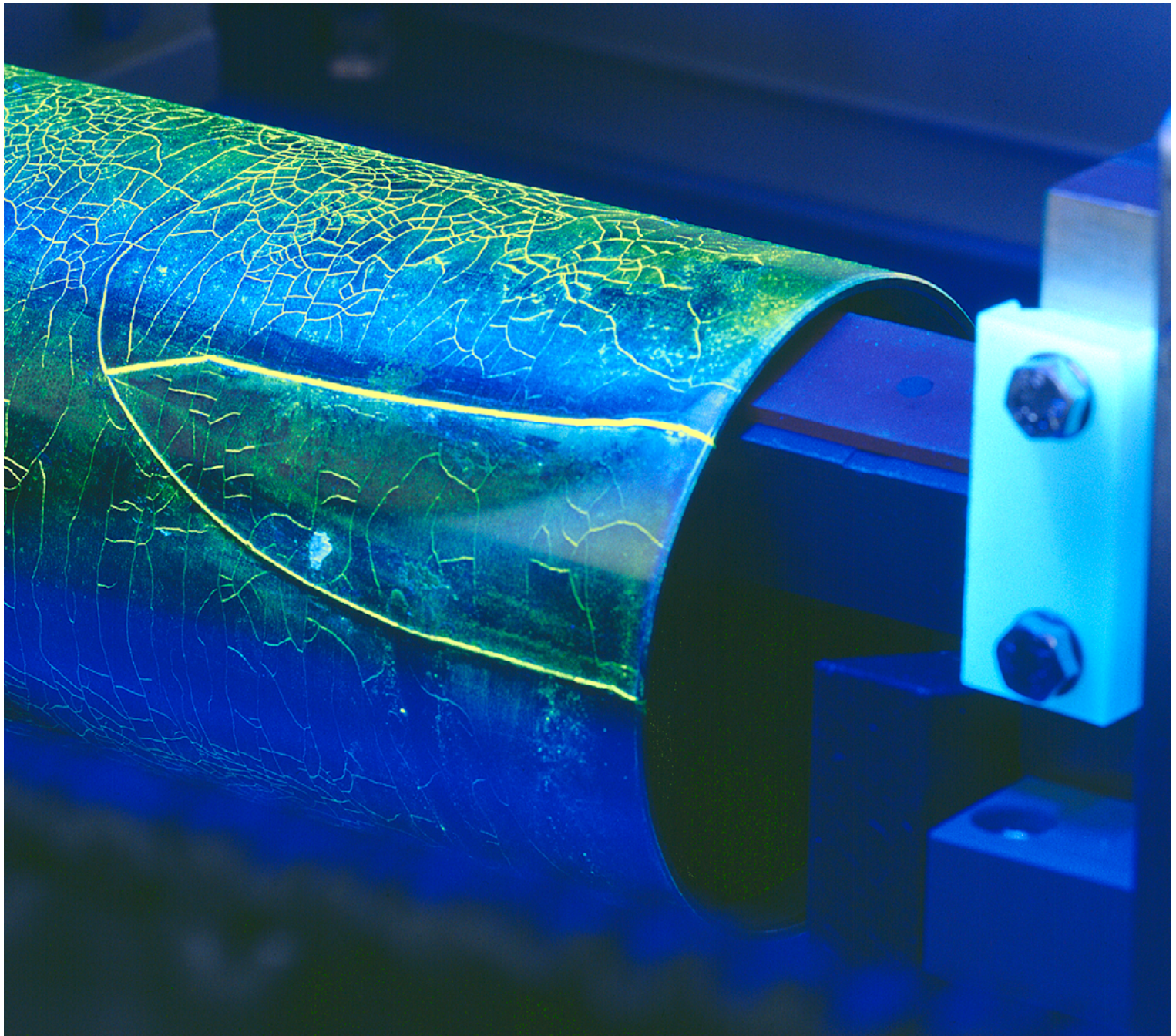




FLUXA Testing Agents

Inspection Media for Magnetic Particle Testing

KARL DEUTSCH

Inspection Media for Magnetic Particle Testing



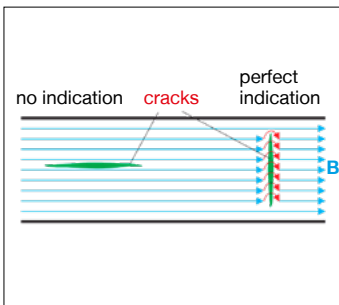
Crack indication with fluorescent magnetic powder

When Do We Use Magnetic Particle Testing Agents?

