

POLYDERM Polyurethanes



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This guide illustrates ALZO International's commitment to innovation in the global cosmetic and personal care market, wherein existing, performance proven, naturally derived raw materials are integrated with urethane technology. Key attributes of the POLYDERM polyurethanes are:

- thermolytic stability
- resistance to hydrolysis in high and low pH mediums
- ease of usage
- effectiveness at low formulation levels
- superior substantivity

The POLYDERM polyurethanes can readily be incorporated into a broad range of cosmetic applications and we have refined these materials to be functional as:

- conditioners
- coupling agents
- dispersants
- emollients
- emulsifiers
- film formers
- fragrance solubilizers
- slip additives
- thickeners



ALZO has also synthesized the POLYDERMS into multifunctional polymeric surfactants, which encompass:

- amine oxides
- betaines
- phosphates
- quaternaries
- tertiary amine salts



By utilizing our novel technology, an unlimited number of polymers can be designed to accommodate your specific needs and applications. Service and innovation being at the forefront of our 26 years of success, ALZO technical personnel are ready to customize a product to meet your individual requirements. For more information and for samples, please contact your ALZO representative or reach us directly at our headquarters:

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Hydroxyester and Triglyceride Emollients

Trade name: **POLYDERM PPI-CO**

INCI Name: Castor Oil/IPDI Copolymer

Appearance @ 25C: Clear Viscous Liquid

Ionic Nature: Nonionic

Solubility: Oil

Description: POLYDERM PPI-CO is a polymeric emollient where the triol is a natural derivative of castor oil.

Applications: All color cosmetics for pigment dispersion. Transfer resistance in lipsticks. Shine agent for lip products. Water resistance and extended wear in mascaras. Binder for pressed powders. Cosmetic pencils and eyeliners. Barrier protection and emolliency in creams, lotions. Water and rub resistance in sunscreens. Conditioner/sheen additive for hair applications, styling aids. Use level 1-15%.

Trade name: **POLYDERM PPI-CO-H**

INCI Name: Hydrogenated Castor Oil/IPDI Copolymer

Appearance @ 25C: Waxy Solid (M.P. 80C)

Ionic Nature: Nonionic

Solubility: Oil

Description: POLYDERM PPI-CO-H is a polymeric solid emollient where the triol is a hydrogenated castor oil.

Applications: Builds body and adds viscosity to skin care products. Emulsion stabilization. Adds rigidity to antiperspirant and deodorant sticks. High melting point solid (80C) for lipsticks and mascaras. Suspending agent. Use level 0.5-10%.

Trade name: **POLYDERM PPI-CO-40**

INCI Name: PEG-40 Hydrogenated Castor Oil/IPDI Copolymer

Appearance @ 25C: Soft Opaque Paste (M.P. 30C)

Ionic Nature: Nonionic

Solubility: Water

Description: POLYDERM PPI-CO-40 is a water soluble polyurethane where the triol is an ethoxylated (40 moles), hydrogenated castor oil.

Applications: Hair and Skin Care for conditioning and emolliency. O/W emulsification (HLB 12.5). Fragrance coupling, retention and solubilization. Surfactant in personal cleansers. Slip and lubricity in antiperspirants and deodorants. Low color and low odor. Use level 0.5-5%.

Trade name: **POLYDERM PPI-CO-200**

INCI Name: PEG-200 Hydrogenated Castor Oil/IPDI Copolymer

Appearance @ 25C: Solid (M.P. 50C)

Ionic Nature: Nonionic

Solubility: Water

Description: POLYDERM PPI-CO-200 is a solid, water soluble polymer where the triol is an ethoxylated (200 moles), hydrogenated castor oil.

Applications: Adds lubricity and emolliency to skin care formulations. Gives body and stability to emulsions. Rheology modifier for water phase. Solubilizer for fragrances (HLB 15.0). Helps create clear sticks. Helps reduce whitening of antiperspirants. Use level 0.5-10%.

Trade name: **POLYDERM PPI-DGDIS**

INCI Name: Polyglyceryl-2 Diisostearate/IPDI Copolymer

Appearance @ 25C: Clear Very Viscous Liquid

Ionic Nature: Nonionic

Solubility: Oil

Description: POLYDERM PPI-DGDIS is a plant sourced polyurethane based on glycerine and a long chain fatty acid.

Applications: Color cosmetics. Exceptional shine agent for lip products. Excellent pigment dispersant and suspending agent. Water resistance and extended wear in mascaras. Cosmetic pencils and eyeliners. Substantive film forming emollient for skin care. Water and rub resistance in sunscreens. Sheen additive/conditioner in hair applications, styling aids. Use level 1-15%.

