Structure of unhardened steel

Metal structures can be imaged quickly and easily with high-frequency, focussed acoustic waves on polished surfaces **without** previous etching. Using intelligent image processing with linear measurement and object analysis, statistic evaluation of the grain size distribution is no problem. In addition, the high resolution attained at ultra high frequencies (1 - 2 GHz) enables open grain boundaries to be detected, as can be seen by the interference phenomena in the bottom left half of Fig.a.

Fig.a: Structure of steel
The differences in grey level are caused by the direction dependance of the acoustic velocity.
The grain boundaries represent a disturbance in the propagation of the sound waves.
Frequency: 1.1 GHz, Image width: 1000 µm

The crystallites show different grey values based on the orientation dependance of the acoustic velocity. The grain boundary contrast is causes by scattering of the surface wave.

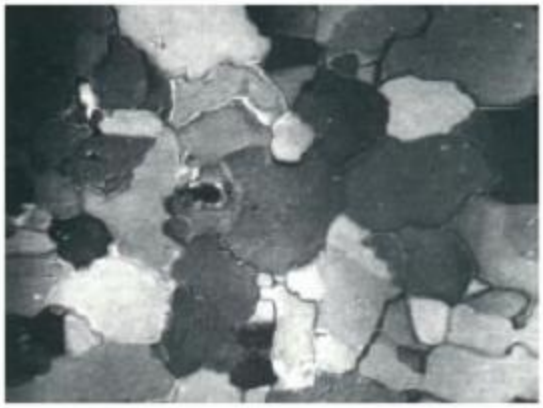

Fig.b: Structure of steel
The differences in grey level are caused by the direction dependance of the acoustic velocity.
The grain boundaries represent a disturbance in the propagation of the sound waves.
Frequency: 1.6 GHz, Image width: 312 µm