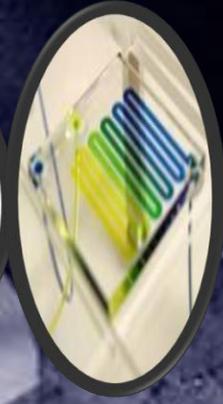
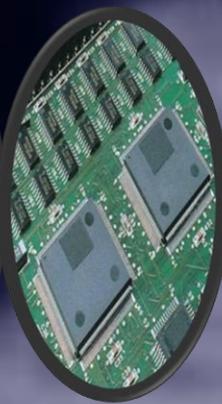
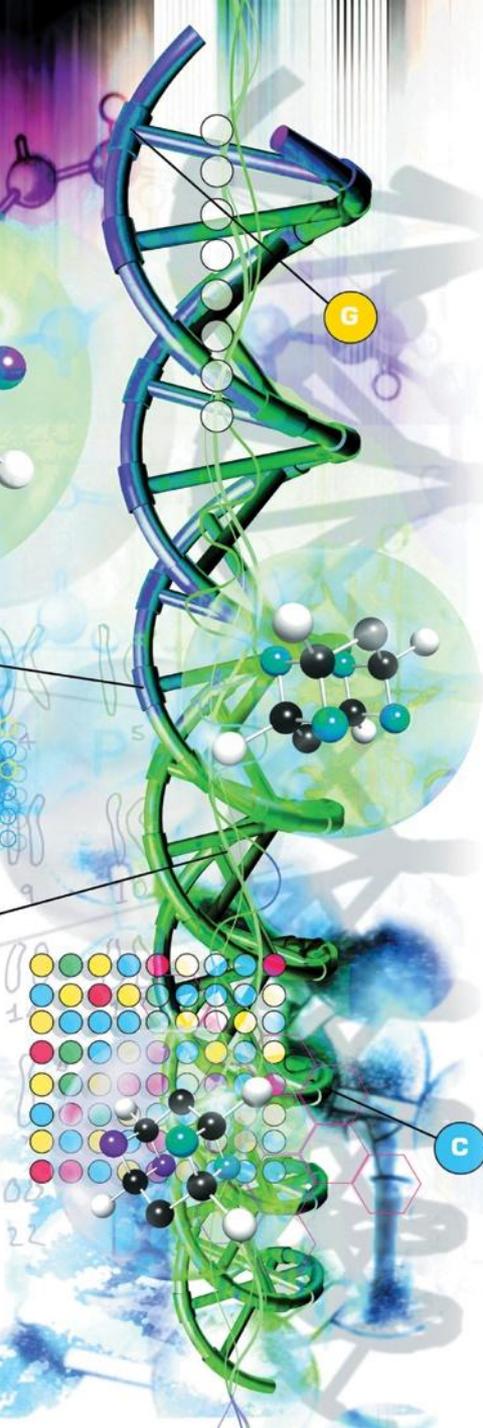


Gelest

Enabling Your Technology





Gelest

**11 East Steel Road
Morrisville, PA 19067
Telephone: (215)-547-1015
Telefax: (215)-547-2484
Internet - info@gelest.com
Web Site - www.gelest.com**

Gelest

GELEST INC.



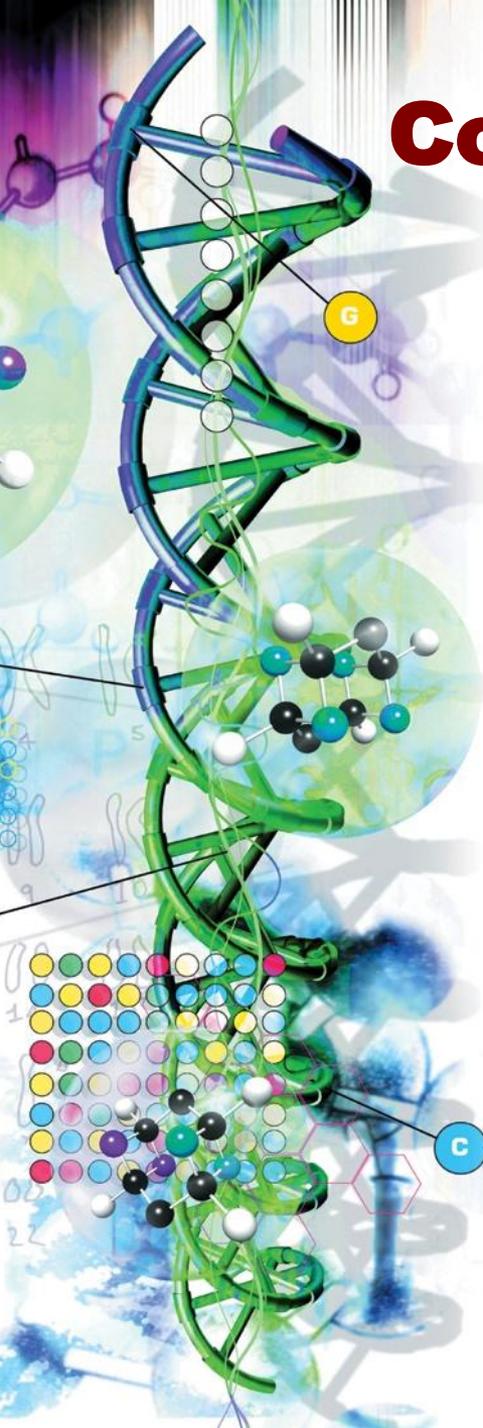


Global Supply



- ★ Corporate Office, R&D, Manufacturing
- ◆ Direct Commercial Sales
- Distributors / Agents
- ★ Logistics Center





Core Technical Competencies

Organosilanes

Metal-Organics

Silicones

Functionalized Micro-Particles

Quality Policy

- Gelest is dedicated to providing quality specialty silanes, silicones and metal-organic products. Gelest addresses the quality needs by market and by customer.
- Each employee understands the necessity and responsibility of quality.
- The Gelest quality management system is compliant with the ISO9001:2008 standard.

