HELLING

NON DESTRUCTIVE TESTING

Herewith we want to give a short introduction to the HELLING Company. This catalogue will present an overview of our main delivery programme concerning products and accessories of Non Destructive Testing. For further deliverable items have a look to our website www.helling.de.

The HELLING Company was founded in 1863 and has a long-term experience on the European and worldwide market. Constant growth and long-standing partnerships have contributed to a continuous development of the company. Today HELLING is a leading manufacturer and supplier of high quality equipment for Non Destructive Testing in 39 countries worldwide.

The HELLING Company is a member of the German Society for Non Destructive Testing (DGZfP), the Russian Association on Non Destructive Testing & Engineering Diagnostics, the Czech Association of Non Destructive Testing and respective Japanese and American Associations.

Based upon a sound scientific footing we design and offer highly efficient testing techniques, corresponding to world standards' requirements.

We hope for a lasting and beneficial co-operation,

Yours faithfully,

HELLING GmbH

Prof. h.c. Nathanael Riess
CEO

Cornelia Bergholz
Managing director

Contents

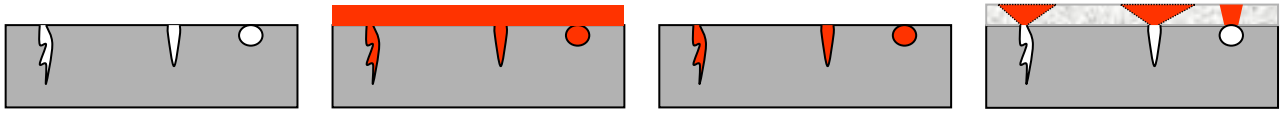
PENETRANT TESTING

The penetrant method of non-destructive testing is based on capillary penetration of indicator liquid (penetrant) into the surface defects (cracks, pores, etc.). After intermediate cleaning and subsequent drying, a developer is applied as a thin, white layer onto the surface to be inspected. The developer "pulls" the penetrant out of the surface defects and makes them visible as coloured, linear or rounded indications. Documentation is possible by means of adhesive films, photographs or video techniques.

Penetrant testing is reliable in detecting the defects with a width down to the range of µm.

Penetrant inspection can detect surface defects accurately and independent of types, materials and surface configuration of the objects to be tested. Other methods of non-destructive testing can be applied with restrictions only. Inevitable condition: defects must be open to surface. Capillary systems have been also used for the leak testing.

PROCEDURE OF PENETRANT TESTING



Pre-cleaning | Penetrant application | Intermediary cleaning | Developer application, surface inspection, documentation

APPLICATION FIELDS:

- Aircraft industry
- Automobile industry
- Engineering
- Ship building
- Nuclear industry
- Metallurgy
- Electrical engineering
- Medicine
- Boiler manufacturing
- Foundry
- Welding

WORK WITH MATERIALS:

- Alloyed and plain steels
- Nonferrous metals
- Plating
- Products of powder metallurgy
- Weld joints
- Steatite
- Plastics
- Ceramics
- Other synthetic materials

DEFECTS INDICATION:

- Cold cracks
- Heat cracks
- Grinding cracks
- Pores
- Pore clusters
- Sponge structure
- Corrosion cracks

Defects indication effected by fluorescent penetrant system application

Defects indication effected by contrast penetrant system application

CONTRAST PENETRANT TESTING

Method «A» — Water washable

- Pre-clean surface
- Apply penetrant
  Part surface temperature 10-52°C
- Dwell
  Minimum 10 minutes
- Wash
  Water temperature 10-38°C
- Dry / Apply aqueous developer
- Spray on non-aqueous developer / Dry
- Dwell
  Minimum 10 minutes
- Inspect surface
  Visible light of minimum 500 lx

Method «B» — Post emulsifiable

- Pre-clean surface
- Apply penetrant
  Part surface temperature 10-52°C
- Dwell
  Minimum 10 minutes
- Apply emulsifier
- Wash
  Water temperature 10-38°C
- Dry / Apply aqueous developer
- Spray on non-aqueous developer / Dry
- Dwell
  Minimum 10 minutes
- Inspect surface
  Visible light of minimum 500 lx

Method «C» — Solvent removable

- Pre-clean surface
- Apply penetrant
  Part surface temperature 10-52°C or 65-177°C for high temperature penetrant systems
- Dwell
  Minimum 10 minutes
- Cloth wipe with cleaner
  Part surface temperature 10-52°C or 65-177°C for high temperature penetrant systems
- Spray-on non-aqueous developer
  Part surface temperature 10-52°C or 65-177°C for high temperature penetrant systems
- Dwell
  Minimum 10 minutes
- Inspect surface
  Visible light of minimum 500 lx

Method «E» - water and solvent removable: first rinse with water, then wipe off with a solvent-wetted cloth

CONTRAST (RED-WHITE) PENETRANT TESTING

NORD-TEST PENETRANT SYSTEM

The NORD-TEST penetrant system is widely applied for parts testing in engineering and automobile industry, ship and boiler building, welding, etc. within a temperature range from −5°C to +50°C.

In order to assure the proper sensitivity while testing at low temperature (from -5 °C to +10 °C) it is necessary to increase the penetration time according to the requirements of EN ISO 3452-6.

For testing at higher temperature (from 65° C to 180° C) the SUPER-CHEK penetrant system has been developed specially.

The NORD-TEST penetrant system was tested and approved in accordance with EN ISO 3452-2, KTA and meets the requirements of Lloyd's Register of Shipping, Bureau Veritas, Bureau Central Hollandais, Germanischer Lloyd, MIL-I-25135/QPL-25135, AMS 2644, ASME Boiler and Pressure Vessel, ASTM E165 und ASTM E1417. The low content of sulfur and halogens was ascertained and confirmed according to ASTM E 165-02 and ASTM D 516-02, as well as to requirements of KWU and EN ISO 3452-2.

Product name	*Sensitivity level DIN EN ISO 3452-2*	*Removal method*	*Product information*
NORD-TEST Cleaner U 87	NA *Delivery form:* *Spray can 500 ml* *Can 1 L* *Can 10 L* *Cask 200 L*	NA Art.No.121.300.101 Art.No.121.300.102 Art.No.121.300.103 Art.No.121.300.104	Environmentally safe alcohol based cleaner. Class 2 - Nonhalogenated solvent remover. Fast evaporating without residues.
NORD-TEST Kontrastrot U88 Penetrant	Level 2 (high sensitivity) *Delivery form:* *Spray can 500 ml* *Can 1 L* *Can 10 L* *Cask 200 L*	A - water washable; C - solvent removable; E - water and solvent removable Art.No.121.300.201 Art.No.121.300.202 Art.No.121.300.203 Art.No.121.300.204	Highly sensitive, deep red penetrant (Type II) with good wetting properties. Well washable. Practically odor-free.
NORD-TEST Rot 3000 Penetrant	Level 2 (high sensitivity) *Delivery form:* *Spray can 500 ml* *Can 1 L* *Can 10 L* *Cask 200 L*	A - water washable; C - solvent removable; E - water and solvent removable Art.No.121.300.301 Art.No.121.300.302 Art.No.121.300.303 Art.No.121.300.304	Red, fluorescent penetrant (Type III) without azo dye. Biodegradable. Very well washable. Practically odor-free. Fluorescent under UV irradiation for brilliant indications.
NORD-TEST FP 90 blue N Penetrant	Level 2 (high sensitivity) *Delivery form:* *Can 200 ml* *Can 1 L* *Can 10 L*	A - water washable; C - solvent removable; E - water and solvent removable Art.No 122.500.125 Art.No.122.500.122 Art.No.122.500.123	Blue-fluorescent penetrant (Type I). Non-hazardous (no labelling required). Intrinsic color: transparent uncolored. For special applications to avoid discoloration of sensitive surfaces.
NORD-TEST Food Penetrant	Level 2 (high sensitivity) *Delivery form:* *Can 1 L*	C - solvent removable Art.No. 124.000.102	Blue penetrant in food quality – safe for testing in food preparation and storage areas. Highly sensitive. Also usable for conventional industrial applications.
NORD-TEST Developer U 89	NA *Delivery form:* *Spray can 500 ml* *Can 1 L* *Can 10 L* *Cask 200 L*	NA Art.No.121.300.701 Art.No.121.300.702 Art.No.121.300.703 Art.No.121.300.704	Fine-grained white powder suspension on alcohol base. Flavoring free. Short drying time. Forms a thin and homogenous layer.
NORD-TEST Set 12 x 500 ml	*Delivery form:* *1 carton with 12 spray cans*	Art.-Nr.121.300.750	1 set contains: 6 spray cans NORD-TEST Cleaner U87 2 spray cans NORD-TEST ROT 3000 4 spray cans NORD-TEST Developer U89

CONTRAST (RED-WHITE) PENETRANT TESTING

STANDARD-CHEK PENETRANT SYSTEM

The Standard-Chek penetrant system is a system widely used for parts testing in engineering and automobile industry, ship and boiler building, welding, etc. in a temperature range from −5°C to +50°C.
For testing at higher temperature (from 65° C to 180° C) the SUPER-CHEK penetrant system has been developed specially.

The Standard-Chek penetrant system was tested and approved in accordance with EN ISO 3452-2, KTA and meets the requirements of Lloyd's Register of Shipping, Bureau Veritas, Bureau Central Hollandais, Germanischer Lloyd, MIL-I-25135/QPL-25135, AMS 2644, ASME Boiler and Pressure Vessel, ASTM E165, ASTM E1417.

The low content of sulfur and halogens was ascertained and confirmed according to ASTM E165 and ASTM D516, as well as to requirements of KWU and EN ISO 3452-2.

Product name	*Sensitivity level DIN EN ISO 3452-2*	*Removal method*	*Product information*
Standard-Chek Cleaner No.1	NA	NA	Alcohol-based cleaner, fast evaporating without residues.
	Delivery form:		
	Spray can 500 ml	Art.No.121.200.101	
	Can 1 L	Art.No.121.200.102	
	Can 10 L	Art.No.121.200.103	
	Cask 200 L	Art.No.121.200.104	
Standard-Chek Kontrastrot No.2 Penetrant	Level 2 (high sensitivity)	A - water washable; C - solvent removable; E - water and solvent removable.	Red penetrant (Type II) with a wide application range used for inspections in welding, petrochemical, pharmaceutical industries and general metal working.
	Delivery form:		
	Spray can 500 ml	Art.No.121.200.201	
	Can 1 L	Art.No.121.200.202	
	Can 10 L	Art.No.121.200.203	
	Cask 200 L	Art.No.121.200.204	
Standard-Chek Rot 2003 Penetrant	Level 2 (high sensitivity)	A - water washable; C - solvent removable; E - water and solvent removable.	Red fluorescent penetrant (Type III) without azo dye. Almost odor-free. Very well washable. Fluorescent under UV irradiation for brilliant indications.
	Delivery form:		
	Spray can 500 ml	Art.No.121.200.301	
	Can 1 L	Art.No.121.200.302	
	Can 10 L	Art.No.121.200.303	
	Cask 200 L	Art.No.121.200.304	
Standard-Chek Developer No.3	NA	NA	Alcohol-based, fine-grained white powder suspension being applied as a homogenous thin layer. Short drying time.
	Delivery form:		
	Spray can 500 ml	Art.No.121.200.501	
	Can 1 L	Art.No.121.200.502	
	Can 10 L	Art.No.121.200.503	
	Cask 200 L	Art.No.121.200.504	

CONTRAST (RED-WHITE) PENETRANT TESTING

MET-L-CHEK PENETRANT SYSTEMS

MET-L-CHEK penetrant systems are listed on the Qualified Products List for AMS-2644. They are used in nuclear and aerospace industry, welding, general metal working etc. in a temperature range from +5°C to +50°C.

For testing at higher temperature (from 52° C to 177° C) the specially developed VP-302 penetrant is used in combination with D-702 developer and R-502 cleaner.

MET-L-CHEK penetrant systems meet the requirements of AMS-2644E, AMS-2647, ASME Boiler and Pressure Vessel Code Section V, ASTM E165, ASTM E1417, ISO 3452, NAVSEA-T9074-AS-GIB-010/271.

The low content of sulfur and halogens was ascertained and confirmed according to ASTM E165 and ASTM D516, as well as to requirements of KWU and DIN EN ISO 3452.

MET-L-CHEK Penetrants

Product name	*Sensitivity level DIN EN ISO 3452-2*	*Removal method*	*AMS-2644 QPL*	*Product Information*
MET-L-CHEK VP-30	Level 2 (high sensitivity) *Delivery form:* *Spray can 400 ml* *Can 1 L* *Can 10 L* *Cask 200 L*	A - water washable C - solvent removable Art.No. 121.100.201 Art.No. 121.100.202 Art.No. 121.100.203 Art.No. 121.100.204	yes	One of the most versatile penetrants applied in welding, petrochemical, dairy and food processing, pharmaceutical, nuclear and general metal working.
MET-L-CHEK ROT 1001	Level 2 (high sensitivity) *Delivery form:* *Spray can 400 ml* *Can 1 L* *Can 10 L* *Cask 200 L*	A - water washable C - solvent removable Art.No. 121.100.301 Art.No. 121.100.302 Art.No. 121.100.303 Art.No. 121.100.304	conf.	Red fluorescent penetrant without azo dye for application in welding, nuclear industry, general metal working and food processing.
MET-L-CHEK VBP-300	Level 2 (high sensitivity) *Delivery form:* *Can 1 L* *Can 10 L* *Cask 200 L*	A - water washable C - solvent removable Art.No. 121.100.222 Art.No. 121.100.223 Art.No. 121.100.224	yes	Penetrant oil- and solvent-free, biodegradable, V.O.C.-free, environmentally friendly. For use in general metalworking, welding, nuclear and automotive applications for surface flaw and through leak detection.
MET-L-CHEK VP-302	Level 2 (high sensitivity) *Delivery form:* *Can 10 L* *Cask 200 L*	C - solvent removable Art.No. 123.200.203 Art.No. 121.200.204	yes	Special high temperature penetrant used for applications in which the part surface temperature is 52°C to 177 °C. VP-302 finds wide use in field weld and weld repair inspection as well as in the inspection of refinery processing equipment that is at elevated temperatures. It is used with R-502 remover and D-702 developer only.

CONTRAST (RED-WHITE) PENETRANT TESTING

MET-L-CHEK PENETRANT SYSTEMS

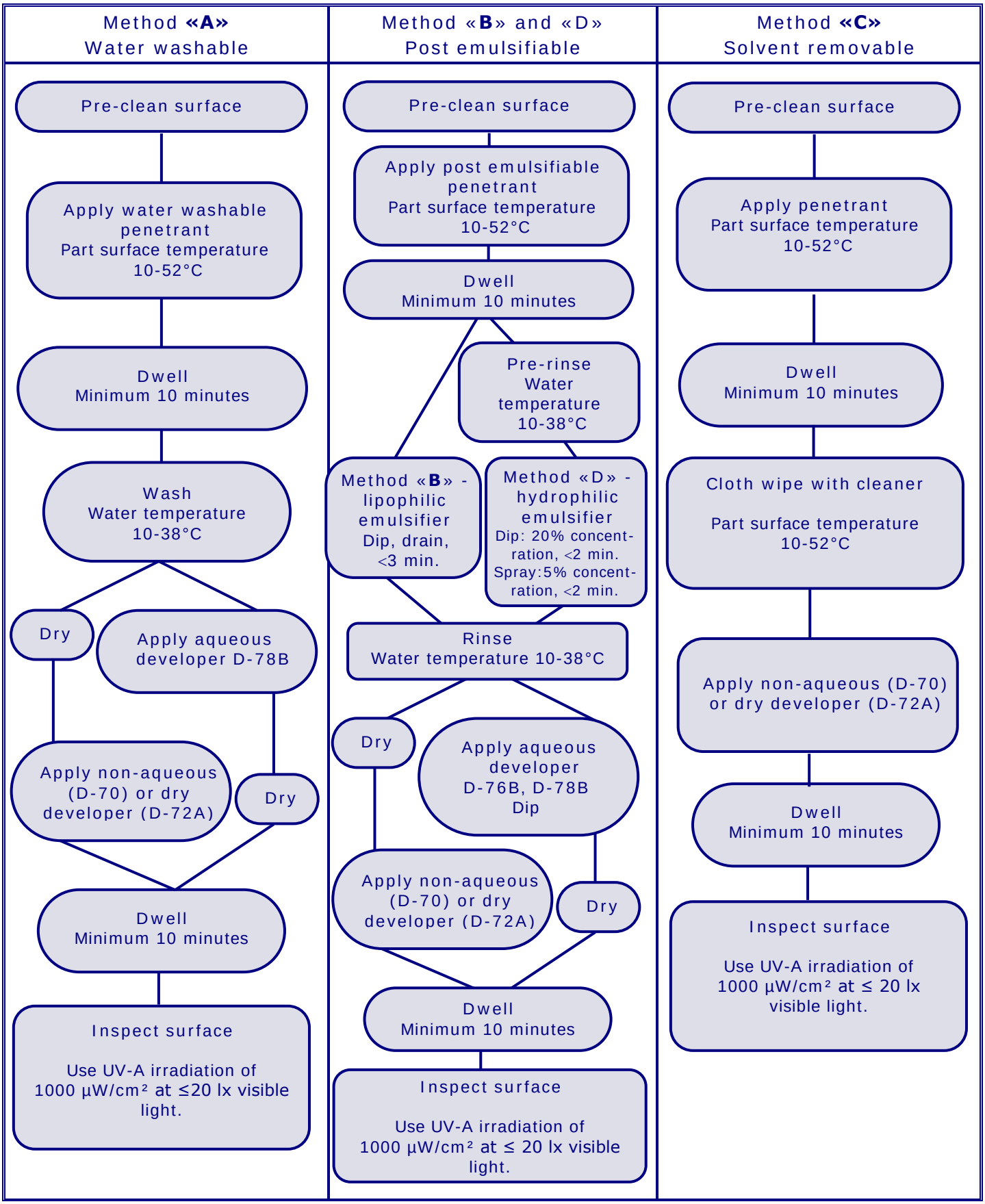
MET-L-CHEK Cleaners & Removers

Product Name	*Solvent Class*	*AMS-2644 QPL*	*Product Information*
MET-L-CHEK NPU	Class 2 – non-halogenated *Delivery form:* *Spray can 400 ml* Art.No. 121.100.101 *Can 1 L* Art.No. 121.100.102 *Can 10 L* Art.No. 121.100.103 *Cask 200 L* Art.No. 121.100.104	conf.	Alcohol based cleaner and remover for use with all penetrants.
MET-L-CHEK E-59 A	Class 2 – non-halogenated *Delivery form:* *Spray can 400 ml* Art.No. 122.113.101 *Can 1 L* Art.No. 122.113.102 *Can 10 L* Art.No. 122.113.103 *Cask 200 L* Art.No. 122.113.104	yes	Moderate drying cleaner and remover for use with all penetrants, ideal for penetrant wipe removal and pre-inspection surface cleaning. It is composed of petroleum solvents and has a gentle solvent action, which is ideal for the removal of excess surface penetrant.
MET-L-CHEK R-502	Class 3 – Special application remover *Delivery form:* *Can 25 L* Art.No. 123.200.103 *Cask 200 L* Art.No. 123.200.104	yes	Special application high temperature inspection penetrant remover used as a method C remover. It is used with high temperature visible penetrant *VP-302*. R-502 finds wide use in field weld and weld repair inspection.
MET-L-CHEK R-503	Class 2 – non-halogenated *Delivery form:* *Can 1 L* Art.No. 122.113.112 *Can 10 L* Art.No. 122.113.112 *Cask 200 L* Art.No. 122.113.112	yes	A fast drying cleaner and remover for use with all penetrants. Ideal for penetrant wipe removal and pre-inspection surface cleaning as well as for storing test panels in.
MET-L-CHEK R-504	Class 2 – non-halogenated *Delivery form:* *Spray can 400 ml* Art.No. 112.113.121	yes	A very fast drying cleaner and remover, ideal for penetrant wipe removal, especially for the verification of indications. Phenol free.

MET-L-CHEK Developers

Product Name	*Form*	*AMS-2644 QPL*	*Product Information*
MET-L-CHEK D-70	d & e – non-aqueous developer *Delivery form:* *Spray can 400 ml* Art.No. 121.100.501 *Can 1 L* Art.No. 121.100.502 *Can 10 L* Art.No. 121.100.503 Cask 200 L Art.No. 121.100.504	yes	A suspension of an absorbent powder in a volatile solvent. The solvent action of this type of developer helps bring the penetrant to the surface enhancing the detectability of the finest flaws. D-70 dries quickly and produces a smooth, uniformly white coating. Use with visible and fluorescent penetrants.
MET-L-CHEK D-702	f – special application material *Delivery form:* *Can 25 L* Art.No. 123.200.403 *Cask 200 L* Art.No. 123.200.404	---	D-702 is a special application high temperature (52°C-177°C) inspection developer with high temperature visible penetrant VP-302 to enhance detection of surface cracks and porosity on hot surfaces in field weld and weld repair inspection.

FLUORESCENT PENETRANT TESTING



FLUORESCENT PENETRANT TESTING

MET-L-CHEK PENETRANT SYSTEMS

MET-L-CHEK manufactures a complete line of post emulsifiable and water washable fluorescent penetrants, designed to meet the requirements of nearly all applications.

Products are available in steps of sensitivity from level 1 to level 4.

The penetrants are listed on the Qualified Products List for AMS-2644. They meet the requirements of AMS-2644E, AMS-2647C, ASME Boiler and Pressure Vessel Code 07 Section V, ASTM E-165, ASTM E-1417, ASTM E-1209, ISO 3452, NAVSEA 250-1500-1 for penetrant inspection materials.

The MET-L-CHEK production program covers also a broad selection of emulsifiers, cleaners and removers.

These materials are designed to be used for removal of the penetrant film from the inspected surface while retarding the removal from any discontinuities, facilitating flaw detection.

MET-L-CHEK offers a wide range of developers used in the penetrant inspection process. The developer draws the penetrant from the discontinuity to form a more uniform background enhancing the detectability of the penetrant indication.

MET-L-CHEK materials are low in sulfur, chlorine and other halogens, making them safe for use on titanium and high nickel alloys in nuclear applications.

Water washable fluorescent penetrants (Type I)

Removal methods: A – water washable,
C – solvent removable

Product Name		*Product Information*
MET-L-CHEK FP-90		A low-cost penetrant for general metal working inspection
	Delivery form:	
	Can 1 L	Art.No. 122.101.102
	Can 10 L	Art.No. 122.101.103
	Cask 200 L	Art.No. 122.101.104
MET-L-CHEK FP-91		A moderate-priced fluorescent for general metal working inspection
	Delivery form:	
	Can 1 L	Art.No. 122.101.162
	Can 10 L	Art.No. 122.101.163
	Cask 200 L	Art.No. 122.101.164
MET-L-CHEK FP-91B		A moderate-priced fluorescent for general metal working inspection
	Delivery form:	
	Can 1 L	Art.No. 122.101.502
	Can 10 L	Art.No. 122.101.503
	Cask 200 L	Art.No. 122.101.504

FLUORESCENT PENETRANT TESTING

MET-L-CHEK PENETRANT SYSTEMS

Water washable fluorescent penetrants (Type I)

Removal methods: A – water washable,
C – solvent removable

Product Name	*Sensitivity Level acc. to AMS-2644*	*AMS-2644 QPL*	*Product Information*
MET-L-CHEK FBP-911	Level 1 *Delivery form:* *Can 1 L* *Can 10 L* *Cask 200L*	yes Art.No. 122.101.602 Art.No. 122.101.603 Art.No. 122.101.604	Biodegradable penetrant used for the detection of fine cracks, porosity, and through leaks on metals, composites, synthetic materials, and some plastics. Low in sulfur and halogens, VOC free, and safe for use on all metal surfaces. It is bright yellow, smooth washing and non-gel forming, allowing a clean wash from rough surface.
MET-L-CHEK FP-921	Level 1 *Delivery form:* *Can 1 L* *Can 10 L* *Cask 200 L*	yes Art.No. 122.102.612 Art.No. 122.102.613 Art.No. 122.102.614	Penetrant for general metal working inspection, also approved for use in aircraft industry by Boeing BSS 7039 & BAC 20-20-0, Pratt & Whitney FPM PMC #4353-AG, General Electric Aircraft Engines 70-32-02 & Gas Turbines LM6000 PC 11, Rolls-Royce RPS-702-7.
MET-L-CHEK FBP-912	Level 2 *Delivery form:* *Can 1 L* *Can 10 L* *Cask 200 L*	yes Art.No. 122.101.902 Art.No. 122.101.903 Art.No. 122.101.904	Biodegradable penetrant used for the detection of fine cracks, porosity, and through leaks on metals, composites, synthetic materials, and some plastics. Low in sulfur and halogens, VOC free, and safe for use on all metal surfaces. It is bright yellow, smooth washing and non-gel forming, allowing a clean wash from rough surface.
MET-L-CHEK FP-922	Level 2 *Delivery form:* *Can 1 L* *Can 10 L* *Cask 200 L*	yes Art.No. 122.102.602 Art.No. 122.102.603 Art.No. 122.102.604	Penetrant with broad application spectrum, approved for high sensitivity aerospace applications by Boeing BSS 7039 & BAC 20-20-0, Pratt & Whitney FPM PMC #4353-AG, General Electric Aircraft Engines 70-32-02 & Gas Turbines LM6000 PC 11, Rolls-Royce RPS-702-7.
MET-L-CHEK FBP-913	Level 3 *Delivery form:* *Can 1 L* *Can 10 L* *Cask 200 L*	yes Art.No. 122.101.142 Art.No. 122.101.143 Art.No. 122.101.144	Biodegradable penetrant used for the detection of fine cracks, porosity, and through leaks on metals, composites, synthetic materials, and some plastics. Low in sulfur and halogens, VOC free, and safe for use on all metal surfaces. It is bright yellow, smooth washing and non-gel forming, allowing a clean wash from rough surface.
MET-L-CHEK FP-923	Level 3 *Delivery form:* *Spray (400 ml)* *Can 1 L* *Can 10 L* *Cask 200 L*	yes Art.No. 122.102.621 Art.No. 122.102.622 Art.No. 122.102.623 Art.No. 122.102.624	Highly sensitive penetrant with broad application spectrum, especially used in aerospace applications at high demands and approved by Boeing BSS 7039 & BAC 20-20-0, Pratt & Whitney FPM PMC #4353-AG, General Electric Aircraft Engines 70-32-02 & Gas Turbines LM6000 PC 11, Rolls-Royce RPS-702-7.
MET-L-CHEK FBP-914	Level 4 *Delivery form:* *Can 1 L* *Can 10 L* *Cask 200 L*	yes Art.No. 122.101.152 Art.No. 122.101.153 Art.No. 122.101.154	Biodegradable penetrant used for the detection of fine cracks, porosity, and through leaks on metals, composites, synthetic materials, and some plastics. Low in sulfur and halogens, VOC free, and safe for use on all metal surfaces. It is bright yellow, smooth washing and non-gel forming, allowing a clean wash from rough surface.

