



A  MITSUBISHI CHEMICAL GROUP company

Precision Low-Volatile Siloxane Systems



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Ultra-low cyclic siloxane technologies for critical-performance applications

D4 / D5 / D6

Low Volatiles

AROP / Living
Polymerization

The external need

- Growing market attention on D4, D5, and D6 restrictions under evolving EU REACH requirements.
- Demanding applications require low outgassing, reduced extractables, and long-term material consistency.
- Customers want silicone building blocks that support compliance and performance without broad reformulation risk.

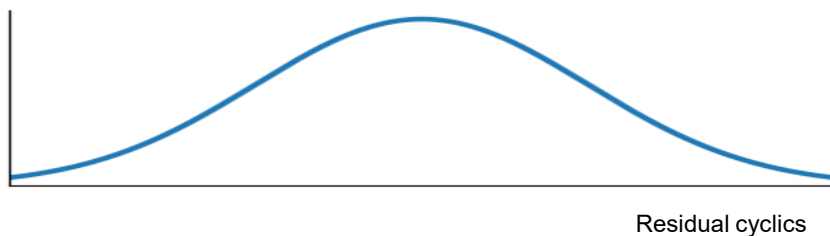
Gelest technology answer

- Living / anionic ring-opening polymerization enables controlled molecular architecture and end-group fidelity.
- Narrow molecular weight distribution supports consistent performance and formulation behavior.
- Process and analytical focus can support ultra-low volatile cyclic targets for high-value markets.

Technology comparison: traditional equilibrium vs. living polymerization

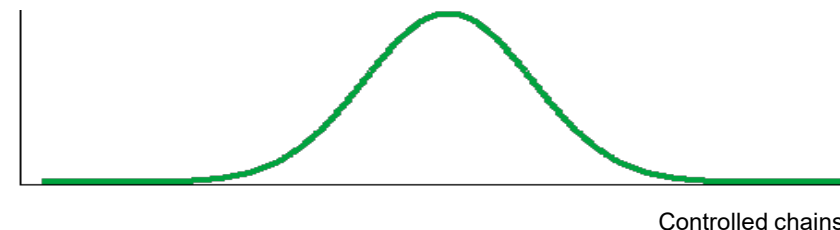
Traditional equilibrium polymerization

Broader molecular weight distribution and greater risk of residual cyclics.



Living polymerization / AROP

Controlled chain growth and narrower distribution for lower volatile cyclic formation.



Target Cyclics

D4/D5/D6 <0.1%

Target Volatiles

<0.5%

Architecture

Narrow dispersity (PDI's < 1.2 possible) + end-group control

Positioning

Compliance support + performance value

Applications, Markets, and Product Families

Aerospace & Defense

Why it matters

Low outgassing, vacuum stability, contamination control

Applications

Potting, encapsulation, elastomers, sealants

Best-fit chemistries

Vinyl + Hydride PDMS

Electronics / Semiconductor

Why it matters

Dielectric consistency and reduced volatile migration

Applications

Gels, TIMs, conformal coatings, encapsulants

Best-fit chemistries

Vinyl, Hydride, Epoxy PDMS

Advanced Optics & Sensors

Why it matters

Optical clarity, low extractables, stable lens performance

Applications

Lens coatings, sensors, tunable optics

Best-fit chemistries

Methacrylate PDMS

Medical & Coatings

Why it matters

Extractables / leachables control and coating consistency

Applications

Device coatings, flexible films, specialty adhesives

Best-fit chemistries

Methacrylate + Carbinol PDMS

Platform	Representative products	Typical Role in Formulation	Key Benefits
Vinyl-terminated PDMS	MCR-V21, MCRV25, DMS-VM31, DMS-HV22	Base polymer	Flexible, low Tg, excellent dielectric performance
Hydride-terminated PDMS	MCR-H07, MCR-H21, DMS-HM series, DMS-HV22	Crosslinker	Controlled cure and network formation
Methacrylate-functional PDMS	MCR-M07, MCR-M11, MCR-M17, MCR-M22	UV-curable resin	Fast cure, optical clarity, low VOC processing
Specialty functional siloxanes	MCR-C series, MCR-E series	Modifier / reactive intermediate	Tailored adhesion, compatibility, and surface properties

Need a low-volatile silicone solution? Our technical team can help identify the right chemistry for your performance and purity requirements.