ALLESSA

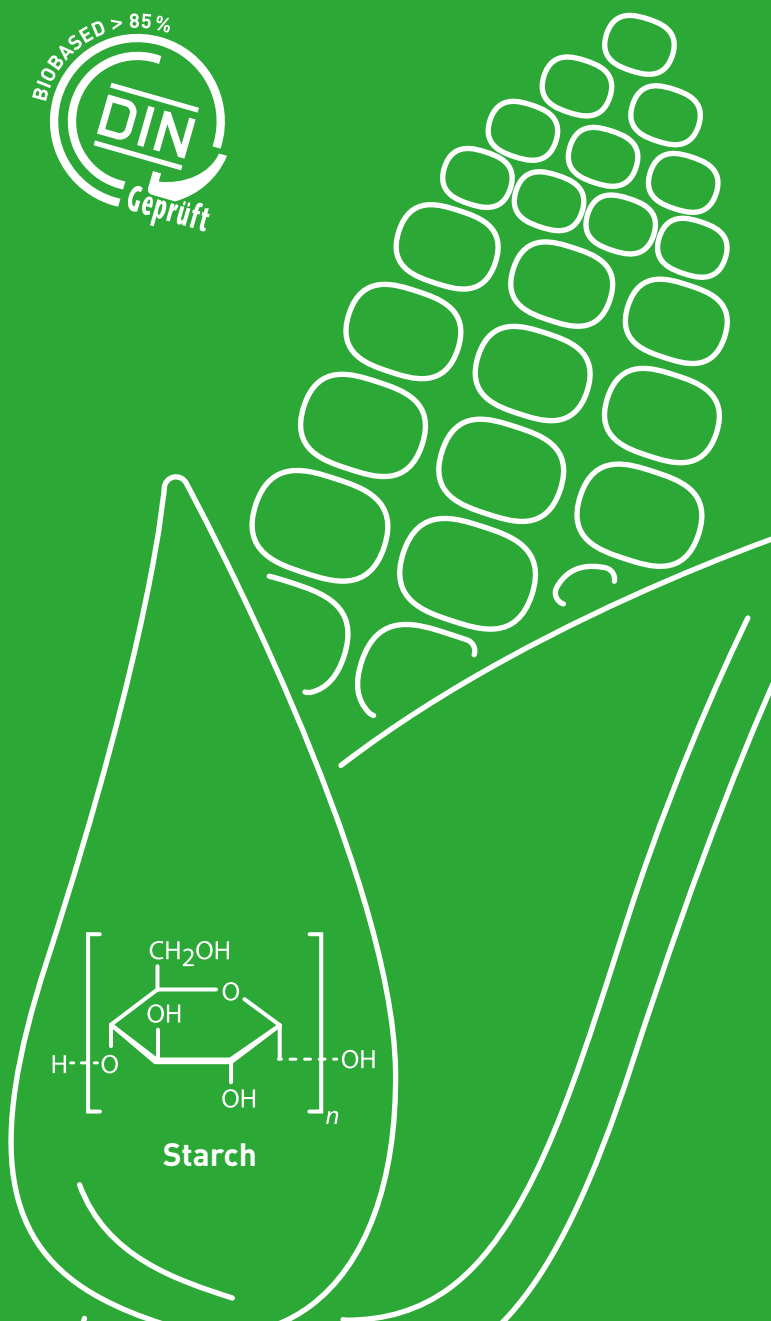
Member of WeylChem Group of Companies

VELVETOL® – 100 % BIO-BASED

PO3G POLYPROPANEDIOL

Molecular Weight: 500 – 2700 g/mol
CAS-No.: 345260-48-2

BIOBASED > 85 %
DIN Geprüft



SUSTAINABLE, 100 % BIO-BASED HIGH PERFORMANCE POLYOLS

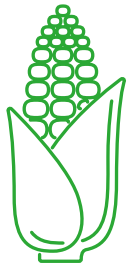
VELVETOL® is a family of high performance polyether polyols made with renewably sourced 1,3-propanediol (Susterra®). Thanks to its outstanding characteristics, it is an ideal replacement for petroleumbased ingredients and polyols, offering a multitude of advantages in various fields of applications without compromising functionality and increasing the renewable content of final products at the same time.