FLUORESCENT PENETRANT TESTING

MET-L-CHEK PENETRANT SYSTEMS

Post emulsifiable fluorescent penetrants

Removal Methods: B – post emulsifiable, lipophilic
C – solvent removable
D – post emulsifiable, hydrophilic

Product Name	Sensitivity Level acc. to AMS-2644	AMS-2644 QPL	Product Information
MET-L-CHEK FP-93A(M)	Level 2	yes	A medium sensitivity penetrant suitable for use in general metal working inspection. Approved for use in aircraft industry by Boeing BSS 7039 & BAC 20-20-0, Pratt & Whitney FPM PMC #4353-AG, General Electric Aircraft Engines 70-32-02 & Gas Turbines LM6000 PC 11, Rolls-Royce RPS-702-7. Used with either lipophilic E-57 (Method B) or hydrophilic E-58D (Method D) emulsifiers.
	Delivery form:		
	Can 1 L	Art.No. 122.102.302	
	Can 10 L	Art.No. 122.102.303	
	Cask 200 L	Art.No. 122.102.304	
MET-L-CHEK FP-95A(M)	Level 3	yes	A high sensitivity penetrant that is widely used on production lines of aircraft and other critical components. Approved by Boeing BSS 7039 & BAC 20-20-0, Pratt & Whitney FPM PMC #4353-AG, General Electric Aircraft Engines 70-32-02 & Gas Turbines LM6000 PC 11, Rolls-Royce RPS-702-7. Used with either lipophilic E-57 (Method B) or hydrophilic E-58D (Method D) emulsifiers.
	Delivery form:		
	Spray can 400 ml	Art.No. 122.102.401	
	Can 1 L	Art.No. 122.102.402	
	Can 10 L	Art.No. 122.102.403	
	Cask 200 L	Art.No. 122.102.404	
MET-L-CHEK FP-97A(M)	Level 4	yes	An ultra-high sensitivity penetrant that is approved for use on fracture critical rotating turbine components by Boeing BSS 7039 & BAC 20-20-0, Pratt & Whitney FPM PMC #4353-AG, General Electric Aircraft Engines 70-32-02 & Gas Turbines LM6000 PC 11, Rolls-Royce RPS-702-7. Used with either lipophilic E-57 (Method B) or hydrophilic E-58D (Method D) emulsifiers.
	Delivery form:		
	Can 1 L	Art.No. 122.102.502	
	Can 10 L	Art.No. 122.102.503	
	Cask 200 L	Art.No. 122.102.504	

Cleaners & Removers:

Product Name	Solvent Class	AMS-2644 QPL	Product Information
MET-L-CHEK NPU	Class 2 – non-halogenated	conf.	Alcohol based cleaner and remover for use with all penetrants.
	Delivery form:		
	Spray can 400 ml	Art.No. 121.100.101	
	Can 1 L	Art.No. 121.100.102	
	Can 10 L	Art.No. 121.100.103	
	Cask 200 L	Art.No. 121.100.104	
MET-L-CHEK E-59 A	Class 2 – non-halogenated	yes	Moderate drying cleaner and remover for use with all penetrants, ideal for penetrant wipe removal and pre-inspection surface cleaning. It is composed of petroleum solvents and has a gentle solvent action, which is ideal for the removal of excess surface penetrant.
	Delivery form:		
	Spray can 400 ml	Art.No. 122.113.101	
	Can 1 L	Art.No. 122.113.102	
	Can 10 L	Art.No. 122.113.103	
	Cask 200 L	Art.No. 122.113.104	
MET-L-CHEK R-503	Class 2 – non-halogenated	yes	A fast drying cleaner and remover for use with all penetrants. Ideal for penetrant wipe removal and pre-inspection surface cleaning as well as for storing test panels in.
	Delivery form:		
	Can 1 L	Art.No. 122.113.112	
	Can 10 L	Art.No. 122.113.112	
	Cask 200 L	Art.No. 122.113.112	
MET-L-CHEK R-504	Class 2 – non-halogenated	yes	A very fast drying cleaner and remover, ideal for penetrant wipe removal, especially for the verification of indications. Phenol free.
	Delivery form:		
	Spray can 400 ml	Art.No. 112.113.121	

FLUORESCENT PENETRANT TESTING

MET-L-CHEK PENETRANT SYSTEMS

Emulsifiers:

Product Name	Method	AMS-2644 QPL	Product Information
MET-L-CHEK E-57	«B»	yes	A lipophilic emulsifier used with all MET-L-CHEK post emulsifiable penetrants. After an appropriate penetrating dwell time the parts are immersed into the emulsifier, then removed and allowed to drain from 30 seconds to 3 minutes, depending upon the part surface roughness. After this step parts are water washed. E-57 is supplied ready to use.
	Delivery form:		
	Can 1 L	Art.No. 122.112.302	
	Can 10 L	Art.No. 122.112.303	
	Cask 200 L	Art.No. 122.112.304	
MET-L-CHEK E-58 D	«D»	yes	A hydrophilic emulsifier for all MET-L-CHEK post emulsifiable penetrants, which is supplied as a concentrate. In use it is diluted with water to 17-20 % concentration for immersion applications and below 5% for spray applications. In immersion applications the penetrant covered part is given a quick water wash and then immersed into the gently agitated emulsifier from 30 seconds to 2 minutes depending upon the part surface roughness. For spray applications the pre-rinse step may be omitted. Then the parts are removed and water washed.
	Delivery form:		
	Can 1 L	Art.No. 122.112.202	
	Can 10 L	Art.No. 122.112.203	
	Cask 200 L	Art.No. 122.112.204	

Developers:

Product Name	Form	AMS-2644 QPL	Product Information
MET-L-CHEK D-70	d & e – non-aqueous	yes	A suspension of an absorbent powder in a volatile solvent. The solvent action of this type of developer helps bring the penetrant to the surface enhancing the detectability of the finest flaws. D-70 dries quickly and produces a smooth, uniformly white coating. Use with visible and fluorescent penetrants.
	Delivery form:		
	Spray can 400 ml	Art.No. 121.100.501	
	Can 1 L	Art.No. 121.100.502	
	Can 10 L	Art.No. 121.100.503	
	Cask 200 L	Art.No. 121.100.504	
MET-L-CHEK D-78B	c – water suspendible	yes	D-78B is a dry powder, which is dispersed in water to form a suspension. It must be agitated to maintain uniformity. This form of developer is generally applied by immersion dip, flow on, or gentle airless spray, prior to the drying process. A uniform film will form during the drying. Not to be used with water washable penetrants.
	Delivery form:		
	Container 20 kg	Art.No. 122.120.406	
MET-L-CHEK D-72A	a – dry	yes	A light, fluffy, dry powder developer, which is used for fluorescent penetrant inspection. This form of developer is generally applied in special storm or dust chamber equipment, but may also be dusted onto parts with a feather duster or electrostatic spray. If sprayed avoid buildup of a heavy developer film. A very fine dusting is the recommended coverage.
	Delivery form:		
	Container 1 kg	Art.No. 122.120.306	
MET-L-CHEK D-76B	b – water soluble	yes	A water soluble developer for use with post emulsifiable fluorescent penetrants. It is supplied as a dry powder which is dissolved in water. Once dissolved, no agitation of the bath is required. This form of developer is generally applied by immersion dip, flow on, or gentle airless spray, prior to the drying process. A uniform film will form during the drying. Most specifications do not allow the use of this form of developer with Method A (water washable) penetrants.
	Delivery form:		
	Container 10 kg	Art.No. 121.100.606	
	Container 20 kg	Art.No. 121.100.607	

Met-L-Chek®

Fluorescent (Type I) and contrast colour (Type II) penetrant inspection media

REMOVAL METHODS:
A – Water washable
B – Post emulsifiable, lipophilic
C – Solvent removable
D – Post emulsifiable, hydrophilic

SENSITIVITY LEVEL: 1 – low; 2 – medium; 3 – high; 4 - ultra high

DEVELOPER FORMS:
a – Dry developer; usable with all fluorescent penetrants
b – Water soluble developer; not to be used with water washable penetrants
c – Water suspendible developer; not to be used with water washable penetrants
d – Nonaqueous developer; usable with Type I penetrants, Methods A, B, C & D.
e – Nonaqueous developer; usable with Type II penetrants, Methods A, B, C & D.
f – Special application developer.

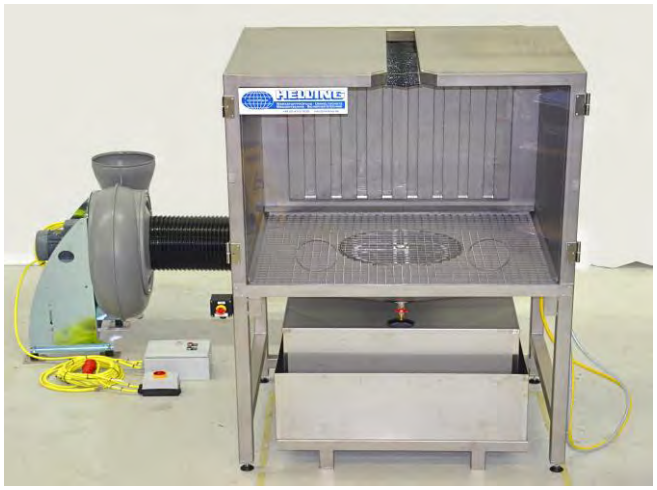
SOLVENT CLASS:
1 – Halogenated solvent remover, usable with all penetrants, Method C.
2 – Nonhalogenated solvent remover, usable with all penetrants, Method C.
3 – Special application material to be used with special penetrants, Method C.

Name	Type	Method / class / form	Sensitivity level	AMS-2644 QPL	General description
FP-90	I	A & C	-	Conf.	Very low sensitivity, general metal working
FP-91	I	A & C	-	Conf.	Low sensitivity, general metal working
FB-91B	I	A & C	-	Conf.	Low sensitivity, general metal working
FBP-911	I	A & C	1	Certified	Biodegradable, low sensitivity, all applications
FP-921	I	A & C	1	Certified	Low sensitivity, approved for aerospace applications
FBP-912	I	A & C	2	Certified	Biodegradable, medium sensitivity, all applications
FP-922	I	A & C	2	Certified	Medium sensitivity, approved for aerospace applications
FBP-913	I	A & C	3	Certified	Biodegradable, high sensitivity, all applications
FB-923	I	A & C	3	Certified	High sensitivity, approved for aerospace applications
FBP-914	I	A & C	4	Certified	Biodegradable, ultra-high sensitivity, all applications
FP-93A(M)	I	B, C & D	2	Certified	Post emulsifiable, medium sensitivity, all applications
FP-95A(M)	I	B, C & D	3	Certified	Post emulsifiable, high sensitivity, all applications
FP-97A(M)	I	B, C & D	4	Certified	Post emulsifiable, ultra-high sensitivity, all applications
VP-30	II	A & C	NA	Certified	Welding, nuclear and general metal working
VBP-300	II	A & C	NA	Certified	Biodegradable, general metal working
ROT 1001	III	A & C	NA	Conf.	AZO-free, welding, nuclear and general metal working
VP-302	II	C	NA	Certified	Special high temperature penetrant (52°C – 177°C)
E-57	I	B	NA	Certified	Lipophilic emulsifier for FP-93/95/97A(M)
E-58D	I	D	NA	Certified	Hydrophilic emulsifier for FP-93/95/97A(M)
NPU	I & II	C, class 2	NA	Conf.	Alcohol based cleaner / remover for all penetrants
E-59A	I & II	C, class 2	NA	Certified	Moderate drying cleaner / remover for all penetrants
R-502	II	C, class 3	NA	Certified	Special high temperature inspection remover for VP-302
R-503	I & II	C, class 2	NA	Certified	Fast drying cleaner / remover for all penetrants
R-504	I & II	C, class 2	NA	Certified	Very fast drying remover / cleaner for all penetrants
D-70	I & II	d & e	NA	Certified	Non-aqueous, solvent based developer, all penetrants
D-72A	I	a	NA	Certified	Dry powder developer, all fluorescent penetrants
D-76B	I	b	NA	Certified	Water soluble developer, post emulsifiable penetrants
D-78B	I & II	c	NA	Certified	Water suspendible developer, post emulsifiable penetrants
D-702	II	f	NA	Certified	Special high temperature inspection developer for VP-302

STATIONARY FACILITIES FOR PENETRANT TESTING

Stationary devices for fluorescent penetrant testing comply with the specifications of main global standards: MIL-I25135E, MIL STD 6866, AMS 2644, EN ISO 3452. All components meet the European requirements for health, safety and ergonomics.

The inspection systems are basically made of stainless steel and equipped with high performance tools for functional control. The devices are designed and manufactured according to customer requirements specifications with regard to specific inspection tasks and test objects.



ELECTROSTATIC DEVICES

Electrostatic liquid application is a highly efficient coating method, offering decisive advantages over conventional application techniques for penetrant testing in many industrial branches.

Due to the electrostatic charge the penetrant (developer) particles repel each other to produce an extremely fine atomization. The uniform spray jet generates a very homogenous material application with an even coating, resulting in a particularly high quality finish.

The wrap-around effect results from an electric field between the negatively charged penetrant (developer) particles and the grounded work piece. Both the front and rear end of the work piece can thus be coated simultaneously – with substantial savings of material and time.

TEST PANELS

Sensitivity of inspection media, quality of intermediate cleaning and control of the whole penetrant process are determined by test bodies, which are metal panels with defined roughness, provided with standardized artificial cracks (defects).

Test body JIS Z 2343

Art.No. 127.600.001 - 10 µm
Art.No. 127.600.002 - 20 µm
Art.No. 127.600.003 - 30 µm
Art.No. 127.600.004 - 50 µm

The test body is used to determine the sensitivity of penetrant systems and for comparing two penetrants, one of which can be taken for standard.

It consists of two test panels which are bronze planes 100 x 35 x 2 mm, plated with a NiCr-layer. Several crosscut cracks are made in the nickel-chromium plating, the depth of cracks equals the thickness of the NiCr-plating. The bodies are designed in 4 types – with plating thicknesses of 10, 20, 30 and 50 µm. The ratio of crack widths to their depth equals 1:20.

Each test panel is delivered with a certificate according to EN 10204, type 3.1 B, which certifies its conformity to EN ISO 3452-3. The test panels with crack depths of 10, 20 and 30 µm are used for testing of the sensitivity of fluorescent penetrant systems. The sensitivity of contrast penetrant systems is determined by panels with crack depths of 30 and 50 µm.

Reference block No.1 (EN ISO 3452-3)

Art.No. 127.400.001 – to be delivered with a certificate

The Type 1 Reference Block for testing the sensitivities of fluorescent and visible penetrant systems consists of 4 nickel-chromium plated panels with 10, 20, 30 and 50 µm thickness of plating respectively.

The panels with crack depths of 10, 20 and 30 µm are used for determination of the sensitivity of fluorescent penetrant systems. The sensitivity of visible (contrast) penetrant systems is determined using the 30 and 50 µm plated panels.

The Type 1 panels are rectangular in shape with typical dimensions of 100 x 35 x 2 mm Transverse cracks are made in each panel by stretching the panels in longitudinal direction. The width to depth ratio of each crack should be approximately 1:20.

Reference test panel No.2 (EN ISO 3452-3)

Art.No. 127.550.000 – to be delivered with a certificate
Art.No. REP.000.006 – test report

The Reference Test Panel No. 2 is an austenitic plate which is chromium-plated and provided with four fields (25 x 35 mm) of different surface roughnesses (Ra = 2.5 µm, Ra = 5 µm, Ra = 10 µm and Ra = 15 µm) on the one half and 5 star-shaped crack patterns of different sizes on the other half. The roughened fields are used for control of the intermediate washing-off. The star-shaped cracks in the chromium plating are generated by ball stamping from the rear side.

The indication on the reference test panel gives no suggestion of the indication on the part under test.

Test panel ASME V

Art.No. 127.100.000
Art.No. 127.100.001 – certificate without photo
Art.No. 127.100.002 – certificate with photo

The ASME V panel is used for testing of the penetrants indication sensitivity. Due to the division of the test panel into two parts it is possible to compare two different penetrants.

The test panel is an aluminum block of 80 x 50 x 10 mm divided by a notch (50 x 2 x 1.5 mm) into two parts. Because of a special thermal treatment the panel surface crack pattern is produced, which is different on the front and rear side of the test panel.

Test panels WTP-1 and WTP-2

Art.No. 127.700.001 - WTP – 1
Art.No. 127.700.002 - WTP – 2

The test panels are designed to evaluate the removability of fluorescent penetrants according to the requirements of AMS 2644F.

WTP-1 is a stainless steel 4×6 inches panel with two parallel "medium rough" strips, each 6 × 1.5 inches, separated by a smooth 1 inch strip.

WTP-2 is a set of two equal 1.5 x 2 inches panels produced from a single sheet and is also used for assessment of fluorescent penetrants removability.

Test panel NR-5 (TAM 146040)

Art.No. 127.800.010 – NR-5 with certificate of conformity
Art.No. 127.800.009 – NR-5 with acceptance test report and certificate of conformity
Art.No. 127.800.011 – NR-5 recalibration
Art.No. 127.800.003 – PSM-5 recalibration

NR-5 is a rectangular 4 x 6 inch (102 x 153 mm) panel made of stainless steel. The chromium-plated strip on the left side contains 5 star-shaped crack patterns which are arranged according to their sizes. The crack pattern is different between the panels. The right half is sandblasted and used to evaluate the penetrant removability.

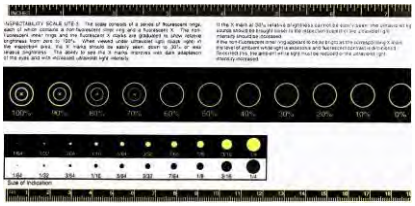
Each NR-5 panel has to be used in only one penetrant line with only one kind of penetrant. The NR-5 test panel is used for testing the penetrant process in whole during human or automatic (semiautomatic) processing according to Pratt & Whitney Aircraft TAM 146040. This panel also meets the requirements of General Electric Specification P3TF2, § 5.4.1&10.1, as well as ASTM E1417 § 7.8.3.1, MIL-STD-6866 § 5.8.3, 33B-11, NAVAIR 01-1A-16 und TM43-0103. The NR-5 test panel is equivalent to the PSM-5 panel.

UTE-3 inspectability scale & visual comparator

Art.No. 127.850.000

The INSPECTABILITY SCALE is used under UV (black) light to determine if fluorescent brightness at the test surface is adequate and in proper contrast to ambient white light. It also can disclose whether the operator can see the size indication he is seeking.

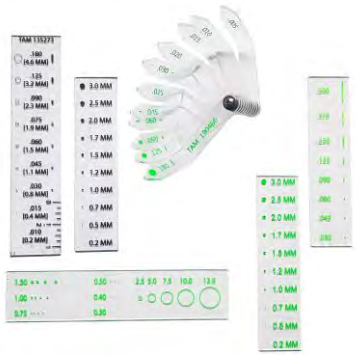
The VISUAL COMPARATOR consists of sentences printed in Jaeger 1 and Jaeger 2 print sizes. The operator's ability to read the appropriate sentence (J1 or J2 as required by the applicable specification) at the test surface, determines his visual ability under the test lightning conditions.



Transparent comparators

Comparators consist of a number of transparent tokens, measuring typically 30 x 100 mm. The various designs offer dots, circles and lines of known dimensions to allow an accurate estimation of the indications measurement and spacing. The defect comparator is to be placed over an indication. The imperfection size is then compared to the markings.

Definitions	Unit	Art.No. black	Art.No. fluorescent
Regular	inch	128.200.008	128.200.101
Metric	mm	128.200.001	128.200.102
PWA-TAM 135273	inch /mm	128.200.002	128.200.103
General Electric	inch	128.200.011	128.200.104
Magnetic Particle	inch	128.200.013	128.200.105
Spacing	inch	128.200.006	128.200.106
Mod. G. E.	inch	128.200.007	128.200.107
Metric	mm	128.200.003	128.200.108
Fractional	inch	128.200.009	128.200.109
Foundry Cir.	inch	128.200.010	128.200.110
Metric Linear	mm	128.200.004	128.200.111
Foundry Solid	inch	128.200.012	128.200.112
Swing Away	inch	128.200.005	128.200.113
PWA-TAM 190466	inch	128.200.014	128.200.114



The magnetic particle testing method (MT) is one of the most sensitive, reliable and productive NDT-methods for surface testing of products from ferromagnetic materials. The method is based on the attraction of ferromagnetic particles by force of leakage flux which appears above surface defects like cracks, laps, lacks of fusion, and pores after an adequate magnetisation. MT can be used for indication of open surface defects and under certain conditions for detection of near-surface defects. A higher probability of detection is achievable if the direction of a defect is oriented perpendicularly to the direction of the applied magnetic field. The smaller is the angle between the defect and magnetic field lines, the weaker will be the indication.

Defect indication after application of fluorescent water based magnetic particle suspension type LY 1500

Defect indication after application of red water-suspended magnetic particles type MEF 515

APPLICATION FIELDS:

- Metallurgy
- Engineering
- Aircraft industry
- Automobile production
- Ship building
- Constructional engineering
- Pipelining
- Power machine building
- Chemical engineering
- Transport (air, rail, motor transport)

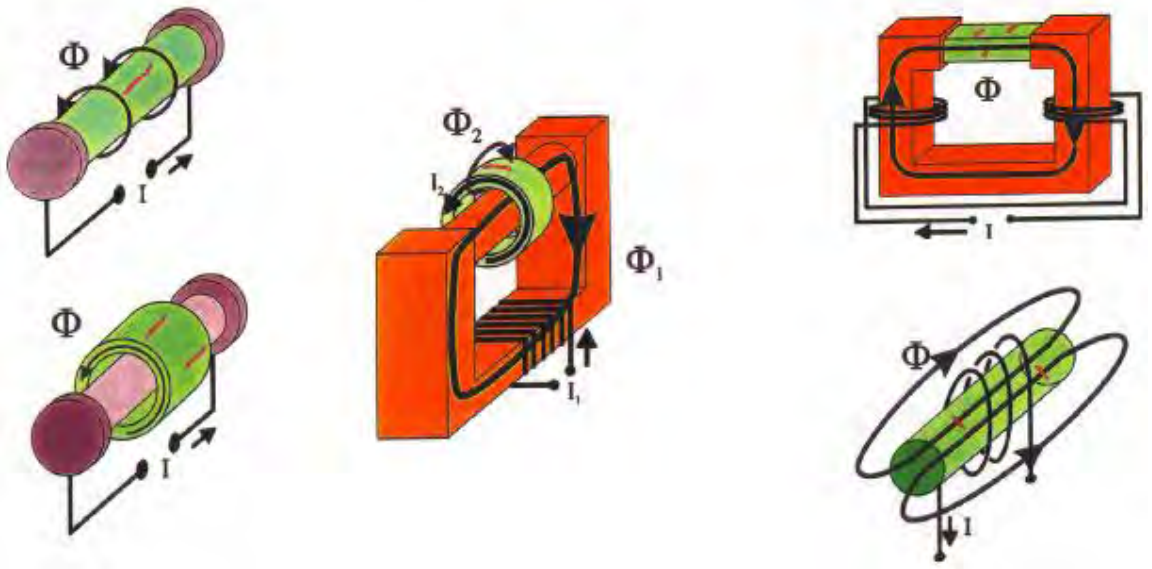
DEFECTS INDICATION:

- Cracks
- Hair cracks
- Tears
- Silver spots
- Lacks of fusion
- Pores

The magnetic particle testing is a procedure which consists of following steps:

1. Preparation of the test objects' surfaces for testing;
2. Magnetisation of the object;
3. Application of magnetic particle suspension (powder) onto the test object;
4. Inspection;
5. Demagnetisation.

Circular, longitudinal or combined magnetisation is used for the magnetic particle testing. There are a lot of magnetisation schemes, some of which are shown below.



FLUORESCENT INSPECTION MEDIA FOR MAGNETIC PARTICLE TESTING

For magnetic particle testing the HELLING Company offers a complete line of fluorescent media in form of dry powders, liquid and dry concentrates and ready-to-use oil-based suspensions.

The HELLING Dry Magnetic Powders excel in their high fluorescence coefficient, defined grain size distribution as well as purity and assure the indication of the finest defects.

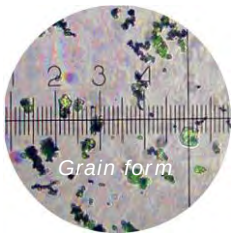
The liquid and dry concentrates for preparing of water-based magnetic particle suspensions contain all necessary wetting, antifoam and antirust agents. These concentrates are used also for testing of corrosion-sensitive parts. The usage of concentrates also lessens the shipping and storing costs significantly.

The ready-to-use suspensions are an ideal inspection material for testing at construction sites and mounting pads or for sampling inspection. The suspensions are based on colorless, odor-free, non-irritant, low-viscosity oils. The oils do not contain fluorescing components. Thus, brilliant indications at high contrast are achieved.

Furthermore, the HELLING delivery program also includes aerosol systems (V.O.C.-free) for quick, handy and efficient magnetic particle testing, also under field conditions.

The HELLING inspection media meet the requirements of ASME-Code Section V, ASTM E 709 and EN ISO 9934.