Trade name: **POLYDERM PPI-GH**

INCI Name: Glycereth-7 Hydroxystearate/IPDI Copolymer

Appearance @ 25C: Light Tan Paste

Ionic Nature: Nonionic

Solubility: Water Dispersible

Description: POLYDERM PPI-GH is polymeric emollient where the triol is a derivative of castor oil and glycerine.

Applications: Conditioner and humectant for skin and hair. Film former for styling products. Moisturizer for lip products. Non occlusive petrolatum replacement. Self emulsifiable in water. Presence of hydroxyl and ether groups enhance polarity. Use level 0.5-5%.

Trade name: **POLYDERM PPI-GRC**

INCI Name: Glyceryl Diricinoleate/IPDI Copolymer

Appearance @ 25C: Clear Very Viscous Liquid

Ionic Nature: Nonionic

Solubility: Oil

Description: POLYDERM PPI-GRC is a highly substantive plant sourced polyurethane where the fatty acid is a derivative of castor oil.

Applications: Color cosmetics. Exceptional shine agent for lip products. Aids in moisturization. Decreases feathering. Excellent pigment dispersant and suspending agent. Water resistant film former. Mascaras, cosmetic pencils, pressed powders, lip treatments. Use level 1-10%.

Trade name: **POLYDERM PPI-PE**

INCI Name: Polydiethylene Glycol Adipate/IPDI Copolymer

Appearance @ 25C: Clear Very Viscous Liquid*

Ionic Nature: Nonionic

Solubility: Oil

Description: POLYDERM PPI-PE is a liquid polyurethane with outstanding adhesive characteristics.

Applications: High shine and increased wear for color cosmetics. Extremely hydrophobic film former and emollient. Excellent adhesion for water resistant sunscreens. Barrier creams and protective lotions for exceptional durability. Use level 1-10%.

*Also available in a less viscous form, as a 60/40% blend with Diisopropyl Adipate.

Trade name: **POLYDERM PPI-PGR**

INCI Name: Propylene Glycol Diricinoleate/IPDI Copolymer

Appearance @ 25C: Clear Very Viscous Liquid

Ionic Nature: Nonionic

Solubility: Oil

Description: POLYDERM PPI-PGR is a highly substantive plant sourced polyurethane where the fatty acid is a derivative of castor oil.

Applications: Color cosmetics. Exceptional shine agent for lip products. Aids in moisturization. Decreases feathering. Excellent pigment dispersant and suspending agent. Water resistant film former. Mascaras, cosmetic pencils, pressed powders, lip treatments. Use level 1-10%.

Silicone Copolyol Emollients

Trade Name: **POLYDERM PPI-SI-20**

INCI Name: Dimethiconol/IPDI Copolymer (and) Cyclomethicone

Appearance @ 25C: Colorless Soft Gel/Viscous Liquid*

Ionic Nature: Nonionic

Solubility: Oil

Description: POLYDERM PPI-SI-20 is a blend of D-5 Cyclomethicone and a polymeric polyurethane of dimethiconol.

Applications: Conditioners, styling aids. Lubricity and slip for hair. Improves wet and dry comb. Enhances shine and conditioning. Antitack emolliency for skin care. Water resistant film former for sunscreens. Use level 1-10%.

* To liquefy, heat gently to 40C. Do not shear.

Trade Name: **POLYDERM PPI-SI-WI**

INCI Name: Bis-PPG-15 Dimethicone/IPDI Copolymer

Appearance @ 25C: Clear Viscous Liquid

Ionic Nature: Nonionic

Solubility: Oil

Description: POLYDERM PPI-SI-WI is a liquid polymeric urethane where the diol is a propoxylated dimethicone copolyol.

Applications: Lubricity and slip for skin and hair. Helps wet comb in conditioners. Improves afterfeel of styling products. Water repellency/film forming in creams, lotions and sunscreens. Emollient in skin care. Wetting agent for pigments and inorganic sunscreens. Helps reduce tackiness in antiperspirants. Use level 0.5-5%.

Trade Name: **POLYDERM PPI-SI-WS**

INCI Name: Bis-PEG-15 Dimethicone/IPDI Copolymer

Appearance @ 25C: Clear Semi-Viscous Liquid

Ionic Nature: Nonionic

Solubility: Water

Description: POLYDERM PPI-SI-WS is a water soluble polymeric urethane where the diol is an ethoxylated dimethicone copolyol.

