

DURATHANE™ ALC SERIES

► Description

Durathane™ ALC series products are medical grade aliphatic polycarbonate-based thermoplastic polyurethanes (TPU). Compared with the polyether-based TPU, polycarbonate-based TPU can provide better oxidation resistance, mechanical properties and chemical resistance in addition to its biocompatibility and hydrolysis resistance. Color-matching is available. These products can be injection molded and extruded.

► Biocompatibility

Durathane™ ALC pellets passed the Hemolysis test (ISO 10993-4), MEM Elution (ISO 10993-5), Skin Irritation test (ISO 10993-10:2010 & 10993-23:2021), Dermal Sensitization test (ISO 10993-10:2010, 2021).

► Storage

Durathane™ ALC TPU pellets should be stored in a cool and dry environment in their original containers until used. Storage temperature should not exceed 85°F/30°C. If only a portion of TPU pellets was used, the container with remaining TPU pellets should be tightly closed.

► Products and Properties

Durathane™ ALC Clear Grade	ASTM Test	ALC-75A	ALC-80A	ALC-85A	ALC-90A	ALC-95A	ALC-60D	ALC-65D	ALC-70D
Durometer (Shore hardness)	D2240	75A	80A	86A	90A	95A	60D	65D	70D
Specific Gravity	D792	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.15
Flexural Modulus (psi)	D790	1,800	1,850	1,900	3,100	7,600	11,000	44,000	92,000
Ultimate Tensile (psi)	D412	3,500	4,000	4,100	4,400	4,700	5,200	5,500	6,000
Tensile Modulus at 100% Elongation (psi)	D412	440	610	780	1,050	1,500	1,900	3,000	3,800
Tensile Modulus at 300% Elongation (psi)	D412	920	1,450	2,000	2,900	3,900	4,600	5,200	NA
Ultimate Elongation (%)	D412	580	490	450	395	350	320	310	290
Mold Shrinkage (mm/mm)	D955	0.025- 0.028	0.018- 0.020	0.013- 0.016	0.008- 0.009	0.007- 0.008	0.006- 0.007	0.003- 0.004	0.003- 0.004

Note : These test results are based on small samples of Durathane™ ALC TPU and do not represent the results from larger test samples. The manufacturing parameters should be adjusted according to users' actual conditions. The mold shrinkage test (D955) was performed on Type A bar specimen molded by injection process.

► Processing Information

Durathane™ ALC TPU pellets are hygroscopic and are **necessarily dried before processing**. Depending on the climate, the pellets absorb moisture rapidly when exposed to the atmosphere. The moisture might cause the degradation of polymers during processing and form bubbles or streaks in the molded and extruded parts. To ensure the efficient and successful processing, the moisture content in TPU pellets is recommended to be **less than 0.05%**. A dehumidifying dryer is recommended for drying Durathane™ ALC Series TPU. For the best drying results, the dew point of the inlet air should not be higher than -40°F / -40°C. The recommended drying conditions are listed below for a **minimum of 5 hours**.



► Processing Information :

Durathane™ ALC	ALC-75A	ALC-80A	ALC-85A	ALC-90A	ALC-95A	ALC-60D	ALC-65D	ALC-70D
Recommended Drying Temperature (°F)	165	165	175	175	175	195	195	195
Recommended Drying Temperature (°C)	75	75	80	80	80	90	90	90

Note : Dry for a minimum of 5 hours at -40°F/ -40°C dew point

► Recommended Extrusion Temperature Profile :

Durathane™ ALC	ALC-75A (°F / °C)	ALC-80A (°F / °C)	ALC-85A (°F / °C)	ALC-90A (°F / °C)	ALC-95A (°F / °C)	ALC-60D (°F / °C)	ALC-65D (°F / °C)	ALC-70D (°F / °C)
Zone 1	350/175	350/175	355/180	355/180	355/180	365/185	365/185	365/185
Zone 2	355/180	355/180	365/185	365/185	365/185	375/190	375/190	375/190
Zone 3	355/180	355/180	365/185	365/185	365/185	375/190	375/190	375/190
Zone 4	365/185	365/185	375/190	375/190	375/190	385/195	385/195	385/195
Adapter 5	365/185	365/185	375/190	375/190	375/190	385/195	385/195	385/195
Die	355-375/ 180-190	355-375/ 180-190	365-385/ 185-195	365-385/ 185-195	365-385/ 185-195	375-390/ 190-200	375-390/ 190-200	375-390/ 190-200

Screen Pack Recommendation : 50/200/100

► Recommended Injection Molding Temperature Profile :

Durathane™ ALC	ALC-75A (°F / °C)	ALC-80A (°F / °C)	ALC-85A (°F / °C)	ALC-90A (°F / °C)	ALC-95A (°F / °C)	ALC-60D (°F / °C)	ALC-65D (°F / °C)	ALC-70D (°F / °C)
Rear	330/165	330/165	340/170	340/170	340/170	350/175	350/175	350/175
Front	340/170	340/170	350/175	350/175	350/175	355/180	355/180	355/180
Nozzle	350/175	350/175	355/180	355/180	355/180	365/185	365/185	365/185
Melt	385-390/ 195-205	385-390/ 195-205	390-410/ 200-210	390-410/ 200-210	390-410/ 200-210	390-420/ 205-215	390-420/ 205-215	390-420/ 205-215
Mold	60-85/ 15-30	60-85/ 15-30	60-85/ 15-30	60-85/ 15-30	60-85/ 15-30	70-105/ 20-40	70-105/ 20-40	70-105/ 20-40

