Testing Service

It's the new service, based on client requests, for the execution of tests and analyzes at the laboratories and pilot plants of CSM.

To receive a quote you must complete this form. The request will be analyzed by our manager within 48h.

If necessary, you can also send photographs of the component or system to the address testingservices@c-s-m.it and you will be contacted by our specialist who will help you in the selection of the required tests.

Request for Quote

To receive a quote:

- **Fill in customer data**
- **Select your tests from the list, by simply specifying the quantity**
- **Enter notes to describe the request**
- **Press the "send form"**

Your request will be analyzed by our specialists and you will be contacted.

Contact

Centro Sviluppo Materiali SpA
Via di Castel Romano 100 – 00128 - Roma
Telephone: + 39.06.5055760 - +39.320.7798803
e-mail: testingservices@c-s-m.it

Client Data

Name*	
Surname*	
Role*	
Email*	
Telephone*	
Company*	
Address*	
Geographical Area*	Italy

*Note: fields marked with * are required*

Note for the Client

Notice of confidentiality: data will be processed by Centro Sviluppo Materiali as provided by law.

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General list of tests

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METALLOGRAPHY AND HEAT TREATMENT	Required Quantity
Visual inspection. Sample as received (documentation by camera or stereo microscope)	
Macroscopic Observation. Sample preparation, documentation porosity and voids or cracks and other defects	
Macroscopic Observation. Sample preparation, etching (ASTM E381), documentation segregations or chemical heterogeneity, or decarburation	
Macroscopic Observation. Sample preparation, etching, documentation Sulfur Prints for Macrostructural Evaluation (- Baunamm - ASTM E1180)	
Metallographic Analysis. Sample preparation, mounting using resin, grinding and polishing, observation and documentation cracks and other defects, or inclusion, or porosity, or precipitation, (n.4 photos)	
Metallographic Analysis. Sample preparation, mounting using resin, grinding and polishing, etching, observation and documentation structure (n.4 photos)	
Metallographic Analysis. Porosity (ASTN A276), inclusion (ASTM E45, ASTM E768, ASTM E1245, UNI 3244, SEP 1570), or grain size (ASTM E112, ASTM E1181), or % phases (point counting ASTM E562), or SDAS, or decarburization (ASTM E1077)	
Metallographic Analysis welded joints. Sample preparation, mounting using resin, grinding and polishing, etching, observation and documentation structure BM, HAZ, WELD. (max n.6 photos)	
Metallographic Analysis. Hardness and micro hardness (n.3 imprint)	
Metallographic Analysis by SEM – EDS. Sample preparation, observation and documentation structure (max n.5 photos and max n.5 EDS)	
Metallographic Analysis by SEM – EDS. Sample preparation, mounting using resin, grinding and polishing, etching, metallization, observation and documentation structure (max n.5 photos and max n.5 EDS)	
Photos additional	
EDS additional	
Metallographic Analysis by EBSD. Sample preparation, electrochemical polishing, analysis	
Metallographic Analysis by AIA (automatic analysis. Sample preparation, mounting using resin, grinding and polishing, etching, metallization, observation and documentation	
Metallographic Analysis soft replica by SEM. Sample preparation, drawing by soft replica, metallization, observation and documentation (max n.5 photos)	
Heat Treatment. Max temperature 1200°C	
Failure Anlysis	
Note (250 Char.)	

Send

TEM & NANOSCOPY	Required Quantity
TEM imaging, EDS analysis	
Extraction replicas	
Specimens preparation for materials science	
Rental with operator (for metals) or without operator	
Note (250 Char.)	

SURFACE ANALYSIS AND DIFFRACTOMETRY	Required Quantity
Qualitative depth profiles GDOES	
Quantitative depth profiles GDOES	
Identification of iron oxide in mixture	
Phases identification on thin films	
Phase analysis on powders, coatings and slag	
Texture analysis O-D-F on steels	
Inverse pole figures on steels	
Determination of diffraction peak with (FWHM)	
Determination of grain dimensions on steels	
Volume fraction of austenite on steels without carbide	
Determination of texture coefficient on electro zinc coatings	
Stress analysis in omega geometry	
Note (250 Char.)	