Applications: Lubricity and slip for skin and hair. Clear conditioners, body gels, facial cleansers, 2in1 clear shampoos, styling aids. Foam stabilization, wetting agent, water soluble emollient and surfactant for personal cleansing systems. Water soluble emollient/film former for creams and lotions. Secondary O/W emulsification (HLB 11-12). Fragrance coupler. Use level 0.5%-5%.

Hydroxy Amine Conditioners

Trade name: **POLYDERM PPI-CA-15**

INCI Name: PEG-15 Cocamine/IPDI Copolymer

Appearance at 25C: Clear Viscous Liquid

Ionic Nature: Cationic

Activity, %: 100

Solubility: Water

Description: POLYDERM PPI-CA-15 is a water soluble polymeric conditioner/emollient based on naturally derived coco.

Applications: 2-in-1 systems, clear shampoos, conditioners, styling aids. Hair dye systems. Liquid soaps, personal washes. Creams, lotions as a substantive emollient. Excellent deposition on skin and hair. Use level 0.25-2%

Trade name: **POLYDERM PPI-G7/CA**

INCI Name: Glycereth-7-Diglycerol-PEG-15 Cocamine/IPDI Copolymer

Appearance @ 25C: Clear Viscous Liquid

Ionic Nature: Cationic

Solubility: Water

Description: POLYDERM PPI-G7/CA is a water soluble polyurethane derived from 3 natural sources: glycerol, diglycerol and cocamine.

Applications: Mild surfactant/humectant for personal cleansers. Conditioner for skin and hair. Fragrance solubilizer (HLB 13-14). Mildly cationic polymer adds emolliency and substantivity to creams and lotions. Use level 1-5%.

Trade name: **POLYDERM PPI-RC**

INCI Name: Ricinoleamidopropyl Dimethylamine/IPDI Copolymer

Appearance at 25C: Clear Amber Viscous Liquid

Ionic Nature: Cationic

Activity, %: 100

Solubility: Oil

Description: POLYDERM PPI-RC is a polymeric conditioner/emollient based on naturally derived castor oil.

Applications: Shampoos, conditioners, styling aids. Hair dye systems. Liquid soaps, bar soaps. Creams, lotions as a substantive emollient. Superior deposition on skin and hair. Use level 0.25-2%.

Trade name: **POLYDERM PPI-SA**

INCI Name: Di-PEG-2 Soyamine/IPDI Copolymer

Appearance at 25C: Clear Viscous Liquid

Ionic Nature: Cationic

Activity, %: 100

Solubility: Oil

Description: POLYDERM PPI-SA is a polymeric conditioner/emollient based on naturally derived soya.

Applications: Shampoos, conditioners, styling aids. Hair dye systems. Liquid soaps, bar soaps. Creams and lotions as a substantive emollient. Superior deposition on skin and hair. Use level 0.25-2%.

Trade name: **POLYDERM PPI-SA-5**

INCI Name: PEG-5 Soyamine/IPDI Copolymer

Appearance at 25C: Clear Liquid

Ionic Nature: Cationic

Activity, %: 100

Solubility: Water Dispersible

Description: POLYDERM PPI-SA-5 is a water dispersible polymeric conditioner/emollient based on naturally derived soya.

Applications: Shampoos, conditioners, styling aids. Hair dye systems. Liquid soaps, bar soaps, personal washes. Creams, lotions as a substantive emollient. Excellent deposition on skin and hair. Use level 0.25-2%.

Trade name: **POLYDERM PPI-SA-15**

INCI Name: PEG-15 Soyamine/IPDI Copolymer

Appearance at 25C: Clear Amber Liquid

Ionic Nature: Cationic

Activity, %: 100

Solubility: Water

Description: POLYDERM PPI-SA-15 is a water soluble polymeric conditioner/emollient based on naturally derived soya.

Applications: 2in1 systems, clear shampoos, conditioners, styling aids. Hair dye systems. Liquid soaps, personal washes. Cream, lotions as a substantive emollient. Excellent deposition on skin and hair. Use level 0.25-2%.

Trade name: **POLYDERM PPI-SA-15 Salicylate**

INCI Name: PEG-15 Soyamine/IPDI Copolymer (and) Salicylic Acid

Appearance at 25C: Clear Viscous Liquid

Ionic Nature: Cationic

Solubility: Water Dispersible

Description: POLYDERM PPI-SA-15 Salicylate is a cationic polyurethane soyamine complexed with salicylic acid.

