Maximum Service Temperature of KYDEX® Sheet

For information applicable to KYDEX® FST please refer to 300 series technical briefs.

TB - 121-A

Introduction

The heat deflection temperature (HDT) of a material is the temperature at which a formed or molded part or flat sheet will begin to lose its shape when subjected to temperature and load. HDT may serve as an estimate of the maximum service temperature of the material. ASTM D-648, Standard Test Method for Deflection Temperature of Plastics Under Flexural Load, is a HDT method used by KYDEX, LLC to estimate the maximum service temperature for various grades of KYDEX® sheet.

ASTM D648 is used to estimate how a given plastic will behave at an elevated temperature for a short period of time and to compare different polymers under identical conditions. With this method, a bar of rectangular cross section is tested as a simple beam with the load applied at its center to give maximum fiber stresses of 455 kPa (66 psi) or 1820 kPa (264 psi). The specimen is immersed under load in a heat-transfer medium provided with means of raising the temperature at 120°C (248°F)/hour. The HDT occurs when the test bar has deflected 0.25mm (0.010").

Actual deflection temperatures will vary due to internal and external stresses, part design, and application. Thermoforming can increase or decrease a part's HDT. If the core of the material is not heated to the proper forming temperature or the part is cooled too quickly, more stresses will be present in the sheet and thus lower the overall HDT of the part.

Samples are typically tested as annealed and/or unannealed. By annealing the sample at 66°C (150°F) for 8 hours, the stresses in the sheet are relaxed and a maximum short-term service temperature is established. An unannealed value represents the minimum short-term service temperature. Depending upon how the parts are processed will determine where in the range of annealed and unannealed values that the part will fall.

*For actual maximum service temperatures, each part should be tested for suitability.

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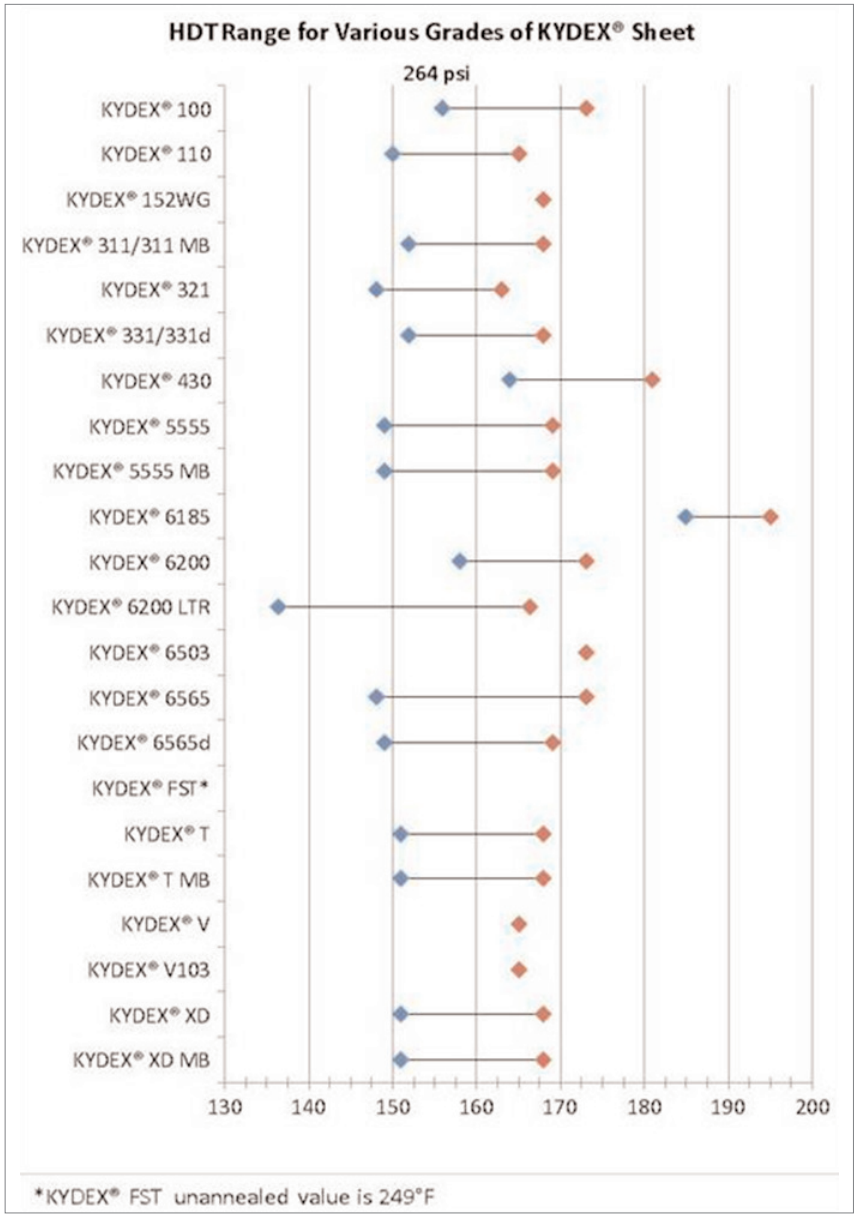
HDT Ranges for Various Grades of KYDEX® Sheet

Tested at 1820 kPa (264 psi)



*KYDEX® FST unannealed value is 249°F

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This information supersedes all previously published data.