



Ferroflux and **Fluoflux** are test chemicals developed by Tiede for the non-destructive surface crack detection using the magnetic particle inspection method. Products of different properties supplied in small and big packing units are offered for various applications. Additionally, test pieces allowing the control of the detectability of the test liquid before and during the inspection procedure are offered.

Wet testing method with oil

	Ref. No.	Packing unit	Particle size	Fluorescent colour	Daylight colour	propellent	Corrosion level acc. to DIN 51360
Fluoflux magnetic powder suspension	690.1	400 ml-aerosol	3 µm	yellow-green	brown	compr. air	0
Fluoflux magnetic powder suspension	690.2	400 ml-aerosol	0,2 µm	-	black	compr. air	0

Powder for wet testing method with oil

	Ref. No.	Packing unit	Particle size	Fluorescent colour	Daylight colour	suitable for	
						conventional inspection	automatic inspection
Fluoflux powder 1 kg for 2 500 - 5000 l of oil	601.1	1 kg-tin	3 µm	yellow-green	brown	*	-
Fluoflux powder 1 kg for 2 500 - 5000 l of oil	601.2	1 kg-tin	14 µm	bright green	green	*	*
Fluoflux powder 1 kg for 2 500 - 5000 l of oil	601.4	1 kg-tin	8 µm	yellow-green	green	(*)	*
Ferroflux powder 1 kg for 100 - 200 l of oil	605.1	5 kg-bag	0,2 µm	-	black	*	-

Concentrates for wet testing method with oil

	Ref. No.	Packing unit	Particle size	Fluorescent colour	Daylight colour	suitable for	
						conventional inspection	automatic inspection
Fluoflux concentrate with wetting agent 1 l for 100l of test oil	622.1	1 l-bottle	3 µm	yellow-green	brown	*	-
Fluoflux paste with wetting agent 100 g for 100l of test oil	612.11	1 kg-tin	3 µm	yellow-green	brown	*	-

Test oils for wet testing method with oil (as carrier medium)

	Ref. No.	Packing unit	Flash point	Viscosity	fluorescence-free	Corrosion level acc. to DIN 51360	suitable for	
							conventional inspection	automatic inspection
Test oil	620.1 620.2	30 l-can 200 l-barrel	63° C	20° C : 2,5 mPa · s	*	0	*	*
Safety test oil	620.10 620.20	30 l-can 200 l-barrel	> 100° C	20° C : 4,3 mPa · s	*	0	*	*

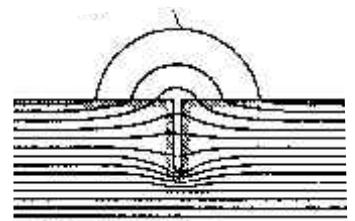
Why is a defect indicated?

When a ferromagnetic material is magnetized, magnetic flux lines will flow within the magnetically conducting medium. When the flux lines meet an area of low magnetic conductivity, i.e. a surface crack, vertically the high magnetic resistance changes the flux distribution.

This means that the magnetic flux lines are diverted into the sound field, a part of them passes through the material separation but also a significant portion edges off the surface and bridges the defect. These flux lines edged off are called „magnetic leakage flux“ and are the basis of magnetic particle testing.

With these techniques the magnetic leakage flux is identified by applying fine iron or iron-oxide powder to the work piece surface. Because magnetic leakage flux lines strictly are moving in non-conducting media they are exposed to a relatively high magnetic resistance. To reduce this magnetic resistance existing leakage fields try to pick up all flexible iron particles on the surface of the work piece in order to build a magnetic bridge over the defective area. This accumulation in the shape of a powder worm can be identified as defective area.

magnetic leakage flux



Wet testing method with water

Powder

for the wet testing method with water

(Additives are necessary)

Ref. No.	Packing unit	Particle size	Fluorescent colour	Daylight colour	suitable for		
					conventional inspection	automatic inspection	
Fluoflux powder 1 kg for 2500 - 5000 l of water	601.1	1 kg-tin	3 µm	yellow-green	brown	*	-
Fluoflux powder 1 kg for 2500 - 5000 l of water	601.2	1 kg-tin	14 µm	bright green	green	*	*
Fluoflux powder 1 kg for 2500 - 5000 l of water	601.4	1 kg-tin	8 µm	yellow-green	green	(*)	*
Ferroflux powder 1 kg for 100 - 200 l of water	605.1	5 kg-bag	0,2 µm	-	black	*	-