Technical Prowess

- Proactive chemistry for key technologies
- Recognized technical management
- Highly skilled operating staff

4 R & D groups

- Silanes
- Silicones and Polymer Development
- Metal Organics
- Applications and Technical Service

Gelest Market Differentials

- Sales to Customers
- Customer Directed Product Development
- Short Commercial Product Life-Cycle
- Fragmented Product Line
- High Level of Academic Interface

Key Markets Served

Gelest provides products and technical development in support of:

- Pharmaceutical
- Separation and Diagnostic Sciences
- Medical Materials
- Microelectronic Metallization and Dielectrics
- Industrial Polymeric Materials
- Cosmetics



Gelest

Organization Flexibility

Privately Held Company

- No outside investors; active stock-holders

Financial Systems

- Order entry, inventory valuation, contract & invoicing practices

Logistics

- Supply-side, warehousing, finished goods, delivery systems

Manufacturing

- Flexible production in a manufacturing environment consistent with high hazard: damage-limiting construction, tiered containment

Personnel

- All operators have a minimum of two years of college chemistry
- Over 20% of staff at Ph.D. level or Chemical Engineer

Analytical

- Chemical, polymer, surface, mechanical property capability

Quality Systems

- ISO Registration consistent for intermittent, recurrent production

Manufacturing Technology

- Monomer, Intermediate Production
- Polymer Production
- Compounded Elastomer Production
- Surface Modification



Material Capabilities

- Air Sensitive Compounds
- Corrosive Materials
- High Purity Gases and Liquids
- High Viscosity Liquids
- Solids Handling
- On-Site Platform
 - Silicon & Metal-Organic Building Blocks

