

# Evonik Liquid Dispersants and their use

Evonik Nutrition & Care  
Interface & Performance  
Technical Service Polymers

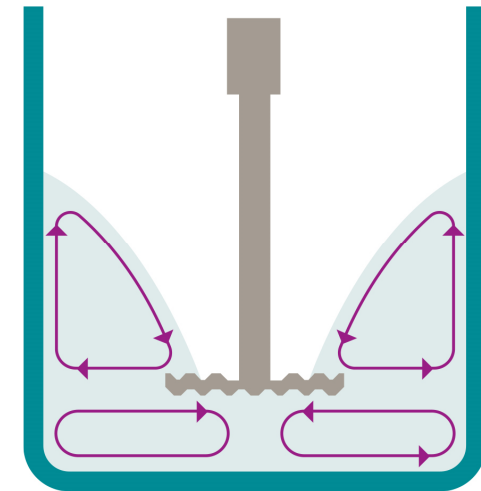


# Production of Liquid Pastes

- Continuous phase
  - Liquid carrier system
  - Dispersant



- Pigment



**Dispersing**, e.g. via high speed disperser

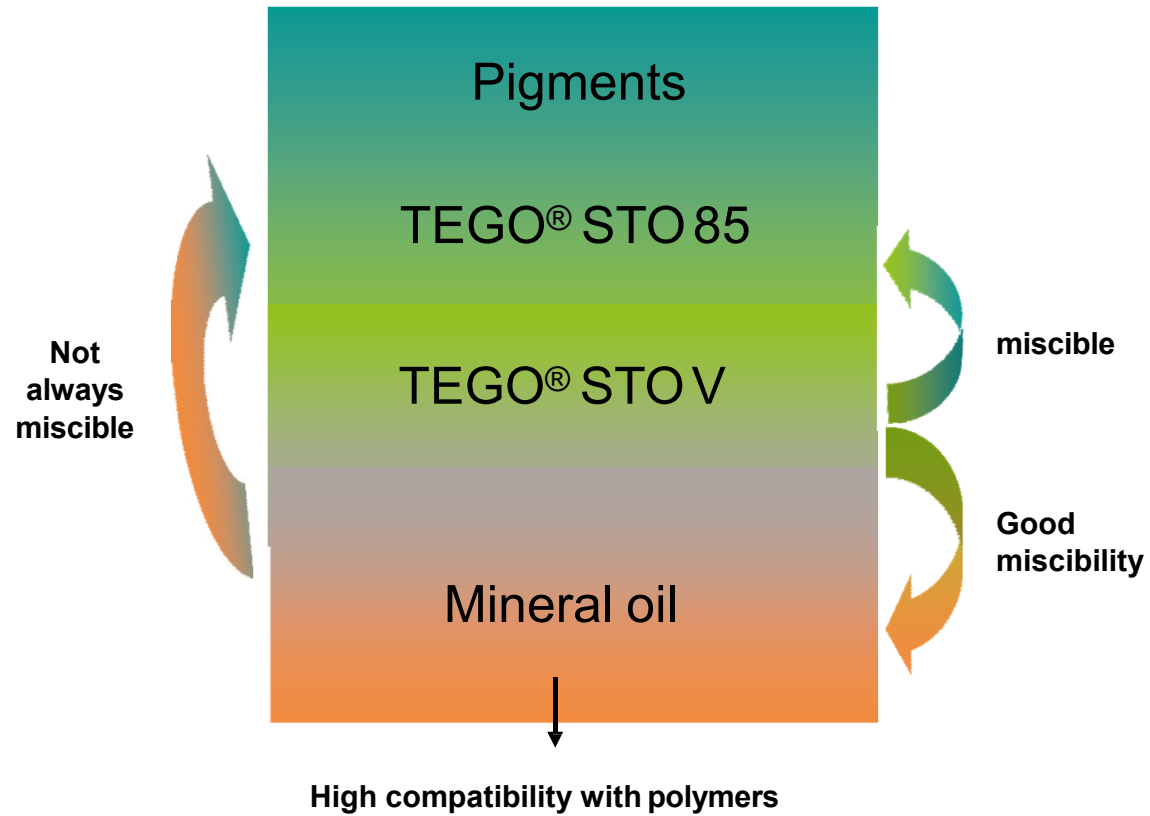
# Recommendations Liquid Dispersants

Continuous Phase		Liquid Dispersant	Application
Mineral or vegetable oil		TEGO® STO V TEGO® STO 85 V TEGOMER® DA 800	<ul style="list-style-type: none"> <li>• Polyolefines, PS, ABS and PET</li> <li>• all kinds of pigments</li> </ul>
Continuous phase = dispersing agent		TEGO® STO V TEGO® STO 85 V TEGOMER® DA 800	<ul style="list-style-type: none"> <li>• Particularly PET, PC</li> <li>• all kinds of pigments</li> </ul>
Phthalates (DINP, DOP, DIBP), adipates, citrates		TEGOMER® DA 626 TEGOMER® DA 646	<ul style="list-style-type: none"> <li>• PVC</li> <li>• Organic pigments, carbon black</li> </ul>
Polyols			<ul style="list-style-type: none"> <li>• PU-foam, solvent-based TPU, PU-moulding materials</li> </ul>
Polyether polyols	hydrophobic	TEGOMER® DA 626 (> 50.000 mPas)	<ul style="list-style-type: none"> <li>• Carbon black (basic, acidic, neutral), organic pigments</li> </ul>
	hydrophilic	TEGOMER® DA 646 (< 800 mPas)	<ul style="list-style-type: none"> <li>• Carbon black (acidic, neutral, basic), organic Pigments</li> </ul>
Polyester polyols		TEGOMER® DA 626	<ul style="list-style-type: none"> <li>• Carbon black, organic pigments</li> </ul>
Silicon oil		TEGOPREN® 6875 TEGOMER® M-Si 2650	<ul style="list-style-type: none"> <li>• Silicone rubber, sealants</li> </ul>

