- *Readings should not be taken on curved surfaces without additional calibration of the instrument.*
- *The test surface should be free from surface contaminants such as dirt, grease, and corrosion products.*
- *Test points should be taken in each reference area to avoid obvious peaks or irregularities in the coating.*
- *A sufficient number of readings should be taken to obtain a true average.*

2. Testing threaded articles by fitting mating parts.

The zinc coating on external threads shall be free from lumps and shall not have been subjected to a cutting, rolling or finishing operation that could damage the zinc coating. The zinc coating of an external standard metric thread that has not been undercut shall be such as to enable the threaded part to fit an oversized tapped nut in accordance with the allowances given in **table 5.**

TABLE 5

OVERSIZE TAPPING ALLOWANCE FOR HOT DIP GALVANIZED NUTS

Nominal size of thread	Allowance (mm)
M8 to M12	0,33
M16 to M24	0,38

On bolts greater than M24, undercutting of bolt threads is frequently preferred to oversizing of nut threads. The allowance should be increased to 0,4mm.

Threaded articles shall fit their mating parts and, in the case of assemblies that contain both externally and internally threaded articles, it shall be possible to screw mating parts together by hand.

3. The Chemical Stripping (Gravimetric) Test (to ISO 1460).

This method is applied where material is inspected after hot dip galvanizing. Since this is a destructive test method, it is generally not suitable for the inspection of large or heavy items unless smaller or representative specimens can be substituted for them (see Test Sampling). The test specimen is cleaned with naphtha or other suitable organic solvent, rinsed with alcohol, dried and weighed. It is then stripped of the zinc coating by immersion in a solution containing 3.5g of hexamethylenetetramine and 500ml concentrated hydrochloric acid in 1litre of water. The stripping of the coating is complete when evolution of gas ceases. After washing and drying, the specimen is weighed; the differences in mass before and after stripping divided by the surface area of the test specimen gives the mass of coating per unit area. In the case of threaded articles, such as bolts and screws, the determination is made on an unthreaded portion of the article.

The stripping test gives an accurate average coating mass of the zinc coating. However, it does not provide any information on how evenly the coating is distributed.

To test compliance with **SANS 32 / EN 10240**, two test pieces shall be taken from the tube to be tested. These should be between 30 and 600cm^2 in surface area, with length between 50 and 150mm taken at least 600mm from the tube end.

4. Metallographic Examination.

Where the hot dip galvanized coating composition and thickness are of interest, microscopic examination is a reliable tool. This test is a requirement for the testing of compliance of Coating A1 to **SANS 32 / EN 10240**. This very accurate method uses a small polished and etched cross-section of the hot dip galvanized component to provide information about the relative thicknesses of the alloy and the free zinc layers which comprise the hot dip galvanized coating.

The following procedures should be adhered to –

- Water should not be used as a lubricant at any stage during the polishing procedure due to staining or mild corrosion of the galvanized layer.
- The etchant should be 2% (max) Nital, i.e. (2ml concentrated HNO_3 in 100 ml of 95% ethanol or methanol).

Important disadvantages of this technique are that –

- Specimens cut from the hot dip galvanized article are required,
- Coating thickness measured only applies to a very limited area, it does not indicate the variation in coating distribution on the article and,
- It is necessary to examine a number of specimens to determine the average coating thickness on the hot dip galvanized article.