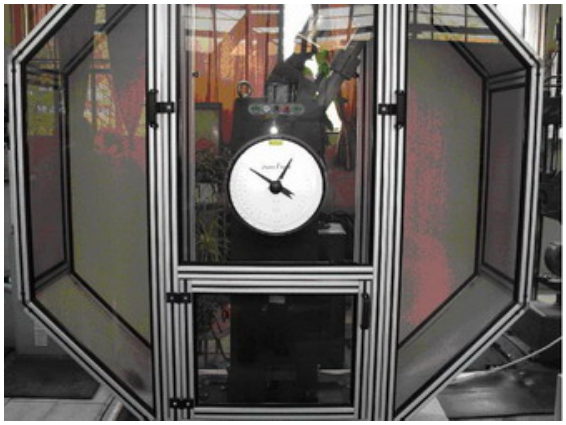
# SPECIAL Steels - Rounds

## Quality Control procedures

Special attention is paid to ensure consistent product quality. Destructive testing on samples from the bars in the Quality Control Laboratory (QCL) and also non-destructive tests (NDT) on the product itself during the production flow are performed.

The Quality Control Laboratory is well equipped with chemical, physical and mechanical testing facilities to ensure that all of the customer's requirements are met, such as emission spectrometer, impact tester, tensile strength tester among others (see below photographs).


***Emission spectrometry facility***



***Impact test facility***

***Tensile strength test facility***

Regular quality control procedures appear in the following table. Other procedures can be carried out according to specific customer requirements.

| QCL Department | Tests |
|---|---|
| Chemical Analysis | Emission Spectrometry |
| | Analytical Chemistry |
| | LECO gas analysis |
| Mechanical Testing | Tensile strength test |
| | Impact test |
| | Hardenability test |
| Metallographic Testing | Blue fracture test |
| | Macroetching test |
| | Sulfur print test |
| | Grain size test |
| | Cleanliness test |

Consistent product quality is ensured in on-line non destructive testing (NDT) facilities (see below).

The non-destructive testing procedures are:

| On-line NDT Department | Function |
|---|---|
| Eddy current magnatest | Material Identity checking |
| Ultrasonic test | Detection of internal defects |
| Circoflux leakage method | Detection of surface cracks |

Material identity checking is also done by use of a portable spectrometer and portable ultrasonic devices can be used for manual inspection of individual bars. Detection of surface defects can be also done with magnetic particles inspection method.

## Research & Development

The Quality Control Laboratory, in an effort to improve product quality, is supported by the Hellenic Metals Research Centre (ELKEME) founded by VIOHALCO Group. ELKEME provides specialized services for detailed investigation of metallurgical problems before or during production.

ELKEME is equipped with state of the art research equipment e.g.:

- Scanning Electron Microscope
- Atomic Scope Microscope
- X ray Diffractometer
- Atomic Absorption
- Inductive Coupled Plasma
- Differential Thermal Analysis