

IMEKO 20th TC3, 3rd TC16 and 1st TC22 International Conference
Cultivating metrological knowledge
27th to 30th November, 2007. Merida, Mexico.

The intercomparison of Charpy impact pendulum calibration

C. Ferrero

Istituto Nazionale di Ricerca Metrologica (INRiM). Torino, Italy.

Abstract

The increasing demand, in particular in Italy, for calibration and certification work and for the accreditation of new calibration centres, is due to a number of concomitant factors:

The need for industry to operate in accordance with EN 45000, ISO 9000 and ISO17025 as regards quality; the Italian law 273/91 establishing the National Calibration System, which comprises the Primary Metrological Institutes and the SIT centres).

INRiM provides for traceability to the standards of mechanical, thermal and electrical quantities all over the country, so as to allow high-quality measurements and tests to be made.

At present the number of SIT centres is **194 in total, plus 24 for force quantity** (load cell, testing machines, impact pendulum, torque, extensometer).

One of the most important activities of the National Accreditation Body (NAB) is the organisation of a series of interlaboratory comparisons (ILC) to verify the best measurements capability of the accredited laboratories.

One of the difficulties in the technological field is represented by the big weight and large size of the equipments to calibrate, so it is difficult or impossible to circulate such equipments (e.g. materials testing machines or impact pendulum). In this case each participating Calibration Centre has to travel to the location where the equipment is located.

Another difficulty for this kind of ILC is that the object of the comparison (the Charpy Impact Pendulum - CIP) has not the status of a reference standard. For this reason in 2005 one ILC was organised in Italy for the calibration of Charpy Impact Pendulum (CIP), with the following purposes:

1. to give an experimental validation of the resilience dissemination in Italy;
2. to evaluate the calibration competence of the different laboratories;
3. to give a contribution to solve the problem for future international comparison for such kind of equipments.

Two Charpy Impact Pendulum were chosen of 500 J and 20 J rated energy, located in one Calibration Centre.

At the experimental ILC participated 6 Calibration Centres, with a grand total of more than 50 first line standards. At each laboratory was asked to calibrate the CIP by using their normal procedure (usually UNI EN ISO 10045/2). The repeatability, accuracy and classification given by each lab were compared.

The main results of the metrological evaluation of the Charpy Impact Pendulum machines obtained during the ILC are discussed.

Keywords: Charpy, impact, intercomparisons, calibration.