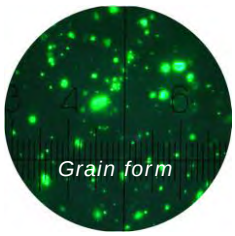
Super Magna LY 2500



Fluorescence coefficient (Cd/W)	2.8
Average grain size (µm)	4
Recommended concentration (g/l)	0.4-1
Sedimentation (1 g/l)/100 ml	0.25
Colour	yellow-green fluorescent

Art.No.135.001.040	Pure magnetic powder	1 kg container	1 kg sufficient for 2,500 L suspension. For water based suspensions use BC 502 Additive!
Art.No.135.103.301	Liquid water-based concentrate 1:40	1 L can	Contains wetting, antifoam (silicone free) and antirust agents. Halogen-free.
Art.No.135.103.304	Liquid water-based concentrate 1:40	5 L can	Contains wetting, antifoam (silicone free) and antirust agents. Halogen-free.
Art.No.135.103.115	Dry concentrate 10g:1L	1 kg container	Contains wetting, antifoam (silicone free) and antirust agents. Halogen-free.
Art.No.135.103.219	Oil-based concentrate 1:10	10 L can	Fluorescent magnetic particle suspension as an oil-based concentrate
Art.No.135.103.220	Spezial High-Temp ready-to-use oil-based suspension	1 L can	For special application high temperature inspection. Flash point >100°C. No hazardous labelling
Art.No.135.103.221	Spezial High-Temp ready-to-use oil-based suspension	10 L can	For special application high temperature inspection. Flash point >100°C. No hazardous labelling
Art.No.135.103.216	Ready-to-use oil-based suspension	1 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils
Art.No.135.103.217	Ready-to-use oil-based suspension	10 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils

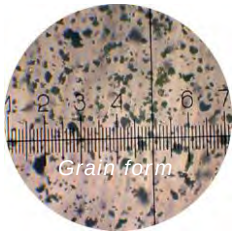
Super Magna LY 2300



Fluorescence coefficient (Cd/W)	3.4
Average grain size (µm)	6
Recommended concentration (g/l)	0.5-1
Sedimentation (1 g/l)/100 ml	0.2
Colour	Yellow-green fluorescent

Art.No.135.001.150	Pure magnetic powder	1 kg container	1 kg sufficient for 2000 L suspension. For water based suspensions use BC 502 Additive!
Art.No.135.103.401	Liquid water-based concentrate 1:40	1 L can	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.102.118	Liquid water-based concentrate 1:40	5 L can	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.103.421	Dry concentrate 10g:1L	1 kg container	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.102.216	Ready-to-use oil-based suspension	1 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils
Art.No.135.102.217	Ready-to-use oil-based suspension	10 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils

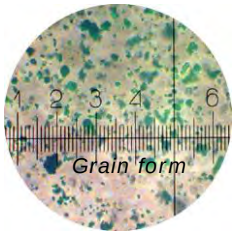
Super Magna LY 1500



Fluorescence coefficient (Cd/W)	5.2
Average grain size (µm)	14.5
Recommended concentration (g/l)	0.6-1
Sedimentation (1 g/l)/100 ml	0.18
Colour	Yellow-green fluorescent

Art.No.135.001.010	Pure magnetic powder	1 kg container	1 kg sufficient for 1600 L suspension. For water based suspensions use BC 502 Additive!
Art.No.135.103.501	Liquid water-based concentrate 1:40	1 L can	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.103.504	Liquid water-based concentrate 1:40	5 L can	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.101.118	Dry concentrate 10g:1L	1 kg container	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.101.216	Ready-to-use oil-based suspension	1 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils
Art.No.135.101.217	Ready-to-use oil-based suspension	10 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils

Super Magna CGY 4000



Fluorescence coefficient (Cd/W)	11.3
Average grain size (µm)	14
Recommended concentration (g/l)	0.5-1.5
Sedimentation (1 g/l)/100 ml	0.23
Colour	Yellow-green fluorescent

Art.No.135.001.180	Pure magnetic powder	1 kg container	1 kg sufficient for 2000 L suspension. For water based suspensions use BC 502 Additive!
Art.No.135.104.115	Liquid water-based concentrate 1:40	1 L can	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.104.118	Dry concentrate 10g:1L	1 kg container	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.104.216	Ready-to-use oil-based suspension	1 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils
Art.No.135.104.217	Ready-to-use oil-based suspension	10 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils

COLOUR INSPECTION MEDIA FOR MAGNETIC PARTICLE TESTING

Alongside the fluorescent testing media the HELLING product range includes diverse colour consumables like dry powders, concentrates and ready-to-use oil-based suspensions.

Dry Magnetic Powders are noted for their bright colours, defined grain size distribution and purity. Thus they serve for reliable indication, yet on dark or polished surfaces.

The dry concentrates for preparation of water-based magnetic particle suspensions contain all wetting, antifoam and antirust agents needed. These concentrates are used for testing of corrosion-sensitive parts.

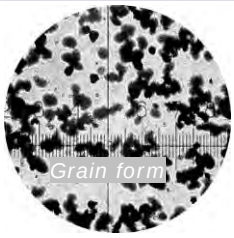
The application of concentrates also helps to cut down the shipping and storage costs significantly.

The ready-to-use suspensions are an ideal inspection material for testing at construction sites and mounting pads or for sampling tests. The suspensions are based on colourless, odor-free, non-irritant and low-viscosity oils.

Furthermore, the HELLING delivery program also includes aerosol systems (V.O.C.-free) for quick, handy and efficient magnetic particle testing, also in the field conditions.

The HELLING inspection media meet the requirements of ASME-Code Sect. V, ASTM E 709 and EN ISO 9934.

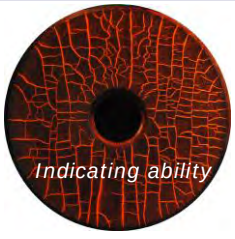
Super Magna BW 333



Average grain size (µm)	4
Recommended concentration (g/l)	3-5
Sedimentation (1 g/l)/100 ml	0.1
Colour	Black

Art.No.135.002.010	Pure magnetic powder	1 kg container	1 kg sufficient for 300 L suspension. For water-based suspensions use BC 502 Additive!
Art.No.135.002.031	Liquid water-based concentrate 1:50	1 L can	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.100.301	Dry concentrate 15g:1L	1.5 kg container	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.100.216	Ready-to-use oil-based suspension	1 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils
Art.No.135.100.217	Ready-to-use oil-based suspension	10 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils

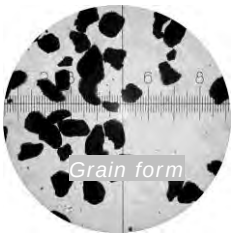
Super Magna MEF-515 rot



Average grain size (µm)	10
Recommended concentration (g/l)	3-5
Sedimentation (1 g/l)/100 ml	0.1
Colour	Red fluorescent

Art.No.135.001.011	Pure magnetic powder	1 kg container	1 kg sufficient for 300 L suspension. For water-based suspensions use BC 502 Additive!
Art.No.135.001.012	Liquid water-based concentrate 1:20	1 L can	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.001.014	Dry concentrate 15g:1L	1.5 kg container	Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.
Art.No.135.001.013	Ready-to-use oil-based suspension	1 L can	Based on colorless, odor-free, non-irritant, low-viscosity oils

Super Magna WD-105



Average grain size (µm)	37
Recommended concentration (g/l)	5
Sedimentation (1 g/l)/100 ml	0.1
Colour	Grey-white daylight fluorescent

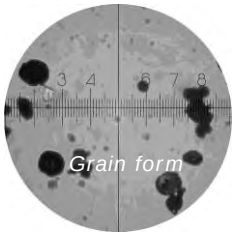
Art.No.135.001.530 Pure magnetic powder

Art.No.135.001.531 Dry concentrate 15g:1L

1 kg container — 1 kg sufficient for 500 L suspension. For water based suspensions use BC 502 Additive!

1.5 kg container — Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.

Super Magna TGL-11



Average grain size (µm)	35
Recommended concentration (g/l)	5
Sedimentation (1 g/l)/100 ml	0.3
Colour	Red-orange daylight fluorescent

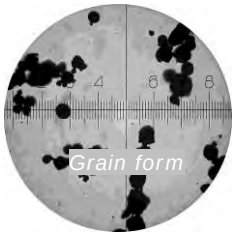
Art.No.135.001.510 Pure magnetic powder

Art.No.135.001.540 Dry concentrate 15g:1L

1 kg container — 1 kg sufficient for 500 L suspension. For water based suspensions use BC 502 Additive!

1.5 kg container — Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.

Super Magna WW-50



Average grain size (µm)	30
Recommended concentration (g/l)	5
Sedimentation (1 g/l)/100 ml	0.25
Colour	Grey-white daylight fluorescent

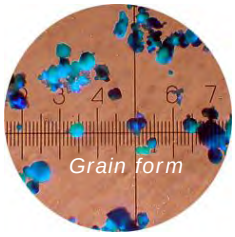
Art.No.135.003.030 Pure magnetic powder

Dry concentrate 15g:1L

1 kg container — 1 kg sufficient for 500 L suspension. For water based suspensions use BC 502 Additive!

1.5 kg container — Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.

Super Magna TGL-12



Average grain size (µm)	37
Recommended concentration (g/l)	5
Sedimentation (1 g/l)/100 ml	0.3
Colour	Light green daylight fluorescent

Art.No.135.001.520 Pure magnetic powder

Art.No.135.001.522 Dry concentrate 15g:1L

1 kg container — 1 kg sufficient for 500 L suspension. For water based suspensions use BC 502 Additive!

1.5 kg container — Contains wetting, antifoam (silicone-free) and antirust agents. Halogen-free.

AEROSOL SYSTEMS FOR MAGNETIC PARTICLE TESTING

The consumables in spray cans are used for quick, handy and efficient testing, also in test labs and under field conditions.

The HELLING aerosol suspensions both oil-based and water-based excel in their indicating ability and serve for detection of the finest cracks. Due to the economic consumption and ease of application they are an ideal material for testing on construction sites and mounting pads or for sampling inspection.

The HELLING aerosol systems are V.O.C.-free and meet the requirements of ASME-Code, Sect. V, ASTM E 709 and EN ISO 9934.

Weld joint inspection on a bridge by use of BW 333 black magnetic particle suspension and NR 104 A white background paint.

LY 2500 fluorescent suspension, water-based

Art.No.135.005.611

A fluorescent water-based magnetic particle suspension.
The suspension contains all necessary wetting, antifoam and antirust agents and provides a very high sensitivity. The average grain size of magnetic particles is about 4 µm.

Contents: 400 ml.

BW 333 black suspension, water-based

Art.No.135.005.601

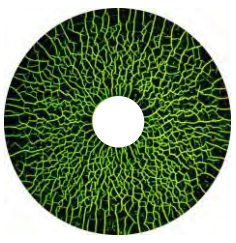
A black water-based magnetic particle suspension.
The suspension contains all necessary wetting, antifoam and antirust agents and provides a high sensitivity. The average grain size of magnetic particles is about 4 µm.

Contents: 400 ml.

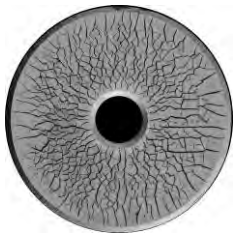
NRF 101 fluorescent suspension, oil-based

Art.No.135.005.050 – spray can 400 ml
Art.No.135.005.055 – 1 L can
Art.No.135.005.060 – 10 L can

A fluorescent magnetic particle suspension based on odour-free oil with a high flash point. The suspension is an efficient corrosion inhibitor and provides a very high sensitivity. The average grain size of magnetic particles is about 4 µm.



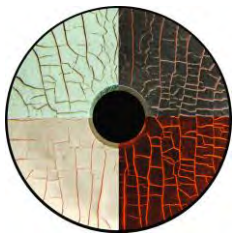
NRS 103 black suspension, oil-based



Art.No.135.005.070 – spray can 400 ml
Art.No.135.005.080 – 1 L can
Art.No.135.005.090 – 10 L can

A black magnetic particle suspension of high sensitivity. It is based on odour-free oil with a high flash point and is an efficient corrosion inhibitor. The average grain size of magnetic particles is about 4 µm.

HANSA-NORD MEF 515 red fluorescent suspension, oil-based



135.005.079 – spray can 500 ml

A red fluorescent, oil-based magnetic particle suspension, which provides a clear contrast indication even on black and polished surfaces, on white background as well as under UV irradiation. The average grain size of magnetic particles is about 10 µm.

NR 104 A background paint

Art.No.135.006.020 – spray can 400 ml
Art.No.135.006.022 – 1 L can
Art.No.135.006.030 – 10 L can

A white pigment suspension background paint in a slightly volatile solvent. It does not contain chlorinated hydrocarbons. Dries quickly (about 1 min. at 20 °C) and produces a smooth, uniform white background coating. To be applied as a layer with a thickness up to 30 µm.

NR 104 A/S background paint

Art.No.135.006.021 – spray can 400 ml

A white re-dyeable background paint without chlorinated hydrocarbons. Dries quickly (about 2 min. at 20 °C) and produces a smooth, uniform white background coating. To be applied as a layer with a thickness up to 30 µm.

NR 107 remover

Art.No.135.006.050 – spray can 400 ml
Art.No.135.006.062 – 1 L can
Art.No.135.006.060 – 10 L can
Art.No.135.006.061 – 200 L cask

Remover for background paints.

Oil No. 01500 for magnetic particle testing

Art.-Nr.135.007.050 - 10 L can
Art.-Nr.135.007.060 – 201 L cask

Low-viscosity oil carrier for preparation of magnetic particle suspensions. Aging-resistant, odour-free, colourless, non-irritating, without intrinsic fluorescence.

Oil No. 4965 for magnetic particle testing

Art.-Nr.135.007.020 – 10 L can
Art.-Nr.135.007.030 – 200 L cask

Low-viscosity oil carrier for preparation of magnetic particle suspensions. Totally evaporating. Aging-resistant, odour-free, colourless, non-irritating, without intrinsic fluorescence.

BC 502 additive

Art.No.135.007.080 – 1 L bottle
Art.No.135.007.090 – 10 L can

A composition of water, amine borate, anionic and nonionic surfactants. It is used as wetting (surface-active), antifoam and corrosion-preventive agent for preparation of water-based magnetic particle suspensions.

Dosage: 20-50 ml per 1 L of ready-to-use water-based magnetic particle suspension.

RS 602 corrosion-preventive additive

Art.No.135.008.081 – 1 L bottle

An additive for preparation of water-based magnetic particle suspensions. Free of chlorides, halogens and nitrites.
It is used for production of water-based cooling fluids, cleaning liquids, fluids for metal working.

Dosage: 20 ml per 1 L of water or ready-to-use water-based magnetic particle suspension.

Universal-degreaser

Art.No.129.900.070 – 750 ml spray can
Art.No.129.900.072 – 1 L can
Art.No.129.900.073 – 10 L can
Art.No.129.900.074 – 200 L cask

An all-purpose degreaser for cleaning oiled and greasy metal surfaces used in crack detection.

HAND MAGNETIZING DEVICES

HAND YOKE ELECTROMAGNETS

With the HANSA series HELLING company presents a new generation of hand yoke electromagnets, which excel by many advantages as compared with the previous series: they are more light-weight, handy and powerful!

An important ergonomic feature of this series is the specially narrow handle, which facilitates a fatigue-free working – also with small hands.

The series includes the UM-8, UM-9, UM-10 and UM-15 hand yokes. The UM-8, UM-9 and UM-10 yokes differ in dimensions (pole spacing and length), in weight and in lifting strength. Optionally the devices can be fitted with two-limbs flexible poles, whose lower limbs can be swung inwards or outwards, increasing/decreasing the pole spacing. Due to the contact surface inclination the poles optimally fit to the geometry of the object under testing. For use under rough working conditions the yokes can be provided with special protective poles.

The UM-15 is provided with three-limbs flexible poles standardly. Hereby the poles distance can be set in the range from 95 up to 250 mm.

All hand yokes of the HANSA series – also with flexible poles by maximum pole spacing – meet the requirements of general guidelines and standards (EN ISO 9934-3, ASTM 709 and ASME-Code Sect. V). Here a lifting strength of min. 45 N (4.5 kg) or a tangential field strength of min. 20 A/cm (EN ISO 9934-3) is required as operational capability proof.

The HANSA hand yokes are completely sealed, powered by 230 V or 42 V and fulfills the IP 65 protection class requirements. They can be used (with the exception of UM-8 (60 s/30% ED) with the maximum switch-on time of 150 sec. and maximum duty cycle of 50%. The cable can be uncoupled in order to prevent breaking of the connecting bushing.

UM-8 / HANSA-230 hand yoke electromagnet

Art.No.	131.002.020
Pole spacing, mm	170
Pole cross section, mm	25 x 25
Dimensions, mm	265x163x49
Tangential field strength, A/cm	30
Lifting force, N	130
Supply voltage, V	AC 230
Operating current, A	2
Duty cycle, %	50
Weight, kg	2.9
Cable length, m	5
Protection class	IP 65

Optional: changeable cable 3 m, Art.No. 131.002.040
Optional: changeable cable 10 m, Art.No. 131.002.045

UM-8 / HANSA-42 hand yoke electromagnet

Art.No.	131.002.030
Pole spacing, mm	170
Pole cross section, mm	25 x 25
Dimensions, mm	265x163x49
Tangential field strength, A/cm	30
Lifting force, N	130
Supply voltage, V	AC 42
Operating current, A	9
Duty cycle, %	50
Weight, kg	2.9
Cable length, m	5
Protection class	IP 65

Necessary auxiliaries:
Step-down transformer 230/42 V, Art.No.131.009.050
Optional: changeable cable 10 m, Art.No. 131.009.060

UM-9 / HANSA-230 hand yoke electromagnet

Art.No.	131.002.024
Pole spacing, mm	170
Pole cross section, mm	25 x 25
Dimensions, mm	250x135x49
Tangential field strength, A/cm	30
Lifting force, N	>130
Supply voltage, V	AC 230
Operating current, A	2
Duty cycle, %	50
Weight, kg	2.9
Cable (detachable), m	5
Protection class	IP 65

Optional: changeable cable 3 m, Art.No. 131.002.040
Optional: changeable cable 10 m, Art.No. 131.002.045

UM-9 / HANSA-42 hand yoke electromagnet

Art.No.	131.002.025
Pole spacing, mm	170
Pole cross section, mm	25 x 25
Dimensions, mm	250x135x49
Tangential field strength, A/cm	32
Lifting force, N	>130
Supply voltage, V	AC 42
Operating current, A	8.5
Duty cycle, %	50
Weight, kg	2.9
Cable (detachable), m	5
Protection class	IP 65

Necessary auxiliaries:
Step-down transformer 230/42 V, Art.No.131.009.050
Optional: changeable cable 10 m, Art.No. 131.009.060

UM-10 / HANSA-230 hand yoke electromagnet

Art.No.	131.002.026
Pole spacing, mm	135
Pole cross section, mm	25 x 25
Dimensions, mm	210x110x49
Tangential field strength, A/cm	30
Lifting force, N	>90
Supply voltage, V	AC 230
Operating current, A	0.8
Duty cycle, %	50
Weight, kg	2.2
Cable (detachable), m	5
Protection class	IP 65

Optional: changeable cable 3 m, Art.No. 131.002.040
Optional: changeable cable 10 m, Art.No. 131.002.045

UM-10 / HANSA-42 hand yoke electromagnet

Art.No.	131.002.027
Pole spacing, mm	135
Pole cross section, mm	25 x 25
Dimensions, mm	210x110x49
Tangential field strength, A/cm	30
Lifting force, N	>90
Supply voltage, V	AC 42
Operating current, A	4.4
Duty cycle, %	50
Weight, kg	2.2
Cable (detachable), m	5
Protection class	IP 65

Necessary auxiliaries:
Step-down transformer 230/42 V, Art.No.131.009.056
Optional: changeable cable 10 m, Art.No. 131.009.060

UM-15 / HANSA-230 hand yoke electromagnet

Art.No.	131.002.028
Pole spacing, mm	95-245
Pole cross section, mm	25 x 25
Dimensions, mm	255x173x45
Tangential field strength, A/cm	23
Lifting force, N	>45
Supply voltage, V	AC 230
Operating current, A	3
Duty cycle, %	50
Weight, kg	3.2
Cable (detachable), m	5
Protection class	IP 65

Optional: changeable cable 3 m, Art.No. 131.002.040
Optional: changeable cable 10 m, Art.No. 131.002.045

UM-15 / HANSA-42 hand yoke electromagnet

Art.No.	131.002.029
Pole spacing, mm	95-245
Pole cross section, mm	25 x 25
Dimensions, mm	255x173x45
Tangential field strength, A/cm	20
Lifting force, N	>45
Supply voltage, V	AC 42
Operating current, A	9
Duty cycle, %	50
Weight, kg	3.2
Cable (detachable), m	5
Protection class	IP 65

Necessary auxiliaries:
Step-down transformer 230/42 V, Art.No. 131.009.050
Optional: changeable cable 10 m, Art.No. 131.009.060

Flexible & protective poles for hand yokes

Art.No. 131.002.023 – Flexible poles 45° - 1 set (2 pcs.)

Flexible poles 45° for UM-8, UM-9 and UM-10 / HANSA-230. The lower pole limbs can be swung inwards or outwards by 45°, increasing / decreasing the poles spacing by approximately 60 cm.

Art.No. 131.002.019 – Flexible poles 76° - 1 set (2 pcs.)

Flexible poles 76° for UM-8, UM-9 and UM-10 / HANSA-230, optimized for fillet weld testing.

Art.No. 131.002.602 – Flexible poles special design - 1 set (2 pcs.)

Flexible poles with straight limbs and double joints for UM-9 and UM-10 / HANSA 230.

Art.No. 132.020.021 – Protective poles with pin - 1 set (2 pcs.)

Protective poles with pin for UM-8, UM-9 and UM-10 / HANSA-230. Serve for poles surface protection while working under rough conditions.

Art.No.131.002.021 – Protective poles with screws - 1 set (2 pcs.)

Protective poles for fixing with screws to UM-9 and UM-10 / HANSA 230. Serve for poles surface protection while working under rough conditions.

HAND MAGNETIZING DEVICES

KMU 8/42 CROSS YOKE

The KMU 8/42 Cross Yoke represents a supplement to the HANSA series – the new generation of hand yoke magnetizing devices. The KMU 8/42 consists of two alternating current yokes disposed crosswise with pole spacing of 170 mm.

They are fed by 2 equipotent alternating currents with 90° phase shift, thus producing a rotating magnetization vector whose field strength is equal in all directions. This magnetization technique enables the detection of discontinuities of any orientation. In practice it enables: simultaneous indication of longitudinal, transversal and oblique cracks during one operation. Therefore, the KMU 8/42 Cross Yoke is especially appropriate for testing of lengthy welded joints, for example in pipe manufacturing, tank and pressure vessel building or ship building.

The long-duration duty cycle of up to 60 % favourises the application in these production fields.

The magnetic field is induced to the part under test over a short air gap. Therefore the yoke poles are equipped with adjustable castors. The castors maintain a constant air gap between the poles and the part surface and make the yoke easily movable.

The KMU 8/42 Cross Yoke is completely sealed, powered by an additional transformer with 2 x 42 V alternating voltage and fulfills the IP 54 protection class requirements. The cross yoke and the transformer are coupled with a flexible 5 m cable. The transformer meets the criteria of the IP 23 protection class and requires the primary voltage of 3 x 400 V.

KMU 8/42 cross yoke

Art.No.	131.016.100
Pole spacing, mm	170 x 170
Pole cross section, mm	25 x 25
Dimensions, mm	230 x 240 x 330
Tangential field strength, A/cm	32
Lifting force, N	> 300
Operating current, A	2 x 13
Duty cycle, %	60
Weight, kg	10.8
Cable (detachable), m	5
Protection class	IP 54

Necessary auxiliaries: step-down transformer (Art.No. 131.016.110)
Optional: changeable cable 10 m at request
Also available:
KMU 8/42 Cross Yoke in special design for fillet weld testing
KMU 8/42 Cross Yoke in special design for planar surface testing

KMU 8/42 mini cross yoke

Art.No.	131.016.101
Pole spacing, mm	140 x 140
Pole cross section, mm	25 x 25
Dimensions, mm	210 x 220 x 330
Tangential field strength, A/cm	27
Lifting force, N	>250
Operating current, A	2 x 8.5
Duty cycle, %	60
Weight, kg	9.8
Cable (detachable), m	5
Protection class	IP 54

Necessary auxiliaries: step-down transformer (Art.No. 131.016.110)
Optional: changeable cable 10 m at request

Also available:
KMU 8/42 mini Cross Yoke in special design for fillet weld testing
KMU 8/42 mini Cross Yoke in special design for planar surface testing

INDUCTIVE UV and WHITE LIGHT LED SOURCES

Inductive UV or White Light LED Sources are used while working with hand yoke or cross yoke electromagnets. The light sources have been designed for simultaneous irradiation (illumination) of the working area during testing with fluorescent or colour magnetic particle powder by single handed operation. The adjustable swivel head ensures the correct irradiation angle depending on distance between poles and length of the yoke legs in order to achieve a homogeneous irradiation field right in the center of the working area.

The splash-protected (IP 65) light source fits on all hand yokes with a pole cross section up to 50x50 mm.

The light sources can be fixed quickly and easily to the yoke leg and fastened with two plastic screws.

When switching on the yoke – viz. during magnetizing, post-magnetizing and the examination cycles – the unit is fed by inductive current and illuminates/ irradiates the working area. Therefore no additional power source is needed.

The light sources have proved of value, especially during testing under restricted space conditions, on construction sites and improvised test places where only limited space for using auxiliary instrument is available.

Inductive UV irradiation source with swivel head

Art.No.	131.002.053
Operating current	appr. 500 mA
UV source	1 UV LED
UV LED lifetime	appr. 10,000 h
UV intensity at 70 mm dist.	appr. 2000 µW/cm^2
Wavelength	365 nm
Weight	appr. 70 g
Dimensions	65 x 80 mm

Inductive UV irradiation source with double swivel head

Art.No.	131.002.063
Operating current	appr. 500 mA
UV source	2 UV LED
UV LED lifetime	appr. 10,000 h
UV intensity at 70 mm dist.	appr. 3500 µW/cm^2
Wavelength	365 nm
Weight	appr. 80 g
Dimensions	65 x 80 mm

Inductive white light source with swivel head

Art.No.	131.002.054
Operating current	appr. 500 mA
White light source	1 white light LED
LED lifetime	appr. 10000 h
Light intensity at 70 mm dist.	appr. 1000 lux
Weight	appr. 70 g
Dimensions	65 x 80 mm

HAND MAGNETIZING DEVICES

DC YOKES

The portable HANSA–DC yokes are battery-powered, thus network independent, direct current magnetizing devices for mobile operation – also under field conditions.

The HANSA – DC yokes have a reduced weight and a comfortable ergonomic grip in order to facilitate a fatigue-free working. The device surface is slightly rough, thereby uncontrolled gliding in the hand is eliminated.

The devices are fed by a powerful compact NiMH-battery pack sufficient for continuous working time of about 4 hours. An LED operation indicator integrated in the yoke housing indicates the battery charge status.

The carrying case for battery pack can be fastened quickly at the waist-belt.

