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Struktol V-Series Lubricants for PVC

VC-100 for CPE Modified Rigid PVC

Quality Additives for Performance



Struktol V-Series Lubricants for PVC are unique, multicomponent internal/external lubricant packages intended to replace traditional lubricants for rigid PVC compounds.

VC-100 has been specifically designed to work synergistically with chlorinated polyethylene impact modifiers to provide:

- Significant reduction of fusion and equilibrium torques vs. control lubricants at equal levels
- Excellent metal release
- Good stability over a wide range of temperature and processing conditions
- Higher output rates due to torque reduction
- Lower overall compound costs vs. control



Struktol VC-100 in PVC Siding Base Coat Formulation:

<u>Ingredient</u>	<u>Function</u>	<u>Control</u>	<u>A</u>	<u>B</u>	<u>C</u>
PVC	Resin	100.0	100.0	100.0	100.0
Chlorinated PE	Impact Modifier	5.0	5.0	5.0	5.0
Calcium Carbonate	Filler	12.0	12.0	12.0	12.0
Calcium Stearate	Lubricant	1.2	---	---	---
Acrylic Process Aid	Process Aid	0.5	0.5	0.5	0.5
Paraffin Wax	Lubricant	1.1	---	---	---
Oxidized PE Wax	Lubricant	0.2	---	---	---
Titanium Dioxide	Colorant	0.3	0.3	0.3	0.3
Struktol VC-100	Lubricant	<u>---</u>	<u>2.5</u>	<u>2.0</u>	<u>1.5</u>
		121.3	121.3	120.8	120.3



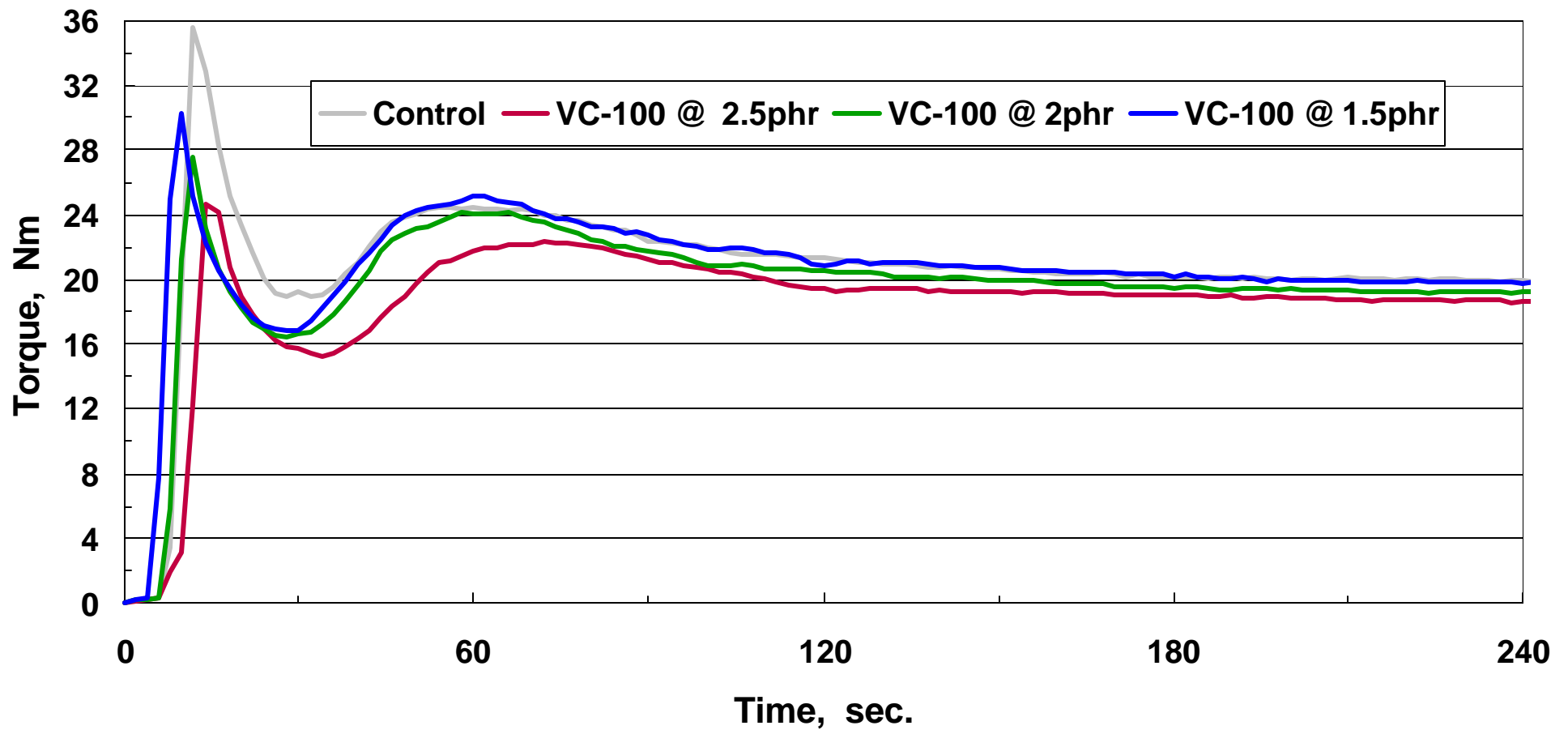
Brabender fusion evaluation at various levels of additive:

	Mixing			Fusion			Equilibrium		
	Level	Temp, °C	RPM	Time, s	Torque, Nm	Temp, °C	Time, s	Torque, Nm	Temp, °C
Control	2.5	200	90	46	24.4	194.0	240	20.0	212.2
VC-100	2.5	200	90	58	22.4	199.7	240	18.7	214.5
VC-100	2.0	200	90	50	24.1	198.1	240	19.3	216.1
VC-100	1.5	200	90	52	25.1	196.7	240	19.8	213.5



