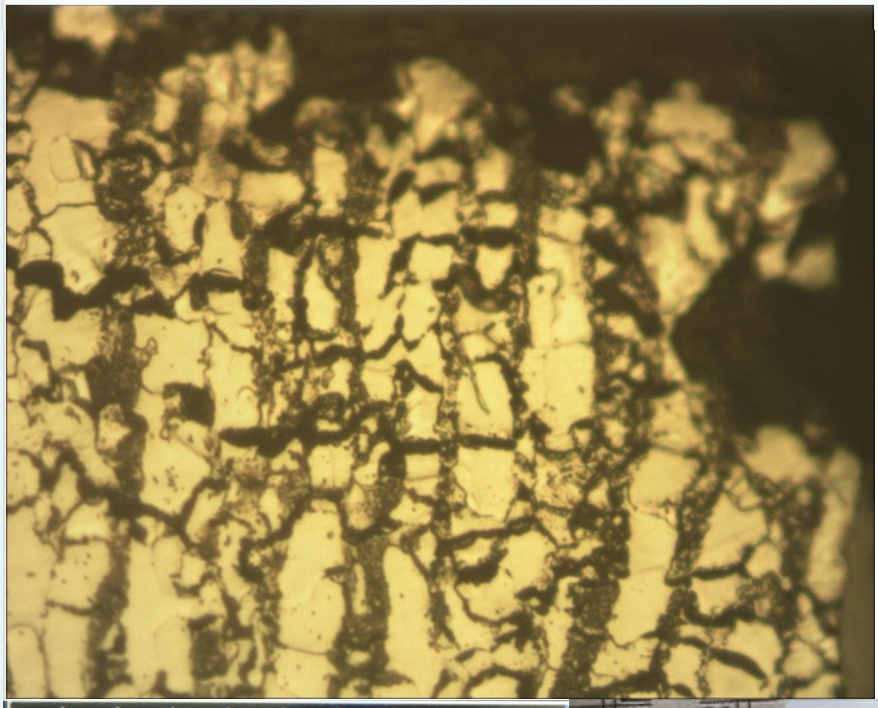
MC + 4H = M + CH4

These bubbles exert pressure and also coalesce resulting in to fissures. The growth of voids and fissures weakens the metal and the fissures develop in to major crack.

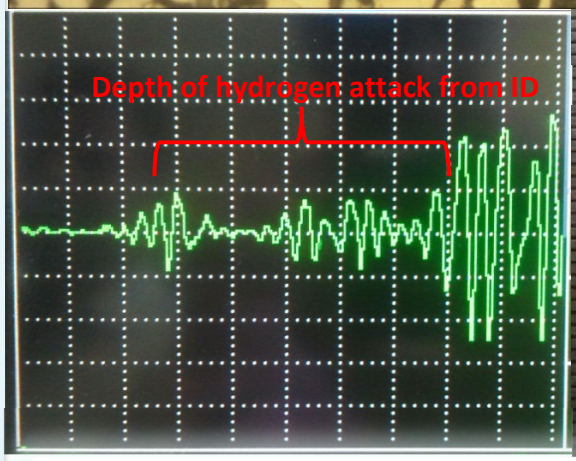
This reaction decarburizes the steel, produces micro cracks/fissures and lowers toughness of steel but not necessarily cause loss in thickness.

The degree of hydrogen attack depends upon temperature, hydrogen partial pressure, stress level, exposure time, steel composition and structure.

TCR Advanced has designed a procedure based on API 941 for detection and estimation of HTHA by ABUT



Microstructure shows presence of fissures from ID due to HTHA



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