# Training program for magnetic particle testing (MT)

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

| Subject | Level 1 | Level 2 | Level 3 |
|---|---|---|---|
| *Preface* | + | + | + |
| *Introduction* | + | + | + |
| *Basic physical principles* | + | + | + |
| - Electricity | + | + | + |
| - Basics of 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 | --- | + | + |
| - The human eye | + | + | + |
| *Detection of the stray field* | + | + | + |
| *Inspection media* | + | + | + |
| - Wet inspection | + | + | + |
| - Dry inspection | + | + | + |
| *Preparation of components for inspection* | + | + | + |
| - Pre-cleaning | + | + | + |
| - Short-time preservation | + | + | + |
| *Process procedures* | + | + | + |
| - Continuous method | + | + | + |
| - Residual field method | + | + | + |
| *Current types* | + | + | + |
| *Methods of magnetization* | + | + | + |
| - Indirect (yoke) magnetization | + | + | + |
| - Magnetization using a current-carrying conductor | + | + | + |
| - Longitudinal magnetization with current-carrying coil | + | + | + |
| - Circular magnetization with current-carrying conductor | + | + | + |
| - Special methods | + | + | + |
| - Current-flow magnetization | + | + | + |
| - Magnetic induction | + | + | + |
| - Magnetic induction with quick break | + | + | + |
| - Combined method | --- | + | + |
| - Change of field direction | --- | + | + |
| *Self-demagnetization* | --- | + | + |
| *Magnetization data* | --- | + | + |
| - Circular magnetization | --- | + | + |
| - Longitudinal magnetization | --- | + | + |
| - Low fullness factor | --- | + | + |
| - High fullness factor | --- | + | + |
| *Field distribution with the current-flow method* | --- | + | + |
| *Evaluation* | + | + | + |
| - Types of indications | + | + | + |
| - Forgings | + | + | + |

continued

| Subject | Level 1 | Level 2 | Level 3 |
|---|---|---|---|
| - Bars, billets, wire | + | + | + |
| - Sheet material | + | + | + |
| - Defects caused during processing and machining | + | + | + |
| - Turning | + | + | + |
| - Hardening | + | + | + |
| - Grinding | + | + | + |
| - Electroplating | + | + | + |
| - Welding | + | + | + |
| - Defects occurring in operation | + | + | + |
| - Manifestation of defects | + | + | + |
| *Types and causes of indications* | + | + | + |
| *Defect locations, definitions* | + | + | + |
| *Assessment of indications (basic specification)* | --- | + | + |
| - Scope and purpose | --- | + | + |
| - General requirements | --- | + | + |
| - Definitions and inspection characteristics | --- | + | + |
| - Acceptance limits | --- | + | + |
| *Assessment of indications (component-specific specification)* | --- | + | + |
| *Demagnetization* | + | + | + |
| *Post-treatment of components* | + | + | + |
| - Post-cleaning | + | + | + |
| - Preservation | + | + | + |
| *Sequence of inspection in production* | --- | + | + |
| *Illumination / irradiation* | + | + | + |
| *Verification of the proper functioning of the system* | + | + | + |
| - Circular magnetization | + | + | + |
| - Longitudinal magnetization | + | + | + |
| - Inspection media | + | + | + |
| - Demagnetization | + | + | + |
| - Tangential field strength meter | + | + | + |
| - UV meter | + | + | + |
| - Lux meter | + | + | + |
| - Quick break device | + | + | + |
| - Timers | + | + | + |
| *Calibration, checks* | + | + | + |
| *NDT instruction* | + | + | + |
| *Inspection task, inspection instruction* | + | + | + |
| *Documentation* | --- | + | + |
| *Inspection report* | --- | + | + |
| *Limitations of the process* | --- | + | + |
| *Other NDT methods* | --- | + | + |
| - Penetrant inspection | --- | + | + |
| - Ultrasonic inspection | --- | + | + |
| - Eddy-current inspection | --- | + | + |
| - Thermography | --- | + | + |
| - X-ray inspection | --- | + | + |
| *Standards and specifications* | --- | + | + |
| *Requirements on inspection personnel* | + | + | + |
| *Safety precautions and environmental protection* | + | + | + |

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

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