

## Training program for eddy current testing (ET)

In the NDT training course the following knowledge will be educated.

Subject	Level 1	Level 2	Level 3
<i>Preface</i>	+	+	+
<i>Introduction</i>	+	+	+
<i>Basic physical principles</i>	+	+	+
- Electricity	+	+	+
- Magnetism	+	+	+
- Elementary magnetism	+	+	+
- Earth magnetism	+	+	+
- Magnetic field of a current-carrying conductor	+	+	+
- Current-carrying coils	+	+	+
- Characteristics	+	+	+
- Hysteresis curve	+	+	+
- Interrelation of permeability and field strength	+	+	+
- Magnetic properties of materials	+	+	+
- Temperature resistance of magnetic properties	+	+	+
- The law of induction	+	+	+
- Generation of AC voltage	+	+	+
- Lenz's rule	+	+	+
- Resistance in the AC circuit	+	+	+
- Inductivity of a coil	+	+	+
<i>Generation of eddy currents</i>	+	+	+
- Skin effect	+	+	+
- Penetration depth	+	+	+
<i>Impedance</i>	+	+	+
- Measurement in the impedance plane	---	+	+
- Use of the complex impedance plane	---	+	+
<i>Basic principles of eddy-current inspection</i>	+	+	+
- Effects of the geometry of the components inspected	+	+	+
- Material thickness	+	+	+
- Material separation	+	+	+
- Edge effect	+	+	+
- Effects of the coil geometry	+	+	+
- Lift-off effect and fullness factor	+	+	+
- Summary	+	+	+
<i>Coil systems</i>	+	+	+
- Surface probe coil	+	+	+
- Rod core coils	+	+	+
- Toroidal core coil	+	+	+
- Parallel coil	+	+	+
- Focused coil	+	+	+
- Differential coil, multi-differential coil	+	+	+
- Through coils	+	+	+
- Encircling coil	+	+	+
- Internal coil	+	+	+
- Through coils with pre-magnetization	+	+	+
- Other types of through coils	+	+	+
- Transmission method	+	+	+
- Reflection method	+	+	+

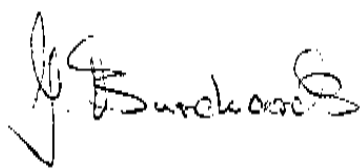
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<b>Subject</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>
<i>Eddy-current instrument</i>	+	+	+
<i>Presentation of measured values</i>	---	+	+
- Instrument indication	---	+	+
- Screen display	---	+	+
- y-t presentation	---	+	+
- Time-linear presentation with different phase shifts between signal voltage and deflection voltage	---	+	+
- Point presentation	---	+	+
<i>Signal evaluation</i>	---	+	+
- Amplitude evaluation	---	+	+
- Y-component evaluation	---	+	+
- Phase-amplitude evaluation	---	+	+
- Evaluation of correlation	---	+	+
<i>Suppression of disturbances</i>	---	+	+
- Use of phase adjusters	---	+	+
- Use of filters	---	+	+
- Low-pass filters	---	+	+
- High-pass filters	---	+	+
- Band-pass filters	---	+	+
- Suppression of relative permeability	---	+	+
- Suppression of disturbances – summary	+	+	+
- High-pass filter	+	+	+
- Low-pass filter	+	+	+
- Band-pass filter	+	+	+
- Relative permeability	+	+	+
<i>Inspection coil and instrument</i>	+	+	+
- Electrical interconnection (DIN 54140 Part 3)	+	+	+
- Frequency and material	+	+	+
- Inspection instrument	+	+	+
- Adjustment of test instrument	+	+	+
- Auxiliary fixtures	+	+	+
<i>Inspection instruction and component requirements</i>	+	+	+
- Inspection instruction	+	+	+
- Requirements to be met by the components	+	+	+
<i>Further applications of eddy-current inspection</i>	+	+	+
- Measurement of coating thicknesses	+	+	+
- Measurement of wall thicknesses	+	+	+
- Conductivity measurements	+	+	+
- Effects of permeability	+	+	+
<i>Test procedure</i>	+	+	+
- Instrument setting	+	+	+
- Screen spread	+	+	+
- Balance	+	+	+
- Phase adjustment	+	+	+
- Frequency adjustment	+	+	+
- Beam location	+	+	+
- Aperture	+	+	+
- Plotter output	+	+	+
<i>Applications in engine construction</i>	+	+	+
- Static inspection	+	+	+
- Measurement of residual wall thickness	+	+	+
- Measurement of crack depth	+	+	+
- Inspection of turbine airfoil edges	+	+	+
- Inspection of blade locating slots	+	+	+
- Dynamic inspection	+	+	+
- Inspection of rotor disks	+	+	+
- Inspection of holes	+	+	+

continued

<b>Subject</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>
<i>Other important topics</i>	+	+	+
- Recording	+	+	+
- Defect sizes	+	+	+
- Defect types	+	+	+
- Inspection report	+	+	+
<i>Sequence of inspection in production</i>	---	+	+
- Alloy-type test	---	+	+
- Inspection for defects	---	+	+
- Dimensional inspection	---	+	+
<i>Inspection specifications and literature</i>	---	+	+
- Specifications	---	+	+
<i>Comparison with other methods</i>	---	+	+
- Applications and framework conditions	---	+	+
- Differences in defect detectability	---	+	+
- Other NDT methods	---	+	+
<i>Requirements on inspection personnel</i>	---	+	+
<i>Digital techniques</i>	---	+	+
<i>Eloscan</i>	---	+	+
<i>Inspection report</i>	---	+	+
<i>MTV 1015 Eddy-current inspection using probes</i>	---	+	+
<i>Diagram: Frequency and probe inductance</i>	---	+	+

+ subitem of the level  
 --- no item of the level



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Prüfungsbeauftragter / Examiner / Level 3