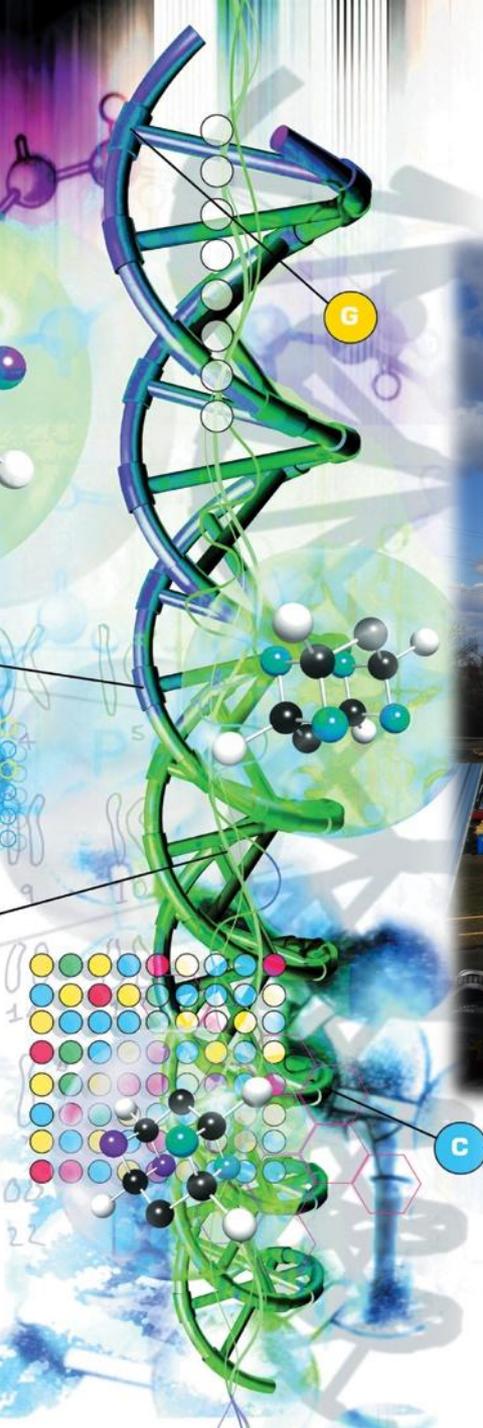


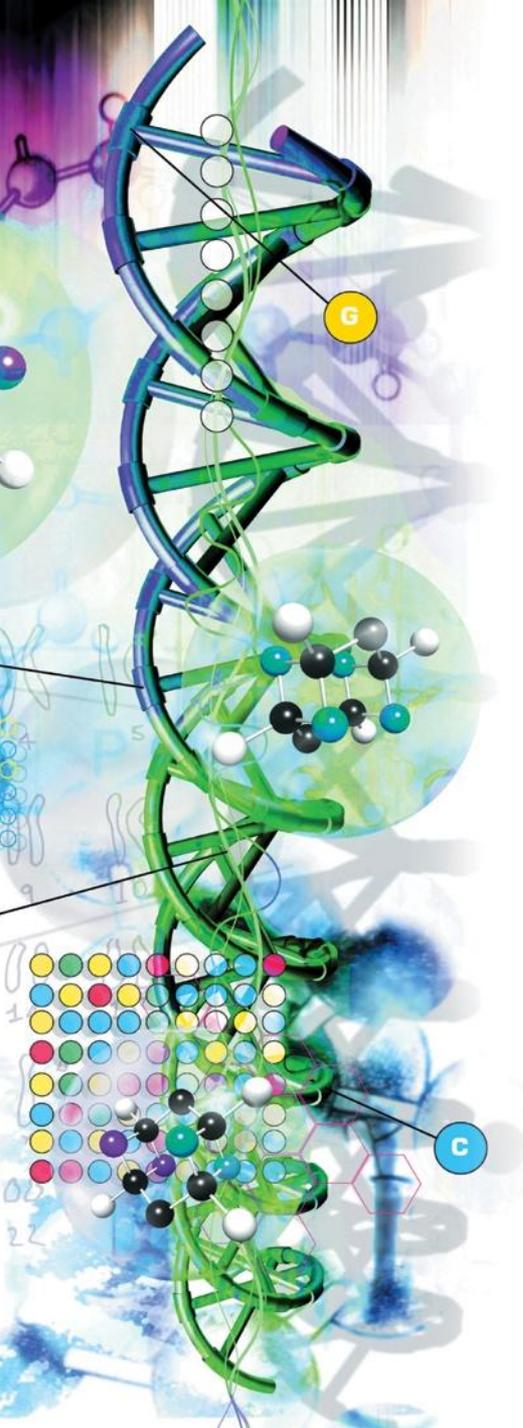
Gelest, Inc. Morrisville, PA Facilities

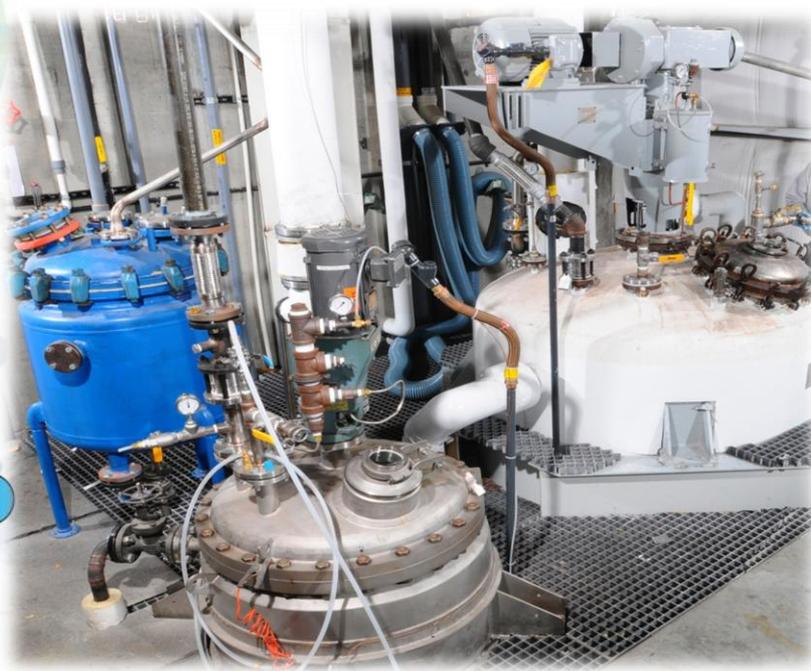
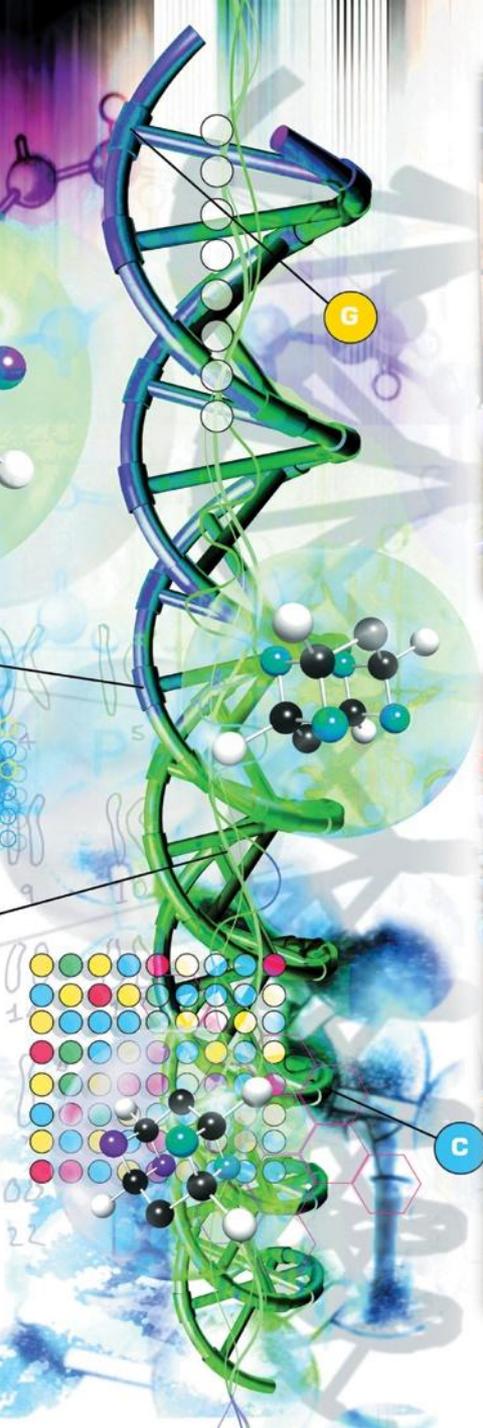


Future Research Development &
Pilot Facility

Manufacturing







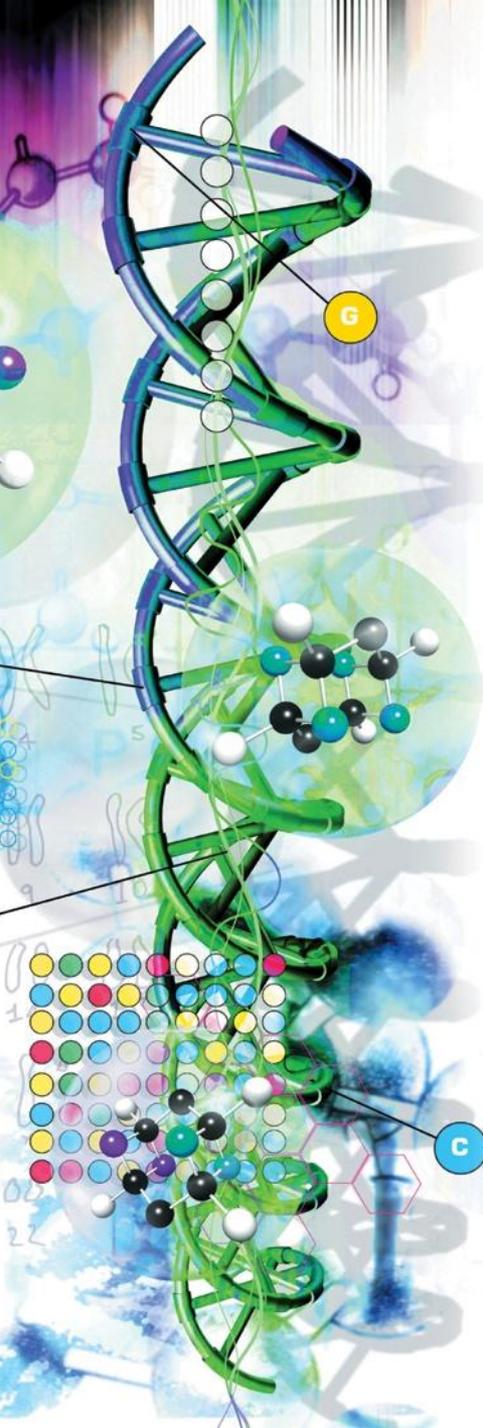
Gelest

Functional Micro-Particles



Gelest

Functional Micro-Particles



High Hazard (Band 4) Building



Production Environment

- **Flexible Manufacturing**
 - Cellular Design
- **High Hazard**
 - Damage Limiting Construction
 - Tiered Containment
- **Environmental Control**
- **Utility Redundancy & Back-up**