Magnetic particle testing (MT) is a method of non-destructive testing (NDT) used to detect surface cracks and near-surface cracks. It is regarded as a reliable and sensitive crack detection method in this field and is therefore primarily used to inspect safety-critical components in the automotive industry, as well as welds on boilers and pipework.

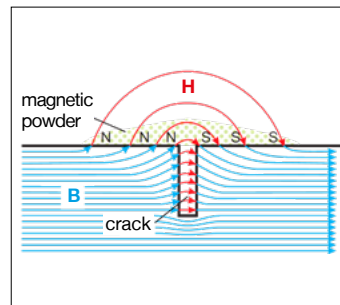
A prerequisite for the applicability of this method is that the material exhibits ferromagnetic properties and can be sufficiently magnetised. In most cases, the material is steel; less commonly, it may be nickel or cobalt. Cracks connected to the surface with a width of 1 – 300 μm are tested, depending on the testing equipment. Hidden cracks can be detected to a depth of approximately 1 mm when using alternating current. When magnetised using direct current, a detection depth of several millimetres is possible.

The Procedural Steps



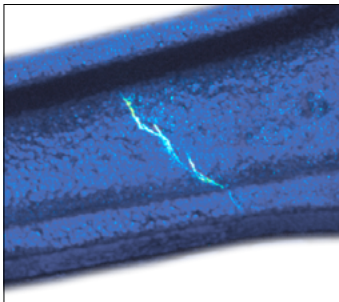
1. Magnetisation

Depending on the method selected, the workpiece is subjected to a current and/or a magnetic field. The magnetic field generated during this process must be oriented perpendicular to the crack so that the field lines exit the material at that point.



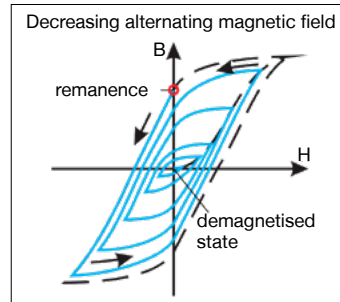
2. Wetting

Testing agent containing magnetic powder is applied to the test piece in the form of a suspension or an aerosol. The fluorescent or coloured powder accumulates in the magnetic field around the crack, thereby making it visible.



3. Evaluation

Evaluation using fluorescent powders is carried out under UV light and is highly accurate and reproducible. Some powders are made for use under daylight and sometimes use a white background to provide contrast.



4. Demagnetisation

Demagnetisation is usually carried out by generating a decreasing alternating magnetic field (electronically or using a coil) or by counter-polarisation using a magnetic field in the opposite direction.

FLUXA testing agents are ...

- suitable for use in all applications where high standards are required for magnetic particle testing, and are used in the automotive, aerospace and maritime sectors, in mechanical engineering, vessel and reactor construction, maintenance, welding technology, and many other industrial sectors.
- type-tested according to DIN EN ISO 9934-2 and meet the requirements of other standards (ASTM E709, ASTM E14, and many more).
- marked by "Low sulphur and halogen content according to DIN EN ISO 9934" with regard to the corrosive components (sulphur,

fluorine, chlorine) and fulfil the requirements of the ASME Code, Section V, Article 7.

- made in Germany: developed and produced in Wuppertal.

Under this QR code (scan or click), you will find the following on our website for all our chemical products:

- **Technical Information Sheets**
- **Safety Data Sheets**



Fluorescent Inspection Media

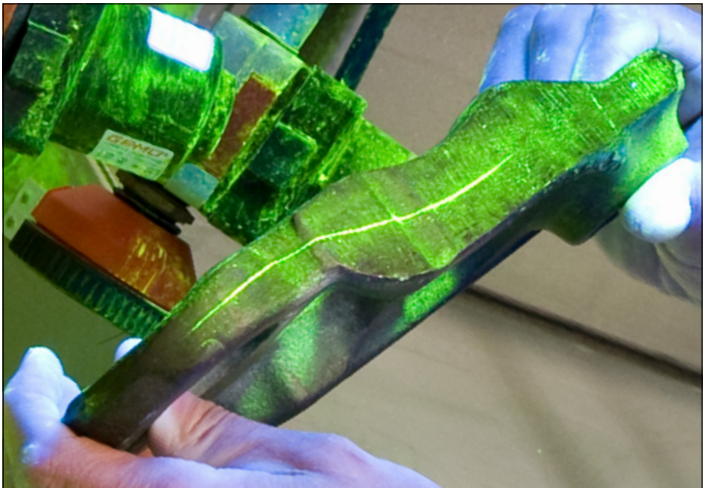
Water-Based Magnetic Powders

Fluorescent magnetic particle crack detection agents are used in the mass inspection of ferromagnetic components, as their fluorescent properties provide excellent luminance contrast. When used in stationary systems, a large number of test pieces can be inspected for even the finest cracks in a reproducible manner within short cycle times. The use of testing agents tailored to the specific testing task further increases the sensitivity of the inspection.

