



Very low frequency rotating magnetic field testing installation



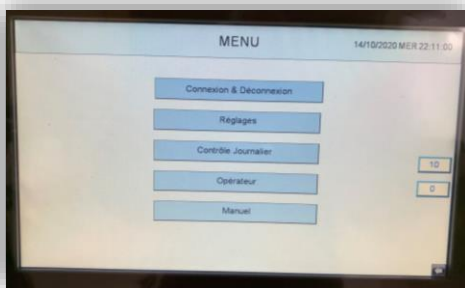
- ❑ Complete testing of any type of part in a single cycle
- ❑ Operation and control of the machine via a touch screen control
- ❑ Creation of testing programs adapted to each type of part
- ❑ Testing PV recording and export via USB port
- ❑ Rotating magnetic field → quick and efficient control without handling the part
- ❑ Possibility of manual control of the generators in magnetization and degaussing mode
- ❑ Possibility of launching testing cycles via the touch screen, push button or pedal



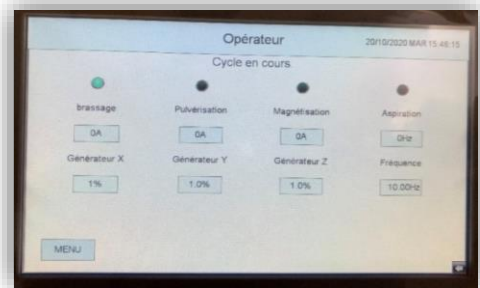
Option: tangential magnetic field measurement probe system



Use of the testing machine



Main menu of the testing program



Part testing cycle in progress

- ☐ Using the machine via a touch screen control
- ☐ Configuration of cycles, control and creation of programs adapted to each type of parts
- ☐ Possibility of setting the operating times of the pumps and the power of the generators
- ☐ Degaussing function at the end of the cycle or in manual mode
- ☐ Manual control of generators in magnetization and degaussing mode
- ☐ Manual control of the three pumps (spraying, suction, mixing)
- ☐ Recording of control reports with date, time, part number, indications observed and name of the operator
- ☐ Export files via USB port



Composition of the testing machine



Well and testing screen



Spray station



Low frequency electric current generators

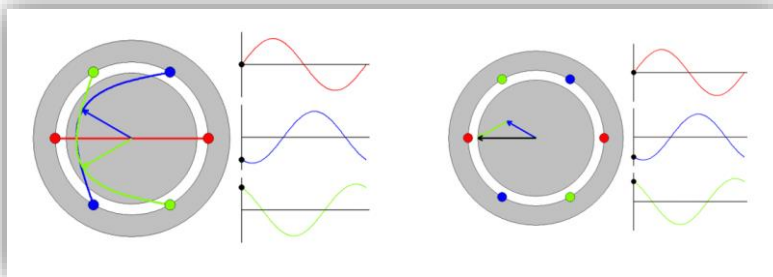
The testing machine is composed of:

- ☐ **A well made of non-magnetic material in which the part is inserted for inspection: volume of magnetization 750 x 750 x 1000 mm**
→ Customized sizing according to the dimensions of the testing parts
- ☐ **A touch control screen on an articulated arm:**
 - Launch of parts inspection cycles
 - Creation of testing programs
 - Export of control reports recorded via a USB port
- ☐ **A spray station**
 - A magnetic liquor storage bin (basic capacity of 100 L)
 - A magnetic liquor spray pump
 - A magnetic liquor suction pump from the control well to the storage tank
 - A magnetic liquor brewing pump in the storage bin
- ☐ **Three low-frequency electric current generator**
 - 0-2000A output current / 60 kVA power per generator
 - A main electrical control and management cabinet
 - Current frequency adjustable from a few Hz to 50Hz





Control by rotating magnetic field



Principle of rotating magnetic field phenomenon by alternating current phase shift



Testing of parts of all types and sizes

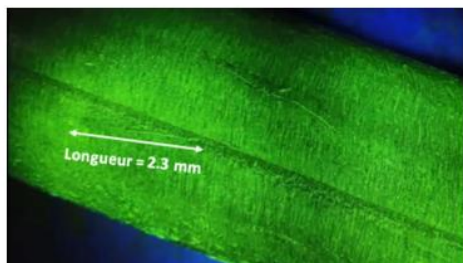
Advantages of control by rotating magnetic field:

- ☐ Quick and efficient control without handling the part
- ☐ Control of large series of parts in a short time / 1 part per minute
- ☐ Control of parts of all types in all directions over the entire surface of the part, no defects can be missed (rotating magnetic vector)
- ☐ Easy to set up → less qualified operators can perform checks without loss of efficiency (easily usable by COFREND level 1 operator)

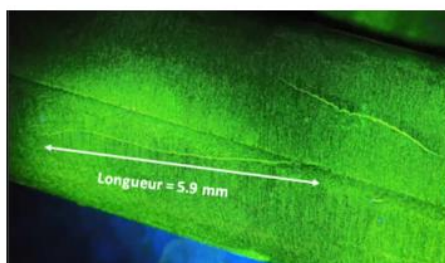


Low frequency magnetic field testing (10 Hz)

