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Plastics Pipe Institute Hydrostatic Stress Board (PPI HSB)

- **Frequently Asked Questions**

Q1. What is the Hydrostatic Stress Board (HSB) and what does it do?

The Hydrostatic Stress Board (HSB) is organized under the Plastics Pipe Institute (PPI) as a board of internationally recognized plastic piping experts. HSB Board members are selected and appointed based on their expertise on the various aspects of plastic pressure piping including application engineering, material science, manufacturing, testing, and formulation. The primary functions of the HSB are to issue recommendations regarding the long-term strength bases and the hydrostatic design stress (HDS) of thermoplastic piping materials for pressurized applications, and to develop appropriate policies and procedures for the conduct of this activity for the industry. North American plastics pressure pipe standards often reference the HSB's recommendations.

Q2. What is the history of the Hydrostatic Stress Board (HSB)?

Abstracted from Stephen Boros, "Long-Term Hydrostatic Strength and Design of Thermoplastic Piping Compound," Journal of ASTM International, Vol. 8, No. 9, 2011.

"In the 1950's designing with thermoplastics was relatively new and there were no standardized methods to do so in a consistent and reliable manner. In 1958, the Thermoplastic Pipe Division of the Society of the Plastics Industry (subsequently named the Plastics Pipe Institute) established the Working Stress Subcommittee, the predecessor of the Hydrostatic Stress Board. This board consisted of various technical persons well-versed in the evaluation and forecasting of the long-term strength of plastics. After studying the application for several years, the first tentative method was developed, and in 1963 the group issued its first hydrostatic design stress recommendations for thermoplastic compounds. After evolving through fifteen iterations, this method was published in 1969 as ASTM D2837. The methodology has proven pertinent to all thermoplastic materials, and even thermoplastic based composite pipes, that exhibit a response of decreasing rupture strength when subjected to a continuous load over relatively long periods of time."

Q3. What is the PPI HSB Listing Program?

Development of the PPI HSB Program began in the early 1950's to provide a rigorous process to ensure that listed thermoplastic materials demonstrate appropriate capabilities (hydrostatic design basis, etc.) for continuous use in pressure pipe applications [1]. This listing program has proven very useful to end-users, as it increases their confidence in designing thermoplastic piping systems used in a variety of pressure piping applications.

[1] Stan Mruk, "The Hydrostatic Stress Board of Plastics Pipe Institute: The First 50 Years," Journal of ASTM International, Vol. 8, No. 4, 2011.

Q4. How are materials or ingredients listed in the program?

Established policies and procedures for listing are detailed in two documents, PPI TR-2 and TR-3.

- PPI TR-2 is titled "PPI PVC Range Composition - Listing of Qualified Ingredients". This document: (a) provides lists of ingredients by their commercial designation that have been accepted by the Hydrostatic Stress Board (HSB) as qualified for use in PPI's PVC Range Composition; (b) shows allowable use levels for each ingredient; and (c) provides any other applicable limitations.
- PPI TR-3 is titled "Policies and Procedures for Developing Hydrostatic Design Basis (HDB), Hydrostatic Design Stresses (HDS), Pressure Design Basis (PDB), Strength Design Basis (SDB), Minimum Required Strength (MRS) Ratings, and Categorized Required Strength (CRS) for Thermoplastic Piping Materials or Pipe". This document presents the policies and procedures used by the HSB to develop recommendations of long-term strength ratings for commercial thermoplastic piping materials or pipe.
- In addition to the policy documents, PPI HSB publishes strength basis recommendations in PPI TR-4, "PPI Listing of Hydrostatic Design Basis (HDB), Pressure Design Basis (PDB), Strength Design Basis (SDB) and Minimum Required Strength MRS) Ratings for Thermoplastic Piping Materials or Pipe", a regularly updated document. Also, PPI HSB has an online searchable database where company representative's contact information is available: http://www.plasticpipe.org/hsb-listing.html.

Q5. Where can I find the documents PPI TR-2, TR-3 and TR-4?

These three documents are provided free of charge for public download on the PPI website at the following address - http://plasticpipe.org/publications/technical-reports.html. As the PPI HSB online TR-4 and TR-2 databases are updated regularly, it is best to obtain a current copy containing all active listings in TR-2 and TR-4 just prior to using the listing data. Use the Search Listing feature to view active listings: http://plasticpipe.org/hsb/searchlistings.html.

Q6. What do I do if the PPI HSB Listing Program requirements do not seem to apply to my material or piping product?

In cases for which there is no applicable policy, including TR-3 Part A.6 ("Recommended HDB for New Materials") or in PPI TR-2 B.2 for Functional Equivalent Ingredients, the HSB may determine requirements through a "Special Case" consideration. Please contact the HSB Chairman, Sarah Patterson +1-469-499-1051 (USA) or email, spatterson@plasticpipe.org, to discuss how to proceed.

[1] Stan Mruk, "The Hydrostatic Stress Board of Plastics Pipe Institute: The First 50 Years," Journal of ASTM International, Vol. 8, No. 4, 2011.