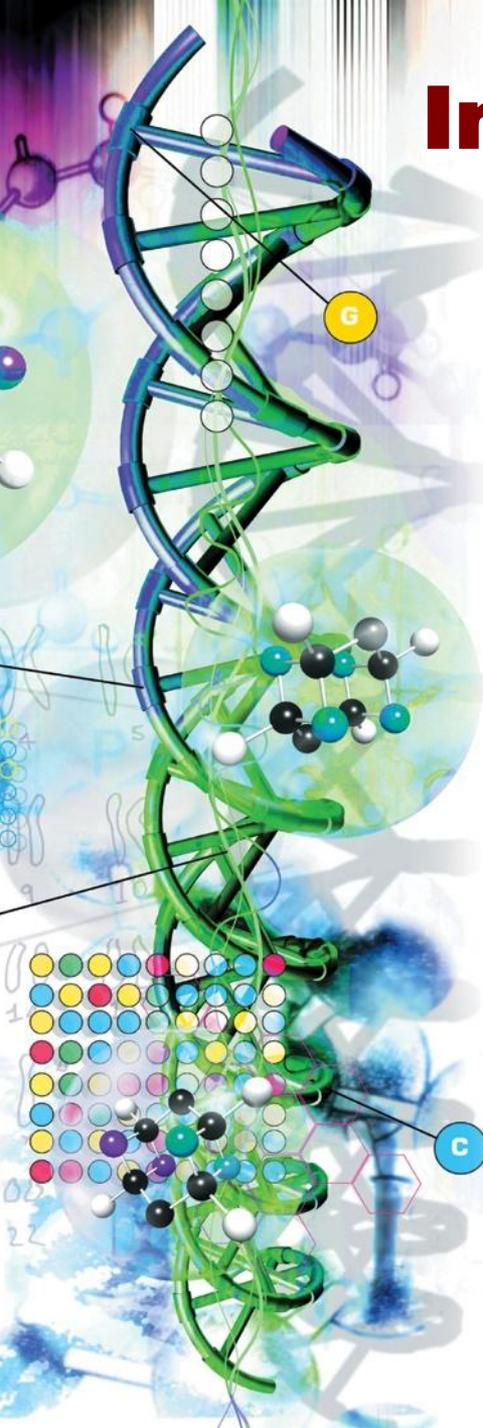
Intermediate Unit Processes

Metal-Carbon Bond Formation

- Direct-Process
- Hydrosilylation
- Grignard
- Metal-Alkyl Transfer
- Disilylation
- Dehydrochlorinative Coupling

Metal-Halide Conversions

- Hydrolysis
- Esterification
- Amination
- Reduction



Intermediate Unit Processes

Non-Metal Center Organic Transformations

- Halogenation
- Amination
- Sulfonation
- Phase Transfer
- Reduction

Metal / Mixed Metal Coupling

- Wurtz Coupling
- Metal-Lithium

Polymerization Unit Processes

- Hydrolytic
- Anionic Equilibration
- Cationic Equilibration
- Anionic “Living” Polymerization
- Graft Hydrosilylation
- Silylated Acrylate Radical Polymerization

Process Equipment

Reactors

- 30L-100L all glass with process control
- 50-2,000 gallon (189-7,570L) glass lined -10 to 200°C
- High Pressure to 400 gallon (1,514L) 1000psi

Distillation

- 5-300 gallon (19-1,135L) 40 plate, 120 plate

Continuous

- Hydrosilylation
- Polymerization
- High Pressure 350psi

Solids Handling

- Hastelloy filter and vacuum tumble dryer

Functional Micro-Particle Technology

gram to ton quantities

- Sigma-Blade
- High Shear
- Twin-shell blenders with intensifier, vacuum, heating
- Low shear blenders, with vacuum, heating
- Ribbon-Blender
- Particle Attrition
- 20 ft³ cone blenders
- 50 ft³ cone blender
- Spin Coater
- Vapor Phase Deposition
- Flammable & Corrosive Chemical Handling
- Recovery & Recycle Systems



Extensive analytical support includes:

GC
GC-MS
HPLC
GPC
NMR
FTIR
UV-VIS
DSC-TGA
Viscosity
Sedigraph
Rheometry
Goniometer
Zeta Potentiometer
Mechanical property testing



Expansions

2007

- New surface chemistry production facility
- High Pressure reactor suite (up to 1,000 psi)
- Analytical department expansion with new instrumentation
- New Administration building

2008

- Expanded metal-organic pilot production
- New polymer production suite

2009

- Plant security systems
- Polymer and application laboratories

2011

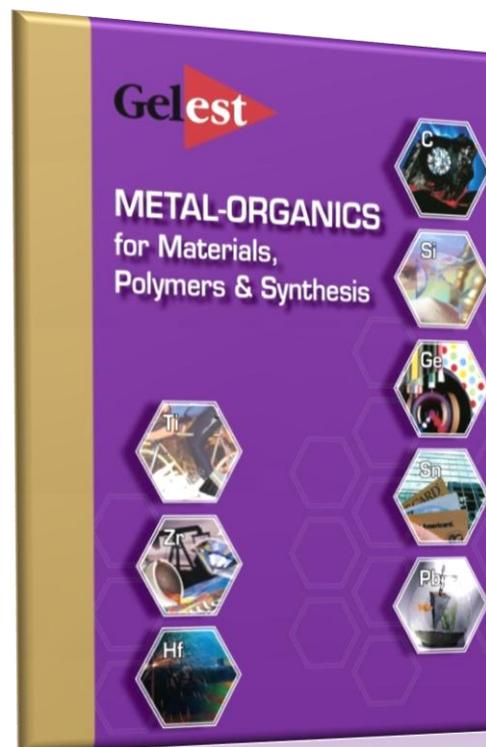
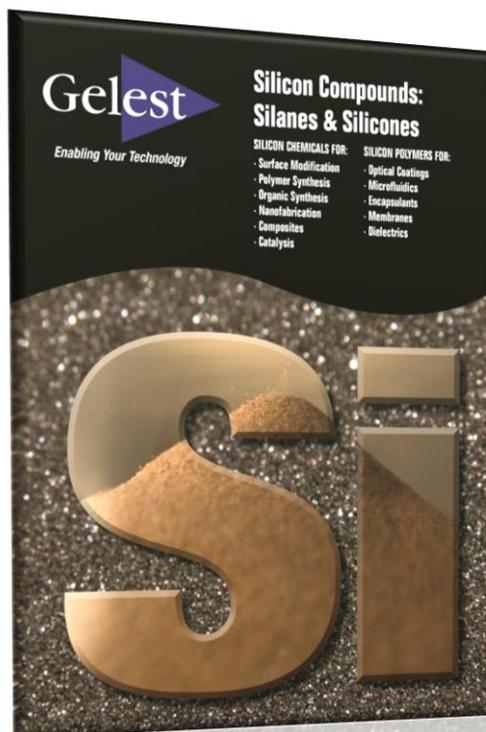
- Band-4 High Hazard Facility
- European Logistics Facility (Frankfurt)
- New 154,000 sq. ft. warehouse

2012-2016

- R&D and Pilot Manufacturing Center
- Upgrade Business Processes

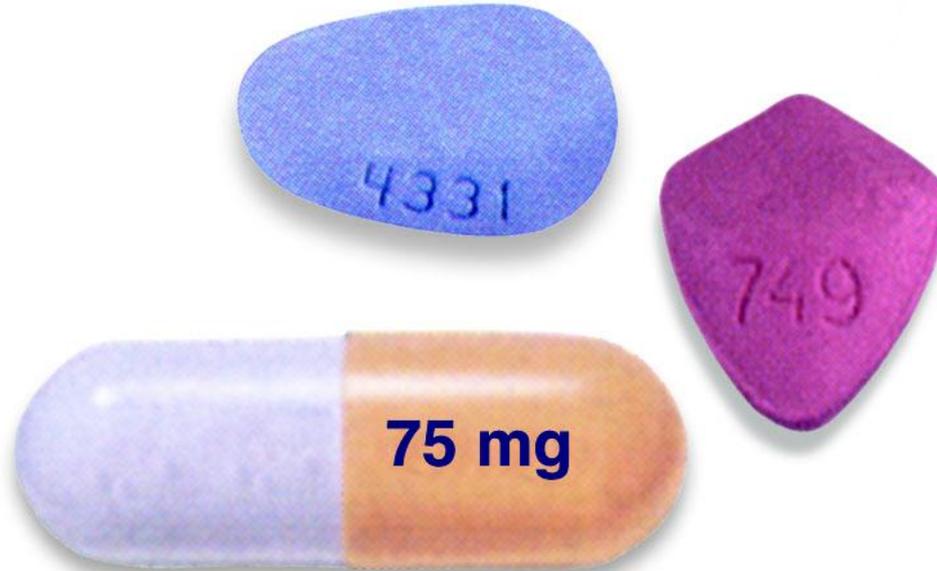
Manufacturer of over 3,000 organosilanes, metal-organics and silicones in research, pilot and commercial scale.