In addition to standard inspection media, our range also includes specialised testing agents designed to meet the requirements of

various testing tasks, such as the testing of components coated with cooling lubricants or the testing of corrosion-sensitive test specimens.

The majority of our testing agents meet the requirements for corrosive components as set out in DIN EN ISO 9934-2, and all media meet the requirements of the ASME Code, Section V, Article 7. Furthermore, most of the inspection media are biodegradable, ensuring simple and environmentally friendly disposal.



Selecting the appropriate magnetic powder depending on the testing task is crucial to the quality of the inspection results.

Water-Based Magnetic Powders

	 FLUXA CONCENTRATE HRS	 FLUXA CONCENTRATE HRS/SPECIAL	 FLUXA CONCENTRATE HRS/G
	▪ ready-to-use concentrate ▪ ideal for serial testing under UV light ▪ contains corrosion protection, wetting agent, and antifoam	▪ ready-to-use concentrate ▪ ideal for serial testing under UV light ▪ contains corrosion protection, wetting agent, and antifoam ▪ suitable for testing surfaces that are difficult to wet	▪ ready-to-use concentrate ▪ ideal for serial testing under UV light ▪ contains high corrosion protection for testing corrosion-sensitive parts, as well as wetting agents and defoamers
Approvals and specifications	DIN EN ISO 9934-2, SAE AMS3044, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7, SAE AS4792		
Average particle size	approx. 3 µm	approx. 3 µm	approx. 3 µm
Label-free	✓	✓	✓
Carrier medium	water	water	water
Rec. concentration	1:20 to 1:40	1:20 to 1:40	1:20 to 1:40
Application temperature	5 °C to 60 °C	5 °C to 60 °C	5 °C to 60 °C
Packaging	500 ml aerosol can, 1 l, 5 l	500 ml aerosol can, 1 l, 5 l	1 l, 5 l

Fluorescent Inspection Media

Water-Based Magnetic Powders

	 FLUXA CONCENTRATE HVP	 FLUXA CONCENTRATE HFI	 FLUXA CONCENTRATE HKS/SPECIAL
	- ready-to-use concentrate - ideal for serial testing under UV light - contains corrosion protection, wetting agent, and antifoam - excellent contrast ratios due to bright powder - suitable for automated systems with camera evaluation	- ready-to-use concentrate - ideal for serial testing under UV light - contains corrosion protection, wetting agent, and antifoam	- high concentrate - ideal for serial testing under UV light - contains corrosion protection, wetting agent, and antifoam
Approvals and specifications	DIN EN ISO 9934-2, SAE AMS3044, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7, SAE AS4792		
Average particle size	approx. 3 µm	approx. 3 µm	approx. 3 µm
Label-free	✓	✓	✓
Carrier medium	water	water	water
Rec. concentration	1:40 to 1:80	1:50	1:100 to 1:200
Application temperature	5 °C to 60 °C	5 °C to 60 °C	5 °C to 80 °C
Packaging	1 l, 5 l	1 l	1 l

	 FLUXA CONCENTRATE FRS	 FLUXA CONCENTRATE FS	 FLUXA POWDER FS
	- ready-to-use concentrate - ideal for serial testing under UV light - contains corrosion protection, wetting agent, and antifoam	- high concentrate - ideal for serial testing under UV light - addition of corrosion protection and wetting agent may be necessary	- powder - ideal for serial testing under UV light - to be mixed with water, FLUXA TEST OIL or TEST OIL 110 - optionally FLUXA WETTING AGENT und FLUXA ANTIRUST
Approvals and specifications	DIN EN ISO 9934-2, SAE AMS3044, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7, SAE AS4792		DIN EN ISO 9934-2, SAE AMS3044, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7
Average particle size	approx. 3 µm	approx. 3 µm	approx. 3 µm
Label-free	✓	✓	✓
Carrier medium	water	water	oil, water
Rec. concentration	1:20 to 1:40	1:1000 to 1:2000	0.25 g/l to 0.5 g/l
Application temperature	5 °C to 60 °C	5 °C to 60 °C	5 °C to 60 °C
Packaging	5 l	1 l	1 kg

