

COMPARISON OF WATER-BASED AND SOLVENT-BASED RELEASE AGENTS



Release agents are one of the most widely used chemical specialties for the creation of molded polyurethane parts, elements present in a wide variety of sectors and applications.

There are a number of **critical factors** that need to be taken into account when deciding on the use of a particular release agent. These are:

- **Quantity of VOCs**
- **Flammability**
- **Toxicity**
- **Final impact on the environment**

For the manufacture of polyurethane (PU) foams, experts **recommend** setting aside the use of solvent-based release agents and opting for **water-based** ones, which are more sustainable.

This was stated by **Concontrol's R&D team**, which created a comparative study of water-based products designed for the release of polyurethane foam.

PROPERTY	WATER BASE	WATER BASE CO-SOLVENT	HYBRID 30% SOLVENT	HYBRID 50% SOLVENT	SOLVENT BASE CLASS III
TOUCH	Dry - soft, like a solvent base, to light or intense oily (anti - noise).		Dry - soft, like a solvent base, small uniform pores.		Dry - soft, small uniform pores.
STRUCTURE	80-85% water, solvent <10%. Emulsified active ingredients (waxes, resins, additives, etc.): 5-20%. Fatty ones can carry more solids.	65-85% water, solvent: 10-25%. Emulsified active ingredients (waxes, resins, additives, etc.) (*): 5-10%. In the case of fatty ones they can carry more solids.	55-70% water, solvent: 25-35%. Emulsified active ingredients (waxes, resins, additives, etc.): 5-10%. Emulsified solvent base product.	65-30% water, solvent: 40-60%. Emulsified active ingredients (waxes, resins, additives, etc.): 5-10%. Emulsified solvent base product.	6-9% of active ingredients (waxes, resins, additives, etc.) dispersed in aliphatic and / or insoparaffinic solvents.
FOULING OF MOULDS AND INSTALLATIONS / DRY FINISH:	DRY FINISH: 10-15% more dirt than a solvent base inside the mould (**). In the environment as a solvent base, that is, unappreciable. White mould. OILY FINISH: Yellowish dirt on the mould and on the outside. Dirty appearance in general although its release and anti-noise power are excellent. Possible allergies.		10-15% more dirt than a solvent base inside the mould. In the environment, as a solvent base, that is, hardly or not appreciable. White mould.		One-week cycles without cleaning the moulds are common.

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PEELING OF THE WAX LAYER	Totally dry to the touch products can flake off after 3-4 days of work. Oily finish products do not peel off, so their uncleaned use is extended from 2 weeks to 6 months, depending on the isocyanate-water interaction.				Solvent-based products, due to their hardness, cause peeling before or after.
THEORETICAL VOCs (***)	<10	<=25	<=35	<=60	91-94%
FLASH POINT	N.A.	N.A.	>90°C	56°C	56°C
TYPES OF SOLVENTS	Aliphatic and/or isoparaffinic.				Aliphatic and/or isoparaffinic.
RECOMMENDED MOULD CLEANING	Cryogenic.				Cryogenic, abrasive spraying or waste melting.
APPLICATION	Mainly airbrushing. Nozzle 0.3 to 0.8 mm depending on the size of the mould and the required flow. The larger the mould and / or viscosity, the bigger the nozzle.				
ELECTROSTATIC APPLICATION	Water-based products and hybrids have not responded adequately so far, as the application of water-based products in an electrostatic manner is not sufficiently developed, and conductivity is uncontrollable.				All solvent-based products can be electrostatically activated, and applied as such.

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NECESSARY CONTROLS DURING ITS APPLICATION	Flow, spray air at least once per shift and when changing batch number.				
PRODUCT STABILITY	All the emulsions that make up the water-based range for PU release agents have excellent stability. As a precaution, it is recommended to shake the product with sufficient pneumatic agitation until the product mass moves evenly and evenly. Hold for 30 minutes. For the next few days the container lasts, shake daily in the morning for 15 minutes.				Solvent base. With constant agitation it remains stable.
STORAGE	Never in the open air, water-based products. Protect from the cold in general, mainly below or near 0 °C. Keep between 15 and 30 °C closed in the original container.				No freezing problem, but avoid leaving it in the open air.

(*) Note that these emulsifiers, being polar surfactants, do not facilitate release.

(**) Applicable to all types of water-based release agent for polyurethane. The residues on the mould can increase or decrease, taking into account that part of them come produced by the reaction isocyanate + water = polyureas, infusible white solid and of good adhesion to the mould. Any amount of water left on the mould at the time of polyurethane casting will end up as polyurethane, in addition to the usual fouling.

(***) VOC definition (https://www.eurofins.com/media/313747/e_10_-_eu_ecolabel.pdf)