Custom manufacture for specialty applications.



Gelest

Block-Buster Drugs



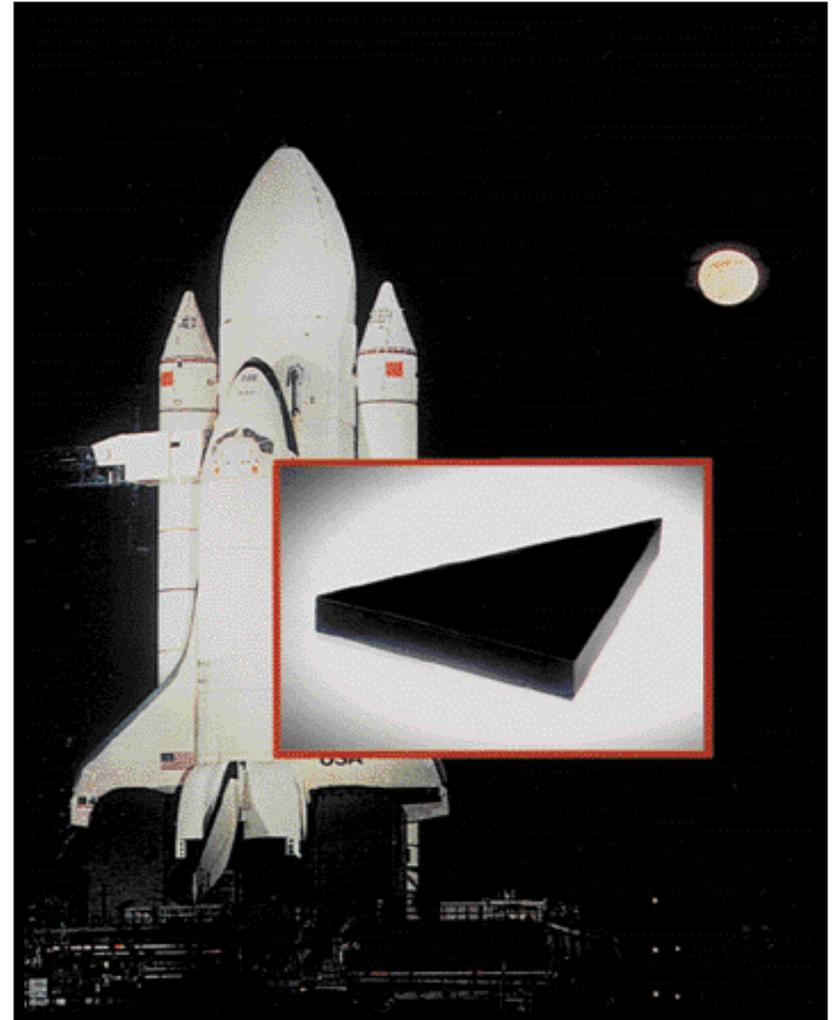
Viread AIDS (Gilead),
Zocor Hypercholesterolemia (Merck),
Tamiflu Anti-viral (Roche)

Surface Modification

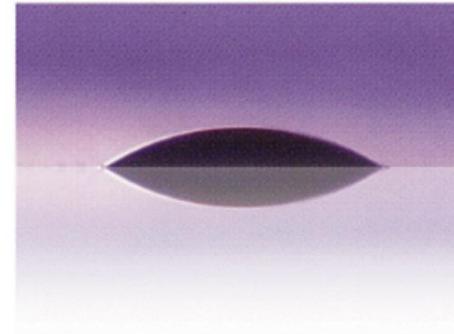
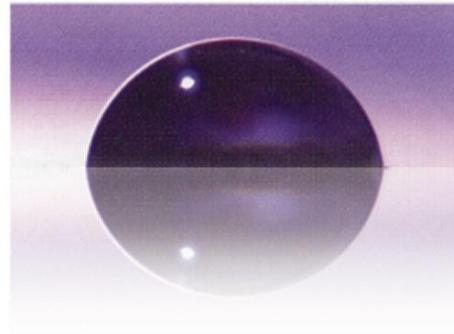
Hydrophobic
Hydrophilic
Oleophobic
Oleophilic
Coatings

Space Shuttle:

- Hydrophobic
- Non-Charring
- Tile Treatment



Surface Modification



- Bonded Phases
- Optical Coatings
- Water-Repellents
- Release Coatings
- Dielectric Coatings
- Anti-Stiction Coatings
- Functionalized Microparticles
- Pigment & Mineral Dispersants
- Self-Assembled Monolayers (SAMs)



BIOSAFE®



Sporting Gear



Boating



Personal Hygiene & Healthcare



Antimicrobial Protection
•Coatings
•Surface Sprays
•Liquid Formulations



Automotive



Pools & Outdoor Leisure



Pet Care



BIOSAFE's polymer shield destroys microbes and prevents colonization

Without BIOSAFE

BIOSAFE Protected



Bacterial colonies flourish

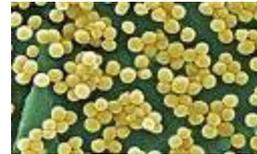


No Bacteria!

