PMMA Retardant AR-S11

Inovia AR-S11 is a newly developed halogen-free flame retardant for acrylate polymers(eg. PMMA). It can afford acrylate polymers superior flame retarding performance while not affecting its transparency, which is the first case ever in the whole world. It can be used for extruding and casting products.

1. Materials

PMMA: Arkema PLEXIGLAS V040

Flame retardant: Inovia AR-S11

2. Processing

2.1 Drying: 80℃ for 4h in a vacuum oven.

2.2 Extrusion temperature: 200~230℃

2.3 Injection temperature: 215~230℃; mold temperature: 60℃

Note: AR-S11 can be added during polymerization or during modification steps. If the additive is added during modification, liquid side feeder is recommended. The processing temperature can be about 20°C lower than that for the virgin resin. Too high extrusion temperature or shearing force need to be avoided.

3. Application Example Data

Table 1. Flame Retardant Performance

AR-S11	UL 94 rating
9%	1.6mm V0

Table 2. Optical Properties

	Method	Thickness	PMMA	9%AR-S11
Transmittance (%)	ASTM D 1003	1.6mm	92.4	92.3
Haze (%)	ASTM D 1003	1.6mm	0.50	0.57
YI	ASTM E313	1.6mm	1.58	1.78

Table 3. Mechanical and Thermal Properties

	Method	Unit	PMMA	9%AR-S11
Tensile strength	ISO 527	MPa	82	69
Elongation at break	ISO 527	%	5.0	2.2
Flexural strength	ISO 178	MPa	90	80
Flexural modulus	ISO 178	MPa	2339	2819
Charpy unnotched impact strength	ISO 179	kJ/m^2	18.3	18.3
Charpy notched impact strength	ISO 179	kJ/m^2	2.4	2.3
VST (10N)	ISO 306	℃	112	107
HDT (1.8MPa)	ISO 75	℃	81	72
Tg	/	℃	114	107
MI (230℃ / 3.8kg)	ISO 1133	g/10min	4.5	9.8