

# CARBOWAX™ SENTRY™ PEG formulation guide for cosmetics, pharmaceuticals, and more

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# CARBOWAX™ SENTRY™ PEGs in consumer health and pharmaceuticals

- CARBOWAX™ SENTRY™ Polyethylene Glycols (PEGs) are widely used in the consumer health and pharmaceutical industries because of their unique formulation properties, low toxicity, mildness and water-solubility.
- CARBOWAX™ SENTRY™ Methoxypolyethylene Glycols (MPEGs) are primarily used as intermediates in the synthesis of pharmaceutical actives, for example, in esterification reactions. They have also been found to enhance the water solubility of less polar compounds and are used in topical applications.
- A significant advantage of using PEGs is the availability of a wide range of molecular weights, which provide a wide range of viscosities and melting points. PEGs can be formulated to almost any desired consistency.
- PEGs may be used to compound a variety of water soluble ointments, which are nonionic and require no emulsifiers. They are easily applied to both moist and dry skin to facilitate even distribution and quick release of actives.
- PEGs do not support microbial growth, nor become rancid.

## Consumer health and pharmaceuticals formulation guide

Product / Process	Function of PEG	Suggested CARBOWAX™ SENTRY™ PEGs	Formulation guideline
Capsules	Carrier/Plasticizer	300-1450	5-50%
Films	Plasticizer	300-100	5-30%
Glycerine replacement	Humectant/Solvent	300	10-100% glycerine content
Granules	Granulation aid	3350-8000	1-3%
Liquid formulations (oral)	Carrier	300, 400, 1450	10-50%
Medicated lotions	Base/Carrier	400	50-95%
Ointments	Base/Carrier	540 Blend	50-95%
Spray-on medications	Solubilizer/Carrier	300, 400	10-25%
Suppositories	Base	1000	50-95%
Sustained-release	Carrier/Plasticizer	3350, 4000, 8000	5-50%
Tablet coating	Plasticizer	3350, 4000, 8000	1-5%
Tablets	Binder	3350, 4000, 8000	15-30%
Tablet processing	Lubricant	3350, 4000, 8000	1-3%
Toothpaste or dentifrices	Humectant/Consistency control	300, 400, 600, 1450, 3350	1-30%

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## CARBOWAX™ SENTRY™ PEGs in cosmetics & personal care

- CARBOWAX™ SENTRY™ Polyethylene Glycols (PEGs) are valuable ingredients in a wide range of cosmetics and personal care preparations. They are water-soluble, odourless, non-irritating, neutral, non-volatile, and lubricating. When used as intermediates, they are converted into their fatty acid esters, which are used as cleaners, ointments, and as emulsifying and suspending agents.
- PEGs do not support microbial growth, nor become rancid. In addition, aqueous PEG solutions do not pose stability problems at room temperatures.

### Cosmetics and personal care formulation guide

Product / Process	Function of PEG	Suggested CARBOWAX™ SENTRY™ PEGs	Formulation guideline
Antiperspirant/Deodorant	Binder/Carrier/Solubilizer	300-8000	1-15%
Bath oil/Foam bath	Actives solubilizer/Conditioner	400	1-5%
Bath powder	Anti-dusting agent/Binder	3350, 4000	1%
Cologne	Humectant/Carrier	400, 600	1-5%
Creams	Carrier/Emollient	300-8000	1-15%
Glycerine replacement	Solvent/Carrier	300	10-100% of glycerine content
Hair care	Conditioner/Binder	400, 540 Blend, 3350-8000	1-10%
Hair styling (aerosol)	Antistatic agent/Plasticizer	400	1-5%
Hand cleaners	Coupling agent/Conditioner	300, 540 Blend	5-10%
Lipsticks	Solvent	300, 400, 600	5-15%
Lotions (face or neck)	Cleansing agent	400	1-5%
Make-up	Binder/Solubilizer	300, 400, 600, 3350, 4000	1-10%
Make-up remover	Coupling agent/Conditioner	400	20%
Nail polish remover	Vehicle/Humectant	200, 400, 3350, 4000, 8000	5-15%
Ointments	Base/Carrier	540 Blend, 1000	Use pure or with 1-10% water
Shampoo	Wetting agent/Conditioner	300-600	1-10%
Shaving cream	Foam stabilizer/Consistency regulator	300-1450	5-15%
Shave (pre- and after-)	Non-greasy lubricant/Conditioner/ Perfume Stabilizer	200-400	1-5%
Soap	Emollient/Mold release agent	400, 1450, 3350, 4000	5-10%
Sunscreens	Solubilizer/Conditioner	200-600, 1450	1-10%
Tablets (effervescent)	Binder	3350-8000	5-15%

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