HIGH TEMPERATURE CHEMISTRY	Required Quantity
Differential thermal analysis (1650°C)	
Thermo gravimetry (1650°C)	
Thermal conductivity (1500°C)	
Thermal diffusivity (1500°C)	
Corrosion test (1500°C)	
Note (250 Char.)	

Send

MELTING TECHNOLOGIES AND METALLURGICAL CHEMISTRY	Required Quantity
Tundish casting: flow simulation by water modeling	
Mould casting: flow simulation by water modeling	
Ladle steelmaking: flow simulation by water modeling	
Note (250 Char.)	

ANALYTICAL CHEMISTRY	Required Quantity
Determination of the composition of carbon steels, low and alloy steels by FRX	
Qualitative / semi-quantitative determination of carbon steels, low and alloy steels by FRX	
Determination of total hydrogen in steels	
Calcium and magnesium in steels by ICP-OES	
Determination of C and S	
Determination of O and N	
Determination of composition of steels and non-ferrous alloys by ICP-OES (10 elements)	
Determination of trace elements (B, As, Pb, ...) in steels by ICP-MS (6 elements)	
Determination of total Al in steels	
Determination of acid-soluble Al in steels	
Note (250 Char.)	

CERAMICS & HOT FORMING	Required Quantity
Sintering and expansion curve	
Thermal treatment (forno Hereuse)	
Thermal treatment TAV	
Composite panels RTM	
Note (250 Char.)	

Send

REFRACTORY	Required Quantity
Cold Crushing Strenght	
Cold Modulus of Rupture	
Hot Modulus of Rupture	
Bulk Density of Powders	
Sieve Analysis	
Melting Behavior of Casting Powders	
Thermal Shock by water cooling	
Reversible Linear Dimensional Variation	
Refractory Under Load / Creep Test	
Porosimetry by Mercury Intrusion	
Cold Gas Permeability	
Hot Gas Permeability	
Note (250 Char.)	

TRIBOLOGY	Required Quantity
Fretting	
Pin on disk	
High temperature wear test	
Thermal fatigue	
Slurry	
Scratch test	
Ring on ring	
Note (250 Char.)	

Send

SURFACE TREATMENT AND CORROSION PROTECTION	Required Quantity
Coating thickness	
Gravimetric determination of the mass per unit area	
Gravimetric determination of the uniformity mass per unit area	
Aesthetic characterizations (Gloss)	
Aesthetic characterizations (Color)	
Coating hardness (pencil)	
Coating hardness (Buchholz)	
Abrasion resistance (Taber Test)	
Coating hardness (Scrub test)	
Adhesion tests of coatings (Pull-off)	
Adhesion-ductility tests of coatings (T-bend)	
Adhesion-ductility tests of coatings (cupping test)	
Adhesion tests of coatings (impact test)	
Atmospheric corrosion tests	
Cyclic corrosion testing VDA	
Cyclic corrosion testing NORSOK	
Cyclic corrosion testing SAE	
Immersion tests	
UV-CON	
Salt spray test (neutral, acid)	
Exposure in humid cabinet	
Humidostatic chambers continuous condensation	
Metallic coating electrodeposition	
Electrolytic and chemical pickling	
Degreasing and cleaner apparatus for steel and various material surfaces	
Note (250 Char.)	

Send

ORGANIC COATINGS AND PLASTICS	Required Quantity
Coating thickness	
Aesthetic characterizations (Gloss)	
Aesthetic characterizations (Color)	
Coating hardness (pencil)	
Coating hardness (Buchholz)	
Abrasion resistance (Taber Test)	
Coating hardness (Scrub test)	
Rubbing test (MEK)	
Coating adhesion (X test)	
Coating adhesion (cross cut)	
Coating adhesion (Pull-off)	
Coating adhesion-ductility (T-bend)	
Coating adhesion-ductility (cupping test)	
Coating adhesion (impact test)	
Atmospheric corrosion	
Cyclic corrosion testing VDA	
Cyclic corrosion testing NORSOK	
Cyclic corrosion testing SAE	
Immersion test	
UV-CON	
Salt spray test (neutral, acid)	
Exposure in humid cabinet	
Humidostatic chambers continuous condensation	
Density of paints (pycnometer)	
Viscosity of paints (Ford Cup)	
Solid content of paints	
Hardness Shore A	
Hardness Shore D	
Tensile tests	
3 point bending tests	
4 points bending tests	
Compression tests	
Fatigue tests	
High temperature tensile tests (up to 250°C)	
Adhesion tests (Lap Shear test)	
Adhesion tests (Peel test)	
Applying of organic coatings	
Note (250 char.)	