The HANSA-DC yokes meet the requirements of ASTM E 709-15 and ASTM E1444/E1444M-16. The pull-off strength by poles distance of 135 mm is more than 27 kg (265 N). Note: min. 22.5 kg (225 N) are required acc. to ASTM E1444/E1444M-16.

UM-9 / HANSA–DC yoke

Battery powered DC yoke with LED operation indication red/green

Art.No.	131.002.127
Pole spacing, mm	170
Pole cross section, mm	25x25
Dimensions, mm	250x135x49
Operating current, A	1.0
Voltage, V	6
Continuous working time, h	4
Protection type	IP 65
Lifting force acc.to ASTM E1444 (N)	> 225
Weight, kg	2.9

UM-10 / HANSA–DC yoke

Battery powered DC yoke with LED operation indication red/green

Art.No.	131.002.125
Pole spacing, mm	135
Pole cross section, mm	25x25
Dimensions, mm	210x110x49
Operating current, A	1.0
Voltage, V	6
Continuous working time, h	4
Protection type	IP65
Lifting force acc.to ASTM E1444 (N)	> 225
Weight, kg	2.2

Flaw Finder Type A permanent magnet

Art.No. 131.001.010

Flaw Finder Type A meets the requirements of ASTM E709 and ASTM E1444/E1444M and is an ideal instrument for magnetizing of small-sized parts and weld joints. It consists of 2 permanent magnets connected with a magnetic conductor.

Lifting force: >30 kg (294 N)
(ASTM E1444/E1444M requires min. 22.5 kg)

Magnetic material: neodymium-iron-boron

Flaw Finder Type N permanent magnet

Art.No. 131.001.022

The Flaw Finder Type N meets the requirements of ASTM E709 and ASTM E1444/E1444M, it consists of a central permanent magnet with attached flexible magnetic conductors. These flexible poles serve for optimal fit to surface geometry. The magnetizing force is tested by TB10 test block.

Lifting force by pole spacing 100-150 mm: >27 kg (265 N),
(ASTM E1444/E1444M requires min. 22.5 kg)

Magnetic material: neodymium-iron-boron

TB-10 weight lift test bars

Art.No. 134.002.017

TB-10 is used for calibration and certification of AC and DC electromagnets as well as permanent magnets to the following specifications by testing their pull-off strength. The bar weight is stamped on each bar and is traceable to NIST specifications. The TB-10 bars are provided with a central drilling so that they can be screwed together to perform DC yokes testing. Without artificial defects.

Complies with ASME Section V, Article 7; ASTM E709-15, NAVSEA-TB-T9074-AS-GIB-010/271 Rev. (September 11,2014), ASTM E-1444/E1444M-16.

Weight: 10 lb (4.5359 kg)

TB-10 SP weight lift test bars

Art.No. 134.002.018

TB-10 SP serves for calibration and certification of AC electromagnets. The bar weight is stamped on each bar and is traceable to NIST specifications. Provided with artificial defects.

Complies with ASME Section V, Article 7; ASTM E709-15, NAVSEA-TB-T9074-AS-GIB-010/271 Rev. (September 11,2014), ASTM E-1444/E1444M-16.

Weight: 10 lb (4.5359 kg)

TB-2 weight lift test bars

Art.No. 134.002.030

TB-2 is used for calibration and certification of AC and DC electromagnets as well as permanent magnets by testing their pull-off strength. The TB-2 bars are provided with a central drilling so that they can be screwed together to perform DC yokes testing.

Complies with DIN EN ISO 9934-3.

Material: Steel C22.8.

Weight: approx. 4.6 kg

MOBILE AND STATIONARY MAGNETIZING DEVICES

Cross yoke NR 01

Art.No. 131.011.120

The Cross Yoke NR 01 is used for contact and non-contact magnetization of different parts. It is powered by two equipotent alternating currents, dephased by 90°, thus producing a rotating magnetization vector whose field strength is equal in all directions. This magnetization technique enables the detection of discontinuities of any orientation during only one operation. The Cross Yoke NR 01 is particularly suitable for testing of tube ends, tooth gears and different cylinder parts.

Specifications	
Operating voltage, cross yoke, VAC	2 x 50
Operating current, A	2 x 60
Pole spacing, mm	360 x 360
Pole cross section, mm	60 x 60
Dimensions, mm	330 x 500 x 330
Min. internal pipe size, mm	500
Lifting force, N	> 600
Primary voltage, transformer, VAC	3 x 400
Duty cycle, %	60
Weight, kg	approx. 85
Protection class	IP 54

Necessary auxiliaries: control desk Art.-No. 131.011.121
Foot switch Art.-No. 131.020.090
Hold systems as per customer's request. e.g. Art.-No. 131.011.122

MT test device with cross-shaped coil

Art.No. 139.901.100

The MT Test Device consists of a cross-shaped coil type KR 650® with an integrated suspension showering arrangement, foot-switch, suspension collection tank and control box. The cross-shaped coil is used for non-contact magnetization of bars, billets, ingots or cylindrical parts. It is powered by two equipotent alternating currents that are dephased by 90°, thus generating a rotating magnetizing vector. Thus, surface cracks of any orientation can be detected during one operation.

Specifications	
Operating voltage, V	AC 3 x 400, AC 3 x 9/12/15
Power consumption, kVa	50
Magnetizing currents, A	3 x 0-1800, stepless setting
Tangential field strength, A/cm	≥ 30
Cross coil diameter, mm	650
Cross coil weight, kg	approx. 150
Test piece cross section max, mm	300 x 210
Test piece weight max, kg	10
Control box dimensions, mm	2400 x 1200 x 800
Control box weight, kg	approx. 800

Optional: darkening cabin, UV LED equipment, PLC control

HETT demagnetizing tunnels

The demagnetization effect of the AC demagnetizing tunnels is based on the principle of subjecting the part to a reversing and decreasing magnetic field. This can be accomplished by pulling a part out and away from a coil with AC passing through it.

The AC magnetic field penetration at 50 Hz frequency is about 2 mm (on steel). In order to increase the penetration depth an additional low-frequency generator with $16\frac{2}{3}$ Hz should be used.

	HETT 1500	HETT 2500	HETT 4500
	Art.No. 132.002.010	Art.No. 132.002.020	Art.No. 132.002.040
Voltage, V	AC 230	AC 230	AC 230
Field strength, A/cm	110	90	65
Dimensions, mm	325x260x260	325x390x390	325x580x577
Clear diameter, mm	150	250	450
Weight, kg	approx. 24	approx. 46	approx. 90

HELLMAG high-current generators

The HELLMAG mobile magnetizing devices are high current generators designed for current and field flow magnetization, for pulse magnetization as well as for demagnetization. Using conventional power cables, the HELLMAG can be combined with a variety of testing equipment such as the chain testing devices, closed or hinged coils, and trapezoidal coils for railway wheels testing.

Specifications	HELLMAG 1100 Standard	HELLMAG 3300 Standard	HELLMAG 3300 Premium
Art.No.	131.100.093	131.100.082	131.100.080
Mains connection, V / Hz / A	230 / 50-60 / 16	400 / 50-60 / 32	400 / 50-60 / 32
Power consumption, kVA	3,2	5	5
Nominal current, A	1000 AC	2500 AC	2500 AC
Current adjustment	stepless	3-steps-switch	3-steps-switch
Relative duty cycle, %	30	30	30
Current indication	analogue	analogue	analogue
Operating mode	1[1)]	1[1)]	1, 2, 3[1)]
Connecting cables auxiliaries	2 x 2.5 m	2 x 2.5 m	4 x 2,5
Cable cross section, mm²	95	95	95
Socket 230 V	-	-	+
Socket 230 V, switchable	+	-	+
Dimensions, mm	370 x 255 x 235	564 x 300 x 324	564 x 300 x 324
Weight, kg	approx. 19	approx. 57[2)]	approx. 57[2)]

[1)] 1 – magnetization
2 – demagnetization
3 – pulse mode

[2)] optionally with laminated core transformer

HELLMAG K-Series high-current generators

The HELLMAG mobile magnetizing devices are high current generators designed for current and field flow magnetization, for pulse magnetization as well as for demagnetization. Using conventional power cables, the HELLMAG can be combined with a variety of testing equipment such as the chain testing devices, closed or hinged coils, and trapezoidal coils for railway wheels testing.

Specifications	HELLMAG 7k	HELLMAG 15k	HELLMAG 50k
Art.No.	131.100.094	131.100.095	131.100.096
Mains connection, V / Hz / A	400 / 50-60 / 32	400 / 50-60 / 63	400 / 50-60 / 123
Power consumption, kVA	7,5	15	48
Nominal current, A	750 AC	1850 AC	6000 AC
Current adjustment	stepless	stepless	stepless
Relative duty cycle, %	60	60	40
Current indication	digital	digital	digital
Operating mode	1, 2, 3[1)]	1, 2, 3[1)]	1, 2, 3[1)]
Dimensions, mm	600 x 600 x 400	600 x 600 x 400	800 x 800 x 500
Weight, kg	approx. 50	approx. 120	approx. 300

[1)] 1 – magnetization
2 – magnetization with following demagnetization
3 – pulse mode

Power cables with handles and contact electrodes

Art.No. 131.030.090

Set consisting of 2 pcs. power cable 2.5 m, cross section 95 mm², mounted with:

- 1 handle with control cable and copper braid contact electrode for testing current transition
- 1 handle with copper braid contact electrode for testing current transition

Melt-off electrodes

Art.No. 131.020.081 – melt-off electrodes Type HA up to 1500 A
Art.No. 131.020.082 – melt-off electrodes Type B 1500-3000 A
Art.No. 131.020.083 – melt-off electrodes Type C 3000-8000 A

Melt-off electrodes for connecting to the power cables at the handles for surface protective testing.

Associated articles: 1 set handles for melt-off electrodes (Art.No. 131.020.084) consisting of: 1 handle with control cable and 1 handle without control cable.

Connecting cables for HELLMAG 3300 Premium accessories

Art.No. 131.030.091

Set consisting of 2 connecting lines x 2 cables, cross section 95 mm², length 2.5 m.

Each connecting line mounted with 2 plugs for connection to HELLMAG 3300 Premium and 1 cable shoe for accessories connection.

Connecting cables for HELLMAG Standard accessories

Art.No. 131.030.096

Set consisting of 2 connecting lines x 1 cable, cross section 95 mm², length 2.5 m.

Each connecting line mounted with 1 plug for connection to HELLMAG 1100 Standard or HELLMAG 3300 Standard and 1 cable shoe for accessories connection.

Foot switch

Art.No. 131.020.090

Foot switch for HELLMAG operating.

Hinged magnetizing coils

Art.No. 131.020.021 - Magnetizing coil 200, inner diameter: 200 mm
Art.No. 131.020.022 - Magnetizing coil 350, inner diameter: 350 mm
Art.No. 131.020.023 - Magnetizing coil 500, inner diameter: 500 mm

Hinged magnetizing coil with easy-to-operate locking handle for connection to HELLMAG 3300 via connecting cables (Art.No. 131.030.091).

Number of windings: 3

Closed magnetizing coils

Art.No. 131.020.011 – Magnetizing coil 200, inner diameter: 200 mm
Art.No. 131.020.012 – Magnetizing coil 350, inner diameter: 350 mm
Art.No. 131.020.013 – Magnetizing coil 500, inner diameter: 500 mm

Closed magnetizing coil for connection to HELLMAG 3300 via connecting cables (Art.No. 131.030.091).

Number of windings: 3

Mobile chain testing systems

Art.No. 131.020.001 – Chain testing system Premium, operated by HELLMAG 3300 Premium
Art.No. 131.020.003 – Chain testing system Standard, operated by HELLMAG 3300 Standard
Art.No. 131.020.004 – Chain testing system 200, operated by HELLMAG 1100 Standard

Mobile chain testing systems according to UVV 18.4 / DIN 685 part 5 consisting of:

- Transport car designed for HELLMAG installation;
- Magnetic particle suspension collecting tank with integrated showering arrangement;
- High-power pump for magnetic particle suspension;
- Closed magnetizing coil mounted at the suspension-collecting tank. Usable diameter Type Premium/Standard: 320 mm, Type 200: 200 mm.
- HELLMAG high-current generator (type congruent);
- Connecting cables 95 mm²;
- Foot switch for HELLMAG operation.

Optionally: UV LED hand lamp.

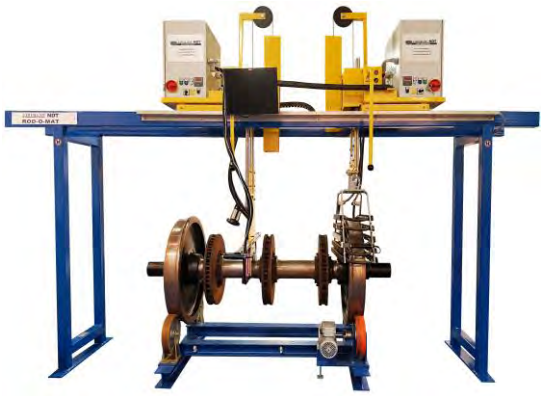
HELLCHAIN 3000 chain testing system

Art.No. 131.020.005

Chain testing system according to UVV 18.4 / DIN 685 part 5 consisting of:

- Transport car with mounted suspension pump incl. integrated bypass;
- Magnetic particle suspension collecting tank approx. 600 L;
- Magnetizing coil ∅ 350 mm with showering circle mounted at a holder on the transport car. Working height approx. 1050 mm;
- HELLMAG 3300 high-current generator;
- 2 sets (4 pcs.) connecting cables 95 mm²;
- Foot switch for HELLMAG 3300 operation;
- UV-Inspector 711 UV LED hand lamp.

ROD-A-MAT system for semi-automatic magnetic particle inspection of wheel set assemblies



Art.No. 131.050.045

Fully integrated system for magnetic particle inspection of railway axles and wheels. Contactless magnetizing by the means of retractable coils.

The ROD-A-MAT system consists of:

- Steel frame, optionally mounted on rails for loading wheel sets by crane;
- Two carriages to be manipulated manually or automatically holding one high-current-generator and one magnetizing coil each;
- Wheel set support with double roles;
- Retractable trapezoid coil with handle and push button switch for magnetizing railway wheels Ø 800 - 1200 mm;
- Half-coil with handle and push button switch for magnetizing wheelset axles up to Ø250 mm;
- Double-pulley linear axis for vertical adjustment of each coil;
- Two control boxes with operating and display units;
- Two high-current generators: 1 x HELLMAG 5k (5 kVA; 400 V – 32 A; 60% ED) for trapezoid coil and 1 x HELLMAG 15k (15 kVA, 400 V – 63 A; 60 % ED) for half-coil
- Distance monitoring by light sensor.

Also separately available:

- Trapezoid coil, Art.No. 131.020.103, designed for non-contact magnetization of the complete wheel surface (except for the wheel hub inner face). Five windings. Power supply via 60 x 10 mm Cu-rails.

- Half-coil, Art.No. 131.020.093, applicable for magnetization of shafts with the diameter from 100 to 250 mm. Especially suitable for narrow spaces (e.g. between wheel and brake disc). Two windings, 400 mm²/winding. Mounting included.

HELLMAG Type Vario 2500 test bench

The test bench HELLMAG Type Vario 2500 has been designed for combined magnetization with two magnetizing circuits - AC current flow and AC coil magnetization. Thus, the equipment is capable of detecting flaws of any orientation simultaneously. This bench is especially appropriate for testing railroad wheelset axles.

The HELLMAG Type Vario 2500 includes following components: dark room unit with curtains and roller blind; swivel control panel, sliding UV LED lamp, joystick for coil movement and work piece rotating, manually adjustable work piece support carriages with pneumatic clamping, motor-driven travelling coil with circular showering unit, suspension tank with pump and bypass, control cabinet.

Specifications:

AC current flow (stepless adjustable)	max. 3000 A eff. 4200 A peak
AC coil magnetization (stepless adjustable)	max. 4500 AT
Clamping length	2500 mm
Work piece weight	max. 500 kg
Stroke length of quick-clamping device	
Two-hand-control	approx. 25 mm
Foot switch	approx. 7 mm
Suspension tank	40 L
Mains connection	AC 400 V, 3-phase
Control voltage	DC 24 V
Power consumption	approx. 75 kVA
Pressurized air	5 – 6 bar
Automatic demagnetization	yes

HELLMAG Universal 500 AC / 700 AC test bench

This test bench has been designed for testing short-run batches and for training purposes. The test bench has two magnetizing circuits - AC current flow magnetization and AC yoke magnetization. Either single or simultaneous initiation of magnetizing circuits is possible. The test bench is equipped with a Siemens multi-colour touch panel for easy data input and operation. The test bench is provided with constant current control. Every test piece current setting can be saved (eventually with a password). Test settings can be sent to a PC or any other management system via Ethernet.

The HELLMAG Universal test benches are equipped with powerful state-of-the-art UV LED lamps.

Specifications	HELLMAG Universal 500 AC	HELLMAG Universal 700 AC
Art.No.	139.900.330	139.900.310
AC current flow	1200 A eff.	1500 A eff.
AC yoke magnetization	approx. 12000 AT	approx. 16000 AT
Clamping length	60 – 500 mm	60 – 700 mm
Relative duty cycle	40 %	40 %
Data storage	+	+
Data transfer to PC	optionally	optionally
Mains connection	400V / 50Hz / 32A	400V / 50Hz / 100A
Power consumption	max. 18 kVA	max. 28 kVA
Dimensions	130 x 60x200 cm	170x66x200 cm
Weight	approx. 385 kg	approx. 480 kg

Included in the delivery:
- UV LED overhead lamp ZERO 500/4 IP 54;
- Foot switch for starting the magnetization process.

Optionally:
- Suspension tank 18 l with hand shower, material stainless steel;
- Pump incl. dry run protection;
- Adjustable bypass for mixing the suspension;
- Regulation of flow rate.

HELLMAG Universal 1000 AC test bench

The test bench has two magnetizing circuits - AC current flow magnetization and AC yoke magnetization. Either single or simultaneous initiation of magnetizing circuits is possible. The test bench is equipped with a Siemens multi-colour touch panel for easy data input and operation. The test bench is provided with constant current control. Every test piece current setting can be saved (eventually with a password). Test settings can be sent to a PC or any other management system via Ethernet.

Specifications:	HELLMAG Universal 1000 AC
Art.No.	139.900.320
AC current flow	2000 A eff.
AC yoke magnetization	approx. 20000 AT
Clamping length	150 – 1000 mm
Relative duty cycle	40 %
Data storage	+
Data transfer	+
Mains connection	400V / 50Hz / 125A
Power consumption	max. 55 kVA
Dimensions	approx. 250 x 80 x 140 cm
Weight	approx. 790 kg

ZER-O-MAT magnetizing and inspection station

ZER-O-MAT® devices are magnetizing and inspection stations designed for magnetic particle testing of pipes, rods, bars and other tubular parts with diameters from 20 up to 660 mm. The devices enable the user to find surface flaws of multidirectional orientation in one operation within short time.

Besides applicable for local inspection at repair stations, the devices can also be used for full length testing of tubular products, and an immediate repair, viz. directly after the (re-) inspection, is possible in both cases.

An essential part of the device is the ZER-O-MAT® solenoid coil, developed and patented by Helling GmbH. This coil has a characteristic U-shape, so that items to be inspected can be ″dipped″ into the coil from above. The non-contact magnetization with the coil prevents burns at the tube surface and enables detection of surface flaws of multidirectional orientation within short time. The tangential field strength is min. 24 A/cm. ZER-O-MAT®-coils are operated with AC-current. Therefore, only the surface layer of the material is magnetized due to the skin effect. Thus, no demagnetization is necessary after inspection.

The ZER-O-MAT® is equipped with an up-to-date, high power UV LED lamp.

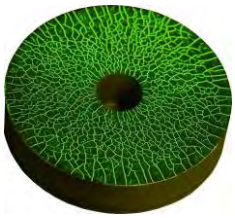
Specifications	
Mains connection	400 V / 50 Hz
Control voltage	230 V / 50 Hz
Power consumption	max. 90 kVA
Current	min. 250 A
Tangential field strength	≥ 24 A/cm
Test piece diameter	20 – 660 mm

REFERENCE BLOCKS AND FIELD INDICATORS

Reference and test blocks are used for quality analysis of the magnetic particle suspensions as well as for the estimation of overall MT performance.

Reference block No.1 (DIN EN ISO 9934-2)

Art.No. 134.002.000 – reference block No.1 without certificate
Art.No. 134.002.002 – reference block No.1 including certificate
Art.No. K02.000.100 – reference block No.1 recalibration



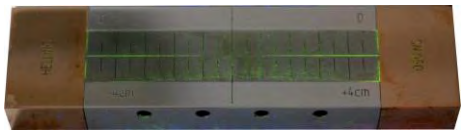
The reference block No.1 is a disc with 2 types of natural cracks at the surface. Coarse cracks are the result of polishing, fine cracks are the result of stress corrosion. The block is magnetized permanently by a through-hole central conductor. Control of magnetic particle suspensions is carried out by visual or other suitable methods for comparison of indications.

Specifications

Sample diameter	50 mm
Sample height	10 mm
Cracks width	2-10 µm

Reference block No.2 (DIN EN ISO 9934-2)

Art.No. 134.002.100 – reference block No.2 including certificate
Art.No. 134.002.101 – reference block No.2 calibration



Reference block No. 2 is a self-contained unit requiring no external magnetic field induction. It is used to determine the quality of the magnetic particle suspensions. The block consists of 2 soft iron bars, separated by a thin (15 µm) Al-foil, representing an artificial defect. Permanent magnets are placed at the sample ends. Because of the permanent magnetic field the bars get magnetized and magnetic particles accumulate over the artificial defect forming indication lines. The quality of the suspension or dry powder is determined by the summarized length of the lines.

Specifications

Dimensions	155 x 40 x 12 mm
Tangential component of magnetic field over the artificial defect at points G (-4)	-100 ± 10 A/cm
B (4)	100 ± 10 A/cm

Berthold magnetic field indicator (penetrameter)

Art.No. 134.003.000 – Berthold indicator without certificate
Art.No. 134.003.002 – Berthold indicator including certificate

The Berthold indicator is designed to determine strength and direction of the selected magnetizing setup and the quality of fluorescent magnetic powder suspension.

When placed on a magnetized test piece, magnetic lines pass through the sectioned iron cylinder. The cuts on the iron cylinder will be visible when magnetic powder or fluorescent magnetic solution is applied. Optimum indication direction is achieved by rotating the sample around its axis. The field direction is perpendicular to the flaw at maximum indication. Magnetizing efficiency, penetration and quality of the fluorescent oil suspension can be determined by slowly turning the outside ring of the field indicator, increasing the distance between the thin brass plate and the test piece. The amount of lift-off at the point of first appearance of the indication gives a measure of the magnetic field testing efficiency.

Specifications

Sample diameter	20 mm
Sample height	5 mm
Holder length	95 mm
Weight	24 g

D 250 magnetic field indicator (ASME indicator)

Art.No. 134.003.100 – D 250 indicator without certificate
Art.No. 134.003.003 – D 250 indicator including certificate

The ASME indicator is used for localisation of magnetic fields and their directions during execution of magnetic particle testing.

Suitable magnetic flux is obtained when the indicator is laid copper side up on the work piece in the area of interest and a clearly defined indication is formed across its face when magnetic particle suspension is applied.

The magnetic field indicator type D 250 is designed in accordance with the following specifications:
MIL-STD-271 E, § 4.3.2.5.5, figure 8
NAVSHIPS 250-1500-1, § 12.4.1.5, figure 12 – 17
ASME, section V, Art. 25, SA-275, figure 8

Specifications

Sample diameter 27 mm	
Sample height	4 mm
Holder length	100 mm
Weight	42 g

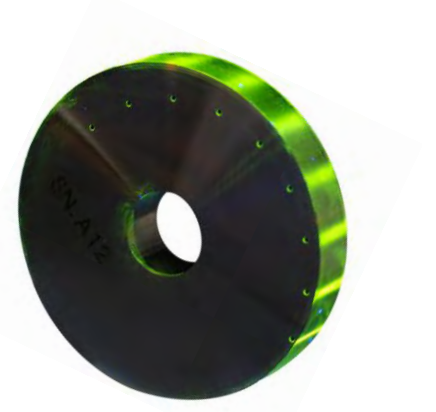
Burmah-Castrol magnetic flux indicators

Art.No. 134.002.110 - Typ I
Art.No. 134.002.120 - Typ II

Burmah-Castrol strips are widely used to indicate the presence of induced magnetic fields giving an evidence of external field above the magnetized surface.
Type I indicators are typically used for general engineering applications and type II are used for aerospace applications. Both types consist of three laminations of 50 x 12 mm which are fixed together to form a sandwich structure which is nominally 0.15 mm thick. The outer lamination has 3 interruptions which are parallel to the long side. Type I indicators respond to a weaker field than Type II strips. Both types are protected by a polymer layer and can be differentiated by the Roman numbers.

Flux Indicators have the advantage of being flexible enough so that they can be bent to fit the contours of a work piece, but robust enough to be usable many times.

Ketos tool steel ring / Aerospace standard tool steel ring



Art.No. 134.004.000 - Ketos tool steel ring acc. to ASTM E1444/E1444M-16
Art.No. 134.004.011 - Certificate
Art.No. 134.004.100 - Tool steel ring acc. to SAE AS5282A
Art.No. 134.004.101 - Certificate

The tool steel rings serve for the sensitivity and performance evaluation of the whole testing system.

Each sample is a ring (∅ 127 mm x 22 mm) made of AISI 01 tool steel, hardness 90 to 95 HRB, provided with a central bore with a diameter of 31.75 mm. At the front face bore holes with a diameter of 1.75 mm are drilled at different distances from the ring edge.

In order to test the complete MT procedure efficiency, the magnetizing direct current has to be passed through the center of the ring via a central conductor (length ≥ 406.4 mm, ∅ 25.4 - 31.75 mm) to generate the leakage fields above the holes. The field strength decreases along with increasing distance to the ring edge. When the magnetic suspension is applied on the ring, magnetic powder accumulates on the ring edge over the holes, forming indication lines.

The process corresponding to the recovery of a recommended number of holes is accepted as optimal.