Fluorescent Inspection Media

Water- and Oil-Based Magnetic Powders

	 FLUXA CONCENTRATE FGR/G	 FLUXA 140 G	 FLUXA CONCENTRATE TRS
	- ready-to-use concentrate - ideal for serial testing under UV light - high distinguishability between green magnetic powder and rust under daylight - contains increased corrosion protection, as well as wetting agent and antifoam	- ready-to-use concentrate - ideal for serial testing under UV light - high distinguishability between green magnetic powder and rust under daylight - excellent magnetisability - low background fluorescence, high-contrast indications	- red and red fluorescent ready-to-use concentrate - ideal for serial testing under UV light - also suitable for testing under daylight - contains corrosion protection, wetting agent, and antifoam
Approvals and specifications	DIN EN ISO 9934-2, SAE AMS3044, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7, SAE AS4792		DIN EN ISO 9934-2, SAE AMS3044, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7
Average particle size	approx. 3 µm	approx. 3 µm	approx. 3 µm
Label-free	✓	✓	✓
Carrier medium	water	water	water
Rec. concentration	1:20 to 1:40	1:40 to 1:80	1:40 to 1:80
Application temperature	5 °C to 60 °C	5 °C to 60 °C	5 °C to 60 °C
Packaging	1 l	1 l, 5 l	1 l, 5 l

Oil-Based Magnetic Powders

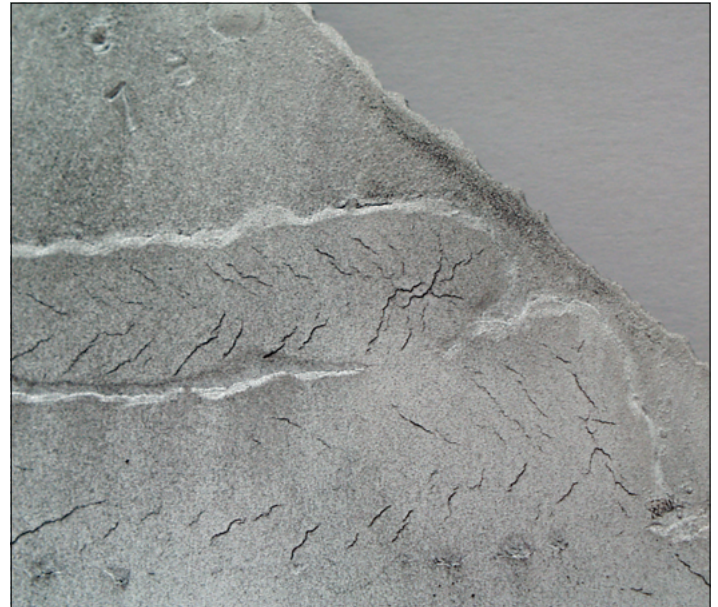
	 FLUXA CONCENTRATE HS-O	 FLUXA HS-O, ready-to-use	 FLUXA HS-O-110, ready-to-use
	- ready-to-use concentrate - ideal for serial testing under UV light - to be mixed with water, FLUXA TEST OIL or TEST OIL 110	- ready-to-use suspension for magnetic particle testing - diluted with FLUXA TEST OIL - ideal for serial testing under UV light - excellent wetting properties	- ready-to-use suspension for magnetic particle testing - diluted with FLUXA TEST OIL 110 - ideal for serial testing under UV light - excellent wetting properties
Approvals and specifications	DIN EN ISO 9934-2, SAE AMS3044, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7	DIN EN ISO 9934-2, SAE AMS2641, SAE AMS3044, SAE AMS3045, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7	
Average particle size	approx. 3 µm	approx. 3 µm	approx. 3 µm
Label-free	✓	-	-
Carrier medium	oil	oil	oil
Rec. concentration	1:100 to 1:200	ready to use	ready to use
Application temperature	-10 °C to 60 °C	-10 °C to 60 °C	10 °C to 100 °C
Packaging	1 l	500 ml aerosol can, 10 l, 25 l	10 l, 25 l

Inspection Media for Daylight Inspection Concentrates and Powders

Black magnetic particle crack detection agents, when used in combination with background paint, are frequently employed on construction sites, in workshops, during repairs or for spot checks due to their ease of use. As quick, manual inspections require only one can each of the black testing agent, background paint and a hand-held yoke, this method is also popular for mobile inspections.

The inspection is carried out under normal daylight or daylight-simulating lighting, thereby eliminating the need for complex darkening installations. However, black-and-white inspection is also frequently used in mass production, particularly when larger components need to be inspected.

When selecting inspection media, there is a choice between powders or concentrates for dilution in the carrier media of water and oil. Ready-to-use suspensions are also available to ensure greater inspection reliability.