Send

MAGNETIC MEASUREMENT	Required Quantity
Magnetization curve at industrial frequencies (50 Hz/60 Hz) obtained by means Epstein frame or Single Sheet Tester (IEC 60404-2; IEC 60404-3)	
Magnetization curve at medium frequencies (10-1000 Hz) obtained by means Epstein frame or Single Sheet Tester - (IEC 60404-10)	
Hysteresis Loop at industrial frequencies (50 Hz/60 Hz) obtained by means Epstein frame or Single Sheet Tester	
Hysteresis loop at medium frequencies (10-1000 Hz) obtained by means Epstein frame or Single Sheet Tester	
Resistivity measurement at room temperature	
Separazione delle perdite su materiali CGO, HGO, NGO	
Standard magnetic characterization of grain oriented Electrical Steels: core losses measured at 1.5 and 1.7 T and J800 measurement. (EN 10107)	
Standard magnetic characterization of Non Oriented Electrical Steels: core losses measured at 1.0 and 1.5 T end J25, J50 e J100 measurement. (EN 10106)	
Standard magnetic characterization of semi-finished materials (EN 10341)	
Magnetostriction Curves l(p-p), l(0-p) at industrial frequencies (50 Hz/60 Hz) obtained by means Single Sheet Tester	
Butterfly loop at industrial frequencies (50 Hz/60 Hz) obtained by means Single Sheet Tester	
Harmonic analysis of magnetostriction signal and evaluation of the magnetostriction contribution to acoustic noise in transformers (Kawasaki Steel model)	
Standard AC magnetic characterization of electrical steel sheets (MPG 100 Brockhaus)	
Note (250 Char.)	

Send

LABORATORY SIMULATION OF THERMAL-MECHANICAL CYCLES OF SPECIALTY STEELS	Required Quantity
Hot Rolling and Cold Rolling Pilot Plants	
Annealing Simulators and Furnaces (50 °C to 1400 °C) Annealing Atmospheres : H2,N2,He,Ar,H2O vapor., NH3, CO, CO2, O2, Aria, e their combinations in controlled content combinations, and Vacuum. Cooling: controlled cooling rates, water quenching	
Pilot Plant for continuous annealing treatment of mini-coils (15 m length, 1100°C maximum temperature) to simulate on Pilot Scale for industrial trials/scaling up continuous annealing treatment of industrial cold rolled strips for the production of Electrical Steels	
Nitriding	
Carburation	
Quenching, Annealing, Hardening and Tempering	
Note (250 Char.)	

WELDING	Required Quantity
Tekken Test	
Conventional welding test	
Laser Welding and Friction Stir Welding test	
Radiographic Testing	
Ultrasonic Testing	
Magnetic Particle Testing and Penetrant Testing	
Note (250 Char.)	

Send

CREEP	Required Quantity
Stress Rupture	
Stress Rupture (hourly cost extra)	
Creep-Rupture	
Creep-Rupture(hourly cost extra)	
Stress Rupture	
Stress Rupture (hourly cost extra)	
Creep-Rupture (time max 30 hours)	
Creep-Rupture (time max 70 hours)	
Creep-Rupture (time max 100 hours)	
Creep-Rupture (time max 1000 hours)	
Creep-Rupture (time max 3000 hours)	
Creep-Rupture in ARGON	
Creep-Rupture in ARGON: (hourly cost extra)	
Thermal cycles	
Note (250 Char.)	

