

# Material Analysis Capabilities

At Luma Metall we have a well equipped laboratory for testing and development. In our laboratory we carry out various wet chemistry, physical and thermal analysis as well as corrosion testing. You are welcome to discuss with our chemists on how we could assist you to meet your requirements in materials testing and analysis.



**The instruments, equipments and various laboratory set-ups available at Luma Metall include:**

## **(Flame) Atomic Absorption Spectroscopy (AAS)**

AAS is used for quantitative determination of elemental composition of an analyte in solution. The technique is based on absorption of light. The absorption is specific for each particular element and is detected.

Hollow cathode lamps are today available at Luma Metall to study Au, Ag, Ni, Fe and Cu in an air acetylene flame. The detection limit is of ppb. The air acetylene mix is the preferable flame for determination of about 35 elements. The AAnalyst 200 is easy to use and is a suitable choice for metal analyses, process control.



## **Scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS)**

2 SEM microscopes are available at Luma Metall; JCM 5000 and JCM 6000.

JCM 6000 has EDS analysis possibilities, to quantitatively determine elemental concentrations in a solid sample.

Both microscopes are table top microscopes, which are easy to operate. Magnifications of 40 000 – 60 000 are possible. Secondary and back scatter electron modes are available. The secondary mode gives topographic information and the back scatter mode gives an atomic number contrast. Low vacuum mode can be used if low conducting specimen is to be studied.

The SEM analysis can give information about;

- Topography and morphology
- Orientation of grains
- Crystallography
- Chemistry

The maximum specimen size is 50 mm x 70 mm.



### Grinding and polishing equipment

LaboPol-I and LaboForce-I equipment is available at Luma Metall for grinding and polishing. The equipment is user friendly and easy to operate. It can be used for example to grind and polish epoxy molded samples to study cross sections;

- Grain size
- Defects
- Phases
- Coating distribution
- Corrosion

### Climatic Test cabinet

A climate chamber VCL 4003 is available at Luma Metall. This is a temperature and a temperature and humidity test cabinet.  $t = (-)40\text{ }^{\circ}\text{C} - 180\text{ }^{\circ}\text{C}$ .

For climatic tests;

$t = 10\text{ }^{\circ}\text{C} - 95\text{ }^{\circ}\text{C}$  and the relative humidity that can be used is 10 % rh – 95 % rh.

The climate test cabinet is used to study the resistance, corrosion resistance, of the material to temperature and temperature with a pre set humidity. The cabinet parameters can be cycled.

### Tensile test machine

The tensile tester is a Z2.5 TN table top machine from Zwick; the maximum load available is 1 kN and the maximum testing speed is 800 mm/min.

The Tensile tester is used to test core/final material tensile strength and the adhesion of applied coatings. The test results are evaluated automatically.

### Laser equipment for ovality measurements

Laser equipment, model LDS0200, from Cersa – MCI is easy to use and show excellent metrology performances. The LDS0200 is not sensitive to wire vibration.

The measuring range is between 5 to 200  $\mu\text{m}$  and the repeatability of the

measurements is  $\pm 0.03\%$ .

### Light optical microscope (LOM)

Reflected Light Microscope, Axiolab A from Zeiss, for metallographic studies is available at Luma Metall, with a maximum magnification of 500 times.