Synthetic Leather Formulations for Upholstery in the Railway market

CEN 45545-2 : Fire Protection in Railways Application

F1A Product: Upholstery for passenger seats and head rests

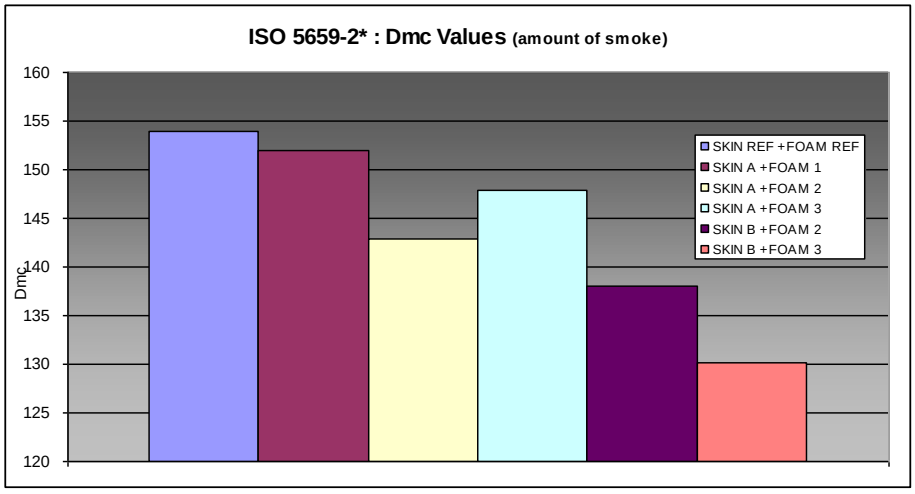
R20/Tests	Unit	HL1	HL2	HL3
Cone calorimeter - ISO 5660-1(25kW/m²) - T3.02	MARHE kWm^{-2}	75	50	50
NBS - ISO 5659-2 (25kW/m²) - T10.03	D_s max.	300	300	200
Gas analysis - ISO 5659-2 (25kW/m²) - T11.02	CIT_G	1.2	0.9	0.75

HL1: Vehicle out of which it is the easiest to escape to an area of ultimate safety
HL3 : Mainly for undeground trains - most severe classification

SKIN FORMULATIONS = 210g/m²	Skin Ref	Skin A	Skin B
Emulsion PVC (K 80)	80	80	80
Extender PVC	20	20	20
Santicizer® 141	***55***	***57.5***	***60***
Aluminium Trihydrate		15	25
CaZn Stabilizer	2	2	2
ESO	1.2	0.8	0.8
Zinc Borate	10	5	5
Sb_2O_3	***10***	***5***	
TOTAL	178.2	185.3	192.8

Pregelification	150°C - 2'
Expansion	190°C - 2'

FOAM FORMULATIONS = 435 g/m²	Foam Ref	Foam 1	Foam 2	Foam 3
Emulsion PVC (K 70)	80	80	80	80
Extender PVC	20	20	20	20
Santicizer® 141	***44***	***66***	***66***	***66***
Viscosity supressant	5			
Zinc Borate		5	10	10
Chlorinated Paraffin	20			
Aluminium Trihydrate	70	70	70	70
Mg CO3				2.5
ESO	1.6	1.6	1.6	1.6
Sb_2O_3	***15***	***10***	***5***	
Azodicarbonamide	1.25	1.25	1.25	1.25
Kicker	0.5	0.5	0.5	0.5
TOTAL	257.4	254.4	254.4	251.9



All the formulations are well below the smoke density tresholds.

The better results are obtained when Sb2O3 is replaced by Santicizer® 141.

*Tests have been done without textile.

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