Miniature QQI-Model KSC-4-230

Art.No. 134.002.403

The Miniature QQI-Model KSC-4-230 (Quantitative Quality Indicator) is a shim-type reference standard containing artificial flaws (notches) acc. to SAE AS5371, ASTM E1444/1444M-12, ASME V, art.7-764.1.2

Description

4 circles with cross-type notches in one shim. Shim thickness 0.002″ (0.051 mm).
Circle diameter 0.255″
Notches length 0.235″
Notches depth 0.0006″ (15 µm) - 30% of shim thickness

Standard QQI-Model KSC-230

Art.No. 134.002.401

The Standard QQI-Model KSC-230 (Quantitative Quality Indicator) is a shim-type reference standard containing artificial flaws (notches) acc. to SAE AS5371, ASTM E1444/1444M-12, ASME V, art.7-764.1.2

Description

1 circular notch with a linear cross-like notch within the circle. Shim thickness 0.002″ (0.051 mm).
Circle diameter 0.507″
Notch length 0.25″
Notch depth 0.0006″ (15 µm) - 30% of shim thickness

Variable depth QQI-Model KSCT 234

Art.No. 134.002.402

The variable depth QQI-Model KSCT 234 (Quantitative Quality Indicator) is a shim-type reference standard containing artificial flaws (notches) acc. to SAE AS5371, ASTM E1444/1444M-12, ASME V, art.7-764.1.2

Description

3 circles of 0.507″, 0.383″, 0.258″ diameter in a 0.002‟ (0.05 mm) thick shim.
Notch depths 0.0004″ (10 µm), 0.0006″ (15 µm) and 0.0008″ (20 µm) - 20%, 30% and 40% of the shim thickness.

Standard QQI-Model KSC-430

Art.No. 134.002.404

The Standard QQI-Model KSC-430 (Quantitative Quality Indicator) is a shim-type reference standard containing artificial flaws (notches) acc. to SAE AS5371, ASTM E1444/1444M-12, ASME V, art.7-764.1.2

Description:

1 circular notch with a linear cross-like notch within the circle. Shim thickness 0.004″ (0.102 mm).
Circle diameter 0.507″
Notch length 0.25″
Notch depth 0.0012″ (30 µm) - 30% of shim thickness

Variable depth QQI-Model KSC-4-234

Art.No. 134.002.405

The variable depth QQI-Model KSC-4-234 (Quantitative Quality Indicator) is a shim-type reference standard containing artificial flaws (notches) acc. to SAE AS5371, ASTM E1444/1444M-12, ASME V, art.7-764.1.2

Description:

3 circles of 0.507″, 0.383″, 0.258″ diameter in a 0.004‟ (0.102 mm) thick shim.
Notch depths 0.0008″ (20 µm), 0.0012″ (30 µm) and 0.0016″ (40 µm) - 20%, 30% and 40% of the shim thickness.

ACCESSORIES

Centrifuge tubes for sedimentation control

Art.No. 134.005.003 – for fluorescent MP suspensions acc. to ASTM E709-15
Art.No. 134.005.002 – for non-fluorescent MP suspensions acc. to ASTM E709-15
Art.No. 134.005.004 – combined
Art.No. 134.005.001 – centrifuge tube holder

Pear-shaped centrifugal tube having a graduated stem. Used for ascertaining the magnetic particles concentration in the suspension.

After a settling period (30 minutes for water-based carrier and 60 minutes for oil-based carrier) with the exact concentration a specified graduation mark has to be reached. If the concentration is out of the tolerance stated in the written procedure add particles or suspension vehicle as required and re-determine the particle concentration.

Gelatinous docu-films PT-MT

Art.No. 134.007.311 - black 13x18 cm, 10 pcs.
Art.No. 134.007.312 - black 13x36 cm, 10 pcs.
Art.No. 134.007.315 - transparent 13x18 cm, 10 pcs.
Art.No. 134.007.316 - transparent 13x36 cm, 10 pcs.
Art.No. 134.007.313 - white 13x18 cm, 10 pcs.
Art.No. 134.007.314 - white 13x36 cm, 10 pcs.

For an easy and inexpensive documentation of crack indications. The Docu-Films PT-MT are suitable for fixing of flaws and surface roughness and can be compared with photography. The Docu-Films can be used on both plane and curved surfaces.

Test case for magnetic particle testing

Art.No. 131.500.100

The HELLING test case has been developed for teaching purposes at training centers and technical schools. It is also suitable for inspectors of NDT classification companies to appraise the proper MT test performance and therewith the absence of cracks. The test case contains all necessary equipment and consumables for the flexible MT testing.

Contents:
1. UM 9 / HANSA -230 hand yoke electromagnet
2. Two-limbs flexible poles for UM 9 hand yoke
3. Inductive light sources:
   a. White light LED source
   b. UV LED source
4. UV-Inspector 365 lamp
5. Consumables:
   a. NRF 101 fluorescent MP suspension (aerosol can)
   b. NRS 103 black MP suspension (aerosol can)
   c. NR 107 remover for background paint (aerosol can)
   d. NR 104 A white background paint (aerosol can)
6. UV protective glasses
7. Combined UV-intensity and luxmeter
8. Magnetic field meter MP-1000 with tangential probe and reference gage
9. Reference block No.1 (acc. to EN ISO 9934-2)
10. Reference block No.2 (acc. to EN ISO 9934-2)
11. Berthold magnetic field indicator
12. D 250 magnetic field indicator (acc. to ASTM)
13. Burmah-Castrol Type I and Type II magnetic flux indicators
14. Centrifuge tube for sedimentation control with stand
15. Gelatinous Docu-Films for defectogram documentation (10 pcs)
16. SCRUBS cleaning towels

MP-1000 magnetic field meter

MP-1000 is a handy universal instrument for measuring all magnetic fields, recommended for fast measurements on-site:

- Measurement of all kinds of constant and alternating fields (True-RMS).
- Very fast, integrated peak value storage for measuring pulsed fields ≥0.1 msec.
- Measuring range up to 2,000 kA/m, switchable between Gauss (Oe) and A/cm.
- Simple, one-button operation; automatic range selection.
- Can be used with tangential, axial or reed probes.

Scope of supply: MP - 1000 without measuring probe, incl. Certificate of Calibration, probe cable and carrying case

Specifications

Art.No.	133.005.027
Display	LCD 3-digit
Measurement Units	A/cm – Gauss (Oe) (selectable)
Measuring ranges	DC: 0-20000 A/cm (Gauss/Oe) AC: 20-20000 A/cm (Gauss/Oe) Automatic range selection
Resolution	0-100 A/cm (Gauss): 0.1 A/cm (G) > 100 A/cm (Gauss): 1 A/cm (G) > 10000 A/cm (Gauss): 0.1 kA/cm (kG)
Accuracy in homogeneous filed	DC/AC - 0-2,000 kA/m ± 2%
AC frequency range (AC=RMS)	10 Hz – 5 kHz
Peak hold	Impuls duration >=0.1 ms
Power supply	2 x 1.5 V AA Mignon alternatively 2 x 1.2 V AA rechargeable accumulators
Operating time	Approx. 80 h
Measuring probes	P-A2 axial, P-T2 tangential, P-Z2 flexible reed
Dimensions	105 x 65 x 26 mm
Weight	137 g (with batteries)

MP-2000 magnetic field meter

MP - 2000 Universal Field Meter is the highest performance device with special features, offering the professional user the following options:

- Measurement of all kinds of constant and alternating fields (True-RMS).
- Very fast, integrated peak value storage for measuring pulsed fields >= 0.1 ms
- Measuring range up to 4,000 kA/m, switchable between Tesla - Gauss - A/cm - kA/m.
- Illuminated graphic display with additionally measured analogue value indication
- Automatic range selection.
- Menu navigation in various languages.
- Measurement storage (10,000 measurements), distributable into up to 100 application memories.
- Can be used with tangential, axial or reed probes.
- Integrated RS232 and USB - wireless interfaces for documenting the measurement results on a PC or printer

Scope of supply: MP - 2000 without measuring probe, incl. Certificate of Calibration, probe cable, USB radio receiver and carrying case.

Specifications

Art.No.	133.005.028
Display	Illuminated graphic display
Measurement Units	kA/m - A/cm - Gauss(Oe) - Tesla (selectable)
Measuring ranges	DC: 0- 4000 kA/m; 0-40000 A/cm (Gauss/Oe); 0–4000 mT AC: 20-20000 A/cm (Gauss/Oe); 20–2000 kA/m; 20–2000 mT Automatic range selection
Resolution	0-200 A/cm (Gauss): 0.1 A/cm (G) > 200 A/cm (Gauss): 1 A/cm (G) > 10000 A/cm (Gauss): 1 kA/cm (G) 0-20 kA/m (mT): 0.01 kA/m (mT) > 20 kA/m (mT): 0.1 kA/m (mT) > 1000 kA/m (mT): 1 kA/m (mT)
Accuracy in homogeneous filed	DC/AC – 0-2000 kA/m ±2%; >2000 kA/m ±3%
AC frequency range (AC=RMS)	10 Hz – 5 kHz
Peak hold	Impulse duration >=0.1msec
Power supply	3 x 1.5 V AA Mignon, or 3 x 1.2 V AA rechargeable accumulators
Operating time	Approx. 100 h
Measuring probes	P-A2, P-A4 axial, P-T2, P-T4 tangential, P-Z2, P-Z4 flexible reed
Statistical evaluation	X
Dimensions	198 x 92 x 35 mm
Weight	265 g (with batteries)

PROFI hydraulic pump atomiser

Art.No. 126.400.000

An atomiser used for sputtering of magnetic particles suspensions as well as for penetrants spraying. With an integrated scale. Applicable for isopropanol, ethanol and mineral oil.

Specifications

Operating pressure	4 bar
Container volume	1.5 l
Filling volume	1.3 l

Safety valve with a standard or viton seal.

Eco-Sprayer with air-filling station

Art.No. 126.450.000 - Eco-Sprayer
Art.No. 126.450.002 – air-filling station

A refillable aluminum container used for air pressure spraying test media during magnetic particle or penetrant testing. The container can be filled manually from above and pressurized via bottom valve using the air-filling station, that has to be connected to a compressed air source via pneumatic hose.

Specifications

Container	Aluminum with inside protective coating and powder coating
Usage	Flexible, in any position
Seals	Viton / Neopren
Filling volume	400 ml
Operating pressure	6 – 8 bar
Max. permissible operating pressure	10 bar
Weight	350 g

Spray pistol

Art.No. 880.000.002 – spray pistol
Art.No. 880.000.004 – flow cup

A light-weight and handy spray pistol made of high-durability synthetic materials. All fluid conducting parts are made of stainless steel in order to avoid possible chemical reactions.

Air volume control, stepless circular and wide spray adjustment, large selection of nozzles.

Nessesary accessory: flow cup, Art.No. 880.000.004.

Pistol grip for spray cans

Art.No. 129.800.003

Usable with all spray cans for spraying test media, paints, cleaners, lubricants etc.

Ergonomic design for exact spraying. Handy grip for non-fatiguing working.
Robust construction for multiple usage.

Pistol grip for spray cans with attachable UV LED light

Art.No. 129.800.004

Usable with all spray cans for spraying fluorescent test media. Precise working under UV irradiation.

UV irradiance approx. 1,200 µW/cm² at 400 mm distance. Handy grip for non-fatiguing working. Robust construction for multiple usage.

The UV light can be fixed easily with two knurled screws.

Pistol grip for spray cans

Art.No. 129.800.002

Usable with all spray cans for spraying test media, paints, cleaners, lubricants etc.

Cost-effective and handy design for precise spraying.

Over the past few years the powerful compact UV LED lamps have improved remarkably – especially for magnetic particle testing and penetrant testing by use of fluorescent materials. Through the quasi-monochromatic emission spectrum of the UV light-emitting diodes there is no irradiation part, which is adjected to visible light (≥400 nm) or lies within. Irradiation in the visible range results in undesirable brightening and reflection, especially while testing metallic shiny, curved objects. Such reflections are not only perceived by an inspector as artifacts, they also reduce the contrast and therefore affect the defect recognition.

The most significant advantages of these lamps are the low power consumption (thus enables battery supply), a very long lifetime, no warm-up time and above all the defined UV wavelength of 365±3 nm in the UV-A range. This wavelength ensures a good contrast between the crack indication and its background.

ZERO 100/1 IP65 - overhead UV LED lamp

Art.No. 144.200.063*

ZERO 100/1 is a small-sized overhead UV LED lamp of the IP65 protection class. The lamp can be equipped additionally with a swivel arm (Art.No. 144.200.056). For passive cooling the lamp has a sealed ribbed aluminium housing which integrates 9 UV LED, optics, starting controller, UV filter and power supply unit.

Specifications

Input voltage	230 V / 50 Hz
Operating voltage	36 V
UV source	1 x 9 UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 4500 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 950 g
Dimensions (without bracket)	165 x 205 x 80 mm
Risk class acc. to DGZfP Guideline EM 6	II
Protection class	IP65
Irradiation area at >1,000 µW/cm²:	300 x 300 mm

Scope of delivery
UV LED lamp with supply cable 3.5 m, UV protective glasses

* *optionally with defect recognition – see page 49.*

ZERO 200/2 IP65 - overhead UV LED lamp

Art.No. 144.200.066*

ZERO 200/2 is a compact overhead UV LED lamp of the IP65 protection class. For passive cooling the lamp has a sealed ribbed aluminium housing which integrates 18 UV LED, optics, starting controller, UV filter and power supply unit.

Specifications

Input voltage	230 V / 50 Hz
Operating voltage	36 V
UV source	2 x 9 UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 8000 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Overall weight	approx. 5.0 kg
Dimensions (without bracket)	346 x 280 x 70 mm
Risk class acc. to DGZfP Guideline EM 6	II
Protection class	IP65
Irradiation area at >1,000 µW/cm²:	300 x 450 mm

Scope of delivery
UV LED lamp with supply cable 3.5 m, UV protective glasses

* *optionally with defect recognition – see page 49.*

ZERO 400/3 IP54 - overhead UV LED lamp

Art.No. 144.200.085*– ZERO 400/3 IP54 Standard with clear-glass filter
Art.No. 144.000.409*– ZERO 400/3 IP54 with MUGLED filter glass
Art.No. 144.000.410*– ZERO 400/3 IP54 with UG2A filter glass
Art.No. 144.000.424 – ZERO 400/3 IP54 Premium with UG2A filter glass

ZERO 400/3 is an overhead UV LED lamp, which can be upgraded with adjustable UV intensity and/or dimmable white light. The Premium-model integrates these features by design.

For the passive cooling the lamp has a ribbed aluminium housing which contains 27 UV LED, optics, starting controller and UV filter.

Specifications

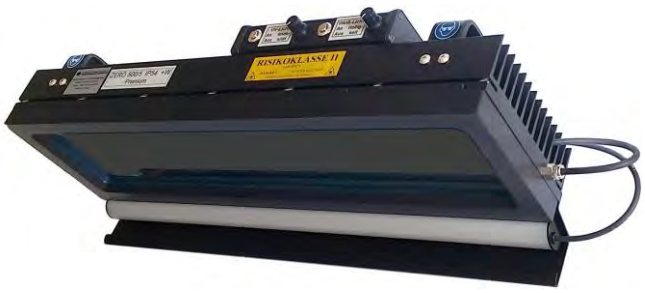
Input voltage	230 V / 50 Hz
Operating voltage	36 V
UV source	3 x 9 UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 3000 - 8000** µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Overall weight	approx. 4.9 kg
Dimensions (without bracket)	435 x 150 x 100 mm
Risk class acc. to DGZfP Guideline EM 6	II
Protection class	IP54
Irradiation area at >1000 µW/cm²:	480 x 320 mm

Scope of delivery
UV LED lamp with supply cable 5.0 m, power supply unit with cable 3.5 m, UV protective glasses.

** optionally with defect recognition – see page 49.*
*** stepless adjustable for the lamp models with adjustable UV intensity, otherwise pre-set by manufacturer in the above mentioned range according to customer's requirements.*

ZERO 500/5 IP54 - overhead UV LED lamp

Art.No. 144.200.083*– ZERO 500/5 IP54 Standard with clear-glass filter
Art.No. 144.200.067*– ZERO 500/5 IP54 with MUGLED filter glass
Art.No. 144.200.070*– ZERO 500/5 IP54 with UG2A filter glass
Art.No. 144.200.072 – ZERO 500/5 IP54 Premium with UG2A filter glass



ZERO 500/5 is an overhead UV LED lamp, which can be upgraded with adjustable UV intensity and/or dimmable white light. The Premium-model integrates these features by design.

For the passive cooling the lamp has a ribbed aluminium housing which contains 45 UV LED, optics, starting controller and UV filter.

Specifications

Input voltage	230 V / 50 Hz
Operating voltage	36 V
UV source	5 x 9 UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 3000 - 9000** µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Overall weight	approx. 5.9 kg
Dimensions (without bracket)	535 x 150 x 105 mm
Risk class acc. to DGZfP Guideline EM 6	II
Protection class	IP54
Irradiation area at >1,000 µW/cm²	650 x 340 mm

Scope of delivery
UV LED lamp with supply cable 5.0 m, power supply unit with cable 3.5 m, UV protective glasses

** optionally with defect recognition – see page 49.*
*** stepless adjustable for the lamp models with adjustable UV intensity, otherwise pre-set by manufacturer in the above mentioned range according to customer's requirements.*

ZERO 500 - overhead UV LED lamp

Art.No. 142.200.519 – ZERO 500 LK with clear-glass filter
Art.No. 142.200.520 – ZERO 500 NR with UG2A filter glass

ZERO 500 LK is a compact low-cost overhead UV LED lamp with a high intensity.

ZERO 500 NR is a compact overhead UV LED lamp, which can be equipped additionally with a foot switch (Art.No. 131.020.090) and/or a red or white light LED bar (Art.No. 144.200.128).

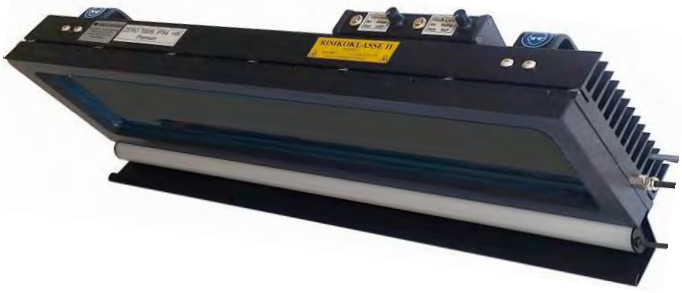
This lamp type has a ribbed aluminium housing for passive cooling, which integrates 20 UV LED, optics, starting controller and UV filter.

Specifications

Input voltage	230 V / 50 Hz
Operating voltage	24 V
UV source	20 UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm, ZERO 500 LK	approx. 9500 µW/cm²
UV intensity at 400 mm, ZERO 500 NR	approx. 4500 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Overall weight	approx. 2.0 kg
Dimensions (without bracket)	490 x 50 x 80 mm
Risk class acc. to DGZfP Guideline EM 6	II
Protection class	IP20

Scope of delivery
UV LED lamp with supply cable 5.0 m, power supply unit with cable (Type ZERO 500 LK - 1.0 m long; Type ZERO 500 NR - 3.5 m long),
UV protective glasses

ZERO 700/6 IP54 - overhead UV LED



Art.No. 144.200.084*– ZERO 700/6 IP54 Standard with clear-glass filter
Art.No. 144.200.064*– ZERO 700/6 IP54 with MUGLED filter glass
Art.No. 144.200.073*– ZERO 700/6 IP54 with UG2A filter glass
Art.No. 144.200.076 – ZERO 700/6 IP54 Premium with UG2A filter glass

ZERO 700/6 is an overhead UV LED lamp, which can be upgraded with adjustable UV intensity and/or dimmable white light. The Premium-model integrates these features by design.

For passive cooling the lamp has a ribbed aluminium housing which integrates 54 UV LED, optics, starting controller and UV filter.

Specifications

Input voltage	230 V / 50 Hz
Operating voltage	36 V
UV source	6 x 9 UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 3000 – 9000** µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Overall weight	approx. 7.4 kg
Dimensions (without bracket)	705 x 150 x 105 mm
Risk class acc. to DGZfP Guideline EM 6	II
Protection class	IP54
Irradiation area at >1,000 µW/cm²	840 x 340 mm

Scope of delivery
UV LED lamp with supply cable 5.0 m, power supply unit with cable 3.5 m, UV protective glasses

* *optionally with defect recognition – see page 49.*
*** stepless adjustable for the lamp models with adjustable UV intensity, otherwise pre-set by manufacturer in the above mentioned range according to customer's requirements.*

AITM UV LED OVERHEAD LAMPS

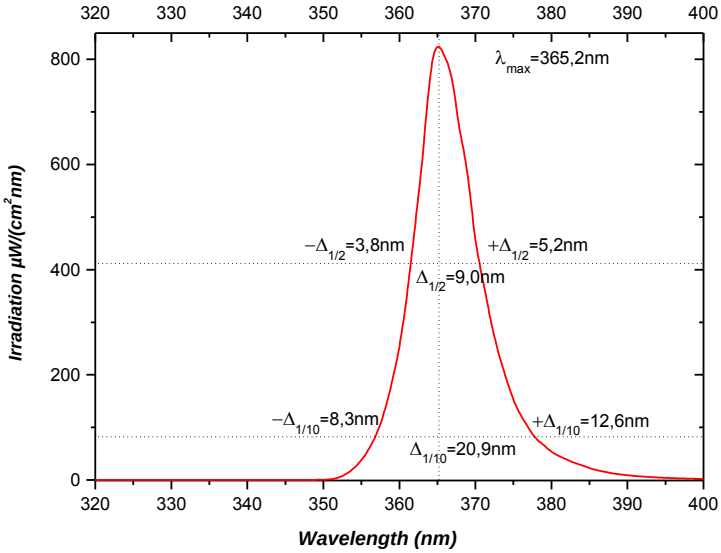
SERIES ZERO 100/1, ZERO 200/2, ZERO 400/3, ZERO 500/5, ZERO 700/6

UV LED overhead lamps are an indispensable part of non-destructive testing. The increasing lifetime of the UV LED has contributed to today's widespread acceptance in surface testing with fluorescent inspection materials. The manufacturers of UV LED now guarantee a constant output intensity for a period of approx. 10,000 operating hours. That is one of the prerequisites for industrial use.

UV LED overhead lamps can be switched on and off as needed and without delay. They do not require any warm-up time and do not have to be permanently in operation, which further decreases the already reduced energy consumption and correspondingly increases the lifetime and service life expectancy.

HELLING, with its innovative developments in UV technology, meets with the new AITM series aviation requirements, in particular those of the regulations:

- Rolls-Royce specification RRES 90061
- Airbus AITM 6-1001.



Parameter	Set value	Actual value
λ max.	365±5	365.2 nm
$\Delta_{1/2}$	<20 nm	9.0 nm
$-\Delta_{1/2}$	<10 nm	3.8 nm
$+\Delta_{1/2}$	<10 nm	5.2 nm
$\Delta_{1/10}$	<30 nm	20.9 nm
$-\Delta_{1/10}$	<15 nm	8.3 nm
$+\Delta_{1/10}$	<15 nm	12.6 nm

Spectral irradiation Eλ(λ) of a ZERO 500/5 AITM UV LED lamp

For this a 2-level system was developed:

Level 1

- Equipping the lamp with clear-glass filter, MUGLED filter or UG2A filter
- Defect recognition and detection by a control LED (e.g. if an LED fails) or switching off the lamp

Level 2

- Equipping the lamp with UG2A filter
- Defect recognition and detection by a control LED (e.g. if an LED fails) and switching off the lamp
- Switching off the lamp when the ambient temperature is under 10° C or above 50° C.

Following certificates are available:

- According to Rolls-Royce specification RRES 90061 for UV LED lamps with MUGLED filter
- According to ASTM E3022
- According to Airbus specification AITM 6-1001

	ZERO 100/1 IP65 Level 1	ZERO 200/2 IP65 Level 1	ZERO 400/3 IP54 Level 1	ZERO 400/3 IP54 AITM Level 2 Art.No. 144.200.089	ZERO 500/5 IP54 Level 1	ZERO 500/5 IP54 AITM Level 2 Art.No. 144.200.090	ZERO 700/6 IP54 Level 1	ZERO 700/6 IP54 AITM Level 2 Art.No. 144.200.091
UV LED (number)	9	18	27	27	45	45	54	54
Clear-glass filter	*)	*)	✓	-	✓	-	✓	-
MUGLED filter glass	*)	*)	*)	-	*)	-	*)	-
UG2A filter glass	✓	✓	*)	✓	*)	✓	*)	✓
White light bar	*)	*)	*)	*)	*)	*)	*)	*)
ON/OFF switch	✓	✓	✓	✓	✓	✓	✓	✓
Passive cooling	✓	✓	✓	✓	✓	✓	✓	✓
Protection class	IP65	IP65	IP54**	IP54**	IP54**	IP54**	IP54**	IP54**
Level 1: - Equipping the lamp with clear-glass filter, MUGLED filter or UG2A filter - Defect recognition and detection by a control LED (e.g. if an LED fails) or switching off the lamp	✓	✓	✓		✓		✓	
Level 2: - Equipping the lamp with UG2A filter - Defect recognition and detection by a control LED (e.g. if an LED fails) and switching off the lamp - Switching off the lamp when the ambient temperature is under 10° C or above 50° C.				✓		✓		✓

**) Optionally on request*

***) Optionally on request as IP65 protection class available*

UV-Inspector 2012 Standard - UV LED hand lamp

Art.No. 142.200.416

A handy battery powered UV LED hand lamp for application in NDT, criminalistics as well as leak testing using oils with intrinsic fluorescent or oils doped with H 800 fluorescent additive (see p. 61).

Specifications

Operating voltage	18 V
UV source	4 x UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 3000 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 1.2 kg
Dimensions	150 x 80 x 270 mm
Risk class acc. to DGZfP Guideline EM 6	II

Scope of delivery
UV lamp with Li-Ion battery and reserve battery, charging unit,
UV protective glasses, plastic case.

UV-Inspector 2012 SH - UV LED hand lamp

Art.No. 142.200.422

A handy battery powered UV LED hand lamp with an additional white light source for application in NDT, criminalistics as well as leak testing using oils with intrinsic fluorescent or oils doped with H 800 fluorescent additive (see p. 61).

Specifications

Operating voltage	18 V
UV source	4 x UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	3000 – 20000* µW/cm² (adjustable)
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 1.2 kg
Dimensions	150 x 80 x 270 mm
Risk class acc. to DGZfP Guideline EM 6	II/III

Scope of delivery
UV lamp with Li-Ion battery and reserve battery, charging unit,
UV protective glasses, plastic case.

* *pre-set by the manufacturer in the given range according to customer's specification.*

UV-Inspector 2014 - UV LED hand lamp

Art.No. 142.200.426

A low-priced battery powered UV LED hand lamp with passive cooling for application in NDT, criminalistics as well as leak testing using oils with intrinsic fluorescent or oils doped with H 800 fluorescent additive (see p. 61).

