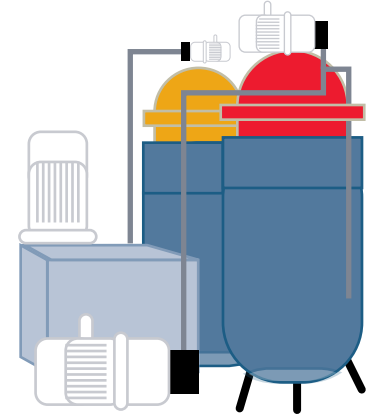


VORASURF™ RF 5382 Additive for appliance foam

VORASURF™ RF 5382 Additive is an excellent choice for a large variety of appliance foam formulations. The molecular architecture design will help formulators meet all desired properties of appliance foam systems. It will help achieve blend stability and clarity with its high polyol side solubility. VORASURF™ RF 5382 Additive is the formulator's choice when the complex cabinet design requires superior flow in domestic or commercial refrigerators or freezers. This product provides insulation properties that will satisfy the increasingly stringent energy efficiency requirements thanks to its silicone backbone design that offers high nucleation potential. The data tables below demonstrate the results from trials with industrial foam equipment, where VORASURF™ RF 5382 Additive is compared with two popular competitor products on the market.

Table 1. Formulations tested and blend quality

Properties	Test	Unit	Ref 1	Ref 2	VORASURF™ RF 5382 Additive
Formulation	Fully formulated polyol/ B- side without silicone	pbw	97.2	97.2	97.2
	Silicone surfactant	pbw	2.8	2.8	2.8
	Blowing agent: c-P/i-P (70/30 v/v)	pbw	13.5	13.5	13.5
	PAPI 27-Polymeric MDI	pbw	150	150	150
B-side blend quality	Appearance without c-P/i-P (70/30 v:v) @3 days	visual observation	clear	clear	clear
	Appearance with c-P/i-P (70/30 v:v) @10 days	visual observation	clear	clear	clear


Table 2. Reactivity

Test	Unit	Ref 1	Ref 2	VORASURF™ RF 5382 Additive
Cream time	s	5	5	5
Gel time	s	40	41	40
Tack free time	s	71	65	69
Free rise density @24h	kg/m ³ (pcf)	24.3 (1.52)	24.2 (1.51)	24.85 (1.56)

Table 3. Flow properties

Test	Ref 1	Ref 2	VORASURF™ RF 5382 Additive
Flow index @24h	1.33	1.31	1.30
Average density distribution @10% over packing	1.2	0.8	0.6
Average density distribution @15% over packing	0.7	0.6	0.6

Table 4. Mechanical properties and insulation performance

Properties	Test	Unit	Ref 1	Ref 2	VORASURF™ RF 5382 Additive
Mechanical	Average skin compression strength @10% over packing	kPa (psi)	158.8 (23.0)	150.5 (21.8)	153.3 (22.2)
	Average skin compression strength @15% over packing	kPa (psi)	185.8 (27.0)	181.6 (26.3)	181.6 (26.3)
Post mold expansion	Post-demold expansion @10% over packing @5 min	%	3.1	2.8	3.0
	Splits	yes/no	no	no	no
Insulation	Thermal conductivity @10°C (50°F), ASTM C518	mW/m.K (BTU.in/ft ² .°F.h)	20.6 (0.143)	20.2 (0.140)	20.4 (0.141)

VORASURF™ RF 5382 Additive is one of the new products Dow Performance Silicones is offering among the large portfolio of silicone surfactants that offers numerous options for the rigid foam formulators. The above results were produced by using VORANOL™ polyols in combination with our silicone surfactant.

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

VORASURF™
silicone polyurethane additives by

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Form No. 26-2633-01-0220 S2D