

MATERIALS TESTING AND CONSULTANCY FOR THE TANZANIAN INDUSTRY

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During the planning stage of the Faculty of Engineering, University of Dar es Salaam, strong emphasis was placed on planning the capacity of the testing machinery within the Materials Technology Laboratory so as to cover not only the teaching and research programs within the Faculty, but also the testing consultancy requirements of local and national industries.

During this last year service requests from industry have steadily increased, such that at the present time more than twenty different companies are receiving consultancy and testing reports on materials either on a continuous, or on occasional basis.

In the case of the leading steel ingot and billet as well as reinforcement steel producers this permanent collaboration and mutual consultancy has led to the fact that a high grade quality level of the products has been reached and can be maintained as well.

In other cases, failure analysis and evaluation of materials exposed to adverse environmental conditions have led to substantial and effective improvement proposals, predominantly considering locally available materials or improvement techniques, as e.g. surface treatment or hardening processes.

At present, the following testing facilities and equipments are available for public request:

Equipment

1. Materials Testing: Metals
 - 1.1 Testing of mechanical properties
 - 1.1.1 Destructive testing
Tensile test, compression test, shear test, bending test, torsion test, impact-bending test (-70°C - 250°C), torsion-bending test, cupping test, fatigue test.
 - 1.1.2 Non-destructive testing
Hardness test, x-ray test, ultrasonic test, spark spectroscopy, magnetic flow detection, layer thickness measurement.
2. Materials Testing: Non-metallic materials
 - 2.1 Testing of mechanical properties
 - 2.1.1 Destructive testing
same as under 1.1.1
 - 2.1.2 Non-destructive testing
Hardness test, x-ray test, ultrasonic test

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3. Metallographic Examination and Heat Treatment

3.1 Preparation of microsections

Grinding, polishing, etching

3.2 Microscopic observations

Ordinary and widefield microscopy, stereo microscopy, micro-hardness test

3.3 Annealing and quenching of metallic specimens, muffle furnace (1400°C), tube furnace (1300°C), salt bath oven

4. Corrosion Testing

4.1 Standardized long-term exposure tests for checking the corrosion, aging or weathering resistance of materials.

Weather tests in the ocean climate, alternate - and continuous-immersion tests in natural sea water.

5. Miscellaneous Facilities

Chemical analysis, including determination of carbon contents in steel.

Micro and macro-photography. Photoelasticity measurements for stress and analysis. Wire strain gauge and inductive displacement measurements.

A special field of consultancy will be devoted to find dependable data of locally available materials vs. imported ones, for comparison and replacement, to the benefit of developing adapted technologies for industrial, commercial and rural requirements.

All data will be fed into the Tanzania Bureau of Standards scheme, thus being available for appropriate utilisation.

Requirements for materials testing and consultancy are welcomed; a list of moderate fees for such tests is available upon request.