Long lasting protection against:

- Bacteria
- Mold
- Mildew
- Algae
- Yeast
- Many Viruses

MRSA



S. aureus



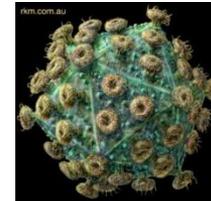
E. coli



A. Niger (fungus)



HIV (virus)



Gelest

Optical Materials

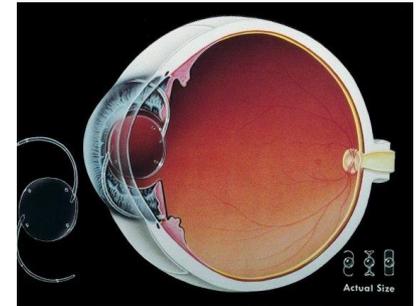
R.I. control fluids, gels, encapsulants

- Index Matching
- High Index
- Low Index

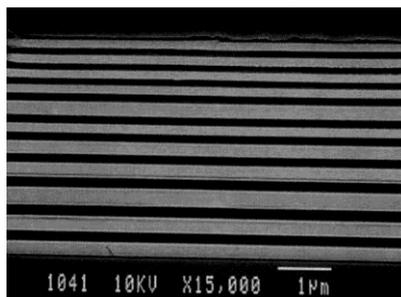
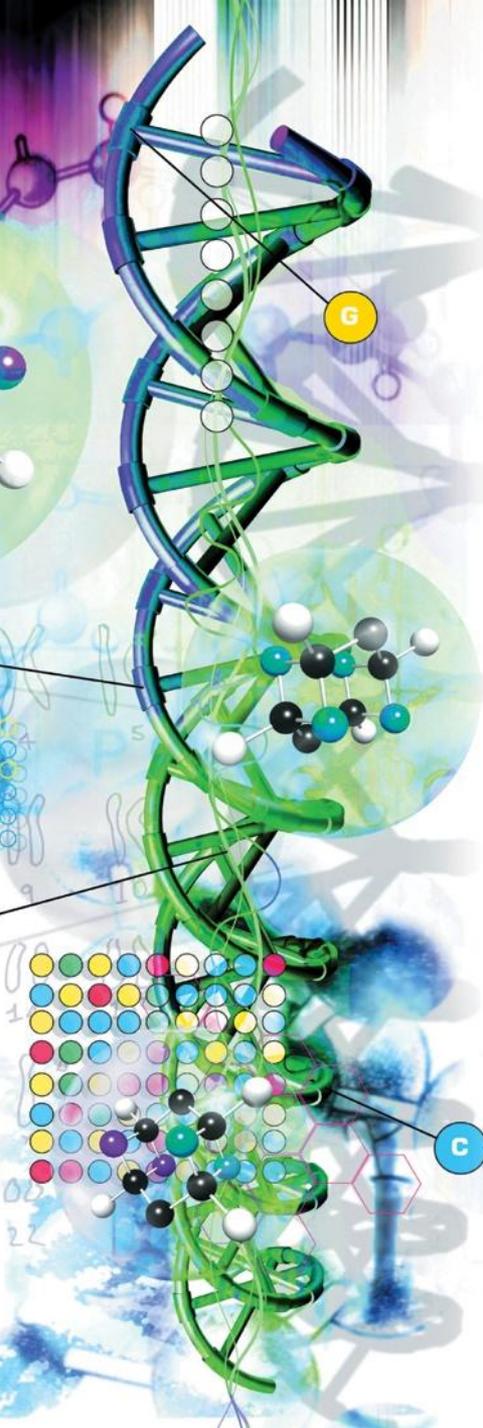


Consumer Optics

- Contact Lens
 - Hydrophilic
 - Rigid Gas Permeable
- Intra-Ocular Lens
- Eye-Wear
 - Abrasion Resistant Coatings
 - Anti-Reflection Coatings



Optical Materials



OLEDs, LEDs, Electrochromics
Sensor - Photonic Materials
Fiberoptic Dopants - Glass Colorants

Separation & Diagnostic Science



Chromatography

DNA Array

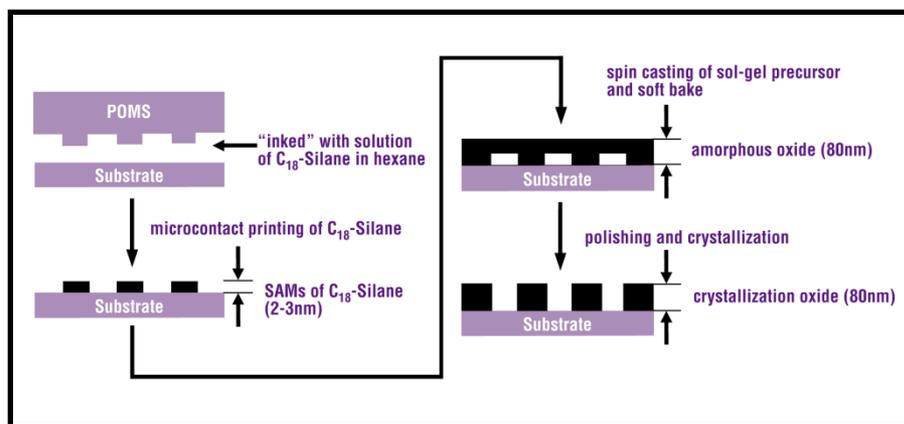
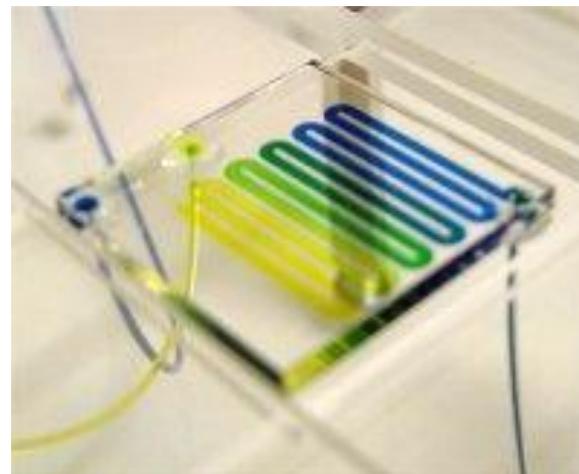
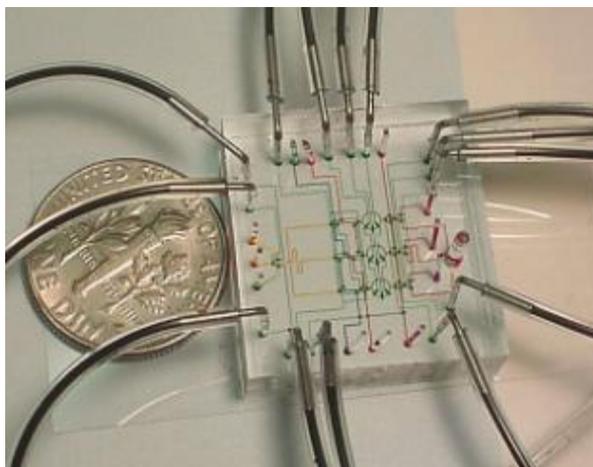
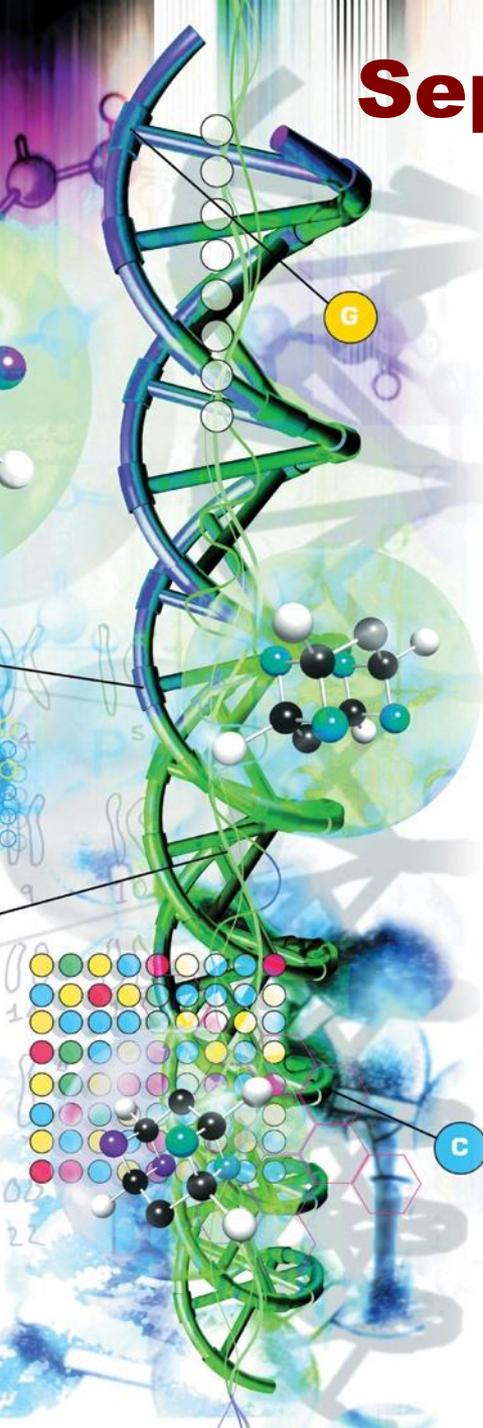
Microfluidics

