



Foster PureEase™

High Yield, Easy Process Thermoplastic Polyurethane Polymers

Unmodified medical grade Thermoplastic Polyurethane (TPU) polymers often exhibit processing obstacles in twin screw compounding and tube extrusion operations. Due to the nature of these materials, processors may experience strand curling, resin agglomeration, inherent tackiness and dimensional instability when unmodified resins are used.

Foster PureEase™ is a range of modified TPU polymers, specifically designed to address these common concerns and improve processing consistency and production yields. PureEase™ formulations incorporate very low loadings of processing enhancements into TPU polymers for operational improvements, while maintaining desired mechanical properties. PureEase™ is available in unfilled resins and can also be used as an additive package in TPU compounds containing pigments and fillers. Foster PureEase™ is ideally suited for tube extrusion applications where processing stability and control of ID/OD tolerances are critical. PureEase™ formulations have passed USP Class VI testing for biocompatibility.

Test Methods & Results

In a comparison study conducted by Foster Corporation, PureEase™ formulations were evaluated against unmodified TPU resins in 80 Shore A and 55 Shore D. PureEase™ was also evaluated in TPU compounds with Barium Sulfate (BaSO₄). Results of the study concluded that PureEase™ TPU yielded a 22% improvement in the OD over unmodified samples, while radiopaque PureEase™ experienced a 42% improvement respectively.

Property	Units	PureEase™ TPU – Unfilled Grades					
		TPU 80A (Control)	PureEase™ 80A TPU	TPU 55D (Control)	PureEase™ 55D TPU	TPU 75D (Control)	PureEase™ 75D TPU
Stress Yield	PSI	-	-	-	-	8738	8036
Stress Break	PSI	6,092	9,230	7,466	8,410	9,415	9,676
Strain Yield	%	-	-	-	-	5.22	5.2
Strain Break	%	639	779	298	367	151	143
Tensile Modulus	PSI	2,822	2,639	16,581	16,103	204,323	186,149
Flexural Modulus	PSI	4,867	5,333	19,482	20,008	311,962	284,217
MFI (224°C / 1.2kg)	g/10 min	-	23.02	-	13.39	-	48.39
Avg. OD Standard Dev.	Inches	0.00324	0.00285	0.00252	0.00124	0.00132	0.00128
Avg. OD Improvement	%	-	12.04	-	50.79	-	3.03

Property	Units	PureEase™ TPU – Radiopaque Filled Grades					
		TPU 80A + BaSO4 (Control)	PureEase™ 80A TPU + BaSO4	TPU 55D + BaSO4 (Control)	PureEase™ 55D TPU + BaSO4	TPU 75D + BaSO4 (Control)	PureEase™ 75D TPU + BaSO4
Stress Yield	PSI	-	-	-	-	8030	7510
Stress Break	PSI	5,801	6,562	6,571	7,039	8,098	9,432
Strain Yield	%	-	-	-	-	4.70	4.75
Strain Break	%	719	692	378	337	162	173
Tensile Modulus	PSI	4,572	4,688	20,731	21,768	228,633	194,696
Flexural Modulus	PSI	6,274	6,975	30,883	29,878	352,459	351,949
MFI (250oC, 5kg)	g/10 min	81.8	20.42	58.01	23.80	101.54	88.03
Avg. OD Standard Dev.	Inches	0.00138	0.00113	0.00352	0.00164	0.01172	0.00535
Avg. OD Improvement	%	-	18.12	-	53.41	-	54.35

Market Applications:

Thermoplastic Polyurethane (TPU) polymers are often used in the manufacturing of central venous catheters, urinary catheters and implants due to their inherent ability to soften when in contact with the body. Design and manufacturing of complex devices (specifically those that are multi-lumen) is critical, although often a challenge for processors. Foster PureEase™ formulations are precisely engineered to overcome common operational obstacles and improve production yields in twin screw compounding and tube extrusion processes.

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