Thermoplastic polyurethane (**TPU**) is a class of polyurethane plastics with many properties, including elasticity, transparency, and resistance to oil, grease, and abrasion. Technically, they are thermoplastic elastomers consisting of linear segmented block copolymers composed of hard and soft segments.

TPU is a block copolymer consisting of alternating sequences of hard and soft segments or domains formed by the reaction of diisocyanates with short-chain diols and diisocyanates with long-chain diols. By varying the ratio, structure and/or molecular weight of the reaction compounds, an enormous variety of different TPU can be produced.

This Standard, **IS 17397 (Part 1): 2022** provides guidance on the requirements, methods of sampling, tests for thermoplastic polyurethanes (TPUs) and also establishes a system for designating all thermoplastic Polyurethanes elastomers available in any form and unmodified or modified by colourants, fillers or other additives etc.

A designation system based on data block system is provided and the information each data block gives is as follows:
Data Block 1 For Indian Standard
Data Block 2 For identification of the material and optional information on the alternating hard and soft segments
Data Block 3 For fillers or reinforcing materials
Data Block 4 For application or processing, additives, supplementary information and other characteristics
Data Block 5 For designatory properties like Hardness and Tensile modulus of Elasticity
Data Block 6 For additional information

The standard classifies materials based on properties like hardness, tensile modulus of elasticity, chemical composition, and processing methods, using a structured designation system and specifies how to differentiate between types of polyurethanes.

This system emphasizes that similar designations do not guarantee identical performance and that additional properties may need to be determined for specific applications. The document also includes references to related standards and details on testing methods, special requirements for polymer , and guidelines for packaging and marking.