

Wrapping Materials for Plastic Scintillator

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■ Good reflector

1. High light collection efficiency → High detection efficiency
2. Good timing resolution

■ High efficiency

*NIM A 567, (2006) 345

Table 1
Comparison of different wrapping materials

Wrapping material	PE per 10 mm	%
VM2000	412	100
Tyvec (loose)	241	58
Teflon tape	196	48
Tyvec (tight)	196	48
Aluminum foil	181	44
Bare scintillator	168	41
Black paper	140	34

3M radiant
mirror foil

Shown is the yield of photoelectrons observed in a bar of dimensions 700 mm × 20 mm × 6.4 mm. The yield has been scaled to a thickness of 10 mm.

■ Timing resolution

*NIM A 555, (2005) 142

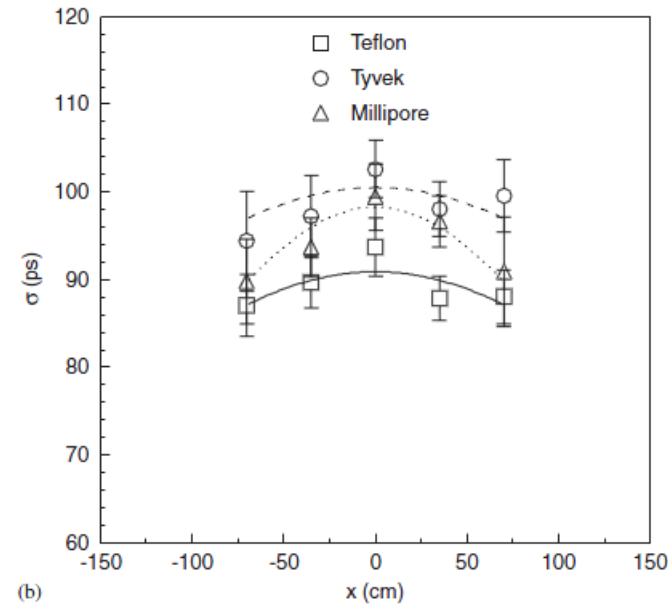
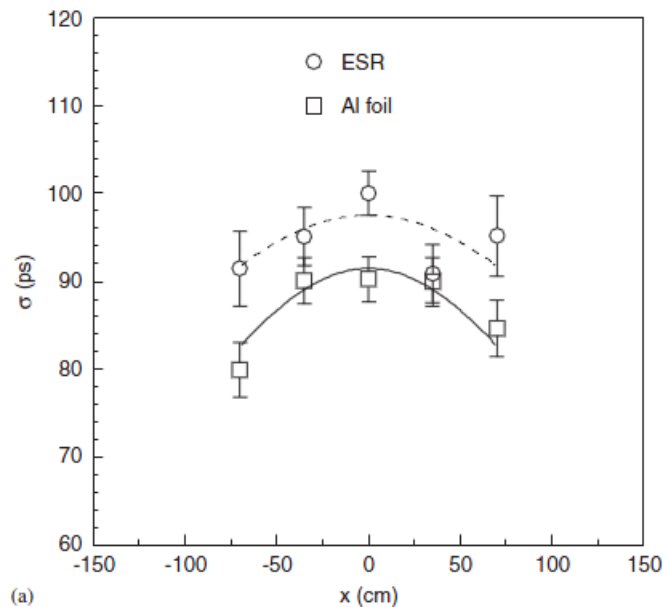
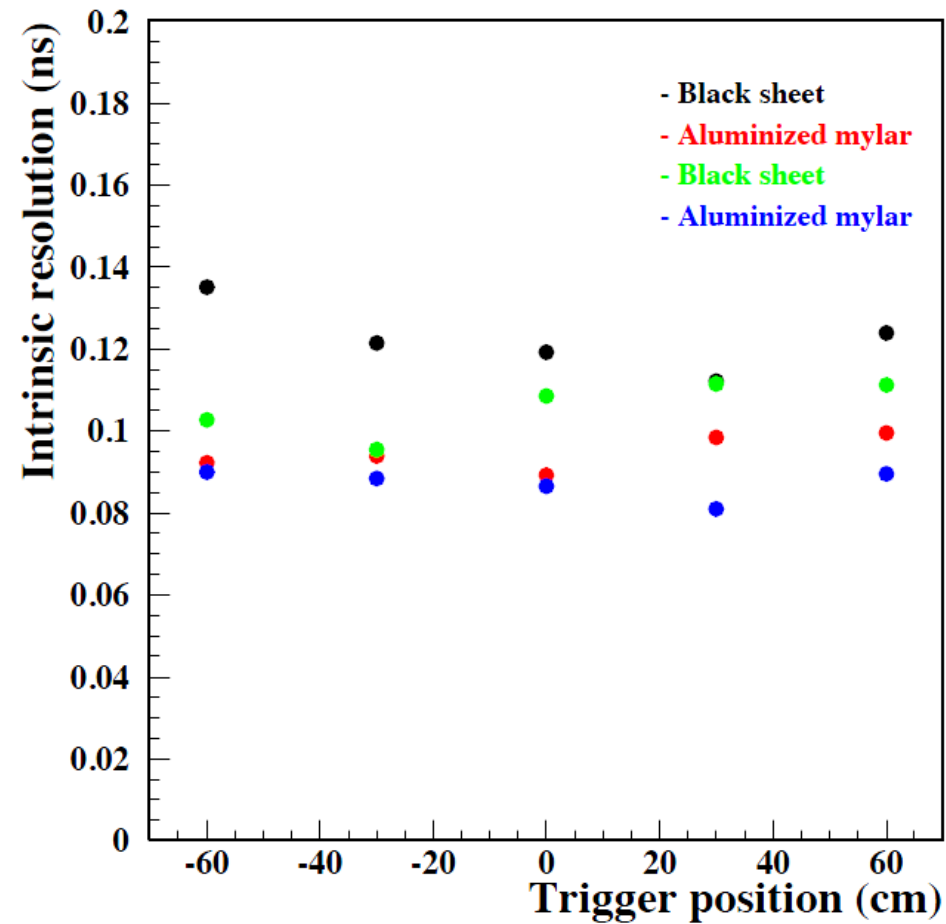


Table 1
Properties of the scintillator bar wrapped with different reflection materials

Reflection materials	Time resolution in center of bar (ps)	Speed of light (cm/ns)	Attenuation length (cm)
Al film	90 ± 3	14.8 ± 0.2	246 ± 4
ESR	100 ± 3	15.0 ± 0.3	321 ± 7
Millipore	99 ± 4	14.8 ± 0.2	305 ± 6
Teflon	94 ± 3	15.0 ± 0.3	297 ± 5
Tyvek	103 ± 3	14.5 ± 0.3	256 ± 5

→ Al foil showed good performance.

*J-PARC double meeting, Dr. Hwang



■ Wrapping materials in several experiments

Wrapping materials	Experiments
Aluminized mylar	BESS
	J-PARC K1.8 group
Enhanced specular reflector	BESS3
Al foil	BESS2
Polyvinyl film	Belle

■ Conclusion

→ There is no significant difference depending on wrapping materials.