Applications: Hair care, skin care. This unique combination provides a good free source of salicylic acid. Use level 1-5%.

Resinous Polyurethane Emulsions

Trade name: **POLYDERM PE/PA**

INCI Name: Polyether-Propionic Acid/
TMXDI Copolymer

Appearance at 25C: Translucent Liquid

Ionic Nature: Anionic

PH @ 25C: 8.0

Activity, %: 33

Solubility: Water Dispersible

Description: POLYDERM PE/PA is a water based polyurethane polyether microemulsion resin.

Applications: Low VOC pump and aerosol hairsprays, styling gels, aerosol and non-aerosol mousses. Acts as a fixative and film former in styling products. Produces a durable, flexible, water resistant film. Use level: 2-10%.

Trade name: **POLYDERM PES/PA**

INCI Name: Polyester-Propionic Acid/
TMXDI Copolymer

Appearance at 25C: Translucent Liquid

Ionic Nature: Anionic

PH @ 25C: 8.5

Activity, %: 33

Solubility: Water Dispersible

Description: POLYDERM PES/PA is a water based polyurethane polyester microemulsion resin.

Applications: Low VOC pump and aerosol hairsprays, styling gels, aerosol and non-aerosol mousses. Acts as a fixative and film-former in styling products. Produces a durable, flexible, water resistant film. Use level: 2-10%.

Phospholipid Emulsifiers

Trade name: **POLYPHOS PPI-CO**

INCI Name: Castor Oil Phosphate/IPDI Copolymer

Appearance at 25C: Very Viscous Amber Liquid

Ionic Nature: Anionic

PH 10% (aq. Dispersion): 3.4

Activity, %: 100

Solubility: Oil

Description: POLYPHOS PPI-CO is a complex phosphate ester based on castor oil polyurethane in free acid form.

Applications: Creams, lotions, hair preparations. Serves as a secondary W/O emulsifier (HLB 3.5). As an acid phosphate ester polyurethane, neutralization will vary the degrees of solubility, thickening and emulsification. Because of its urethane backbone, Polyphos PPI-CO provides superior substantivity and resistance to hydrolysis. Use level 0.5-5%.

Trade Name: **POLYPHOS PPI-CO-40**

INCI Name: PEG-40 Hydrogenated Castor Oil Phosphate/IPDI Copolymer

Appearance at 25C: Very Viscous Opaque Liquid

Ionic Nature: Anionic

PH 10% (aq. Dispersion): 2.35

Activity, %: 100

Solubility: Water Dispersible

Description: POLYPHOS PPI-CO-40 is a complex phosphate ester based on ethoxylated-hydrogenated castor oil polyurethane in free acid form.

Applications: Creams, lotions, hair preparations. Serves as a secondary W/O and O/W emulsifier (HLB 12.4). As an acid phosphate ester polyurethane, neutralization will vary the degrees of solubility, thickening and emulsification. Because of its urethane backbone, Polyphos PPI-CO-40 provides superior substantivity and resistance to hydrolysis. Use level 0.5-5%.

Polymeric Surfactants

Amine Oxides

Trade name: **POLYMOX PPI-CA-15**

INCI Name: PEG-15 Cocamine Oxide/IPDI Copolymer

Appearance at 25C: Clear to Slightly Hazy Viscous Liquid

Ionic Nature: Nonionic

Activity, %: 75

Solubility: Water

Description: POLYMOX PPI-CA-15 is a highly concentrated polymeric amine oxide derived from natural coco.

Applications: Shampoos, detergents, personal washes as a viscosity builder, often used in place of alkanolamides, especially in combination with PEG-150 Distearate. Mild cationic conditioning at acid pH, reducing static charge and fly away in hair care products. Use level 0.25-5%.

Trade name: **POLYMOX PPI-SA**

INCI Name: PEG-2 Soyamine Oxide/IPDI Copolymer

Appearance at 25C: Clear to Slightly Hazy Viscous Liquid

Ionic Nature: Nonionic

Activity, %: 75

Solubility: Water Dispersible

Description: POLYMOX PPI-SA is a highly concentrated polymeric amine oxide derived from natural soya.

Applications: Shampoos, detergents, personal washes as a rheology modifier, often used in place of alkanolamides, especially in combination with PEG-150 Distearate.

Cationic conditioning at acid pH, reducing static charge and fly away in hair care products. Use level 0.25-3%.

