



# LETOMECC

# HELIOS 2 FISHSCALE

## HELIOS 2 FISHSCALE

THE NEW INSTRUMENT  
FOR FISH SCALE RISK  
ASSESSMENT

HELIOS 2 FISHSCALE is an innovative industrial equipment designed to measure the fish scale susceptibility of steels, which can improve the quality control of the vitreous enamel application process.

HELIOS 2 FISHSCALE can perform test according to Italian Standard UNI 11734 and European Standard EN 10209.

In addition, HELIOS 2 FISHSCALE can be used as a laboratory instrument to compare enamel performances during forced fish scale test.

HELIOS 2 FISHSCALE won SMAU Innovation Award in 2016.



## MAIN COMPONENTS & FEATURES

- 1 PC WITH DEDICATED HELIOS APP
- 2 ELECTROCHEMICAL CELL AND MEASURING PROBE
- 3 LIQUID PUMPS FOR AUTOMATIC SOLUTION RECIRCULATION
- 4 WORKBENCH

## TYPICAL APPLICATION

HOME APPLIANCE  
INDUSTRY

STEEL INDUSTRY

PORCELAIN ENAMEL R&D  
LABORATORIES

## FISH SCALE: THE NIGHTMARE OF ALL ENAMELLERS

Fish scale defect is mainly caused by an excess of hydrogen absorption in the steel during enamel firing.

In the subsequent cooling stage, the hydrogen atoms tends to slowly migrate towards the enamel-steel interface. In this region, hydrogen atoms concentrate as the vitreous layer is not permeable to hydrogen, thus reaching high pressure. As a consequence, small chips of enamel may detach from the layer even later in time on the end of the product manufacturing, making the part non-compliant.



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## ADVANTAGES

- Easy calibration using pure iron specimens
- Robust equipment for industrial use
- Quick measures
- Test result on steel is not affected by the enamel or firing condition
- Safe analysis with non hazardous chemicals
- User-friendly interface
- Data can be stored and are remotely accessible



## FUNCTIONING

The steel sample is directly exposed on one side to the solution contained in the electrochemical cell and on the other to the probe. During the test, a defined current is set between the steel sample (cathode) and the anode. Hydrogen atoms are consequently produced inside the cell, on the steel surface. Afterwards they are adsorbed and can diffuse through the metal thickness, until they desorb from the other surface.

The probe, containing a hydrogen gas sensor, is located on the exit sample surface in order to measure the flux of permeating hydrogen. At the end of the test, the hydrogen flux is processed by proper mathematical codes to assess the hydrogen diffusivity in the steel and consequently the steel suitability for enamelling process.

## ACCESS



**WATCH  
THE VIDEO**



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