Polyether TPU Retardant BR-S13

BR-S13 is a novel flame retardant, specially developed for thermoplastic polyurethane in different applications, such as TPU film, circuit, and glue. It can be used individually to maintain the transparency of TPU product. When used in combination with MCA, significant FR synergistic effect was shown, and can improve the mechanical properties significantly.

1. Materials

Polyether TPU: 1185A

Flame Retardants: Inovia BR-S13, BASF MC25

2. Processing

Drying: ionic liquid: 85℃, 4hrs; TPU pallet:100℃, 4hrs

When using BR-S13 individually, please use liquid feeding pump

Extrusion temperature: 170~205℃

Injection temperature: 185~200℃; mold temperature: 60℃

3. Application Example Data

Table 1 Flame Retarding Performance

	BR-S13	MCA	UL 94 rating
Transparent FR-TPU	1.5%	/	V0@1.6mm
Translucent FR-TPU	1%	2%	V0@1.6mm

Table 2 Physical Properties

	Unit	TPU	Transparent FR-TPU	Translucent FR-TPU
Tensile strength	MPa	34.8	23.2	27.8
Stress at 100% strain	MPa	8.9	7.1	7.2
Stress at 300% strain	MPa	16.9	13.4	15.1
Elongation	%	660	671	680

Note: The test standard is ASTM D 412, speed: 500mm/min.

Table 3 Processing Flowability

MI	Unit	TPU	Transparent FR-TPU	Translucent FR-TPU
190℃，5kg	cm^3/min	8.4	27.2	26.3

4. **Summary**

BR-S13 can significantly enhance the MI of TPU. When the MI of the base TPU material is inherently high, the resulting FR TPU tends to exhibit lower tensile strength. Therefore, it is recommended to select a TPU with the same hardness but a lower MI. This approach ensures that both the absolute value and the relative retention rate of tensile properties in the final FR TPU product are optimized.

Note: The experimental results obtained using Lubrizol 58887 and Covestro 9385AU were largely consistent with those of BASF 1185A. The addition of antioxidants may contribute to improved color stability.