Compared to petrochemical alternatives such as poly-(tetramethylene-ether)glycol (PTMEG), polypropyleneglycol (PPG), polyethyleneglycol (PEG) our product VELVETOL® has a significantly lower environmental footprint, saving 40 % in nonrenewable energy consumption and reducing greenhouse gas emissions by 42 % as proofed by an ISO 14000-compliant life cycle analysis.

Allessa GmbH is a global supplier and manufactures VELVETOL® at its plant in Frankfurt, Germany.

Chemistry and Specification of VELVETOL®

Manufacturing process of VELVETOL®



Biomass / Starch

Enzymes → Glucose

Microorganisms → Bio-Propanediol

Polymerization → VELVETOL®

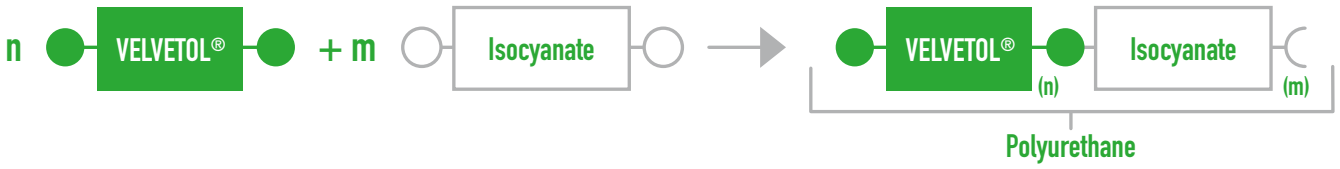
MW: 500–2700 g/mol

VELVETOL® is formed by Polycondensation of Bio-Propanediol derived from renewable feedstock

PROPERTIES	UNITS	H500	H1000	H2000	H2700
Content	%	100	100	100	100
Molecular weight	Dalton	400 – 600	900 – 1100	1900 – 2100	2600 – 2800
Hydroxyl number	mg KOH/g	280 – 187	125 – 102	59.1 – 53.4	43.2 – 40.1
Controlled Polymerization Rate (Alkalinity)	meqKOH/30 kg ppm	–2.0 – +2.0 ‹5	–2.0 – +2.0 ‹5	–2.0 – +2.0 ‹5	–2.0 – +2.0 ‹5
Acid number	mg KOH/g	‹0.05	‹0.05	‹0.05	‹0.05
Na metal content	ppm	‹10	‹10	‹10	‹10
Peroxide content	ppm	‹10	‹10	‹10	‹10
Water	ppm	‹500	‹500	‹500	‹500
Colour	max 50	max 50	max 50	max 50	max 120
Viscosity [40°C]	mPas	90 – 120	200 – 300	750 – 900	1550 – 1850
Density [40°C]	g/ml	1.020	1.018	1.016	1.016
Melting Point	°C	0 – 5	12 – 14	16 – 18	22 – 25

All grades include a bio-based stabilizer.

Use of VELVETOL® as a building block



VELVETOL® can be used as a sustainable building block for PU, COPA* and COPE by polyaddition or polycondensation**