Trade Name: **POLYMOX PPI-SA-15**

INCI Name: PEG-15 Soyamine Oxide/IPDI Copolymer

Appearance at 25C: Clear to Slightly Hazy Viscous Liquid

Ionic Nature: Nonionic

Activity, %: 75

Solubility: Water

Description: POLYMOX PPI-SA-15 is a highly concentrated polymeric amine oxide derived from natural soya.

Applications: Shampoos, detergents, personal washes as a rheology modifier. Often used in place of alkanolamides, especially in combination with PEG-150 Distearate.

Cationic conditioning at acid pH, reducing static charge and fly away in hair care products. Use level 0.25-3%.

Quaternaries

Trade name: **POLYQUAT PPI-CA-15**

INCI Name: PEG-15 Cocamine Ethyldimonium Ethosulfate/IPDI Copolymer

Appearance at 25C: Clear Viscous Liquid

Ionic Nature: Cationic

Activity, %: 100

Solubility: Water

Description: POLYQUAT PPI-CA-15 is a substantive polyquaternary conditioner plant derived from coco.

Applications: Shampoos, conditioners, crème rinses. Cationic creams and lotions. Substantive deposition due to urethane bond and positive (cationic) charge. Anti-static agent, providing body and manageability, and reducing fly away in hair applications. Use level 0.5-2%.

Trade name: **POLYQUAT PPI-RC**

INCI Name: Ricinoleamidopropyl Ethyldimonium Ethosulfate/IPDI Copolymer

Appearance at 25C: Clear Viscous Liquid

Ionic Nature: Cationic

Activity, %: 80

Solubility: Water

Description: POLYQUAT PPI-RC is a substantive polyquaternary conditioner plant derived from castor oil.

Applications: Shampoos, conditioners, crème rinses. Cationic creams and lotions. Substantive deposition due to urethane bond and positive (cationic) charge. Anti-static agent providing body and manageability, and reducing fly away in hair applications. Use level 0.5-2%.

Trade name: **POLYQUAT PPI-SA**

INCI Name: PEG-2 Soyamine Ethyldimonium Ethosulfate/IPDI Copolymer

Appearance at 25C: Clear Amber Viscous Liquid

Ionic Nature: Cationic

Activity, %: 80

Solubility: Water

Description: POLYQUAT PPI-SA is a substantive polyquaternary conditioner plant derived from soya.

Applications: Shampoos, conditioners, crème rinses. Cationic creams and lotions. Substantive deposition due to urethane bond and positive (cationic) charge. Anti-static agent, providing body and manageability, and reducing fly away in hair applications. Use level 0.5-2%.

Polymeric Surfactants (continued)

Betaines

Trade name: **POLYTAINE PPI-CA-15**

INCI Name: PEG-15 Cocamine Betaine/
IPDI Copolymer

Appearance at 25C: Slightly Hazy Viscous Liquid

Ionic Nature: Amphoteric

Activity, %: 50

Solubility: Water

Description: POLYTAINE PPI-CA-15 is an amphoteric polyurethane surfactant based upon naturally derived coco.

Applications: Low irritation surfactant for shampoos, personal washes and bath products. Wetting agent, fragrance solubilizer. Good rinse off properties with a light afterfeel. Excellent solubility over a wide pH range. Specialty performance enhancer for traditional foaming agents. Use level 1-7%.

Trade name: **POLYTAINE PPI-RC**

INCI Name: Ricinoleamidopropyl Betaine/IPDI
Copolymer

Appearance at 25C: Clear to Slightly Hazy Liquid

Ionic Nature: Amphoteric

Activity, %: 45

Solubility: Water

Description: POLYTAINE PPI-RC is an amphoteric polyurethane surfactant based upon a derivative of castor oil.

Applications: Low irritation surfactant for shampoos, personal washes and bath products. Wetting agent, fragrance solubilizer. Good rinse off properties with a light afterfeel. Excellent solubility over a wide pH range. Specialty performance enhancer for traditional foaming agents. Use level 1-7%.

Trade name: **POLYTAINE PPI-SA-15**

INCI Name: PEG-15 Soyamine Betaine/IPDI Copolymer

Appearance at 25C: Slightly Hazy Viscous Liquid

Ionic Nature: Amphoteric

Activity, %: 50

Solubility: Water

Description: POLYTAINE PPI-SA-15 is an amphoteric polyurethane surfactant based upon naturally derived soya.

Applications: Low irritation surfactant for shampoos, personal washes and bath products. Wetting agent, fragrance solubilizer. Good rinse off properties with a light afterfeel. Excellent solubility over a wide pH range. Specialty performance enhancer for traditional foaming agents. Use level 1-7%.

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