## Liquid Dispersants and Miscibility with Continuous Phases

Mixture 1:1	Phthalate DINP	Mineral oil Aralux RP	Hydrophobic polyether polyol PPG 1000	Water
TEGO® STO 85	homogeneous	homogeneous	homogeneous	gelation
TEGO® STO V	homogeneous	homogeneous	homogeneous	shows smears
TEGOMER® DA 626	two phases	two phases	two phases	two phases
TEGOMER® DA 646	homogeneous	two phases	homogeneous	shows smears
TEGOMER® DA 800	two phases	two phases	two phases	homogeneous
TEGOPREN® 5885	two phases	homogeneous	two phases	two phases
TEGO® Surten W 111	homogeneous	homogeneous	homogeneous	two phases

# Sorbitan Ester Derivates - Solubility



# Formulations for Liquid Pastes

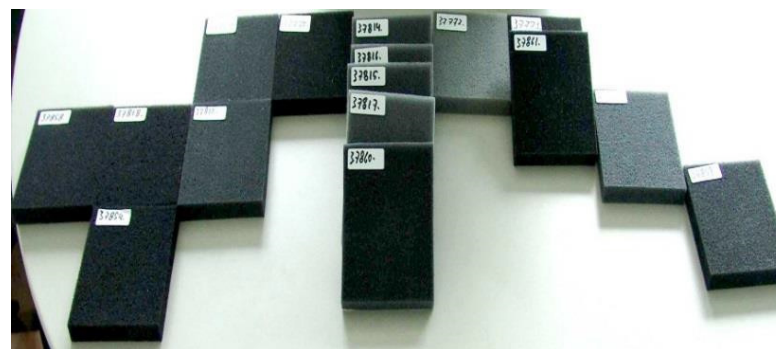
## Example 1

Polyether polyol (PPG 1000) 70 %

TEGOMER® DA626 10 %

Carbon Black 20 %

Printex U (neutral)  
Printex 60 (basic)  
Special Black 4 (acidic)



## Example 2

TEGO® STO V 82 %

Pigment Red 57:1 18 %  
Irgalite 4 BP



## Dosage Recommendations for TEGOMER® Dispersants

	Carbon Black [% AoP]	Organic Pigments [% AoP]	Inorganic Pigments [% AoP]	Fillers [% AoP]
TEGOMER® DA 800	20 - 100	10 - 40	4 - 20	4 - 20
TEGOMER® DA 626	40 - 100	20 - 80	5 - 30	5 - 30
TEGOMER® DA 646	10 - 70	10 - 35	0.5 - 3.0	0.5 - 3.0
TEGO® STO V	20 - 100	20 - 80	10 - 30	10 - 30
TEGO® STO 85 V	20 - 100	20 - 80	10 - 30	10 - 30
TEGOMER® 6875	5 - 15	2 - 5	1 - 2	0.5 - 2


% AoP: Additive calculated on Pigment in parts by weight

## Overview: Polymer – Carrier – Liquid Dispersant

Polymers	Carrier	Liquid Dispersant	Food Contact Status
PA, PET, PC	TEGO® STO V / STO 85 V		EU 10/2011; FDA 178.3400
	TEGO® STO V / STO 85 V	TEGOMER® DA 800	EU 10/2011; FDA 175.300
	TEGOMER® DA 800		EU 10/2011; FDA 175.300
	PPG	TEGO® STO V / STO 85 V	Depends on PPG
	PPG	TEGOMER® DA 800	Depends on PPG
PE, PP, EVA	Vegetable oil (e.g. rapseed) Mineral oil for PP sheet application	TEGO® STO V / STO 85 V	EU 10/2011; FDA 178.3400
	TEGO® STO V / STO 85 V		EU 10/2011; FDA 178.3400
	PPG	TEGOMER® DA 626	no
PMMA	MMA	TEGOMER® DA 626	no
PU	PPG (hydrophobic)	TEGOMER® DA 626	no
	PEG (hydrophilic)	TEGOMER® DA 646	no
	Polyesterpolyols	TEGOMER® DA 626	no
	Phthalates (DINP, DOP, DIBP), Adipates, Citrates	TEGOMER® DA 626	no
PS / ABS	TEGO® STO V / STO 85 V		EU 10/2011; FDA 178.3400
	Vegetable Oil	TEGO® STO V / STO 85 V	EU 10/2011; FDA 178.3400
	TEGO® STO V / STO 85 V	TEGOMER® DA 626	no



# Polarity of Dispersants, Carrier and Polymers



unpolar	Polymer	Carrier	Dispersant
	Silicone rubber	Silicone OH Silicone VS	<b>TEGOMER® M-Si 2650</b> <b>TEGOPREN® 6875</b>
	PE, PP, PS	Mineral oil Vegetable oil	<b>TEGO® STO V</b>
	EVA	DINP PPG	<b>TEGOMER® DA626</b>
	SAN, ABS, PVC PET, PBT		<b>TEGOMER® DA646</b>
	PA, PUR	PEG Water	<b>TEGO® STO 85 V</b> <b>TEGOMER® DA800</b>
polar			



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