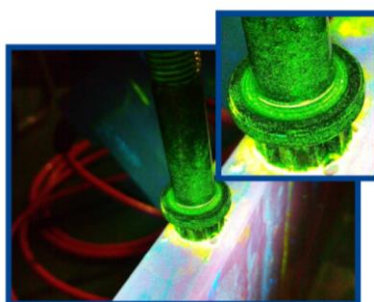
50 Hz



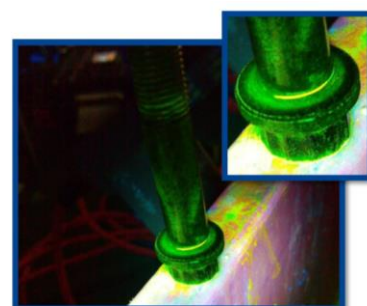
10 Hz



Increased depth of detectable defects



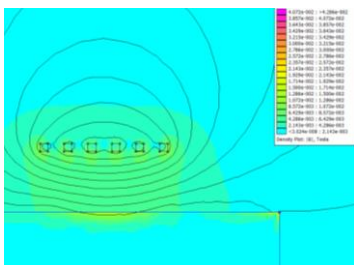
50 hertz



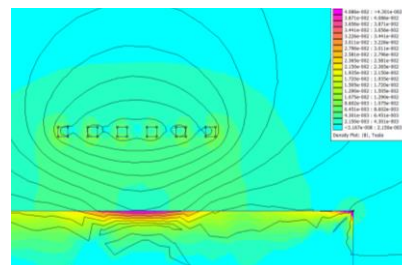
10 hertz

Improved contrast and increased indication / background noise ratio

$f = 50 \text{ Hz}$



$f = 10 \text{ Hz}$



Increased depth of penetration of low frequency magnetic field

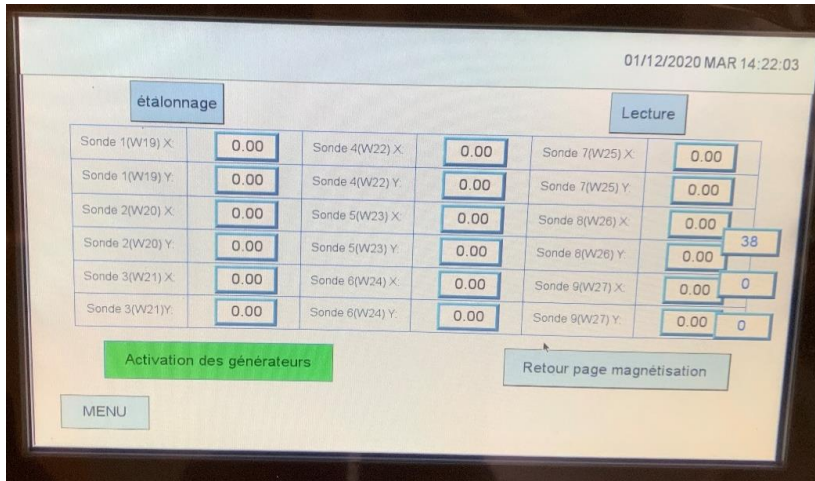
The use of the very low frequency magnetic field allows:

- ☐ Increased depth of penetration of magnetic field lines for effective testing of slightly underlying defects
- ☐ An improvement in the contrast between the background and the indication observed
- ☐ A lower overall power requirement than for a conventional 50 Hz magnetic field
- ☐ Less overall heating of the magnetization circuits and of the magnetic liquor
- ☐ Lower noise generated than for standard 50Hz thyristor generators
- ☐ **Compliance with European Directive 2013/35 / EU: reduction of operator exposure to the magnetic field**





OPTION: Tangential magnetic field measurement probes



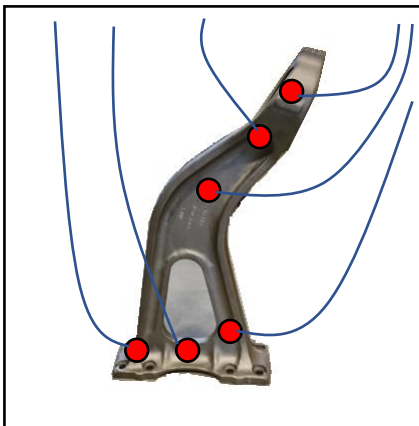
Probe "Measurements" menu



Two-axis measuring probe

Possibility of adding tangential magnetic field measurement probes:

- ☐ Two-axis measurement probes directly integrated into the machine software
- ☐ Use in manual mode to find out the tangent magnetic field as a function of the field applied at different points of the part
- ☐ Mapping of witness parts for the adjustment of testing programs (Number of custom-made probes according to needs)
- ☐ Possibility of fixing the probes on the parts to carry out the measurements in a simple way without crossing the limits of exposure to magnetic fields



(mTesla):		(mTesla)	
Sonde 1(W19) X	3.72	Sonde 4(W22) X	9.65
Sonde 1(W19) Y	7.72	Sonde 4(W22) Y	3.93
Sonde 2(W20) X	12.35	Sonde 5(W23) X	7.80
Sonde 2(W20) Y	18.59	Sonde 5(W23) Y	8.14
Sonde 3(W21) X	4.55	Sonde 6(W24) X	8.97
Sonde 3(W21) Y	12.51	Sonde 6(W24) Y	2.57