FAQ's for Annealing Control Systems

Grain Size Measurements

Q1: What is the relation between the measured grain size value by ultrasound and the grain size value from laboratory in ASTM?

A1: The result from ultrasonic measurement is the averaged grain diameter in µm, whereas the ASTM-value gives the number of grains per unit area. Thus a big ASTM-value corresponds to small grain diameters and vice versa.

Q2: Is the weld seam of the strip dangerous for the measuring device?

A2: Overlapping weld seams can be dangerous. Therefore, each time before a weld seam arrives the transducer arm is moved away from the strip. The signal is given by the weld follower system of the annealing line.

Q3: How is the surface of the ultrasonic transducer cleaned?

A3: When a new weld seam arrives, the transducer is moved into a save position and passes a cleaning brush. On the way back to the strip for measurement the brush is passes a second time.

Q4: How is the correct measuring position for the ultrasonic transducer found?

A4: At the beginning of each strip a so called "angle optimization" is carried out. This means that the position of the maximum signal is investigated by scanning the angle between transducer and strip surface.

Q5: How are the grain size values calibrated?

A5: A precalibration is carried out in advance in the ultrasonic laboratory of Ferrotron by measuring the sensitivity of each ultrasonic transducer. A fine tuning is needed by comparison of on-line measurement with at least one result from the plant laboratory.

Q6: What is the required temperature of the water bath?

A6: The temperature of the water bath must not be higher than 55 °C to prevent damage of the transducer. Recommended temperatures are between 20 °C and 50 °C.

Q7: What are other necessary water conditions?

A7: The water must be free from macroscopic particles and bubbles.

Remanence Measurements

Q1: What is the dimension of the remanence measurement?

A1: The measuring results are dimensionless numbers on a percent scale.

Q2: Is the weld seam of the strip dangerous for the measuring device?

A2: Overlapping weld seams can be dangerous. Therefore, each time before a weld seam arrives the measuring head is lifted from the strip. The signal is given by the weld follower system of the annealing line.

Q3: Is the strip temperature dangerous for the measuring rollers?

A3: If the strip temperature surpasses 80 °C a pressured air cooling of the measuring head is recommended.

Q4: How is the remanence measurement calibrated?

A4: The calibration is carried out by the magnetic field of calibration coils and a constant current source. By this the sensitivity of the Hall probe can be determined independently of the steel strip influence. During the calibration the measuring head has to be in tilted off position.