Membrane



Separation & Diagnostic Products

Microfluidics, Lab-on-a-chip



Biotechnology



Gene Chip



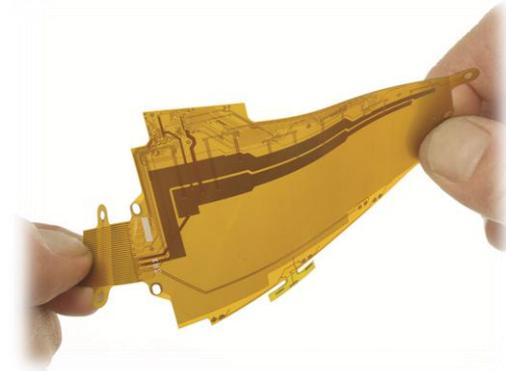
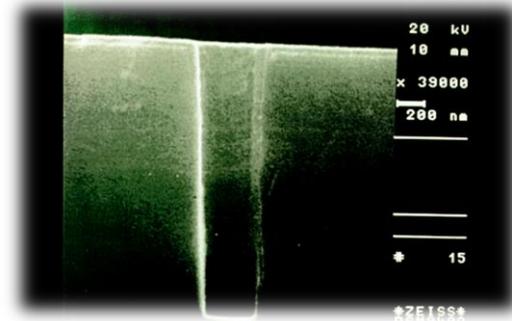
Genetic Testing and Array Technology



Microarray Surfaces

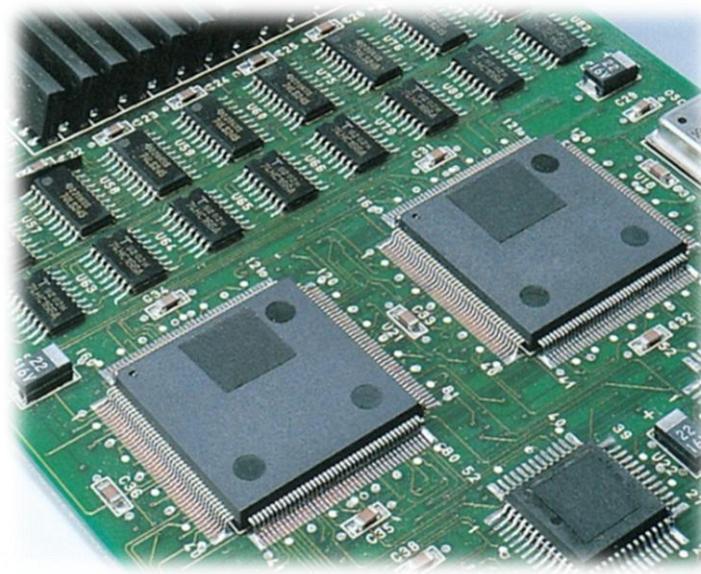
Microelectronics Products

- Inter-Layer Dielectrics
- Diffusion Barrier
- Gate Dielectrics
- Etch Stop & Barrier Layer
- Barrier Layer Deposition
- Strained Silicon
- Photo-Lithography



Microelectronic Advanced Packaging

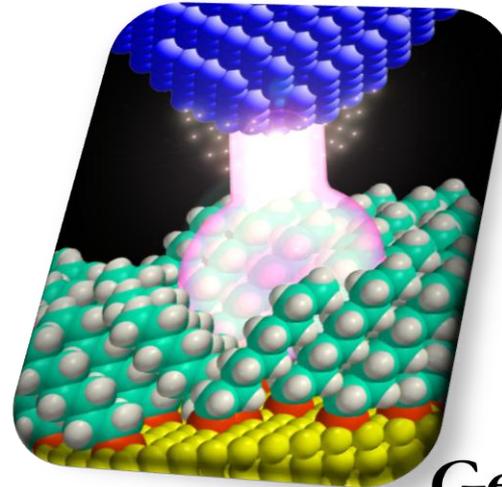
- Reactive Silicones
- Pre-ceramic Polymers
- Functionalized Micro-Particles



Functional Micro-Particles

Leverage Gelest's chemical & mineral knowledge and expertise to provide surface modification services in support of new product development initiatives and commercial applications within a volume space that is typically not available to many companies.

