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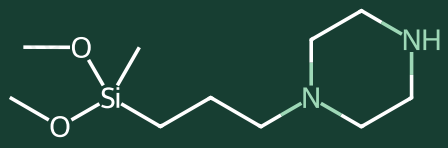
Technical data sheet
TDS-LEGRA-1081-L-EN
Revision 1.0, November 2026

LANDUSIL LEGRA

1081-L

3-Piperazinylpropylmethyldimethoxysilane

Piperazine silane intermediate for amino-functional silicone development



Chemical identity

Chemical name
3-Piperazinylpropylmethyldimethoxysilane

CAS number
128996-12-3

Structure
$C_4H_9N_2(CH_2)_3Si(CH_3)(OCH_3)_2$

Molecular formula
$C_{10}H_{24}N_2O_2Si$

Molecular weight
232.40 g/mol

Hydrolysis by-product
Methanol

Product description

LANDUSIL LEGRA 1081-L is 3-piperazinylpropylmethyldimethoxysilane. A propyl group links the piperazine ring to silicon bearing one methyl and two methoxy groups. The substituted ring nitrogen is tertiary; the other is secondary and initially carries one N–H.

Methoxy hydrolysis releases methanol and forms silanols for controlled condensation into siloxane structures or reaction with suitable hydroxylated surfaces. The secondary N–H offers an addition route with a defined epoxy or NCO partner. Consider tertiary-nitrogen acid–base and catalytic effects separately. Two nitrogen atoms do not provide two identical N–H equivalents, and two methoxy groups do not establish polymer linearity or fabric softness.

Features and benefits

- One secondary and one tertiary nitrogen in a piperazine ring
- One initial N–H bond for a defined addition reaction
- Two methoxy groups and one silicon-bound methyl group
- Building block for selected amino-functional silicones
- Assess the polymer before emulsion and textile formulation

Specification

Property	Unit	Value	Test method
Appearance		**Colorless to light yellow, clear liquid**	Visual
Purity (GC)	%	**min. 95.0**	Gas chromatography

Tested on every batch and reported on the Certificate of Analysis.

Typical properties

Boiling point, 1 mmHg	approx. 110 – 112 °C
Refractive index, n_D^{25}	approx. 1.4628
Relative density, 20/4 °C	approx. 0.986
Behavior in water	Hydrolyzes and releases methanol

For guidance only; not part of the specification.

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Applications

Amino-functional silicone synthesis
Building block for controlled introduction of piperazine functionality; assess polymer composition, viscosity and residual small molecules.

Defined epoxy modification
Investigate the secondary N–H with a specified epoxy-functional partner. Follow conversion and distinguish addition from silicon condensation.

Textile finishing intermediates
Develop a compatible silicone polymer and emulsion before fabric use. Test color, softness, absorbency and wash durability independently.

Metal primers and interface studies
Conditional screening on prepared oxide-bearing surfaces with a compatible binder; assess cure, defects and dry or water-aged adhesion.

Guidelines for use

Silicone polymer synthesis	Establish feed composition, moisture control, catalyst and volatile-removal conditions. Measure amine value, viscosity, residual alkoxy groups and small molecules before subsequent formulation.
Epoxy reaction development	Define epoxy functionality and molecular distribution before setting the reaction ratio. Monitor epoxy conversion, amine value and viscosity; the tertiary nitrogen is not a second N–H equivalent.
Emulsion and interface trials	Set acid demand and emulsifier compatibility for the actual polymer. Check dilution and finishing-bath stability. For primers, establish concentration, drying and assembly interval on the actual prepared surface.

Trial addition levels are starting points. Determine the optimum level and method in trials under your own production conditions.

Handling and safety

- Harmful if swallowed; skin contact or inhalation may also be harmful. Avoid vapor or mist and provide effective ventilation.
- Avoid skin and eye contact. Exposure can cause skin irritation and serious eye damage; wear suitable gloves, protective clothing and eye/face protection.
- Hydrolysis releases toxic methanol. Control moisture, water addition and residual volatiles; keep away from heat and ignition sources.
- Prevent entry to drains and surface water. Use is subject to regional regulations; check the current regulatory status before use.
- Read the Safety Data Sheet before use.

Storage and shelf life

Store in original, tightly closed containers in a cool, dry, well-ventilated place away from sunlight, moisture, heat and ignition sources. Shelf life is 12 months in unopened containers under these conditions. Use promptly after opening and reseal after dispensing.

Packaging

25 kg plastic drum, 200 kg steel drum, 1,000 kg IBC. Other pack sizes on request.

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