Haze

Definition of Haze - Optical Property

During testing a polymeric material or plastics, knowledge of transmission, haze, yellowness, refractive index, gloss etc. is important to understand complete optical properties. Among them, haze is an important property of plastics to consider in several applications – food packaging as one example.

Haze is measured as the percentage of incident light scattered by more than 2.5° through the plastic specimen. There are several factors responsible for light scattering such as:

- Impurities contained in the plastic material
- Surface roughness and internal optical irregulatries caused by crystallization or material's level of crystallinity
- Other factors include inhomogenities (density difference, fillers, pigments…), and
- Porosity, crystal size structure (Crosslinked) etc.
- Mechanical and chemical degradation
- Environmental factors such as weathering or surface abrasion

The lower the Haze value, the higher the clarity
If Haze value is greater than 30%, the material is diffusing

Haze has no specific unit. It is expressed in percentage, %.

Haze is an important property to measure where true color and visibility are necessary as well as visual performance of plastic products.

View All Polymer Grades with High Transparency Available in Omnexus Plastics Database

Check out more on Haze:

» Haze Percentage Values of Several Plastics
» How to Measure Haze of a Material

How is Haze Measured and What are Measurement Standards?

Haze measures the milkiness of the material (film or sheet). All plastics have some degree of light scattering (or transmission loss) which is usually measured by **ASTM D1003**. Hazemeters and spectrophotometers are used to measure the level of haze, light transmitting and light scattering properties of transparent materials.

Test Procedure - Hazemeter

In hazemeter, sample is placed between an incandescent light source and geometrically arranged photocells. The amount of light transmitted by the sample, the light scattered by the sample and the instrument, and the total incident light are measured.

From these values the percentage of transmitted light that is scattered can be calculated. The haze meter measures these variables and interrelates them so that the percentage of scattered light can be read in the meter.

Haze Percentage Values of Several Plastics

Polymer Name	Min Value (%)	Max Value (%)
Amorphous TPI, Moderate Heat, Transparent	2.00	2.00
Amorphous TPI, Moderate Heat, Transparent (Food Contact Approved)	2.00	2.00
Amorphous TPI, Moderate Heat, Transparent (Powder form)	2.00	2.00
Celllulose Diacetate-Gloss Film	0.70	0.70
Celllulose Diacetate-Integuard Films	0.00	4.00
Celllulose Diacetate-Matt Film	72.00	72.00
Cellulose Diacetate-Window Patch Film (Food Grade)	1.10	1.10
Cellulose Diacetate-Colored Films	2.10	2.10

Cellulose Diacetate-High Slip Film	0.70	0.70
Cellulose Diacetate-Semitone Films	63.00	63.00
ECTFE - Ethylene Chlorotrifluoroethylene	4.00	4.00
EVA - Ethylene Vinyl Acetate	5.10	5.10
EVOH - Ethylene Vinyl Alcohol	0.50	1.90
HDPE - High Density Polyethylene	6.00	6.00
Ionomer (Ethylene-Methyl Acrylate Copolymer)	4.00	27.00
LDPE - Low Density Polyethylene	1.30	27.50
LLDPE - Linear Low Density Polyethylene	0.80	28.00
PC - Polycarbonate, high heat	1.00	1.00
PETG - Polyethylene Terephthalate Glycol	0.30	0.60
PFA - Perfluoroalkoxy	4.00	4.00
PLA, Heat Seal Layer	2.00	2.00
PLA, High Heat Films	2.00	2.20
PMMA - Polymethylmethacrylate/Acrylic	1.00	96.00
PMMA (Acrylic) High Heat	2.00	2.00
PMMA (Acrylic) Impact Modified	1.50	7.20
PP (Polypropylene) Copolymer	2.00	2.00
PP (Polypropylene) Homopolymer	11.00	11.00
PS (Polystyrene) Crystal	2.00	2.00
PS, High Heat	1.00	1.00
PVC, Plasticized	3.00	5.00
SAN - Styrene Acrylonitrile	0.45	0.80
SMMA - Styrene Methyl Methacrylate	0.27	0.30