

General Information

The Hydrostatic Design Basis (HDB) classification has been introduced to allow the pressure pipe market to compare different pressure pipe raw materials on an easy basis. Results are classified in MPa value like 5.52, 6.89, 8.62 or 11.03.

The HDB is also corresponding to a similar classification called MRS (Minimum Required Strength) which is based on a similar test and the values are named PE 50, PE 63, PE 80 or PE 100.

Both classifications, HDB and MRS are based on Long Term Hydrostatic Strength (LTHS) efficiency results.

Due to the final HDB value is a result of a formula using long term test results of material property values like tensile strength, elongation at break and bending modulus, it also corresponds to these properties.

Several specifications e.g. PTI and NF ask for a minimum HDB value according ASTM D2837 or ISO 9080 for the HDPE stay pipes, which from the quality aspect for this application is doubling the material requirement as other important properties with min values are also mentioned and as previously stated are corresponding to the HDB.

In most of the project specification we can not find the requirement to verify the HDB value of the raw material by a test. It is just mentioned and need to be confirmed from the manufacturer.

The new FIB 30 has deleted the HDB value by instead specifying minimum values for tensile strength, elongation at break and bending modulus as detailed but also corresponding quality requirements.

HDB Test

The HDB test is mainly used from raw material suppliers during development of new raw materials and prior marketing of these to serve the market with the relevant classification of their material.

The Test is performed using 130 pipes in size 32 mm made of the raw material to be tested and set under different pressures and different temperatures for 8760 hours = 365 days test period. The performance is resulting in a graph. These figures are the basis for the formula calculation resulting in the final HDB value.

Test price of an independent laboratory is about 48000 USD each test.

Conclusion

The HDB value is a special classification for pressure pipes which itself already classify a raw material quality without naming other specific raw material properties.

For other applications than for pressure pipes, the HDB value can be replaced by specific property minimum values. In contradiction to the very expensive and time consuming HDB test, the other standard properties like tensile strength, elongation at break and bending modulus can be tested for verification for reasonable prices and time.

In case HDB is just supplemented by specific property minimum values, the specification should limit the verification tests to the specific properties only.