*co-polyetheramide ** co-polyetherester

Properties of VELVETOL®

Outstanding characteristics of VELVETOL®

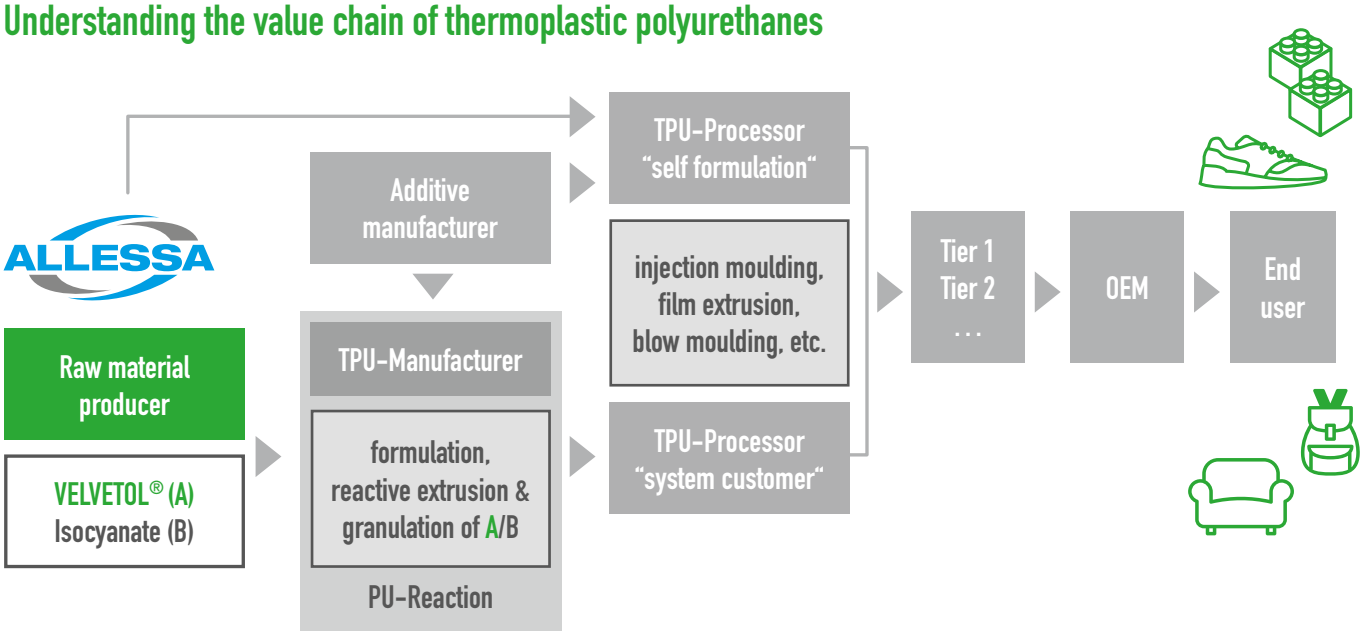
Compared to many other plant-derived polyols, VELVETOL® stands out with its always consistent quality.

1. 100 % sustainable content
2. Environmentally friendly and safe
3. Clear Liquids with low or no melting points (9 – 22 °C), low viscosity (100 – 1500 cp)
4. Easy to handle, to process and to transport
5. Low volatile, bio-degradable
6. High boiling point (>340 °C)
7. Low freezing point (down to –50 °C with additives)
8. High thermal heat capacity
9. Hydrolysis resistant, high oxidative stability
10. Water-soluble/insoluble depending on the molecular weight

Unique added values of VELVETOL® versus PTMEG

1. Chemically similar to PTMEG (C4)
2. Increases the content of bio-based materials in the end products (up to 80 % in elastomers)
3. Good processibility (low melting point, low viscosity, slow crystallization rates, low glass transition temperatures; –81 °C to –77 °C)
4. Offers long durability and superior abrasion resistance in various end use applications including artificial leather and coatings
5. Highly flexible molecules compared to PTMEG
6. Superior breathability (MVTR) over PTMEG based PU films and semi-permeable membranes
7. More resistant against acid and heat compared to PTMEG
8. Exhibits excellent thermo-oxidative stability, comparable to PTMEG

Understanding the value chain of thermoplastic polyurethanes



VELVETOL® creates added value along the whole value chain with its superior mechanical properties and its outstanding 100 % Bio content.

