VORASURF™ Polyurethane Additives
in polyisocyanurate foam – construction applications

Dow offers silicone surfactant additives to manufacture various types of polyisocyanurate (PIR) and polyurethane (PUR) insulation panels (flex-faced, metal-faced, continuous and discontinuous panels). VORASURF™ additives offer increased insulation values, improved adhesion, better surface quality, a wider processing latitude and reduced smoke and flame generation.

VORASURF™
silicone polyurethane additives by Dow

Project goal:

Identify Dow VORASURF™ Silicone Polyurethane Additives in a normal pentane (nP) blown PIR foam system based on PEPS polyols.

Results:

- VORASURF™ DC 5357 Additive provided better insulation performance vs. reference
- VORASURF™ DC 5585 Additive performed similarly to the reference

Table 1: Pore!Scan foam cell size

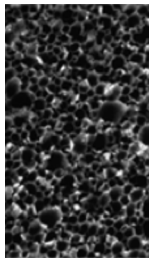
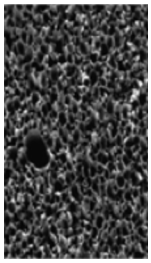
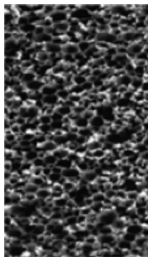
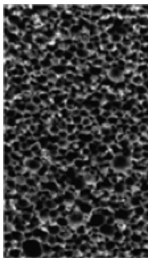
Silicone	VORASURF™ DC 193 Additive	VORASURF™ DC 5357 Additive	VORASURF™ DC 5585 Additive	Competitor REF A
				
µm	187	150	171	166

Table 2: HP machine nP blown foam performances

Properties	VORASURF™ Silicone Polyurethane Additives			Competitor REF A
	DC 193	DC 5357	DC 5585	
Reactivity	=	=	=	REF
Insulation	–	+	=	REF
Mechanical	+	+	=/+	REF
Aesthetics panels 5 cm thick	=	+/–	– –	REF
Adhesion	=/+	+	+	REF
Demolding	=	=	+	REF
Liquid flow panels 10 cm thick	+	+	+	REF

+ Better than REF – Less than REF = Comparable to REF

Table 3: Formulations tested in the HP machine

Formulation	
Polyol	Polyesters
Catalyst	Catalysts
Additive	Flame retardant
Blowing agent	Water
Blowing agent	nP (70%)
Surfactant	VORASURF™ XXXX Silicone Polyurethane Additives
Isocyanate	pMDI high functionality – index 2.5

Table 4: HP machine cP and iP blown foam performances

Properties	VORASURF™ Silicone Polyurethane Additives				
	DC 5357	DC 5604	DC 5585	RF 5374	DC 193
Reactivity	=	=	=	=	REF
Insulation	++	=	+/=	+	REF
Mechanical	=	=/–	=	+	REF
Aesthetics	–	++	+/=	–/=	REF
Adhesion	=	=	=	=	REF
Demolding	++	+	=	+	REF
Fire performance	=	=	=	=	REF

+ Better than REF – Less than REF = Comparable to REF

Table 5: Formulations tested in the HP machine

Formulation	
Polyol	Polyesters
Catalyst	Catalysts
Additive	Flame retardant
Blowing agent	Water
Blowing agent	cP (70%)
Blowing agent	iP (30%)
Surfactant	VORASURF™ XXXX Silicone Polyurethane Additives
Isocyanate	pMDI high functionality – index 2.5

These are typical properties, not to be construed as specifications.

Project goal:

Identify Dow VORASURF™ Silicone Polyurethane Additives in a cylopentane (cP) / isopentane (iP) blown PIR foam system based on PEPS polyols.

Results:

- VORASURF™ DC 5357 Additive provided better insulation performance (measured at 10°C): 5% k-factor improvement vs. reference
- VORASURF™ DC 5604 Additive produced foam with outstanding aesthetics
- VORASURF™ DC 5585 Additive performed similarly to the reference but with marginally improved foam insulation and aesthetic properties
- VORASURF™ RF 5374 Additive performed similarly to the reference providing improved insulation and demolding

For more information on VORASURF™ Silicone Polyurethane Additives, contact your Dow representative or visit www.dow.com/vorasurf

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