Effect of Lubricant Level at Constant Speed

Struktol VC-100 vs. Control





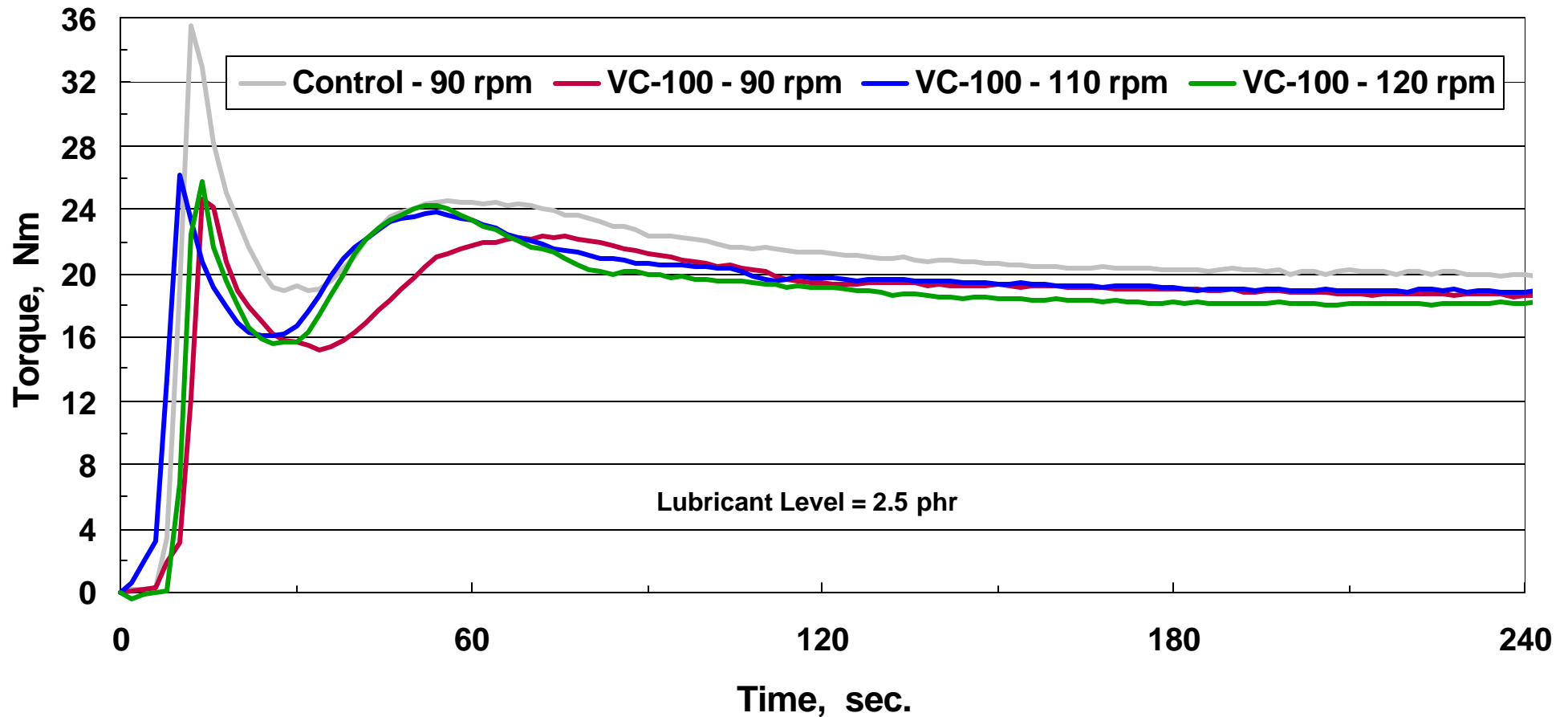
Brabender fusion evaluation at different mixing speeds:

	Mixing			Fusion			Equilibrium		
	Level	Temp, °C	RPM	Time, s	Torque, Nm	Temp, °C	Time, s	Torque, Nm	Temp, °C
Control	2.5	200	90	46	24.4	194.0	240	20.0	212.2
VC-100	2.5	200	90	58	22.4	199.7	240	18.7	214.5
VC-100	2.5	200	110	44	23.8	198.7	240	18.9	218.2
VC-100	2.5	200	120	38	24.3	198.1	240	18.2	218.5



Effect of Rotor Speed at Constant Lubricant Level

Struktol VC-100 vs. Control



Quality Additives for Performance



Summary of Brabender results:

- At equal lubricant levels VC-100 provides lower fusion torque and equilibrium torque versus a control system
- A 2.5 phr level of VC-100 can provide a 33% increase in rotor speed resulting in equal fusion and equilibrium torque of control at 2.5 phr
- A 2 phr level of VC-100 provides lower fusion and equilibrium torque versus 2.5 phr of control system resulting in a 20% reduction in required lubricant
- A 1.5 phr level of VC-100 provides equal fusion and equilibrium torque versus 2.5 phr of control system resulting in a 40% reduction in required lubricant



Properties of VC-100 Lubricant Package

Composition

An optimized blend of special waxes and oleo chemicals

Properties

Appearance	beige pastilles
Ash Content, % max	7
Dropping Point. °C	105-120
Specific Gravity	0.96
Viscosity, CPS @ 140°C	300
Physiological Behavior	refer to safety data sheet
Storage Stability	at least 2 years in normal storage conditions



Additional Development Programs Ongoing:

- VC-100 with stabilizer package included
- VA-Series packages for use in acrylic modified systems