Various application fields of VELVETOL®

VELVETOL® is the answer, if you are looking for a green, safe, effective and compatible replacement for commonly used petroleum-based ingredients and polyols for your final product formulations.Offering exceptional performance and superior value to end-products in various markets, VELVETOL® should be your first choice for making high-performance thermoplastic elastomers (TPEs), apparel and footwear, performance coatings, ink-jet inks and functional fluids.

High-Performance TPEs

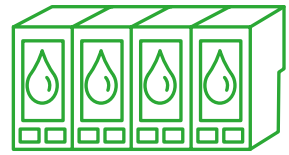
VELVETOL® is an ideal high-performance alternative to petroleum-based ingredients used in Polyurethane, Copolyamides and Copolyesters elastomers. VELVETOL® allows an easy drop-in, soft-segment replacement for PTMEG thermoplastic elastomers, offering unique characteristics including good chemical resistance, high mechanical strength and toughness as well as increased softness and elastic recovery.

Performance Coatings

VELVETOL® can be used as ingredient or additive for auto refinish, industrial metal coatings and PU dispersions in any or all of the coating layers, replacing any petroleum-based polyols. Used in base coatings, VELVETOL® provides excellent adhesion to metal. Used in color coatings, VELVETOL® offers outstanding color dispersion and chip resistance. When used as an additive in clear coatings, VELVETOL® provides increased flexibility and improved gravel and flake resistance.

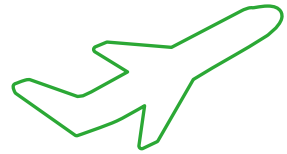
Apparel and Footwear

Thanks to its superior abrasion resistance, soft feel and Moisture Vapour Transmission Rate (MVTR), VELVETOL® is a preferred choice for footwear and performance textile applications including synthetic leather.



Ink-jet Inks

VELVETOL® based polyurethane added to pigment-based ink-jet ink formulations ends up in distinctive, value-added characteristics without compromising functionality. VELVETOL® based pigment inks combine the depth and clarity properties of dyes with the inherent durability of pigments.



Functional Fluids

Thanks to its excellent features such as increased thermal conductivity, improved thermal stability and lubricity, excellent low temperature properties as well as low toxicity and inherent biodegradability, VELVETOL® is an ideal base fluid for lubricants, dielectric coolants and heat-transfer fluids.

Handling and Packaging of VELVETOL®

Shipping Weight:

180 kg in 210 l Drums

Conditions for safe storage, including any incompatibilities:

Keep containers tightly closed in a cool, well-ventilated place. Store in original container and keep them away from heat and sources of ignition. Keep under nitrogen. Also keep away from food, drink and animal feeding-stuffs.

Freight Classification:

Not a dangerous substance or mixture according to the Globally Harmonised System (GHS)

Guideline:

- Before usage, please keep the drum sealed and stored at ambient temperature (5–25°C).
- For usage, it is recommended to work under nitrogen atmosphere.
- In case VELVETOL® has to be molten, please do it at temperatures below 70°C and under nitrogen atmosphere.
- Once open, please keep the remaining VELVETOL® in the drum under nitrogen and be sure that the drum is sealed again properly.

Handling and Safety:

Avoid contact with skin, eyes and clothing and use personal protective equipment. The danger areas must be delimited and identified using relevant warning and safety signs. Avoid release to the environment. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. In case of eye contact, immediately flush with plenty of water. For skin contact, wash off immediately with soap and plenty of water. Take off all contaminated clothing immediately. If inhaled, move person into fresh air. If swallowed, rinse mouth with water and get medical attention if symptoms occur.

Methods for cleaning up: Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Large spills should be collected mechanically (remove by pumping) for disposal. Clean contaminated floors and objects thoroughly while observing environmental regulations.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY:

The minimum warranty for VELVETOL® H500 is at least 2 years if the storage conditions mentioned above are observed.

Important!

The information provided in this Technical Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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