Specifications

Operating voltage	18 V
UV source	4 x UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 2300 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 1 kg
Dimensions	150 x 80 x 270 mm
Risk class acc. to DGZfP Guideline EM 6	II

Scope of delivery
UV lamp with Li-Ion battery, charging unit, UV protective glasses, plastic case.

UV-Inspector 711 - UV LED hand lamp

Art.No. 142.500.007 – UV-Inspector 711
Art.No. 142.500.008 – UV-Inspector 711-SH

A compact battery powered UV LED hand lamp with an additional white light high power LED for application in NDT, criminalistics as well as leak testing (see p. 61). The lamp has a built-in rechargeable battery.

Specifications

Operating voltage	16.8 V (4 x 4.2 V battery)
UV source	3 x UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm, 711 Standard	approx. 3000 µW/cm²
UV intensity at 400 mm, 711-SH	approx. 3000 – 10000* µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight / dimensions	approx. 900 g / 170x215x80 mm
Risk class acc. to DGZfP Guideline EM 6	II

Scope of delivery
UV lamp with built-in Li-Ion battery, charging unit, UV protective glasses, plastic case

** pre-set by the manufacturer in the given range according to customer's specification.*

UV-Inspector 711 SH IP54 - UV LED hand lamp

Art.No. 142.500.013 – UV-Inspector 711-SH IP54
Art.No. 142.500.014 – UV-Inspector 711-SH IP54 Premium

A compact battery powered UV LED hand lamp of IP54 class with an additional white light high power LED for application in NDT, criminalistics and leak testing (see p. 61). The lamp has a rechargeable built-in battery. A battery charging status indicator is arranged on the housing back. Due to the special filter glass combination the white light rate is < 1 lx. The lamps in the Premium-configuration are equipped with 3 high power UV LED by design.

Specifications

Operating voltage	16.8 V (4 x 4.2 V battery)
UV source	3 x UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm, 711-SH IP54	3000 – 10000* µW/cm²
UV intensity at 400 mm, 711-SH IP54 Premium	3000 – 13000* µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight / dimensions	approx. 900 g / 170x215x80 mm
Risk class acc. to DGZfP Guideline EM 6	II/III

Scope of delivery
UV lamp with built-in Li-Ion battery, charging unit, UV protective glasses, plastic case

** pre-set by the manufacturer in the given range according to customer's specification.*

UV-Inspector 711 Steri - UV LED hand lamp

Art.No. 142.500.016 – UV-Inspector 711 Steri

A special edition lamp with a smooth housing surface for application in clean rooms. It can be also used for conventional NDT applications. The lamp has a built-in rechargeable battery and an additional white light high power LED.

Specifications

Operating voltage	16.8 V (4 x 4.2 V battery)
UV source	3 x UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 3000 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight / dimensions	approx. 900 g / 170x215x80 mm
Risk class acc. to DGZfP Guideline EM 6	II

Scope of delivery
UV lamp with built-in Li-Ion battery, charging unit, UV protective glasses, plastic case

UV-Inspector 150 - UV LED hand lamp

Art.No. 142.200.150 – UV-Inspector 150
Art.No. 142.200.153 – UV-Inspector 150-SH
Art.No. 142.200.154 – UV-Inspector 150-SH Premium

A handy mains-operated UV LED hand lamp with an additional white light high power LED for application in NDT, criminalistics and leak testing (see p. 61).

Specifications

Operating voltage	230 V AC (50-60 Hz)
UV source	3 x UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm, Type 150 Standard	approx. 3000 µW/cm²
UV intensity at 400 mm, Type 150-SH	approx. 3000 – 10000* µW/cm²
UV intensity at 400 mm, Type 150-SH Premium	approx. 3000 – 13000* µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight / dimensions	approx. 900 g / 170x215x80 mm
Risk class acc. to DGZfP Guideline EM 6	II/III

Scope of delivery
UV lamp, UV protective glasses, plastic case.

* *pre-set by the manufacturer in the given range according to customer's specification.*

UV-Inspector 160 - UV LED hand lamp

Art.No. 142.160.001 – IV-Inspector 160
Art.No. 142.160.003 – IV-Inspector 160 AITM

A compact mains-operated UV LED hand lamp also in a configuration conform to AITM requirements. The lamp housing intergrates 3 UV LED, 1 white light high power LED, electronics, an ON/OFF switch and a control LED for the defect detection, which is arranged on the housing back. It lights up green, if the lamp is ready for use, or red at the over / under voltage or if a LED fails.

Input voltage	230 V AC (50-60 Hz)
Operating voltage	14.5 V
UV source	3 x UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 3000 – 4300* µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight / dimensions	approx. 750 g / 135x215x80 mm
Risk class acc. to DGZfP Guideline EM 6	II

Scope ofelivery
UV lamp, power supply unit, UV protective glasses, plastic case.

* *pre-set by the manufacturer in the given range according to customer's specification.*

UV-Inspector 100 IP67 - UV LED hand lamp

Art.No. 142.200.170

A mains-operated UV LED hand lamp of the IP67 protection class for application in NDT, criminalistics and leak testing.

Specifications

Input voltage	230 V AC (50-60 Hz)
Operating voltage	36 V
UV source	17 x UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 5000 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight / dimensions	approx. 1300 g / 150x160x60 mm
Risk class acc. to DGZfP Guideline EM 6	II

Scope of delivery
UV lamp, power supply unit, UV protective glasses, plastic case.

UV-Inspector 3018 - UV LED hand lamp

Art.No. 142.200.518 – UV-Inspector 3018 A (battery-operated)
Art.No. 142.200.521 – UV-Inspector 3018 N (mains-operated)

A high power mains- or battery-operated UV LED hand lamp of the IP54 protection class. The lamp housing intergrates 6 UV LED, 5 white light high power LED (separately switchable), electronics and a battery charging status indicator.

Specifications

Input voltage, UV-Inspector 3018 N	230 V AC (50-60 Hz)
Operating voltage, UV-Inspector 3018 A	16.8 V (4 x 4.2 V battery)
UV source	6 x UV LED
Life time of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 3700 – 20000* µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight / dimensions, UV-Inspector 3018 A	approx. 1500 g / 240x230x95 mm
Weight / dimensions, UV-Inspector 3018 N	approx. 1100 g / 240x170x95 mm
Risk class acc. to DGZfP Guideline EM 6	II/III

Scope ofelivery
Type A: UV lamp with built-in Li-Ion battery, charging unit, UV protective glasses, plastic case. Type N: UV lamp, UV protective glasses, plastic case.

* *pre-set by the manufacturer in the given range according to customer's specification.*

UV-Inspector 385 - UV LED pocket lamp

Art.No. 142.200.129

A shock-resistant and splash-proof UV LED pocket lamp with a rubber laminated plastic housing for application in NDT, criminalistics and leak testing (see p. 61).

Specifications

Operating voltage	4.8 V (4 x 1.2 V battery)
UV source	1 x UV LED
Lifetime of UV LED	approx. 10000 h
UV intensity at 400 mm, UV-Inspector 385	approx. 3000 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 480 g
Dimensions	230 x 75 mm
Risk class acc. to DGZfP Guideline EM6	II

Scope of delivery: UV pocket lamp, 4 x NiMh batteries, UV protective glasses.

Optional: Charging unit

Policheck NDT - UV LED pocket lamp

Art.No. 142.200.139

A shock-resistant and splash-proof UV LED pocket lamp with a rubber laminated plastic housing for application in NDT, criminalistics and leak testing (see p. 61).

Specifications

Operating voltage	4.8 V (4 x 1.2 V battery)
UV source	1 x UV LED
Lifetime of UV LED	approx. 10000 h
UV intensity at 400 mm, UV-Inspector PolicheckNDT	approx. 11000 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 480 g
Dimensions	230 x 75 mm
Risk class acc. to DGZfP Guideline EM6	III

Scope of delivery: UV pocket lamp, 4 x NiMh batteries, UV protective glasses.

Optional: Charging unit

Helling-150 NR - UV LED pocket lamp

Art.No. 142.200.424

An UV LED pocket lamp with an aluminum housing for application in NDT, criminalistics as well as leak testing (see p. 61).

Specifications

Operating voltage	4.8 V (4 x 1.2 V battery)
UV source	1 x UV LED
Lifetime of UV LED	approx. 10000 h
UV intensity at 400 mm	1500 – 6500 µW/cm² (focusable)
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 500 g
Dimensions	230 x 50 mm
Risk class acc. to DGZfP Guideline EM6	II

Scope of delivery: UV pocket lamp, 4 x NiMh batteries, UV protective glasses.

Optional: Charging unit.

UV Inspector 380-R - UV LED pocket lamp

Art.No. 142.200.109

An UV LED pocket lamp with an aluminium housing for application in NDT, criminalistics as well as leak testing (see p. 61). The lamp has two intensity switching levels.

Specifications

Operating voltage	4.8 V (4 x 1.2 V battery)
UV source	1 x UV LED
Lifetime of UV LED	approx. 10000 h
UV intensity at 400 mm at level I	approx. 1500 µW/cm²
UV intensity at 400 mm at level II	approx. 3000 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 350 g
Dimensions	170 x 45 mm
Risk class acc. to DGZfP Guideline EM6	II

Scope of delivery: UV pocket lamp, 4 x NiMh batteries, UV protective glasses.

Optional: Charging unit.

UV Inspector 365 - UV LED pocket lamp

Art.No. 142.200.301

An UV LED pocket lamp with an aluminium housing for application in NDT, criminalistics as well as leak testing (see p. 61). The lamp is focusable and has two intensity switching levels.

Specifications

Operating voltage	4.8 V (4 x 1.2 V battery)
UV source	1 x UV LED
Lifetime of UV LED	approx. 10000 h
UV intensity at 400 mm at level I, focusable	approx. 1500-4000 µW/cm²
UV intensity at 400 mm at level II, focusable	approx. 3000-10000 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 350 g
Dimensions	170 x 45 mm
Risk class acc. to DGZfP Guideline EM6	II

Scope of delivery: UV pocket lamp, 4 x NiMh batteries, UV protective glasses.

Optional: Charging unit.

UV-Inspector 520-LT - UV LED pocket lamp

Art.No. 142.200.428

A high power UV LED pocket lamp with an aluminium housing for application in NDT, criminalistics and testing (see p. 61).

Specifications

Operating voltage	4.2 V
UV source	1 x UV LED
Lifetime of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 20000 µW/cm²
UV intensity at 2000 mm	approx. 9000 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 340 g
Dimensions	180 x 50 mm
Risk class acc. to DGZfP Guideline EM6	III

Scope of delivery: UV pocket lamp with built-in Li-Ion battery, UV protective glasses.

UV-Inspector 300 - UV LED pocket lamp

Art.No. 142.200.140

A miniature UV LED pocket lamp with an aluminium housing for application in NDT, criminalistics and testing (see p. 61).

Specifications

Operating voltage	3.7 V
UV source	1 x UV LED
Lifetime of UV LED	approx. 10000 h
UV intensity at 400 mm	approx. 1200 µW/cm²
Wavelength	365±3 nm
Emission half-width	9.5±0.5 nm
Weight	approx. 60 g
Dimensions	95 x 25 mm
Risk class acc. to DGZfP Guideline EM6	II

Scope of delivery: UV pocket lamp with built-in Li-Ion battery, UV protective glasses.

UV-flash camera

Art.No. 147.000.100

The UV-flash camera is an easy-to-use camera with integrated UV flash and infrared shortpass filter designed for documentation of fluorescent images. It is used during penetrant and magnetic particle inspection. This camera can be applied in NDT to record indications as well as criminalistics for detection of false banknotes, licenses, papers and other documents. Furthermore, the UV-flash camera is appropriate for fluorescent indications photographing by daylight, too (approx. 150–200 lx).

Specifications

- 16 megapixel
- 36 x optical zoom
- 3 inch LCD

UV-radiometer-luxmeter

Art.No. 146.000.500

The UV-radiometer-luxmeter is a combined device allowing simultaneous measurement of UV-A and visible light with a single probe.

The device has a resistant case made of reinforced ABS plastic. The probe is enclosed in a separate housing connected with the unit by a 1 m long cable.
The device is provided with a smart measurement processing system, which comes as a time sliding average along with a measurement supervision algorithm.

Specifications

Measurement units	visible light: lx;	UVA: µW/cm²
Measuring range	visible light: 0.1-6000 lx;	UVA: 0.1-20000µW/cm²
Resolution:	visible light: 0.1 lx;	UVA: 1 µW/cm²
Dimensions instrument	120 x 65 x 22 mm	
Dimensions probe	85 x 45 x 16 mm	
Weight	200 g (incl. battery)	
Protection class	IP 64	
Battery	9 V (PP3/6F22/6LR61)	
Current drain	11.6 mA	
Battery life time	43 h	

J-221 UV radiation intensity meter

Art.No. 146.000.300

The UV radiation intensity meter consists of a sensor and an evaluation unit. The sensor can be used both if mounted directly on the device as well if remoted (via connection cables).

Specifications

Measuring range, A scale	0 - 1200 µW/cm²
Measuring range, B scale	1000 - 6000 µW/cm²
Sensitivity range of sensor	300 – 400 nm
Sensor peak sensitivity	365 nm
Power supply	photovoltaic
Dimensions	76 x 76 x 76 mm
Weight	250 g

Conform to MIL STD 45662-A

Scope of delivery
UV radiation intensity meter J-221 incl. metal case, sensor, connection cables, calibration certificate.

UV-2500-II UV radiation intensity meter

Art.No. 146.000.100

A portable device for measuring UV intensity at a spectral range of 330 to 400 nm. Because of the specific design the distribution of irradiation of UV lamps can be measured precisely and an energy distribution curve can be applied. The device is equipped with a UV-resistant Si-photodiode that has a specifically long lifetime. The fluorescent indicator scale allows easy reading, also in dark rooms.

Specifications

Detectable wavelength	365 ± 35 nm
Effective ranges	0 to 2500 µw/cm² 0 to 10000 µw/cm²
Deviation	± 2.5 %
Battery	2 lithium batteries of 3 V each
Power consumption	max. 7.5 mW
Dimensions	60 x 100 x 145 mm
Dimensions probe	20 x 50 x 11 mm
Diameter sensor	7 mm
Weight	500 g

UV-flash for documenting fluorescent images

Art.No. 147.000.120

This powerful UV-flash unit is suitable for documentation of fluorescent images, also at daylight at a distance of up to 2 m.

The UV-flash unit is appropriate for capturing indications during fluorescent magnetic particle testing or penetrant testing and is helpful for documenting in claiming issues.

Moreover, it is suitable for forensic applications such as identifying counterfeit banknotes, ID cards, documents etc.

Specifications

- 7-stage flash power setting (1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64)
- Swivel head for indirect flash: Vertical 0° to 90°, right hand horizontal up to 90°, left hand horizontal up to 180°
- Switches automatically into stand-by after 60 minutes (power save mode)
- Duration of flash 1/800 s to 1/20000 s (depending on camera)
- Power supply: 4 high performance AA batteries or Ni-MH rechargeable batteries
- Weight: 250 g (without batteries)
- Dimensions: approx. 135 x 85 x 72 mm

UV protective over-glasses for spectacle wearers

Art.No. 705.000.982

UV protective over-goggles with a transparent frame. It fits closely to the whole eye area and can be worn over correction spectacles.

Scratch-proof polycarbonate glass for clear, undistorted viewing with 99.9% UV protection.

UV protective glasses yellow, type Millennia

Art.No. 705.000.972

UV protective glasses with a black frame.

Glasses: yellow, polycarbonate hard coated.

Absorbs >99.9% of UV irradiation in the wavelength range up to 400 nm.

UV protective glasses clear, type Millennia

Art.No. 705.000.983

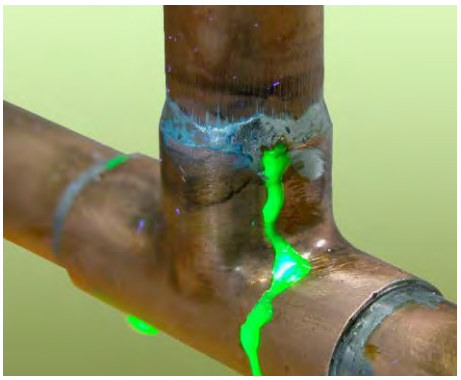
UV protective glasses with a black frame.

Glasses: clear, anti-fog, polycarbonate.

Absorbs >99.9% of UV irradiation in the wavelength range up to 385 nm.

Leak testing is a method of non-destructive testing used for the detection and location of leaks and for measurement of fluid leakage in either pressurised or evacuated systems and components. A leak may be a crack, crevice, fissure, hole or passageway that admits water, air or other fluids or lets fluids escape.

Leaks are special types of flows tremendously important where they influence the safety or performance of engineering systems. The operational reliability of many devices is reduced significantly if large leaks exist. Thus, the purpose of leak testing is to ensure reliability and serviceability of components and to prevent premature failure of systems containing fluids under pressure or vacuum. Leakage has now become a serious concern in the fabrication of nuclear reactor components, unfired pressure vessels, and vessels containing dangerous substances. Leak testing is also applied to other components or systems used for processing of fluid materials possibly affected by the presence of contaminants that react with the product. Leak tests are carried out at pyrotechnic devices, electronic components, automotive air conditioners, food packages and other test items.



Leak detection in cooling system by use of fluorescent concentrate

The vast variety of products to be sealed hermetically require development of diverse methods and equipment for leak testing.

The table below provides an insight into correlation of leakage rate, leak size and actual leak appearance.

Leakage rate m^3 Pa/s	Leak size (diameter)	Actual leak appearance at **Δp**=1 bar
10^{+1}	1,0 mm	Streaming water
10^{-1}	0,1 mm	Dripping water
10^{-3}	0,03 mm	Watertight / gas permeable
10^{-5}	≈ 3 µm	1 air bell (≈1mm^3) in 10 sec.
10^{-7}	≈ 0,1 µm	Gas leak ≈1cm^3 in 12 days
10^{-9}		Gas leak ≈3cm^3 in 1 year
10^{-11}		Gas leak ≈1cm^3 in 300 years

BUBBLE EMISSION METHOD OF LEAK TESTING

In leak testing using the bubble emission method a gas pressure difference is first established across a pressure boundary to be tested. A test liquid is then injected to the lower pressure side. Gas leakage through the pressure boundary can then be detected by observation of bubbles formed in the detection liquid at the exit points of leakage. For detection of small leaks this liquid should form a thin, continuous, wetted film covering all areas to be examined. The probing medium (gas) flows through the leak due to the pressure difference and forms visible bubbles in the foam-film indicator liquid.

Proof-Check aerosol foam-film indicator

Art.No. 616.000.001

A test medium having low surface tension, high foam-forming ability and crawl resistance. Applicable for all installations with technical gases, especially for combustible gases, as well as for nitrogen pipelines, compressed air and liquid gas systems. Considering certain safety regulations, it can be also used for testing oxygen processing systems.

How to use: spray onto pressurised gas systems at a distance of about 30–50 cm. If not under pressure, the system should be first pressurised with a compressed gas. A leakage will be visible by foam bubbles formation. In order to detect very small leakage one should increase the exposure time. Temperature range: +5 to +40°C.

Proof-Check PLUS aerosol foam-film indicator

Art.No. 616.000.010

A test medium for leak testing with a high detection sensitivity at gas cylinders and other tanks, pipelines, solder joints, flange connections, welded joints, screw fittings, valves, armatures etc.

How to use: spray onto pressurised gas systems from a distance of about 30–50 cm. If not under pressure, the system should be first pressurised with a compressed gas. A leakage will be visible by foam bubbles formation. In order to detect very small leakage one should increase the exposure time. Temperature range: -15 to +40°C.

A pressure difference can be also created using a vacuum pump with special vacuum frames. This technique is used for the detection of through-thickness discontinuities in welds and pressure boundaries of systems containing air at atmospheric pressure and systems that cannot be set under pressure. It can be used for increasing the sensitivity of penetrant leak testing technique. In this method, a bubble-forming solution (foam-film indicator) is applied to the surface to be examined. A vacuum frame with a viewing window is placed over the test surface and then evacuated. The test surface is viewed for evidence of through-thickness discontinuities by the formation of bubbles in the foam-film solution.

EV 20 N vacuum pump

Art.No. 611.010.001

The EV 20 N vacuum pump for pressure difference uploading is used in combination with different vacuum frames and foam-film indicators for the detection of through-thickness discontinuities in pipe and vessel welds as well as for the testing of cast products for pores evidence.

Specifications

Flow rate	6 m³/h
Relative vacuum	-900 mbar
Mains connection	230 V / 50 Hz
Protection class	IP 44
Protection class	IP 54
Weight	9,7 kg
Vacuum hose (pump to frame)	3 m

Necessary accessory: transport box, Art.No. 611.010.005

Vacuum frames for pipe welds

Art.No.	For pipe diameter	Art.No.	For pipe diameter
611.001.002	DN 50	611.001.016	DN 450
611.001.003	DN 60	611.001.017	DN 500
611.001.004	DN 70	611.001.018	DN 550
611.001.005	DN 80	611.001.019	DN 600
611.001.006	DN 100	611.001.020	DN 650
611.001.007	DN 110	611.001.021	DN 700
611.001.008	DN 125	611.001.022	DN 750
611.001.009	DN 140	611.001.023	DN 800
611.001.010	DN 150	611.001.024	DN 850
611.001.011	DN 200	611.001.025	DN 900
611.001.012	DN 250	611.001.026	DN 950
611.001.013	DN 300	611.001.027	DN 1000
611.001.014	DN 350	611.001.028	DN 1100
611.001.015	DN 400	611.001.029	DN 1200

Vacuum frames for fillet, butt and corner welds

Art.No. 611.001.030

Vacuum frame for fillet welds. L 600 x W 100 mm

Art.No. 611.001.031

Vacuum frame for butt welds*. L 600 x W 100 mm

Art.No. 611.001.033

Vacuum frame for corner welds*. Side length 300 mm

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** Optionally available with a vacuum manometer*

LEAK TESTING WITH LIQUID TRACERS

USE OF FLUORESCENT TRACERS IN HYDROSTATIC TEST FLUIDS

Testing for leaks by use of dyed liquid tracers is an NDT process closely related to the liquid penetrant testing process used to detect discontinuities open to the surface in test objects. For leak testing, however, the liquid penetrant is applied to one side of the closing wall of a test object or test system and, after adequate time for the penetrant to seep through leaks, visual inspection for leak locations is carried out on the opposite side of the closing wall.

Fluorescent water-based or oil-based concentrates (a composition of luminophores, surface-active agents and corrosion inhibitors) can be added to the pressurised liquid used in hydrostatic pressure tests. During hydrostatic pressure tests (which often serve as proof tests simulating application of service stress), the test operator can examine visually all welds under UV irradiation, and the leaks will be indicated by brilliant fluorescence. This method is widely applied for testing hydraulic systems, engines, boilers and vessels.

The sensitivity of the method equals about 10^{-5} m³·Pa/s.

Leak detection in automobile engine by use of H 800 fluorescent concentrate

H 800 fluorescent concentrate oil-based

Art.No. 616.000.033 – 500 ml
Art.No. 616.000.034 – 1 L
Art.No. 616.000.032 – 10 L
Art.No. 616.000.033 – 20 L

An oil suspendible concentrate for detection of fuels and lubricants leaks as well as oil leaks in hydraulic and cooling systems, engines, vessels etc. The surface under test is to be inspected by use of a UV source. The leakages appear as yellow fluorescent indications.

Consumption	0.5 - 2.0 ml/L
Optimal wavelength of excitation	365 nm
Colour under UV irradiation	yellow

H 849 fluorescent concentrate water-based

Art.No. 616.100.102 – 1 L
Art.No. 616.100.103 – 10 L

A water-based concentrate containing emulsifier and corrosion inhibitor for leak testing purpose, e.g. for detection of leaks in cooling systems. The surface under test has to be inspected by use of a UV source. The leakages appear as green fluorescent indications.

Consumption	2 - 5 ml/L
Optimal wavelength of excitation	365 nm
Colour under UV irradiation	green

NORD-TEST Penetrant FP 93 TU

Art.No. 122.500.102 – 1 L
Art.No. 122.500.103 – 10 L
Art.No. 122.500.104 – 200 L

A fluorescent test medium for leak testing. The surface under test has to be inspected by use of a UV source. The leakages appear as yellow-green fluorescent indications.

Optimal wavelength of excitation	365 nm
Colour under UV irradiation	yellow-green

RB-2-LED X-ray view box

Art.No. 246.000.100

X-ray view LED box for radiographic films with an optical density D ≤ 4.1.
Stepless brightness adjustment. Switchable between foot control and continuous light. With 2 additional screens.

Specifications

Screen	220 x 85 mm
Luminance	130000 cd/m²
Optical density	D ≤ 4.1
Input voltage	100-240 V / 50 Hz
Power consumption	170 W
Dimensions	412 x 210 x 173 mm
Weight	6.3 kg

RB-3-LED X-ray view box

Art.No. 246.000.110

X-ray view LED box for radiographic films with an optical density D ≤ 4.1.
Stepless brightness adjustment. Switchable between foot control and continuous light. With an additional blind for 60 mm films.

Specifications

Screen	445 x 85 mm
Luminance	125000 cd/m²
Optical density	D ≤ 4.1
Input voltage	100-240 V / 50 Hz
Power consumption	450 W
Dimensions	220 x 185 x 615 mm
Weight	10 kg

RB-2 X-ray view box

Art.No. 241.002.000 – RB-2 X-ray view box
Art.No. 241.002.000 – Test certificate

X-ray view box for radiographic films with an optical density D ≤ 3.75.

Specifications

Screen	200 x 85 mm
Additional screen 1	200 x 50 mm (for films of 60 mm width)
Additional screen 2	with 30 mm aperture
Luminance	60000 cd/m²
Optical density	D ≤ 3.75
Light emitter	1 x halogen, 1,000 W
Input voltage	230 V / 50 Hz
Power consumption	1000 VA
Dimensions	400 x 260 x 225 mm
Weight	8 kg
Light adjustment	manual or by foot switch

RB-3 X-ray view box

Art.No. 241.003.000 – RB-3 X-ray view box
Art.No. 241.002.050 – Test certificate

X-ray view box for radiographic films with an optical density D ≤ 3.65.

