



# DEMO CENTER

TEST - EXPERTISE - TRAINING - R&D

TEST - R&D

EXPERTISE

EQUIPMENT



TRAINING

[www.soloswiss.com/metallurgy](http://www.soloswiss.com/metallurgy)



Metal Heat Treatment

## TEST - R&D

### AT DEMO CENTER OR ON PRODUCTION SITE

Tests for study, development or pre-production.

Assistance and metallurgical expertise.

Process optimization: improvement of material properties, increased productivity, reproducibility, definitions of heat treatment ranges.

Reduction of consumption and emissions.

Compliance (safety and environment) of your furnaces.



The DEMO CENTER team consists of 4 qualified metallurgists, 2 material engineers, a safety & standards engineer and an Industry 4.0 engineer with a total of 140 years of experience at SOLO Swiss.

## EXPERTISE

### METALLURGY

Copper alloys, aluminum alloys, carbon steels, low alloyed steels, alloyed steels, stainless steels, titanium alloys, nickel alloys, precious metals.

### ATMOSPHERES

Flammable gases: Hydrogen, Cracked ammonia, Methanol, Propane, Methane.

Inert gases: Nitrogen / Argon / Helium.

Oxidizing Gases: Air / Oxygen / Carbon Dioxide.

### ATMOSPHERE CONTROLLED HEAT TREATMENTS

Annealing, hardening, tempering, brazing, carburizing, carbonitriding, nitriding, nitrocarburizing, oil / salt hardening.

### DIMENSIONS OF PROCESSED PARTS

Up to 60 cm and 65 kg.

### CONTROLLING PROCESS PARAMETERS

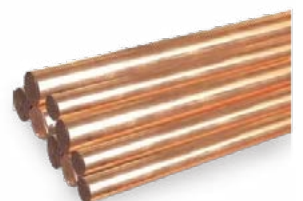
O<sub>2</sub> probe, CO / CO<sub>2</sub> / CH<sub>4</sub> analyzer, oximeter, dew point, pyrometry (temperature monitoring on part and according to specific requests).

### QUALITY REPORT

Hardness measurement (Hv, HRC), microstructure control, deformation control.

### COMPLIANCE WITH INTERNATIONAL STANDARDS

CQI-9, AMS 2750E.



## TRAINING

### METALLURGY & THERMAL TREATMENT

Heat treatment basis, atmospheres used in heat treatment, how insure safety in heat treatment workshop and operations.

### BY ACTIVITY / INDUSTRY

Heat treatment in watchmaking and micromechanics, heat treatment in medical, automotive and aeronautics.

### QUALITY

Metallographic analyzes and controls.

### INTER-COMPANY TRAINING

According to the annual program (max. 15 participants): theoretical classroom training with implementation on the DEMO CENTER equipment.

### TRAINING ON CUSTOMER SITE

DEMO Center is a member of **F S E A** ■ Swiss federation for continuing training



*The courses are taught in French, English, German or Italian.*

## EQUIPMENT

### CHARACTERIZATION EQUIPMENT

Cutting, coating, polishing for sample preparation.  
Hardness (HRC) / micro hardness (Hv).  
Optical microscopy (Olympus BX53M x 1000).  
Image analysis with Stream software (structure and microstructure, decarburization, grain size).

### 15 HEAT TREATMENT FURNACES

SOLO P80 carburizing / hardening / carbonitriding furnace, oil quenching, salt quenching.  
Continuous furnace SOLO 322-10/80.  
BOREL retort furnaces 650 °C and 1100 °C.  
Tilting furnace BOREL 1050 °C with oil quenching.  
BOREL chamber furnaces with removable shovel under protective gas.  
Various ovens and BOREL ovens from 200 °C to 1500 °C.

In agreement with our partners, tests on SOLO or BOREL furnaces currently in service are also possible on request.





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