# **Plasticizers** Evonik product portfolio





# C4-CHEMICALS FROM EVONIK: CHEMISTRY4PEOPLE®

# **PLASTICIZERS FROM EVONIK**

Plasticizers from Evonik offer manufacturers of flexible PVC and their products flexibility, safety and above-average technical performance with a consistently high level of quality.

Plasticizers act like a molecular lubricant: The molecules sandwich themselves between the polymer chains of PVC. This makes the originally tightly-packed, rigid structure flexible, allowing the chains to slide past each other.

# **WE OFFER OUR CUSTOMERS**

#### Maximum delivery reliability

- Verbund production ensures optimal supply
- As a major producer of oxo alcohols continuous production of high-quality plasticizers

#### A full service from a single source

- Needs-based support from order to delivery
- Support from a well-established team with technical and regulatory knowledge
- Information about new developments

#### A strong commitment to regulatory issues

- Membership and active participation in several industry associations of the flexible PVC value chain
- Involvement in the public debate surrounding regulatory topics
- Active support of a science-based assessment of chemicals

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**VESTINOL® 9 (DINP)** is a very effective standard plasticizer for a wide range of flexible PVC applications with the best cost-performance ratio and a very balanced property profile. Learn more



**ELATUR® CH (DINCH)** is a modern, low-viscosity plasticizer with excellent cold flexibility and very good migration properties especially suitable for sensitive applications. Learn more



**ELATUR® DINCD** is an innovative low-viscosity plasticizer with excellent cold flexibility and very low volatility especially suitable for demanding applications. Learn more



**ELATUR® TM** is a specialty plasticizer with an excellent migration profile and very low volatility especially suitable for applications where low emissions are needed. Learn more

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**ELATUR® DPT** is a fast fusing, low-viscosity plasticizer with very low SVOC content and high gelation power preferably used for manufacturing of PVC plastisols. Learn more

Plasticizers from Evonik 🛛

## **VESTINOL<sup>®</sup> 9**

Efficiency. The allrounder sets the benchmark.

VESTINOL® 9 (DINP) is a very effective standard plasticizer for a wide range of flexible PVC applications with the best cost-performance ratio and a very balanced property profile.

# VESTINOL<sup>®</sup> 9 (DINP)

#### **APPLICATIONS**

- Plasticizer for PVC
- Adhesives & Sealants
- Coatings & Paints

#### **SPECIAL OFFERINGS**

- Plastisol ready-for-use grade VESTINOL® 9 cool available
- Life-cycle assessment data available

#### **PERFORMANCE AT A GLANCE**

- Excellent plasticizing efficiency
- Very good viscosity and aging profile
- High gelation and fusion speed
- · Excellent cold flexibility and outdoor stability
- Very good migration properties



#### **PROCESSING PERFORMANCE**

#### VISCOSITY

Plastisols with VESTINOL® 9 show a very good viscosity profile.



#### GELATION

VESTINOL® 9 offers a high fusion speed.





#### COLD FLEXIBILITY

Products with VESTINOL® 9 show excellent low temperature flexibility.



Measurement device: dynamic mechanic thermal analysis (DMTA) Parameter: Evonik method, glass transition temperature Tg Formulation: 100 phr PVC K71, 33 phr plasticizer, 3 phr ESBO, 2 phr stabilizer

#### EFFICIENCY

VESTINOL® 9 is a highly efficient plasticizer.



Measurement device: Shore hardness A, digital hardness tester Parameter: DIN ISO 48-4, storage min 16 h at 23 °C, 50 % humidity Formulation: 100 phr PVC K70, 50 phr plasticizer, 3 phr ESBO, 2 phr stabilizer

#### **MIGRATION INTO PVC-U**

VESTINOL® 9 shows a very low migration tendency into rigid PVC.



Measurement device: lab oven, analytical balance Parameter: weight difference, DIN EN ISO 177, 70 °C Formulation: 100 phr PVC K71, 33 phr plasticizer, 3 phr ESBO, 2 phr stabilizer

#### VOLATILITY

Products with VESTINOL® 9 exhibit low emission.