Concentrate

for the wet testing method with water

Ref. No.	Packing unit	Particle size	Fluorescent colour	Daylight colour	suitable for		Corrosion level acc. to DIN 51360	
					conventional inspection	automatic inspection		
Fluoflux concentrate with wetting agent, defoamer and rust inhibitor - contains silicone 1 l for 50 l of water	633.10 633.50	1 l-bottle 5 l-can	3, µm	yellow-green	brown	*	*	3
Fluoflux concentrate with wetting agent, defoamer and strong rust inhibitor 1 l for 40 l of water	655.2 655.25	1 l-bottle 5 l-can	3, µm	yellow-green	brown	*	*	0
Fluoflux concentrate with increased powder proportion, wetting agent, defoamer and strong rust inhibitor 1 l for 40 - 80 l of water	655.15 655.55	1 l-bottle 5 l-can	3 µm	yellow-green	brown	*	*	0 (40 l) 3 (80 l)
Fluoflux concentrate with increased powder proportion, wetting agent, defoamer and rust inhibitor 1 l for 40 l of water	655.31 655.35	1 l-bottle 5 l-can	3 µm	yellow-green	brown	*	*	3
Fluoflux high concentrate without additives (wetting agent and rust inhibitor to be added separately) 1 l for 500 - 1000 l of water	604.1	1 l-bottle	3 µm	yellow-green	brown	*	-	-
Ferroflux concentrate with wetting agent, defoamer and rust inhibitor - contains silicone 1 l for 50 l of water	616.1	1 l-bottle	0,2 µm	-	black	*	-	3

Physical basic conditions

What can be tested?

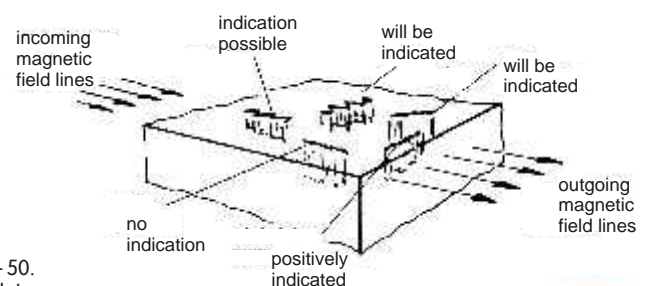
All ferromagnetic materials with a permeability $\mu > 100$.
Part of the group of the ferromagnetic materials are cast iron and all types of steel and their alloys with the exception of austenitic steels.

What can be detected?

All surface and near surface crack-type defects which, due to their position and size, proportionally influence the magnetic field, providing that the crack width-depth-length dimensions are in the ratio $> 1 - 10 - 50$.
Indication sensitivity to near-surface defects and inclusions rapidly reduces as depth increases.

When can a defect be detected?

Optimum crack detection occurs when the magnetic flux lines are at right-angles to the defect. However, the angle between the field direction and the expected defect position should not go below 30°.



Wet testing method with water

Additives

for wet testing method with water

	Ref. No.	Packing unit	Spraying and suspension effect	silicone-free	halogen-free	nitrite-free	suitable for	
							conventional inspection	automatic inspection
Wetting agent TN 6 1l for 500 - 1000 l of water	608.3	1 l-bottle	very good	*	*	*	*	*
Defoamer TS 4 1l for 1000 - 10000 l of water	609.1	1 l-bottle	-	-	*	*	*	*
Defoamer TS 5 1l for 500 - 10000 l of water	609.2	1 l-bottle	-	*	*	*	*	*
Rust inhibitor concentrate TR 6 1l for 100 - 200 l of water	618.10 618.50 618.20	1 l-bottle 5 l-can 30 l-can	-	*	*	*	*	*

Dry testing method

Powder

for the dry testing method

	Ref. No.	Packing unit	Particle size	Fluorescent colour	Daylight colour	suitable for	
						conventional inspection	automatic inspection
Floflux powder - fine -	610.2	5 kg-bag	0,1 - 0,2 mm	yellow-green	-	*	-
Ferroflux powder	611.04	5 kg-bag	0,1 - 0,2 mm	-	red	*	-
Ferroflux powder	611.05	5 kg-bag	0,1 - 0,2 mm	-	olive-green	*	-

Accessories

for testing under daylight

	Ref. No.	Packing unit
Background colour to brighten the component surface when Ferroflux powders are used Colour: white	695.1	500 ml-aerosol
Special cleaner for background colour white	695.2	500 ml-aerosol

ASTM centrifuge

with stand

The exact portion of magnetic powder suspended in oil or water can be determined with the ASTM centrifuge.

If the concentration is mixed correctly, a specified number of graduation marks must be obtained after a settling time of 30 minutes.

Magnetic particle suspensions already circulating in pump process should not be checked with the centrifuge, because dirt particles bias the result.



Ref. No. 135015

Cleaning

the test material system

	Ref. No.	Packing unit
System cleaner to clean and disinfect the test material tank and the system 1l for 50 - 100 l of water	695.4	1 l-bottle

Reference standard 1 and 2 acc. EN ISO 9934-2

with reference photo

When using magnetic particle suspensions it is of prime importance to check the indication efficiency of the test chemicals. Our scope of supply includes both, reference standard 1 and 2.

Our test material correspond to EN ISO 9934-2 und ASME-Code.

(except of 655.31/655.35)



Reference standard 1
Ref. No. 135012



Illustration at daylight

Reference standard 2
Ref. No. 135013



Shows the test result