FLUXA CONCENTRATE BLACK-W

- ready-to-use concentrate
- ideal for series testing under daylight
- contains corrosion protection, wetting agent, and antifoam

FLUXA POWDER BLACK

- black powder
- ideal for series testing under daylight
- to be mixed with water, FLUXA TEST OIL or TEST OIL 110
- optionally FLUXA WETTING AGENT und FLUXA ANTIRUST

Approvals and specifications	DIN EN ISO 9934-2, SAE AMS3042, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7, SAE AS4792	DIN EN ISO 9934-2, SAE AMS3042, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7
Average particle size	approx. 1 µm	approx. 1 µm
Label-free	✓	✓
Carrier medium	water	oil, water
Rec. concentration	1:100 to 1:200	2.5 g/l to 5 g/l
Application temperature	5 °C to 60 °C	5 °C to 60 °C
Packaging	1 l	5 kg

Inspection Media for Daylight Inspection Suspensions and Underground Paint



FLUXA BLACK-O, ready-to-use

- ready-to-use suspension for magnetic particle testing
- diluted with FLUXA TEST OIL
- ideal for series testing under daylight
- excellent wetting properties

Approvals and specifications

DIN EN ISO 9934-2, SAE AMS2641, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7

Average particle size

approx. 1 µm

Label-free

-

Carrier medium

oil

Rec. concentration

ready to use

Application temperature

-10 °C to 60°C

Packaging

500 ml aerosol can, 10 l, 25 l

FLUXA BLACK-AMS, ready-to-use

- ready-to-use suspension for magnetic particle testing
- diluted with FLUXA TEST OIL 110
- ideal for series testing under daylight
- excellent wetting properties

DIN EN ISO 9934-2, SAE AMS2641, SAE AMS3044, SAE AMS3045, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7

approx. 1 µm

-

oil

ready to use

10 °C to 100 °C

10 l, 25 l

FLUXA BACKGROUND PAINT WHITE

- background paint for black and white testing
- bright white for good contrast
- fast drying
- thin top coat
- removable with cleaner KD-CHECK PR-2

Approvals and specifications

DIN EN ISO 9934-2, ASME Code, Section V, Article 7

Label-free

-

Shelf life

at least 3 years at room temperature

Application temperature

5 °C to 60 °C

Packaging

500 ml aerosol can, 5 l, 10 l

FLUXA UG-W

- background paint for black and white testing
- bright white for good contrast
- fast drying
- thin top coat
- removable with cleaner KD-CHECK PR-2
- optimised spraying performance

DIN EN ISO 9934-2, ASME Code, Section V, Article 7

-

at least 3 years at room temperature

5 °C to 60 °C

500 ml aerosol can

Additives and Test Oils

Aqueous suspensions can be prepared from concentrates as well as from all the individual components, such as powders, wetting agents, antifoam and corrosion protection. Precise dosing is essential in this process to ensure the reliability of the test results.

When carrying out wet testing with oil, it is important for the quality of the indication that the carrier medium has as little intrinsic fluorescence as possible, or none at all. Oils without intrinsic fluorescence prevent disruptive background fluorescence. This makes it possible to produce high-contrast indications, leading to greater testing reliability.



FLUXA WETTING AGENT

- additive to improve wetting and preparation of powders
- water miscible

FLUXA ANTIFOAM

- additive to improve the foaming behavior during magnetic particle testing
- water miscible

FLUXA ANTIRUST

- corrosion protection agent for magnetic particle testing
- biodegradable

Label-free	-	✓	✓
Carrier medium	water	water	water
Rec. concentration	1:1000 to 1:2000	1:1000 to 1:2000	1:40 to 1:100
Application temperature	5 °C to 60 °C	5 °C to 60 °C	5 °C to 60 °C
Packaging	1 l, 5 l	1 l	1 l, 5 l, 200 l

FLUXA SYSTEM CLEANER

- cleaning for aqueous and oily baths for magnetic particle testing
- water miscible

FLUXA TEST OIL

- odourless, clear testing oil for magnetic particle testing
- carrier medium for powders and oil-based concentrates
- no disturbing intrinsic fluorescence
- excellent wetting properties

FLUXA TEST OIL 110

Approvals and specifications	-	DIN EN ISO 9934-2, SAE AMS2641, ASTM E1444, ASTM E709, ASME Code, Section V, Article 7	
Carrier medium	water	-	-
Rec. concentration	1:100 to 1:200	-	-
Application temperature	5 °C to 60 °C	-10 °C to 60 °C	10 °C to 100 °C
Packaging	1 l, 5 l	10 l, 25 l, 200 l	10 l, 25 l, 200 l

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