Measurement device: lab oven, analytical balance Parameter: weight decrease, DIN EN ISO 176 Method B, 3 days 120 °C Formulation: 100 phr PVC K70, 50 phr plasticizer, 3 phr ESBO, 2 phr stabilizer

#### **REGULATORY SNAPSHOT**

- Excellent safety profile
- Further information in our regulatory onepager



di-isononyl phthalate (DINP)

#### Disclaimer

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## **ELATUR<sup>®</sup> CH**

Flexibility. The purpose defines the choice.

ELATUR<sup>®</sup> CH (DINCH) is a modern, low-viscosity plasticizer with excellent cold flexibility and very good migration properties especially suitable for ELATUR<sup>®</sup> CH (DINCH)

#### **APPLICATIONS**

• Plasticizer for PVC

sensitive applications.

- Adhesives & Sealants
- Coatings & Paints

#### **SPECIAL OFFERINGS**

- Special packaging available
- Life-cycle assessment data available

#### **PERFORMANCE AT A GLANCE**

- · Excellent low viscosity and aging
- Very good migration properties
- Excellent cold flexibility
- High UV stability



#### **PROCESSING PERFORMANCE**

#### VISCOSITY

Plastisols with ELATUR® CH show excellent processing viscosity.



#### GELATION

ELATUR<sup>®</sup> CH exhibits sufficient fusion speed, which can be increased with ELATUR<sup>®</sup> DPT.



Parameter: complex viscosity after 24 h Formulation: 100 phr PVC K70, 50 phr plasticizer, 3 phr ESBO, 2 phr stabilizer



#### **COLD FLEXIBILITY**

Products with ELATUR<sup>®</sup> CH show outstanding low temperature flexibility.



Measurement device: dynamic mechanic thermal analysis (DMTA) Parameter: Evonik method, glass transition temperature Tg Formulation: 100 phr PVC K71, 33 phr plasticizer, 3 phr ESBO, 2 phr stabilizer

#### EFFICIENCY

Products with ELATUR<sup>®</sup> CH show very good plasticizing efficiency.



Measurement device: Shore hardness A, digital hardness tester Parameter: DIN ISO 48-4, storage min 16 h at 23 °C, 50 % humidity Formulation: 100 phr PVC K70, 50 phr plasticizer, 3 phr ESBO, 2 phr stabilizer

#### **REGULATORY SNAPSHOT**

- Excellent safety profile
- included in European Pharmacopoeia of the European Directorate for the Quality of Medicines & HealthCare (EDQM)



ELATUR<sup>®</sup> CH shows a very low migration tendency into rigid PVC.



#### VOLATILITY

ELATUR® CH exhibits a good emission profile.



Measurement device: lab oven, analytical balance Parameter: weight decrease, DIN EN ISO 176 Method B, 3 days 120 °C Formulation: 100 phr PVC K70, 50 phr plasticizer, 3 phr ESBO, 2 phr stabilizer



di-isononyl cyclohexanoate (DINCH)

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## **ELATUR® DPT**

Speed. The power makes the difference.

ELATUR® DPT is a fast fusing, low-viscosity plasticizer with very good emission profile and high gelation power preferably used for manufacturing of PVC plastisols.

# **ELATUR® DPT**

#### **APPLICATIONS**

- Plasticizer for PVC
- Adhesives & Sealants
- Coatings & Paints

#### **SPECIAL OFFERINGS**

- Special packaging available
- Life-cycle assessment data available

#### **PERFORMANCE AT A GLANCE**

- Outstanding gelation power and efficiency
- Excellent cold storage properties
- Low viscosity and aging
- High plasticizing efficiency
- Very low SVOC (semi-volatile organic compounds) content



#### **PROCESSING PERFORMANCE**

#### VISCOSITY

Plastisols with ELATUR® DPT exhibit low viscosity.



#### GELATION

ELATUR® DPT offers a high gelation power, strongly accelerating general purpose plasticizers.





#### EFFICIENCY

ELATUR<sup>®</sup> DPT exhibits a very high plasticizing efficiency.



#### SEMI-VOLATILE ORGANIC COMPOUNDS

ELATUR® DPT contains max. 1 % SVOC.



Measurement device: gas chromatography Parameter: peak position (DIN EN 16516, DIN EN 16000-6 mod.) Formulation: pure plasticizer

#### **REGULATORY SNAPSHOT**

• Excellent safety profile



di-isopentyl terephthalate (DPT)

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#### VOLATILITY

ELATUR<sup>®</sup> DPT is a fast fuser with a balanced emission profile and low SVOC content.