Send

MECHANICAL TESTING	Required Quantity
Fatigue Crack Growth Rates da/dN at room temperature	
Fatigue Crack Growth Rates da/dN in environment or at high temperature (24 hours)	
Strain-Controlled Fatigue Test at room temperature (24 hours)	
Strain-Controlled Fatigue Test at room temperature (hourly cost extra)	
Strain-Controlled Fatigue Test T< 1100°C (24 hours)	
Strain-Controlled Fatigue Test T< 1100°C (hourly cost extra)	
Thermo-Mechanical Fatigue Behaviour (24 hours)	
Thermo-Mechanical Fatigue Behaviour (hourly cost extra)	
Rotating Bending Fatigue Tests	
Fatigue pre-cracking (time max 4 hours)	
Force Controlled Fatigue Test at room temperature	
Force Controlled Fatigue Test at room temperature at Tmax=1000°C	
Fatigue testing on rail	
Charpy pendulum impact test, +23°C ≤T≤+40°C (n°3 specimens)	
Charpy pendulum impact test, -46°C ≤T<+23°C (n°3 specimens)	
Charpy pendulum impact test,-197°C ≤T<-46°C (n°3 specimens)	
Charpy pendulum impact test at low and high temperature	
Measurement of Fracture Toughness K, J, and CTOD (δ), -20°C ≤T<+20°C according to BS 7448 or similar	
Measurement of Fracture Toughness K, J, and CTOD (δ), -70°C ≤T<-21°C according to BS 7448 or similar	
Drop-Weight Test to Determine Nil-Ductility Transition Temperature according to ASTM E208.	
Fatigue on components (24 hours)	
Fatigue on components (hourly cost extra)	
ROCKWELL and VICKERS Hardness test at room temperature	
Brinell Hardness test at room temperature	
NICK break test	
Tensile test at room temperature (Metallic materials) according to UNI EN ISO 6892-1	
Tensile test at high temperature (Metallic materials) according to UNI EN ISO 6892-2	
Compression and tensile test at room temperature	
Tensile test at room temperature to determine (n,K)	
Tensile test on welded joint, bolt, fasteners	
Bend test (destructive test on weld in metallic material)	
Tensile test on welded joint according to UNI EN 1320	
Tensile/Compression from T>+23°C to T<300°C according to UNI EN ISO 6892-2	
Tensile/Compression from T≥300°C to T<1000°C according to UNI EN ISO 6892-2	
Tensile/Compression from T≥1000°C to T<1500°C according to UNI EN ISO 6892-2	
Hot tensile tests with programmed thermal cycles which include melting and "in situ" solidification of test samples, to obtain solidification structures similar, to those of industrial products.	
Note (250 Char.)	

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ELECTROCHEMISTRY AND CORROSION	Required Quantity
ASTM G31. Immersion Corrosion Testing of Metals (duplicate)	
ASTM A-262 Practice A and D; 763 W. Susceptibility to Intergranular Attack in Ferritic/austenitic Stainless Steels (in duplicate)	
ASTM A-262 Practice B and E; A763 X,Y,Z. Susceptibility to Intergranular Attack in Ferritic/austenitic Stainless Steels (in duplicate)	
ASTM A262 Practice C, Susceptibility to Intergranular Attack in austenitic Stainless Steels - 5 boiling periods of 48 h each	
ASTM G34 Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys (EXCO Test)	
ASTM G28 - A,B Test Methods of Detecting Susceptibility to Intergranular Corrosion in Wrought, Nickel-Rich, Chromium-Bearing Alloys	
ASTM G36 Evaluating Stress-Corrosion-Cracking Resistance of Metals and Alloys in a Boiling Magnesium Chloride Solution	
ASTM G48 - A,B Test Methods for Pitting and Crevice Corrosion Resistance of Stainless Steels and Related Alloys by Use of Ferric Chloride Solution	
ASTM G36 - Stress-Corrosion-Cracking Resistance evaluation of Metals and Alloys in a Boiling Magnesium Chloride Solution	
ASTM G44 - Exposure of Metals and Alloys by Alternate Immersion in Neutral 3.5 % Sodium Chloride Solution	
NACE TM 01-77 Method A (Proof Ring, nitrogen box) Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H2S Environments	
NACE TM 01-77 Method B, C (four point, C-ring) (triplicate) Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H2S Environments	
NACE TM 01-77 Method D Standard Double-Cantilever-Beam (DCB)	
NACE TM 01-77 (Dead Weight, fino a 200°C, 50 bar) Method A Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H2S Environments (Dead Weight, fino a 200°C, 50 bar)	
Autoclave Exposure (2,5/3,5 L max 300°C e 300 bar)	
Autoclave Exposure (10/20 L max 300°C e 300 bar)	
NACE TM 0198 - Slow Strain Rate Test Method for Screening Corrosion-Resistant Alloys (CRAs) for Stress Corrosion Cracking in Sour Oilfield Service	
SSRT IN AUTOCLAVE (max 300°C e 300 bar)	
Cyclic SSRT (max 300°C e 300 bar)	
ASTM G48 - Pitting and Crevice Corrosion Resistance of Stainless Steels and Related Alloys by Use of Ferric Chloride Solution	
ASTM G44 - G47 Exposure of Metals and Alloys by Alternate Immersion in Neutral 3.5 % Sodium Chloride Solution for Determining Susceptibility to Stress-Corrosion Cracking of 2XXX and 7XXX Aluminum Alloy Products1	
ASTM G123 - (U-bend/Four point) Stress corrosion cracking in boiling acidified sodium chloride solution.	
ASTM G61 Potentiodynamic Polarization Measurements for Localized Corrosion Susceptibility of Iron-, Nickel-, or Cobalt-Based Alloys	
Pickling decapaggio/ descagliatura	
Depassivation/passivation time assessment	
Electrochemical metal deposition	
Electrochemical Impedance Spettroscopy	
Potensiostatic/galvanostatic measurements	
Electrochemical dissolution	
Note (250 Char.)	

