GERDAU AMERISTEEL™

Thermex Product Properties and Application

The Thermex process is used by the Knoxville Steel Mill to produce reinforcing bar with high yield strength and excellent ductility and fabricating qualities.

Because the bar is quenched and tempered for a controlled period of time, a lower chemical analysis than that used to produce conventional bar is needed in order to meet the physical property requirements of the ASTM A615/A615M specification. In many cases the material meets the carbon and carbon equivalent limits of ASTM A706/A706M and is therefore a readily weldable material.

The improved physical properties result from the short time quench and temper treatment which produce a dual metallurgical structure in the cross-section of the bar. The structure of the outer portion of the bar is tempered martensite, a strong material, while the core structure is a combination of ferrite-pearlite, a ductile material. The quenching is performed in a series of special tubes located immediately following the last rolling mill stand. The quenched outer case is tempered by the heat of the core as it migrates out of the bar on the cooling bed, prior to shearing and bundling.

The bars possess higher than typical elongation numbers along with the higher yield strength. Bendability and rebendability is excellent. Breakage during fabrication is very minimal. Bars can be welded with less fear of cracking problems in the heat affected zone.

The bars are produced and certified to ASTM A615/A615M. They meet some of the properties of A706/A706M but do not meet the seismic requirements generally and cannot be certified to that specification.

Sincerely,

Gerdau Ameristeel

Bhaskar Yalamanchili
Director, Corporate Quality