*Innovating Particle
Functionalization*



Gelest 

Functional Micro-Particles

- Glass
- Toner
- Energy
- Textiles
- Displays
- Ceramics
- Biological
- Cosmetics
- Digital Inks
- Printing Inks
- Quantum Dots
- Chromatography
- Imaging & Printing
- Plastics – Packaging
- Optics & Optoelectronics



University Collaborations

- SUNY-Albany –
 - Microelectronics
- Columbia University –
 - Asymmetric Synthesis
- University of Illinois –
 - Silicon-Based Cross-Coupling



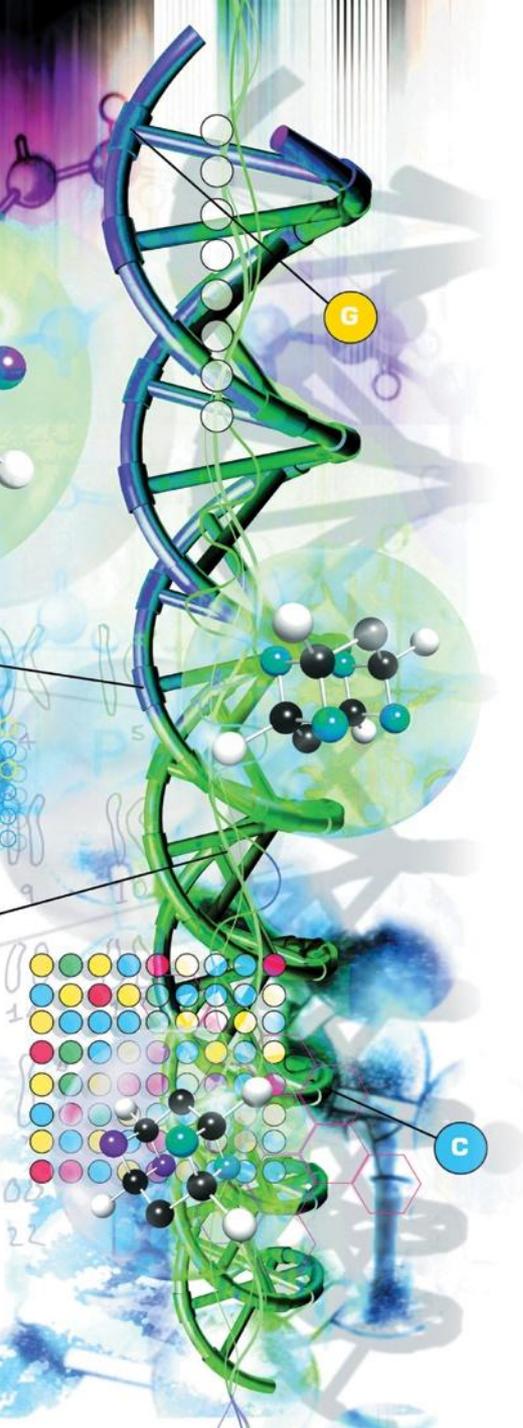
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Recognitions

- CHEMICAL WEEK Named “Hot Prospect”
- Winner of R&D 100 Award
- Strong patent portfolio
- Extensive publications in Trade and Scholarly Journals



Enabling Your Technology

TEL: (215) 547-1015

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Product Code

GO

Products MSDS

Gelest Inc. is recognized world-wide as a leader and innovator in materials science and technology. Gelest manufactures and provides organosilicon and metal-organic compounds serving advanced technology markets through a customer driven approach.

Product Information

Technical Information

Order Center

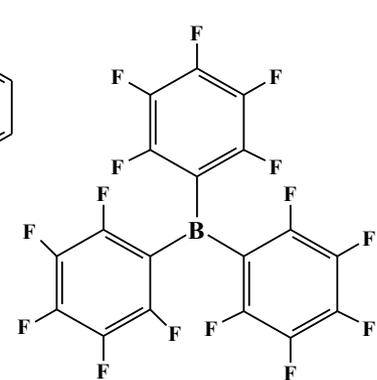
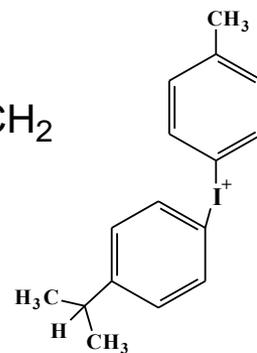
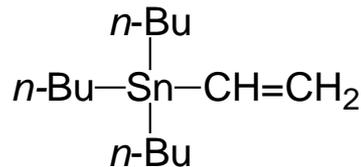
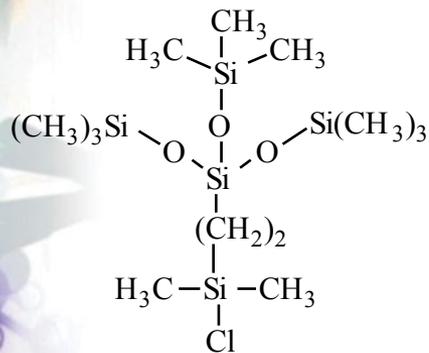
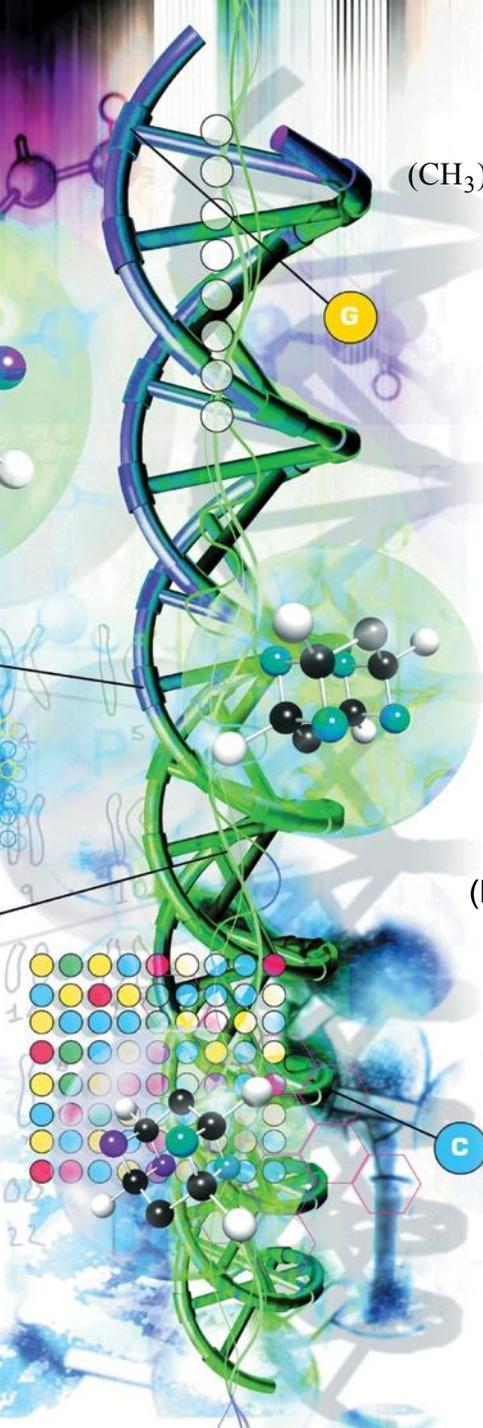
www.gelest.com

Silane Silicone Metal-Organic Compounds

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- **Listing of products offered:**
 - Structures
 - Properties
 - MSD Sheets
 - Pertinent References
- **Published Articles**
- **Literature references focused on silicon & other metal-organic chemistries**



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