



GREY CAST IRON

STRESS/STRAIN CURVE AND FATIGUE LIMIT OF GREY CAST IRON

Grey cast iron is traditionally characterized only by its tensile strength; published stress/strain curves are scarce. The effects of the most important production parameters on the stress/strain curves and fatigue limit were studied systematically in a research project at the Austrian Foundry Institute.

PRODUCTION PARAMETERS

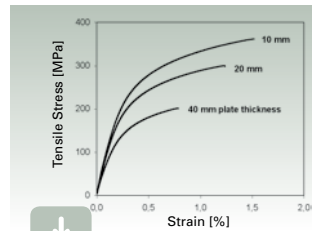
- Chemical Composition:
Carbon Equivalent, alloying elements
- Eutectic cell- and flake size:
Section thickness, inoculation
- Matrix structure:
Abovementioned variables and heat treatment

MECHANICAL PROPERTIES

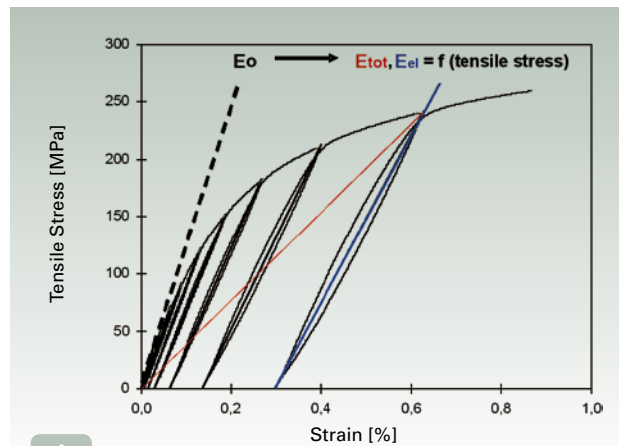
- Stress/strain curves
- Static Youngs modulus as a function of the tensile stress
- Fatigue limit (axial, R = -1)



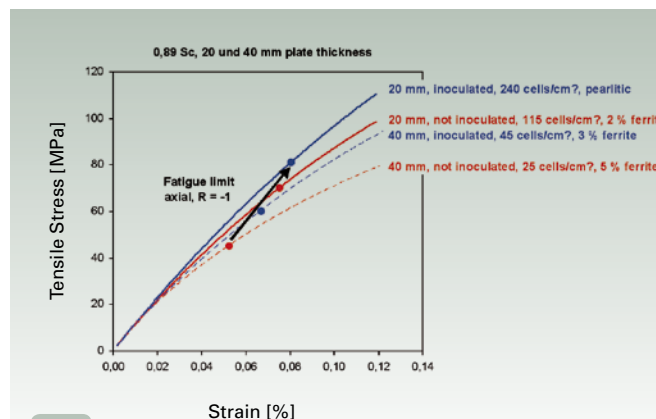
Microstructure GJL



Stress/Strain curves, e.g. effect of section thickness



Determination of the Youngs modulus as a function of the tensile stress



Position of the axial fatigue limit (R = -1) on the stress/strain curve as a function of the eutectic cell count, varied by the section thickness and inoculation