Specification

Screen	440 x 85 mm
Additional screen 1	440 x 50 mm (for films of 60 mm width)
Additional screen 2	with 30 mm aperture
Luminance	45000 cd/m²
Optical density	D ≤ 3.65
Light emitter	11 x halogen, 24 V at 150 W
Input voltage	230 V 50 Hz
Power consumption	1400 VA
Dimensions	660 x 260 x 225 mm
Weight	12 kg
Light adjustment	manual or by foot switch

Image quality indicators ISO 19232 - wire type

Wire type indicators according to ISO 19232-1 and EN 462-1 are used for X-ray image quality control. The image quality indicators consist of seven parallel mulidiameter wires with lengths of 10, 25 or 50 mm. These are made of Fe, Al, Cu or Ti and are embedded in thin and transparent plastic layers together with a radio-opaque identification plaque.

Most models are encapsulated in cast white metal identification plaques which contain information on the standard, number of the thickest wire, material and length, for example – *IQI ISO 19232-1 W10 FE 50*. The full designation can be also shortened to the thickest wire number, material and standard, for example – *10 FE EN*.

Each indicator is identifiable by its charge number and will be delivered with a conformity declaration.

Type	Wire diameter						
W13	0.050	0.063	0.080	0.100	0.125	0.160	0.200
W10	0.100	0.125	0.160	0.200	0.250	0.320	0.400
W6	0.25	0.32	0.40	0.50	0.63	0.80	1.00
W1	0.80	1.00	1.25	1.60	2.00	2.50	3.20

Art.No.	Type	Mat.	Length	Art.No.	Type	Mat.	Length
220.048.010	W1	FE	50 mm	220.048.190	W10	AL	10 mm
220.048.020	W1	CU	50 mm	220.048.200	W10	AL	25 mm
220.048.030	W1	AL	50 mm	220.048.210	W10	AL	50 mm
220.048.040	W6	FE	10 mm	220.048.220	W10	TI	10 mm
220.048.050	W6	FE	25 mm	220.048.230	W10	TI	25 mm
220.048.060	W6	FE	50 mm	220.048.240	W10	TI	50 mm
220.048.070	W6	CU	10 mm	220.048.250	W13	FE	10 mm
220.048.080	W6	CU	25 mm	220.048.260	W13	FE	25 mm
220.048.090	W6	CU	50 mm	220.048.270	W13	FE	50 mm
220.048.100	W6	AL	10 mm	220.048.280	W13	CU	10 mm
220.048.110	W6	AL	25 mm	220.048.290	W13	CU	25 mm
220.048.120	W6	AL	50 mm	220.048.300	W13	CU	50 mm
220.048.130	W10	FE	10 mm	220.048.310	W13	AL	10 mm
220.048.140	W10	FE	25 mm	220.048.320	W13	AL	25 mm
220.048.150	W10	FE	50 mm	220.048.330	W13	AL	50 mm
220.048.160	W10	CU	10 mm	220.048.340	W13	TI	10 mm
220.048.170	W10	CU	25 mm	220.048.350	W13	TI	25 mm
220.048.180	W10	CU	50 mm	220.048.360	W13	TI	50 mm

Wire image quality indicators acc. to ASME / ASTM E-747

These wire image quality indicators (referred to as penetrameters according to ASME/ASTM E-747) comprise six parallel wires arranged in order of increasing diameter made of light metals (magnesium, aluminium and titanium – groups 03, 02, 01) or heavy metals (steel, copper-base, nickel-base and kindred alloys – groups 1 through 5). The wires are encapsulated in thin PVC with two radio-opaque identification plaques.
The identification plague indicates the wire material group number, set identification letter A, B, C or D (thickness range) and the largest wire identity number.

Each indicator is identifiable by its charge number and will be delivered with a conformity declaration.

Art.No.	Type	Mat.	Thickness range
220.053.010	Type 1 A01	FE	0.08 – 0.25 mm
220.053.011	Type 1 B03	FE	0.25 – 0.81 mm
220.053.012	Type 1 C10	FE	0.81 – 2.50 mm
220.053.013	Type 1 D32	FE	2.50 – 8.10 mm
220.053.014	Type 02 A01	AL	0.08 – 0.25 mm
220.053.015	Type 02 B03	AL	0.25 – 0.81 mm
220.053.016	Type 02 C10	AL	0.81 – 2.50 mm
220.053.017	Type 4 A01	CU	0.08 – 0.25 mm
220.053.018	Type 4 B03	CU	0.25 – 0.81 mm
220.053.019	Type 4 C10	CU	0.81 – 2.50 mm
220.053.020	Type 01 A01	TI	0.08 – 0.25 mm
220.053.021	Type 01 B03	TI	0.25 – 0.81 mm

Duplex image quality indicator acc. to DIN EN 462-5

Art.No. 220.049.400

The duplex image quality indicator is used for determination of image unsharpness. It is a useful tool for establishing and monitoring the performance of radioscopic (real-time) systems in particular. The indicator consists of 13 platinum or tungsten wire pairs of different diameters embedded in rigid plastic. The wires spacing in each pair corresponds exactly to the respective wire diameter. The degree of unsharpness is indicated by the number of wire pairs that can be recognised. As unsharpness increases, the wires merge to form a single image.

Wire pairs	U-value of image unsharpness	Wire diameter and spacing
13D	0.10	0.050 mm
12D	0.13	0.063 mm
11D	0.16	0.080 mm
10D	0.20	0.100 mm
9D	0.26	0.130 mm
8D	0.32	0.160 mm
7D	0.40	0.200 mm
6D	0.50	0.250 mm
5D	0.64	0.320 mm
4D	0.80	0.400 mm
3D	1.00	0.500 mm
2D	1.26	0.630 mm
1D	1.60	0.800 mm

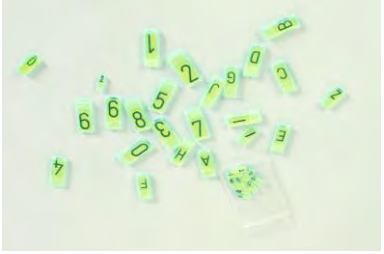
Image quality indicators (penetrameters) acc. to ASME / ASTM E-1025 - plaque type

The penetrameters made of Fe and alloy steel are used for all ferrite and austenitic steels. The lead numerals indicate the penetrameter number which corresponds to penetrameter thickness. The penetrometers are characterised by three holes: 1x, 2x and 4x the thickness of the material from which the penetrameter is made, with minimum diameters of 0.01, 0.02 and 0.04 inch.

Iron, Art.No.	Alloy steel, Art.No.	Type	Thickness
220.060.020	220.060.050	Type 5	6.35 mm
220.060.021	220.060.051	Type 7	9.52 mm
220.060.022	220.060.052	Type 10	12.17 mm
220.060.023	220.060.053	Type 12	15.87 mm
220.060.024	220.060.054	Type 15	19.05 mm
220.060.025	220.060.055	Type 17	22.22 mm
220.060.026	220.060.056	Type 20	25.40 mm
220.060.027	220.060.057	Type 25	31.75 mm
220.060.028	220.060.058	Type 30	38.10 mm
220.060.029	220.060.059	Type 35	44.45 mm
220.060.030	220.060.060	Type 40	50.80 mm
220.060.032	220.060.062	Type 50	63.50 mm
220.060.033	220.060.063	Type 60	76.20 mm
220.060.034	220.060.064	Type 80	101.60 mm
220.060.035	220.060.065	Type 100	127.00 mm
220.060.036	220.060.066	Type 120	152.40 mm
220.060.037	220.060.067	Type 160	200.20 mm
220.060.038	220.060.068	Type 200	254.00 mm

Engraved markers, carrier strips, magnetic holders

Engraved markers made of tinted, toughened plastic material with a slit at the top for use with a carrier strip. Letters, numbers and symbols.



Art.No.	Description
220.101.100-146	Single engraved marker, 4 mm high
220.101.200-246	Single engraved marker, 7.5 mm high
220.101.300-346	Single engraved marker, 10 mm high
220.101.400-446	Single engraved marker, 15 mm high
220.101.500-546	Single engraved marker, 20 mm high
220.101.160	Complete set numbers 0 – 9; 4 mm high
220.101.170	Complete set letters A-Z; 4 mm high
220.101.260	Complete set numbers 0 – 9; 7.5 mm high
220.101.270	Complete set letters A-Z; 7.5 mm high
220.101.360	Complete set numbers 0 – 9; 10 mm high
220.101.370	Complete set letters A-Z; 10 mm high
220.101.460	Complete set numbers 0 – 9; 15 mm high
220.101.470	Complete set letters A-Z; 15 mm high
220.101.560	Complete set numbers 0 – 9; 20 mm high
220.101.570	Complete set letters A-Z; 20 mm high
220.101.600	Engraved arrow; 4 directions; 4 mm high
220.101.601	Engraved arrow; 4 directions; 7.5 mm high
220.101.602	Engraved arrow; 4 directions; 10 mm high
220.101.603	Engraved arrow; 4 directions; 15 mm high
220.101.604	Engraved arrow; 4 directions; 20 mm high
220.002.000	Carrier strip made of flexible plastic; 30x50 mm
220.003.000	Magnetic carrier strip; length on order
220.005.000	Spring steel carrier strip with 2 magnetic holders; 24 cm
220.007.020	Magnetic holder. ∅ 27 mm; H=25.4 mm; 68 N
220.007.025	Magnetic holder. ∅ 35 mm; H=30 mm; 190 N

Lead markers

Unmounted lead markers: letters, numbers and arrows.

Art.No.	Description
220.008.100-144	Single lead marker; 6 mm high
220.008.700-745	Single lead marker; 8 mm high
220.008.500-544	Single lead marker; 10 mm high
220.008.200-245	Single lead marker; 20 mm high
220.008.170	Complete set; numbers 0 – 9; 6 mm high
220.008.180	Complete set; letters A – Z; 6 mm high
220.008.770	Complete set; numbers 0 – 9; 8 mm high
220.008.780	Complete set; letters A – Z; 8 mm high
220.008.570	Complete set; numbers 0 – 9; 10 mm high
220.008.580	Complete set; letters A – Z; 10 mm high
220.008.270	Complete set; numbers 0 – 9; 20 mm high
220.008.280	Complete set; letters A – Z; 20 mm high
220.008.800	Lead arrow; 20 mm long

Mavolux 5032B / 5032C high quality luxmeter

Art.No. 243.000.001 – MAVOLUX 5032 B-USB
Art.No. 243.000.000 – MAVOLUX 5032 C-USB
Art.No. 243.000.101 – additional luminance attachment
Art.No. 243.002.350 – test report

The digital luxmeters Mavolux 5032B and 5032C are classified according to DIN 5032 Part 7 and CIE no. 69. Both instruments allow measuring very high light intensities (brightest daylight, head lights). Either Lux or footcandles can be selected as a measurement unit. The measuring range is matched automatically to the measurement value. The actual value can be held at the display by pressing the data hold key.

Specifications	Mavolux 5032C	Mavolux 5032B
Ranges (I...IV)	0.1...199.9 lx 1...1,999 lx 10...19,990 lx 100...199,900 lx	0.01...19.99 lx 0.1...199.9 lx 1...1,999 lx 10...19,990 lx 100...199,000 lx
Resolution (I...IV)	0.1 lx 1 lx 10 lx 100 lx	0.01 lx 0.1 lx 1 lx 10 lx 100 lx
Accuracy	±3 % of reading +4 digit with incandescent light, total error according to DIN 5033 Part 7: 15% for 5032 C, 8% for 5032 B	
Measuring rate	2 measurements per second	
Display	7 segments, 3 1/2 digits (13 mm) LCD-display 50x23 mm	
Sensor	Silicon photodiode with V(λ) filter	
Dimensions (Sensor)	105 x 31 x 30 mm	
Dimensions (Instrument)	120 x 65 x 19 mm	
Functions	Data-Hold, Max-Hold & battery test, Auto-Power-Off after 2 min without any operation	
Supply	1 x 1.5 Volt alkaline-manganese cell, size AA	
Weight	200 g	

Standard equipment:
Luxmeter 5032C or 5032B, 1 x light sensor, 1 x battery, USB-cable, standard software on CD-Rom and instruction manual, carrying case.

Densitest-N densitometer

Art.No. 242.004.000 – Densitest-N densitometer
Art.No. K01.000.106 – test report

A device for measuring the darkness degree (optical density) of printed outputs, in the photography for measuring photographic density of photographic negatives, diapositives and printout paper.

Specifications	
Indication	digital
Power supply	mains operated or battery powered
Linear measurement range	from S = 1 to S = 5, accuracy ±0.05
Dimensions	150 x 85 x 35 mm

Including hand probe, charging unit and test certificate.

Optionally
Optical density scale, narrow, with test certificate, Art.-No. 242.004.001
Instrument bag, Art.-No. 242.004.002

SONOWALL 50 ultrasonic wall thickness gauge

Art.No. 311.101.001

The SONOWALL 50 enables precise measurement of the wall thickness of components made of metal, glass, ceramics and plastics. This efficient device allows the measurement of materials with both flat and curved surfaces.

Specifications

Measuring range	0.6 - 400 mm (steel)
Sound velocity range	1000 – 10000 m/s
Probe frequency	2 MHz, 5 MHz
Accuracy	0.1 mm
Data logger	max. 10000 readings
Working temperature	-10 °C to 50 °C
Weight	260 g
Dimensions	128 x 80 x 28 mm

SONOWALL 60 ultrasonic wall thickness gauge

Art.No. 311.101.002

The SONOWALL 60 applies multi-echo techniques in order to enable reliable and precise measurement through painted surfaces and surfaces with protective coatings. Simple calibration allows the use of the device with most materials.

Specifications

Measuring range	3 - 250 mm with 2.25 MHz probe 2 - 150 mm with 3.5 MHz probe 1 - 50 mm with 5 MHz probe
Sound velocity range	2000 – 7000 m/s
Accuracy	0.1 mm or 0.05 mm
Working temperature	-10 °C to 50 °C
Weight	275 g
Dimensions	85 x 115 x 25 mm

TM-8810 ultrasonic thickness gauge

Art.No. 311.100.003

A compact and easy-to-use ultrasonic thickness gauge for steel, cast iron, aluminum, red copper, zinc, quartz glass, polyethylene, PVC, gray cast iron and nodular cast iron thickness measuring.

Specifications

Display	10 mm LCD, 4-digit
Measuring range	1.5 - 200 mm
Resolution	0.1 mm
Accuracy	±(0.5%n + 0.2) mm
Power supply	4 x 1.5 V Battery
Operating environment	0 - 50 °C
Weight	260 g
Dimensions	161 x 69 x 32 mm

Calibration block No.1

Art.No. 310.059.270

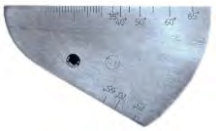
Calibration block No.1 according to EN ISO 2400 with a case and test certificate.

Large angle beam calibration block for range calibration with an angle beam transducer and beam index point and refracted angle measuring.

Calibration block No.2

Art.No. 310.059.121

Calibration block No.2 according to EN ISO 7963 with a case and test certificate.
Small angle beam calibration block for miniature-probes, 5 mm bore hole.



CONSUMABLES

COUPLANTS FOR ULTRASONIC TESTING

Couplants for ultrasonic testing serve for good contact between ultrasonic transducer and test object. This is necessary to prevent an air gap between transducer and surface under test which would disturb ultrasonic impulses.

The couplants made by HELLING are non-toxic, environment-friendly, water removable or peelable gels. The sulphur and halogens contents are less than 50 ppm. The couplants contain all necessary corrosion inhibitors and bactericides.

Upon request, the couplants are available in different colours (red, blue, green, yellow).

NORD-TEST Type US-A - general-purpose couplant for ultrasonic testing

Highly viscous, non-trickling, non-corrosive, chemically inactive. Not subject to labelling.
Temperature range: -5 °C to +80 °C.

Art.No. 310.000.182 – 250 ml
Art.No. 310.000.197 – 1 kg
Art.No. 310.000.184 – 5 kg
Art.No. 310.000.176 – 10 kg
Art.No. 310.000.204 – 25 kg

NORD-TEST Type US-**B** - low-temperature couplant for ultrasonic testing

Highly viscous, non-trickling, non-corrosive, chemically inactive, water removable. Not subject to labelling.
Temperature range: -30 °C to +100 °C.

Art.No. 310.000.187 – 250 ml
Art.No. 310.000.205 – 1 kg
Art.No. 310.000.186 – 5 kg

NORD-TEST Type US-**C** - multipurpose couplant for ultrasonic testing

Medium viscous, non-corrosive, chemically inactive, water removable. Not subject to labelling.
Temperature range: +18 °C to +100 °C.

Art.No. 310.000.193 – 250 ml
Art.No. 310.000.194 – 5 kg
Art.No. 310.000.195 – 10 kg

NORD-TEST Type **HT** - high-temperature couplant for ultrasonic testing

Highly viscous, filled couplant for testing hot surfaces. Non-corrosive, chemically inactive, water removable. Not subject to labelling. Temperature range: -40 °C to +250 °C.

Art.No. 310.000.199 – 130 g
Art.No. 310.000.198 – 1 kg

High-low gauge (round version)

Art.No. 810.080.004

The high-low (round version) gauge guarantees safe and easy operation. It is made of stainless steel, therefore extremely wear-resistant. The scale is calibrated in 1/10 mm increment markings for highly accurate readings. The gauge is equipped with a handy retaining screw. The leg can be adjusted to measure height differences.

High-low gauge (small model)

Art.No. 810.080.005

High-low gauge made of stainless steel with support.
In metric read-out to 1/10 mm for pipe wall thickness up to 1.25" (35 mm).

High-low gauge (large model)

Art.No. 810.080.006

High-low gauge made of stainless steel with support.
In metric read-out to 1/10 mm and standard read-out to 1/128".
For pipe wall thickness up to 4" (100 mm).

Taper gauge

Art.No. 810.080.003

Taper gauge, 1–10 mm, round shape, made of stainless steel.

Taper gauge

Art.No. 810.070.009

A stainless steel gauge for simple and fast control of A-size of corner seams (4, 5, 6, 7, 8, 10, 12, 14 mm).

Weld gauge M

Art.No. 810.070.004

A fan-like gauge with 12 blades for welds 3-12 mm at right-angled welded corners.

Material	steel, polished

Weld gauge S

Art.No. 810.070.005

An aluminum gauge, 1 mm thick, for measuring flat and corner seams.

Range corner seams	2-15 mm
Range flat seams	0-5 mm

Scales and application references on either side.

Inox weld gauge

Art.No. 810.070.002

Measuring tool for easy and fast control of weld seam dimensions.
To measure the a-dimension of fillet welds and to measure the butted joint weld reinforcement height. Equipped with three scales. Application instructions plotted on the gauge.

Range	0-15 mm
Reading	100 µm
Material	stainless steel, polished

Weld gauge J

Art.No. 810.070.003

An easy-to-use weld gauge for measuring undercuts, excess material, fillets, weld size and height, preparation angle and misalignment.
Suitable for inspection of flat seams and fillet welds with angles 60, 70, 80 and 90° for inspection of V-weld on flat seams.
Precise measurement execution.

Material	stainless steel, hardened and polished.
Range	20 mm
Reading	0.1 mm

Digital weld gauge J

Art.No. 810.070.010

A high-precision digital gauge with LCD display for measuring undercuts, excess material, fillets, weld size and height, preparation angle and misalignment.
Suitable for inspection of flat seams and fillet welds with angles 60, 70, 80 and 90° for inspection of V-weld on flat seams.

Material	stainless steel, hardened and polished
Switchable	mm / inch
Reading	0.01 mm
Range	0 - 20 mm / 0 - 0.8 inch
Weight	70 g

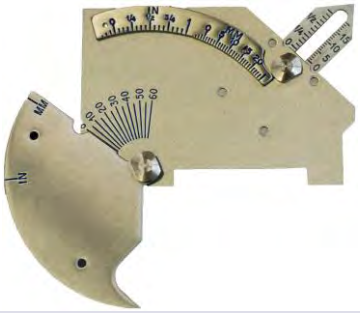
Mark 2 weld gauge

Art.No. 810.070.001

A welding gauge designed for general dimensional inspection of welded fabrications where close tolerances are not expected.

The gauge is used for measuring:

- Angle of preparation	0 - 60°
- Misalignment	0 - 25 mm
- Fillet weld leg length / excess weld metal	0 - 25 mm
- Fillet weld throat	0 - 20 mm
- Undercut	
- General measurement / root face and gap	



Vernier caliper

Art.No. 810.080.018

Stainless steel Vernier caliper with mm and inch graduations.

Range 0 - 150 mm

Analog depth gauge

Art.No. 810.080.126

High-low gauge and dial/pit depth gauge.

Measuring range	1 - 10 mm
Reading	0.01 mm

The set consists of:

- measuring dial gauge
- location vee made of stainless steel, 30 mm width
- stainless steel gauging stylus straight
- stainless steel gauging stylus 99°

Polarity tester

Art.No. 810.080.017

Practical tool for polarity testing. Round. Capped design.
To be placed on the welding cable during welding.

Digital clamp meter for AC/DC

Art.No. 810.080.008

Digital clamp meter for alternating and direct current/voltage.

Alternating current	1000 A
Alternating voltage	500 V
Direct current	1000 A
Direct voltage	200 V
Resistance	200 Ohm

Control-service box

Art.No. 810.080.002 – control-service box
Art.No. 810.080.001 – control-service box calibrated

Content of control-service-box:

- Digital clamp meter for AC/DC
- Gas indicator for accurate gas measurements at the torch exit for
  TIG torches 0-50 L/min
- Illuminated inside quality control unit complete with probes and mirrors
- Torch, stainless steel
- Pocket lens, magnification 3x ,6x ,9x
- Stopwatch
- Telescopic magnet with pen, 700 mm long
- Instant digital display thermometer (-70 °C up to 1,000 °C)
  temperature sensor not included
- Standard temperature sensor
- Stainless steel feeler gauge from 0.05 mm to 1.00 mm
- Zero point stamp, 8 mm print height,
  notch-free for zero-point reading for x-ray work
- Polarity tester, round, capped design,
  to be placed on the welding cable during welding
- Stainless steel Vernier caliper with mm and inch markings
- Fillet weld gauge (stainless steel)
- Aluminum fillet weld gauge, markings on both sides
- Pocket leather shield with pen and notepad
- Taper gauge, 1-10 mm, round design, stainless steel
- High-low gauge and dial/pit depth gauge,
  measuring range up to 10 mm, graduations 0.01 mm
- Stainless steel ruler, 300 mm/12Ø long
- Tinted safety glasses
- Tape measure, 3 m long, with inside read-out, level and compass
- Suitcase with insert and liner
- High-low gauge, made of stainless steel, round version

Hell-Light VT13 - white light LED pocket lamp

Art.No. 142.200.461

Highly efficient white light LED pocket lamp for application in VT and MT testing.

Specifications	
Operating voltage	3.7 V
Light source	3 x white light LED
Battery charging time	approx. 6 h
Lifetime of LED	approx. 10000 h
Illumination intensity	approx. 144000 lx (at 400 mm)
Weight	approx. 500 g
Dimensions	∅ 60 x 135 mm

Scope of delivery: pocket lamp incl. Li-Ion batteries and charging unit

ULA 14.4-18 - white light LED hand lamp

Art.No. 142.200.462

Handy white light LED hand lamp for application in VT and MT testing.

Specifications	
Operating voltage	14.4 – 18.0 V
Light source	1 x white light LED
Lifetime of LED	approx. 10000 h
Illumination intensity	approx. 4200 lx (at 400 mm)
Weight	approx. 800 g
Dimensions	120 x 80 x 230 mm

Scope of delivery: hand lamp incl. Li-Ion battery and charging unit

SLA 14.4-18 - white light LED hand lamp

Art.No. 142.200.463

Handy white light LED hand lamp for application in VT and MT testing.

Specifications	
Operating voltage	14.4 – 18.0 V
Light source	6 x white light LED
Lifetime of LED	approx. 10000 h
Illumination intensity	approx. 1250 lx (at 400 mm)
Weight	approx. 900 g
Dimensions	120 x 80 x 250 mm

Scope of delivery: hand lamp incl. Li-Ion battery and charging unit

LED LENSER P7R - white light LED hand lamp

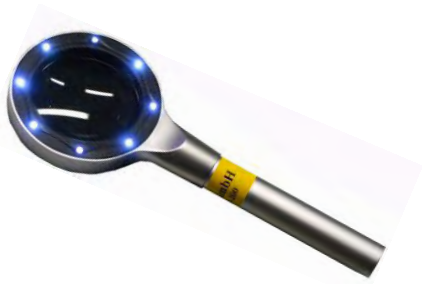
Art.No. 142.200.155

Handy white light LED hand lamp for application in VT and MT testing.

Specifications	
Operating voltage	3.7 V
Light source	1 x High End Power white light LED
Lifetime of LED	approx. 10000 h
Illumination intensity	20 - 1000 Lm
Lighting range	40 - 210 m
Weight	approx. 210 g
Dimensions	Ø 37 mm x 166 mm

Scope of delivery: hand lamp incl. Li-Ion battery, carrying bag, hand strap, USB cable

LED magnifying glass



Art.No. 112.100.090

2.5 x LED magnifying glass for visual testing.

High-quality optical lens (Æ 55 mm). Economical, non-dazzling lightning adjustable in 2 steps by 8 white LED. Easy battery exchange. Metal frame with matt-silver finish.

Specifications

Voltage	3 V
Operating current	100 mA
Light source	8 LED
Lifetime of LED	10000 h
Light intensity at 50 mm distance	600 lx
Weight	200 g
Dimensions	210 x 80 x 20 mm

Inner control set, illuminated

Art.No. 810.080.016

Inner control set, illuminated, with probes and mirrors comprising:

- Handle with battery compartment
- Bulb attachment
- Straight extender 300 mm
- Angle extender 200 mm
- Flex & Stay probe 200 mm
- Flex & Stay probe 300 mm
- Hinged mirror ∅ 14 mm
- Hinged mirror ∅ 22 mm
- Hinged mirror ∅ 30 mm
- Hinged mirror ∅ 40 mm

3-D Laserscanning anti-glare spray

Art.No. 119.990.001 – 3-D Laserscanning spray, can 400 ml
Art.No. 119.900.005 – 3-D Laserscanning coating, can 1 L
Art.No. 119.990.002 – Cleaner, spray can 400 ml

Antireflection coating for optimal test results while 3-D laser scanning.

Due to its fine-grained structure it is possible to apply layers of minimal thickness. The 3-D Anti-Glare Spray is the appropriate product to meet the required accuracy of laser technology.

For surface pre-cleaning and final cleaning use the special 3-D Laserscanning Cleaner which is specially designed for this purpose.