Measurement device: lab oven, analytical balance Parameter: weight decrease, DIN EN ISO 176 Method B, 3 days 120 °C Formulation: 100 phr PVC K70, 50 phr plasticizer, 3 phr ESBO, 2 phr stabilizer

# **ELATUR® DINCD**

Resistance. The toughest for all needs.

ELATUR® DINCD is an innovative low-viscosity plasticizer with excellent cold flexibility and very low volatility especially suitable for demanding applications.

# ELATUR<sup>®</sup> DINCD

#### **APPLICATIONS**

- Plasticizer for PVC
- Adhesives & Sealants
- Coatings & Paints

#### **SPECIAL OFFERINGS**

- Special packaging available
- Life-cycle assessment data available

#### **PERFORMANCE AT A GLANCE**

- · Excellent low viscosity and aging
- Low volatility
- Excellent cold flexibility
- High UV stability



#### **PROCESSING PERFORMANCE**

#### VISCOSITY

Plastisols with ELATUR® DINCD show excellent processing viscosity.



#### GELATION

ELATUR® DINCD exhibits a good gelation profile.





#### COLD FLEXIBILITY

Products with ELATUR® DINCD show superior low temperature flexibility.



#### **EFFICIENCY**

Products with ELATUR® DINCD show high efficiency.



Measurement device: Shore hardness A, digital hardness tester Parameter: DIN ISO 48-4, storage min 16 h at 23 °C, 50 % humidity Formulation: 100 phr PVC K70, 50 phr plasticizer, 3 phr ESBO, 2 phr stabilizer

#### **MIGRATION INTO PVC-U**

ELATUR® DINCD shows a low migration tendency into rigid PVC.



#### VOLATILITY

ELATUR® DINCD exhibits an excellent emission profile.



Parameter : weight decrease, DIN KI ISO 176 Method B, 3 days 120 °C Formulation: 100 phr PVC K70, 50 phr plasticizer, 3 phr ESBO, 2 phr stabilizer

#### **REGULATORY SNAPSHOT**

• Excellent safety profile



di-isononyl-1,4-cyclohexane dicarboxylate (DINCD)

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## **ELATUR® TM**

Stability. Heat resistance at its perfection.

ELATUR<sup>®</sup> TM is a specialty plasticizer with an excellent migration profile and very low volatility especially suitable for applications where low emissions are needed.



#### **APPLICATIONS**

- Specialty plasticizer for PVC
- Automotive applications, e.g. artificial leather
- High temperature cables

#### **SPECIAL OFFERINGS**

• Special packaging available

#### **PERFORMANCE AT A GLANCE**

- High temperature resistance
- Extremely low volatility
- Migration Resistance
- Good cold flexibility



#### **PROCESSING PERFORMANCE**

#### ABSORPTION

Dryblends with ELATUR<sup>®</sup> TM show slightly higher plasticizer absorption times due to higher molecular weight of the plasticizer.



# ELECTRICAL INSULATION CHARACTERISTICS ACCORDING TO DIN EN 62631-3-1

ELATUR<sup>®</sup> TM shows very good electrical insulation properties at elevated temperatures.





#### **COLD FLEXIBILITY**

Products with ELATUR<sup>®</sup> TM show an improved temperature flexibility.



#### **MIGRATION INTO PVC-U**

ELATUR<sup>®</sup> TM shows an improved migration resistance into rigid PVC.



Measurement device: lab oven, analytical balance Parameter: weight difference, DIN EN ISO 177, 70 °C Formulation: 100 phr PVC K71, 33 phr plasticizer, 3 phr ESBO, 2 phr stabilizer

#### **REGULATORY SNAPSHOT**

• Excellent safety profile



Tri-isononyl trimellitate (TINTM)

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#### **MECHANICAL PROPERTIES**

VOLATILITY

ELATUR<sup>®</sup> TM shows good mechanical resistance in aged samples at high temperatures.



Measurement device: tensile testing machine, lab oven, analytical balance Parameter: standard: after 1 day, 23 °C; aged: after 21 days , 135 °C Formulation: 100 phr PVC K71, 50 phr plasticizer, 20 phr filler, 10 phr stabilizer

aged samples at high temperatures.



ELATUR® TM shows extremely low volatility at high

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