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FULL SCALE TESTING	Required Quantity
Hydraulic burst test (max pressure 2500 bar))	
Hydraulic High Pressure Collapse Test (HPCT – max pressure 1700 bar)	
Leak Testing, gas pressure (Nitrogen gas max 2500 bar)	
Hydraulic pressure cycling on vessels, bottles, pipes, etc., up to 10 days duration (max pressure 700 bar)	
Hydraulic pressure cycling on vessels, bottles, pipes, etc., for each day after the 10th day (max pressure 700 bar)	
Residual Stress Measurements (hole drilling, Xray)	
Drop weight tear test	
West Jefferson test (fino a -30°C, pressione max 2000 bar)	
Bending test on pipeline section	
Wide Plate Tear Test	
Fatigue resonant test (max pressure 500 bar, max OD 24")	
Combined load machine tensile and bending max 4000tons	
Four point bending on line pipe section up to OD 56", pipe soil interaction	
Note (250 Char.)	

ADVANCED CASTING TECHNOLOGIES	Required Quantity
Manufacturing process VAR plant	
Manufacturing process VIM plant (Vacuum Induction Meltin)	
Manufacturing process VAR plant (Vacuum Arc Remelting)	
Manufacturing process ESR plant (Electro Slag Remelting)	
Manufacturing process VIGA plant (Vacuum Induction Gas Atomization)	
Note (250 Char.)	

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COMBUSTION LAB	Required Quantity
Combustion system characterization (stability field, flue gas analysis, flame visualization) up to 2.5 MW_{th} (gas based) burning natural gas	
Combustion system characterization (stability field, flue gas analysis, flame visualization) up to 2.5 MW_{th} (gas based) burning syngas	
Thermal Fatigue & quenching tests (heat up to 1300°C e cooling by air and/or water)	
High pressure water descaling tests (flow rate up to 132 l/min at pressure up to 400 bar, travel speed: 1 to 4.2 m/s)	
Note (250 Char.)	

ROLLING & FORMING	Required Quantity
Roughness	
Erichsen test (6 imprints)	
(FLD) Forming Limit Diagram (5 + 5 test specimens included the realization)	
Fukui Test	
Strip Draw Test	
Limit Curve Cracking Coated Materials	
Swift test (test up to failure)	
Electrochemical etching (application grid) - [4 hours]	
Deformation Measurements (reading grid) - [8 hours]	
Hydraulic Press Usage (max 250t) -[per hour]	
Hot Rolling (height 120mm x width 200mm, max 250 t) - [8 hours]	
Cold Rolling (height 5mm x width 200mm, max 120 t) - [8 hours]	
Thermal Treatments (electric furnace) - [8 hours]	
Note (250 Char.)	

WASTE VALORIZATION	Required Quantity
Rotary Kiln Gasifier for syngas production from organic waste 100 kg/h	
Rotary Kiln Heater for pyrolysis processes 50 kg/h	
500 kW Plasma Torch Plant for hazardous waste inertization	
Note (250 Char.)	

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