Spray head with extension

Art.No. 119.990.018 – spray head with extension pipe 100 mm

Spray head with extension for 3-D laser scanning spray cans for precise application in hardly accessible areas.

Tempilstik° temperature indicators

Easy-to-use temperature indicators for determining surface temperatures during welding and metal fabrication, preheat, interpass, postweld heat treatment, annealing, stress relieving.

Highly accurate – melts within ±1% of rated temperature.

How to use:
Stroke the workpiece during heating. When the rated temperature has been reached a distinct melt (smear) will become evident. Tempilstik will make a mark by melting at the point of contact once the surface reaches the specific temperature of the Tempilstik.

Art.No.	°C	°F	Art.No.	°C	°F	Art.No.	°C	°F
510.100.038	38	100	510.100.149	149	300	510.100.300	300	572
510.100.040	40	104	510.100.150	150	302	510.100.302	302	575
510.100.043	43	109	510.100.152	152	306	510.100.316	316	600
510.100.048	48	119	510.100.155	155	311	510.100.320	320	608
510.100.050	50	122	510.100.156	156	313	510.100.343	343	650
510.100.052	52	125	510.100.160	160	320	510.100.350	350	662
510.100.055	55	131	510.100.163	163	325	510.100.371	371	700
510.100.060	60	140	510.100.165	165	329	510.100.399	399	750
510.100.066	66	150	510.100.170	170	338	510.100.400	400	752
510.100.070	70	158	510.100.173	173	344	510.100.427	427	800
510.100.073	73	163	510.100.175	175	347	510.100.454	454	850
510.100.075	75	167	510.100.177	177	350	510.100.460	460	860
510.100.076	76	169	510.100.180	180	356	510.100.482	482	900
510.100.079	79	175	510.100.184	184	363	510.100.500	500	932
510.100.080	80	176	510.100.190	190	374	510.100.510	510	950
510.100.083	83	182	510.100.191	191	375	510.100.525	525	977
510.100.085	85	185	510.100.195	195	383	510.100.538	538	1000
510.100.087	87	188	510.100.198	198	388	510.100.550	550	1022
510.100.090	90	194	510.100.200	200	392	510.100.560	560	1040
510.100.093	93	200	510.100.204	204	400	510.100.566	566	1050
510.100.095	95	203	510.100.210	210	410	510.100.593	593	1100
510.100.097	97	206	510.100.212	212	413	510.100.600	600	1112
510.100.100	100	212	510.100.215	215	419	510.100.621	621	1150
510.100.101	101	213	510.100.218	218	425	510.100.625	625	1157
510.100.104	104	219	510.100.220	220	428	510.100.677	677	1250
510.100.107	107	225	510.100.225	225	437	510.100.700	700	1292
510.100.110	110	230	510.100.230	230	446	510.100.704	704	1300
510.100.115	115	239	510.100.232	232	450	510.100.760	760	1400
510.100.120	120	248	510.100.235	235	455	510.100.788	788	1450
510.100.121	121	250	510.100.239	239	463	510.100.816	816	1500
510.100.124	124	256	510.100.246	246	475	510.100.843	843	1550
510.100.125	125	257	510.100.250	250	482	510.100.871	871	1600
510.100.128	128	263	510.100.253	253	488	510.100.899	899	1650
510.100.130	130	266	510.100.260	260	500	510.100.927	927	1700
510.100.132	132	269	510.100.270	270	518	510.100.982	982	1800
510.100.135	135	275	510.100.274	274	525	510.101.038	1038	1900
510.100.140	140	284	510.100.280	280	536	510.101.066	1066	1950
510.100.142	142	288	510.100.288	288	550	510.101.093	1093	2000
510.100.146	146	294	510.100.290	290	554			

Tempstik° test kit

Art.No. 510.200.000

A professional's temperature indicating kit of 20 indicators systematically spaced between 52 °C and 427 °C (125 °F – 800 °F):

52°C / 125°F	191°C / 375°F
66°C / 150°F	204°C / 400°F
79°C / 175°F	218°C / 425°F
93°C / 200°F	232°C / 450°F
107°C / 225°F	246°C / 475°F
121°C / 250°F	260°C / 500°F
135°C / 275°F	288°C / 550°F
149°C / 300°F	316°C / 600°F
163°C / 325°F	371°C / 700°F
177°C / 350°F	427°C / 800°F

Provides all the information needed for determining the proper temperatures for welding, heat treating, soldering, brazing, and other operations involved in the processing of most metals. In addition, the kit provides information on measuring preheat, interpass and postweld heat treatment temperatures.

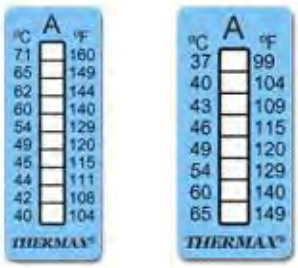
IRT-16 infrared thermometer

Art.No. 520.200.019

Non-contact thermometer with laser targeting for welding inspections. Adjustable emissivity. Type K thermocouple port. Displays: MIN – MAX – DIF.

Specifications	
Measuring range	-60 to +625 °C
Operating range	0 – 50 °C
Accuracy	1.0 °C
Emissivity range	adjustable from 0.1 to 1.0 in 0.01 steps
Resolution	0.1 °C
Response time (90%)	1 s
Distance spot ratio- D : S	16 : 1
Battery life	typical 180 h, min. 140 h continuous use
Dimensions	46 x 143 x 185 mm
Weight	240 g including 2 x AAA batteries
Auto shut off	60 s after last measuring

THERMAX® irreversible temperature labels



Easy-to-apply self-adhesive temperature labels; 8 or 10 level strips.

Size 50.8 x 17.8 mm
Unit pack of 10 strips

Art.No.	Name	Temperature range
514.110.077	Thermax 10 Range B	77/82/88/93/99/104/110/116/121/127 °C
514.110.132	Thermax 10 Range C	132/138/143/149/154/160/166/171/177/182 °C
514.110.188	Thermax 10 Range D	188/193/199/204/210/216/224/232/241/249 °C
514.100.037	Thermax 8 Range A	37/40/43/46/49/54/60/65 °C
514.100.071	Thermax 8 Range B	71/77/82/88/93/99/104/110 °C
514.100.116	Thermax 8 Range C	116/121/127/132/138/143/149/154 °C
514.100.160	Thermax 8 Range D	160/166/171/177/182/188/193/199 °C

Tempilaq° G temperature indicating liquids

Temperature indicating liquid for measuring process temperatures under dynamic conditions. ±1% accuracy of indicated temperature. Used for thermal mapping of many surfaces, calibrating brake calipers, wave soldering PC boards, post forming plastic laminate, annealing polished metal surface, determining glass temperatures at various heating stages, calibrating industrial furnaces, etc. Easy to apply – quickly drying fluid. Non-flammable for maximum safety and unrestricted shipment. No hazardous air pollutants.

How to use: Apply Tempilaq° by brush, dipping or spraying to a clean surface. Tempilaq° will dry rapidly to a homogenous opaque film. As heat is induced and the targeted temperature is achieved the Tempilaq° film will liquefy. Homogenous opaque appearance will change to bright and clear.
Standard packaging: bottles 60 ml.

Art.No.	°C	°F	Art.No.	°C	°F	Art.No.	°C	°F
512.000.079	79	175	512.000.246	246	475	512.000.538	538	1000
512.000.093	93	200	512.000.253	253	488	512.000.550	550	1022
512.000.107	107	225	512.000.260	260	500	512.000.566	566	1050
512.000.121	121	250	512.000.274	274	525	512.000.593	593	1100
512.000.135	135	275	512.000.288	288	550	512.000.621	621	1150
512.000.149	149	300	512.000.302	302	575	512.000.649	649	1200
512.000.156	156	313	512.000.316	316	600	512.000.677	677	1250
512.000.163	163	325	512.000.343	343	650	512.000.704	704	1300
512.000.177	177	350	512.000.371	371	700	512.000.760	760	1400
512.000.184	184	363	512.000.399	399	750	512.000.788	788	1450
512.000.191	191	375	512.000.427	427	800	512.000.816	816	1500
512.000.204	204	400	512.000.454	454	850	512.000.871	871	1600
512.000.218	218	425	512.000.482	482	900	512.000.927	927	1700
512.000.232	232	450	512.000.510	510	950	512.000.982	982	1800

Art.No. 512.100.001 – Thinner for Tempilaq 70 °C – 1371 °C, bottle 55 ml
Art.No. 512.100.009 – Thinner for Tempilaq 70 °C – 1371 °C, bottle 940 ml

Tempilabel° irreversible temperature labels

Easy-to-apply self-adhesive labels. Accuracy within ±2% of the indicated temperature. Used for easy surface temperature monitoring of printed circuits and assemblies, electronic components, semiconductor cabinets, etc. as well as for monitoring/recording maximum temperatures attained during wave soldering, baking, sealing, curing, bonding; monitoring safe operating temperatures of batteries, appliances, machines and motors; monitoring temperatures attained during shipping and storage of heat sensitive materials, biologicals, films. Each label consists of heat sensitive indicator(s) sealed under transparent window(s). As the targeted temperature(s) are reached, the indicator(s) colour change from light grey to black. Permanent record - easily removed after use providing documentation for warranty claims and inspection or quality control reports.

How to use: Remove the backing for exposing the adhesive; press the label to the work or test surface firmly. Before applying the Tempilabel°, the surface should be clean and dry to obtain maximum contact and adhesion.

Tempilabel°Series 21			Tempilabel° Series 4			Tempilabel° roll		
21 labels per sheet			4 temperature ranges per label			1000 labels per roll		
Label size: 12 x 12 mm			Label size: 44 x 22 mm			Label size: 12 x 12 mm		
Indicator window:4.8mm			Indicator window: 4 mm			Indicator window: 4.8 mm		
10 sheets per pack			10 sheets per pack					
Art.No.	°C	°F	Art.No.	°C	°F	Art.No.	°C	°F
514.021.049	49	120	514.04A.038	38-54	100-130	514.R21.060	60	140
514.021.060	60	140	514.04A.054	54-71	130-160	514.R21.071	71	160
514.021.071	71	160	514.04A.077	77-93	170-200	514.R21.088	88	190
514.021.077	77	170	514.04A.088	88-104	190-220	514.R21.104	104	220
514.021.082	82	180	514.04A.104	104-121	220-250	514.R21.110	110	230
514.021.088	88	190	514.04B.052	52-93	125-200			
514.021.093	93	200	514.04C.038	38-121	100-250			
514.021.099	99	210	514.04C.093	93-177	200-350			
514.021.116	116	240						
514.021.121	121	250						
514.021.143	143	290						
514.021.149	149	300						
514.021.204	204	400						
514.021.260	260	500						

Other temperature ranges on request

Pyromark° high temperature paint

Specially designed for protecting, decorating or colour identifying metal surfaces that will be subject to high temperatures.

The silicon-based coatings provide long lasting protection against oxidation and corrosion. Pyromark° coatings have excellent covering characteristics and will not blister, chip, crack or peel at their rated temperature. Pyromark° coatings improve heat transfer in infrared heating applications due to their high emission properties. Solar absorptivity of 0.95 makes it an almost perfect black absorber.

Standard packaging 3.78 L cans

Art.No.	Series	Color	Max. temperature
518.000.000	1200	Black flat	649 °C / 1200 °F
518.100.007	2500	Black flat	1093 °C / 2000 °F
518.500.002	Thinner for Pyromark 2500		

Bloxide° rust preventive weldable coating

Art.No. 519.000.012 – can 3.79 L
Art.No. 519.000.010 – spray can 350 ml

Rust preventive weldable coating protects prepared steel surfaces prior to welding or other-joining methods, protects against porous weldings or other joining flaws, eliminates need for secondary weld preparation on pipe flanges and joints.

Effective for all steels including high tensile carbon and chrome moly. An excellent primer for paint and other coatings. Nuclear fabrication industry-safe since free from lead, sulfur, zinc, cadmium, mercury, chlorine and other halogens.

Dykem Steel Blue / Dykem Steel Red layout fluids

Art.No. 810.040.106 - Dykem Steel Blue, spray can 400 ml
Art.No. 810.080.600 - Dykem Steel Blue, bottle 930 ml
Art.No. 810.080.600 - Dykem Steel Blue, bottle 3.8 L
Art.No. 810.040.007 - Dykem Steel Red, spray can à 400 ml
Art.No. 810.080.696 - Dykem Steel Red, bottle 930 ml

Machine shop operators depend on DYKEM® Layout Fluids to scribe sharp, clear, precise lines. When applied the layout fluids provide a uniform deep color that prevents glare and dries in minutes. All DYKEM® Layout Fluids provide extremely thin coatings which add no relevant thickness to the work piece and remains flexible without cracking and chipping. Toluene-free.

DYKEM staining colors

Art.No. 810.081.705 - yellow
Art.No. 810.081.706 - dark green
Art.No. 810.081.708 - light green
Art.No. 810.081.713 - orange
Art.No. 810.081.724 - black
Art.No. 810.081.725 - light blue
Art.No. 810.081.727 - white
Art.No. 810.081.760 - pink
Art.No. 810.081.778 - dark blue
Art.No. 810.081.791 - red

DYKEM® Staining Colors provide quick identification on a variety of components. These stains repel oils since they adhere without flaking and scaling. DYKEM® Staining Colors can be applied easily by brushing, spraying, dipping or tumbling and dry quickly. One bottle of 3.8 L can cover up to 23 square meter.

DYKEM® Staining Colors are used on springs, steel bars, bearings, bolts, carburetor parts, electrical assemblies, nuts, rivets, rods, coils, spindles etc.

Staining colours can be removed easily with Cleaner 107.

Bottle 3.8 L

TOP-CHECK FE/FE-B/FN/FN-B coating thickness meters

Art.No. 133.005.080 – TOP-CHECK FE

- Integrated swiveling probe for measurements, also in hardly accessible locations
- Self-explanatory multi-lingual menu navigation with one-button operation
- Measurement value memory with Bluetooth interface installed as an option
- Free transfer software for Windows

TOP-CHECK FE / FE-B measure insulating coatings (lacquer, paint, plastic, rubber, ceramics) and galvanic coatings (except nickel) on iron and steel subsurfaces with a magnetic-inductive probe in accordance with ISO 2178. TOP-CHECK FE-B also contains a Bluetooth interface for data transfer.

TOP-CHECK FN / FN-B measure insulating coatings (lacquer, plastic, rubber, ceramics) and galvanic coatings (except nickel) on iron and steel subsurfaces based on the magnetic-inductive method, and insulating coatings for non-ferrous metals (aluminum, brass, copper, bronze, nonmagnetic stainless steels) following the eddy current method with a combined probe in accordance with ISO 2178 and ISO 2360. TOP-CHECK FN-B also contains a Bluetooth interface for data transfer.

Specifications

Measuring range FE, µm	0 – 5,000
Measuring range NFE, µm	0 – 2,000
Resolution	1-100 µm: 0.1 µm; >100 µm: 1 µm; >1,000 µm: 0.01 mm
Accuracy	< 100 µm: ± 1 µm; 100-1,000 µm: ± 1 %; 1,000-2,000 µm: ± 3 %; > 2,000 µm: ± 5 %
Power supply	1.5 V AA Mignon
Automatic switch off	yes
Conversion µm – mils	yes
Statistics	by FE-B / FN-B
Display of statistics	by FE-B / FN-B
Dimensions	Ø 28 x 98 mm
Weight incl. batteries	72 g

Scope of delivery
Instrument, battery, spare battery, calibration set, manual, case.

MEGA-CHECK Pocket FE/FN coating thickness meters

Art.No. 133.005.029 – MEGA-CHECK Pocket FE

MEGA-CHECK Pocket FE measures non-conductive coatings (paint, varnish, plastics, rubber, ceramics) and galvanised films (except nickel) on iron and magnetic steel, based on the magnetic induction technique.

MEGA-CHECK Pocket FN includes both the magnetic induction and eddy current techniques with a dual-function probe. These measurements can be performed: A non-conductive coatings and galvanised films (except nickel) on iron and magnetic steel; all non-conductive coatings (paint, varnish, plastics, anodising on aluminium) on non-ferrous metals (aluminium, bronze, brass, copper, non-magnetic steel).

Specifications

Measuring range FE, µm	0 – 5,000
Measuring range NFE, µm	0 – 2,500
Resolution	1-100 µm: 0.1 µm; >100 µm: 1 µm; >2,000 µm: 0.01 mm
Accuracy	< 100 µm: ± 1 µm; 100-1,000 µm: ± 1 %; 1,000-2,000 µm: ± 3 %; > 2,000 µm: ± 5 %
Available probes	PF-5 (FE) / PFN-52D (FN)
Smallest area	∅ 4 mm (FE) / ∅ 6 mm (FN)
Smallest curvature R	FE: 4 mm, NFE: 6 mm (convex)
Smallest curvature R	38 mm (concave)
Power supply	2 x 1.5 V AA Mignon
Automatic switch off	yes
Conversion µm – mils	yes
Statistics	last series of 100 measurements
Display of statistics	yes
Dimensions	105 x 65 x 26 mm
Weight incl. batteries	137 g

MiniTest 3100 coating thickness meters

Art.No. 160.110.002

Wide range of wear resistant probes for varied applications, universal probes with automatic substrate detection. Special calibration function for rough surfaces and calibration through unknown coating (CTC method).

F-probes: measurement of non-magnetic coatings (e.g. paint, zinc) on steel
FN-probes: measurement of non-magnetic coatings (e.g. paint, zinc) on steel and insulating coatings (e.g. paint, anodizing coatings) on non-ferrous metals
N-probes: non-ferrous metal coatings or insulating coatings on non-ferrous metals
CN-probes: non-ferrous metal coatings on insulating substrates

Measuring range:

- 0 - 50 mm for non-magnetic coatings on steel
- 0 - 100 mm for insulating coatings on non-ferrous metals
- 10 - 200 µm for copper layers on insulating base materials
- 0 - 1600 µm for powder coatings on steel and non-ferrous metals

Scope of Delivery

Instrument (without probe), plastic carrying case, 1 x 9 V battery, manual.

Available probes:

Art.No.	Probe name	Measuring range	Art.No.	Probe name	Measuring range
160.110.037	FN 1.6	0–1600 µm	160.110.027	F 50	0-50 mm
160.110.040	FN 1.6 P	0-1600 µm	160.110.028	N 08 CR	0-80 µm
160.110.038	FN 2/90	0-2000 µm	160.110.029	N 02	0-200 µm
160.110.020	F 05	0-500 µm	160.110.030	N 1.6	0-1600 µm
160.110.021	F 1.6	0–1600 µm	160.110.032	N 1.6/90	0-1600 µm
160.110.022	F 3	0-3000 µm	160.110.033	N 2/90	0-2000 µm
160.110.023	F 1.6/90	0-1600 µm	160.110.034	N 10	0-10 mm
160.110.024	F 2/90	0-2000 µm	160.110.035	N 20	0-20 mm
160.110.025	F 10	0-10 mm	160.110.036	N 100	0-100 mm
160.110.026	F 20	0-20 mm	160.110.039	CN 02	10-200 µm

Further accessories on request.

TR110 surface roughness tester

Art.No. 150.500.110

- Both Ra and Rz parameter measurement in one instrument
- LCD with backlight, dynamic test display:
  progress bar gives indication of the measuring process
- Protection slide on pick-up
- Auto-off after 90 s
- Software calibration
- Large measuring range suitable for most materials
- Piezo-electric pick-up stylus for external surfaces
- Li-ion rechargeable battery
- Sound signal start-test-ready
- Compliance to ISO and DIN standards

Specifications

Roughness parameter	Ra, Rz
Units	µm / µinch
Measuring range	Ra: 0.05 µm - 15.0 µm, Rz: 0.1 µm – 50 µm
Cut-off lengths	0.25 mm, 0.8 mm, 2.5 mm
Filter	2RC
Calibration	By CAL function (on keypad)
Tracing length	6 mm
Tracing speed	1.0 mm/s
Accuracy	Conforms to ISO Class 3
Pick-up stylus	Piezo-electric
Tracer tip	Diamond, radius: 10±2.5 µm, Angle: 90° (+5° or -10°)
Operating temperature	0 °C – 40 °C
Power	3.6 V / 2 x NiCd-batteries. Low battery indication
Dimensions	102 x 70 x 22 mm
Weight	180 g

Scope of delivery:
Instrument, roughness test plate, charger, carrying case

HT-1000**A** hardness tester

Art.No. 710.010.001

- Highly accurate
- Easy to use
- Wide measuring range
- Suitable for testing a variety of materials
- Compact and lightweight - perfect for testing materials on-site
- User friendly monitor clearly displays test results: readings in HL, HV, HB, HRB, HRC, or HSD hardness scales
- Impact type tester that incorporates the Leeb principle of measurement
- For testing the hardness of a variety of metals in remote locations
- Two function keys to select up to 10 materials, 6 hardness scales and 5 testing directions.

Specifications

Hardness scales	HL, HV, HB, HRB, HRC, HSD
Testing range	200-900 HL
Accuracy	±0.5 %
Testing direction	any direction
Data storage	Automatic recording and storing of up to 10 test results incl. readings, time, test material, hardness scale, direction
Dimensions	165 x 28 x 28 mm

TH-170 portable dynamic hardness tester with integrated impact device D

Art.No. 710.013.003

- Dynamic rapid hardness test procedure
- Impact device D
- Wide measuring range
- For most metallic materials
- Automatic gravity compensation for testing at any angle
- Conforms to ASTM A 956 and DIN 50156
- USB connection to PC

Specifications

Hardness scales	HRC, HRB, HV, HB, HS, HL
Accuracy	Within ±6 HLD
Statistics	Average (max. 270 in 9 groups)
Output	USB
Min. surface roughness of workpiece	1.6 µm (Ra)
Impact device	D
Max. hardness value	940 HV
Workpiece radius (convex/concave)	R_{min} = 50 mm (with support ring R_{min}= 10 mm)
Workpiece minimum weight	2 – 5 kg on solid support 0.05 – 2 kg with coupling paste
Workpiece min. thickness coupled	5 mm
Workpiece min. case hardened depth	0.8 mm
Power	AAA batteries
Overall dimensions	155 x 24 x 55 mm
Weight	180 g

Scope of delivery

Instrument with integrated impact device type D; Test block with Leeb- or HRC value; AAA Batteries (2pcs); Cleaning brush; Coupling paste; Support ring small; USB communication cable; USB driver CD; Manual; Carrying case

TH-172 portable dynamic hardness tester with integrated impact device C

Art.No. 710.013.001

- Dynamic rapid hardness test procedure
- Impact device C applying low impact energy for surface hardened components and thin walled components
- Wide measuring range
- For most metallic materials
- Automatic gravity compensation for testing at any angle
- Conforms to ASTM A 956 and DIN 50156
- USB connection to PC

Specifications

Hardness scales	HRC, HRB, HV, HB, HS, HL
Accuracy	Within ±12 HLC
Statistics	Average (max. 270 in 9 groups)
Output	USB
Min. Surface roughness of workpiece	0.4 µm (Ra)
Impact device	C
Max. hardness value	1000 HV
Workpiece radius (convex/concave)	R_{min} = 50 mm (with support ring R_{min}= 10 mm)
Workpiece minimum weight	0.5 - 1.5 kg on solid support 0.02 - 0.5 kg with coupling paste
Workpiece min. thickness coupled	1 mm
Workpiece min. case hardened depth	0.2 mm
Power	AAA batteries
Overall dimensions	155 x 24 x 55 mm
Weight	180 g

Scope of delivery
Instrument with integrated impact device type C; Test block with Leeb- or HRC value; AAA Batteries (2pcs); Cleaning brush; Coupling paste; Support ring small; USB communication cable; USB driver CD; Manual; Carrying case

TH-174 portable dynamic hardness tester with integrated impact device DL

Art.No. 710.013.002

- Dynamic rapid hardness test procedure
- Impact device DL for testing in confined spaces
- Wide measuring range
- For most metallic materials
- Automatic gravity compensation for testing at any angle
- Conforms to ASTM A 956 and DIN 50156
- USB connection to PC

Specifications

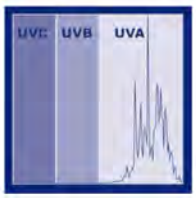
Hardness scales	HRC, HRB, HV, HB, HS, HL
Accuracy	Within ±12 HLDL
Statistics	Average (max. 270 in 9 groups)
Output	USB
Min. surface roughness of workpiece	1.6 µm (Ra)
Impact device	DL
Needle front section of DL-device	Diameter = 4.2 mm, Length = 50 mm
Max. hardness value	950 HV
Workpiece radius (convex/concave)	R_{min} = 50 mm (with support ring R_{min}= 10 mm)
Workpiece minimum weight	2 – 5 kg on solid support 0.05 – 2 kg with coupling paste
Workpiece min. thickness coupled	5 mm
Workpiece min. case hardened depth	0.8 mm
Power	AAA batteries
Overall dimensions	210 x 24 x 55 mm
Weight	200 g

Scope of delivery
Instrument with integrated impact device type DL; Test block with Leeb- or HRC value; AAA Batteries (2pcs); Cleaning brush; Coupling paste; Support ring small; USB communication cable; USB driver CD; Manual; Carrying case

Delivery Program

Penetrant testing
- Fluorescent and red-white testing
- Electrostatic devices
- Stationary PT facilities
- Test panels

Magnetic particle testing
- Fluorescent and color magnetic powders, suspensions, concentrates
- Hand yokes and mobile magnetizing devices
- Stationary magnetizing facilities
- Reference and test blocks



UV sources
- UV LED overhead lamps
- UV LED hand lamps
- Source testing and certification acc. to ASTM, Airbus AITM, Rolls-Royce RRES
- UV radiometers. luxmeters. UV-flash cameras

Leak Testing
- Hydrogen and helium leak detectors
- Ultrasonic leak detectors
- Consumables and equipment for bubble emission testing
- Fluorescent leak tracers

Radiographic testing
- Film processing machines
- X-ray films
- X-ray view boxes
- Darkroom accessories, image quality indicators, densitometers

Visual inspection
- High-power lamps
- Magnifying glasses
- Optics
- 3-D laser scanning anti-glare spray

Ultrasonic inspection
- Ultrasonic thickness meters
- Ultrasonic flaw detectors
- Couplants
- Accessories

Weld inspection
- Weld gauges
- Auxiliary welding equipment
- Control-service boxes
- Electrodes and welding wires

Temperature indication
- Thermometers
- Temperature indicators and labels 38 °C - 1093 °C
- High temperature paints, weldable coatings
- Heat sink compounds

Instruments
- Surface roughness testers
- Thickness gauges
- Hardness testers
- Field meters

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