CHEMENCE

KRYLEX™

ELECTRONIC ADHESIVE TECHNOLOGY

Adhesive options to meet your manufacturing needs.

KRYLEX® adhesive technologies offer unique, groundbreaking, proprietary innovation to match your demanding requirements.

PRIVATE & CONFIDENTIAL

LEADING WITH TECHNOLOGY

CHEMENCE

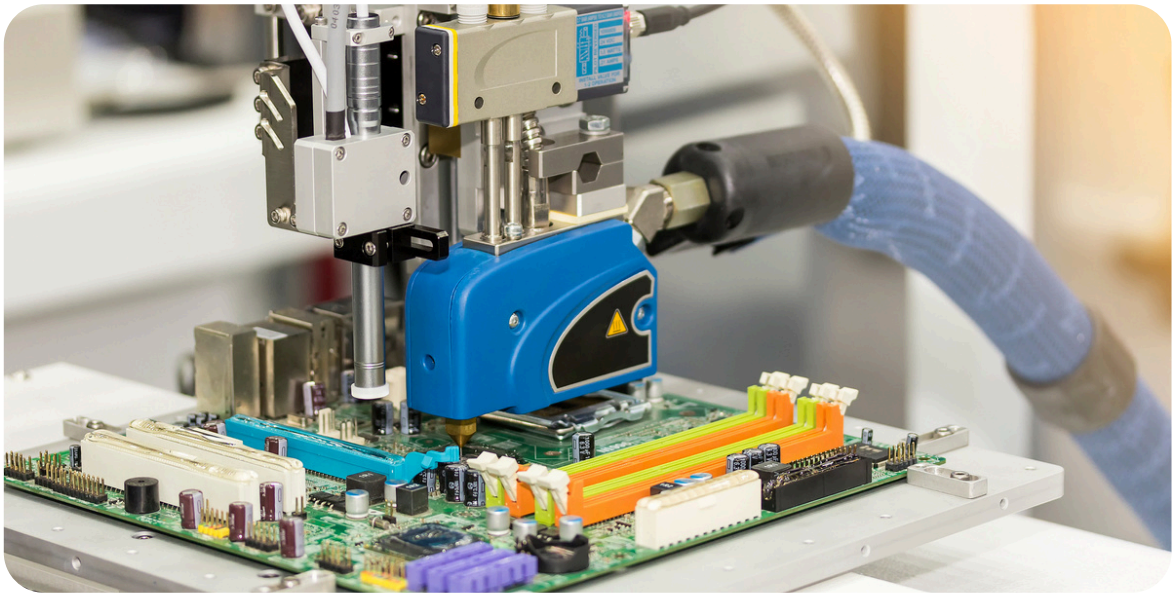
At Chemence, we've dedicated ourselves to pushing the boundaries of what adhesives can achieve. We're a global leader in specialty chemicals, and our commitment to innovation is what fuels our KRYLEX® brand of industrial adhesives and sealants.

KRYLEX® isn't just any adhesive. It's at the forefront of what's possible in consumer electronics, specifically designed to tackle the most demanding technical challenges. Our formulations deliver unmatched performance, ensuring the reliability and durability of the devices we all depend on every day.

Whether you're a manufacturer or an end user, we understand adhesives' critical role. With KRYLEX®, you can be confident you're getting a solution as innovative as the technology it bonds. We invite you to explore the world of KRYLEX® adhesives and discover how we're helping to shape the future of consumer electronics.

- **Innovative & Sustainabile Solutions** ☑
- **Best-in-class Technical Support** ☑
- **Design Partnership** ☑
- **Global Capabilties** ☑

KRYLEX™ VISION & MISSION



Vision

Our position as the go-to industrial adhesives manufacturer and supplier of high-specification industrial applications has helped us develop unparalleled research capabilities and offer innovative bonding solutions. Thanks to our advanced development and manufacturing capabilities, our clients can now realize the benefits of adhesive solutions that help them reduce their manufacturing costs and increase product performance. KRYLEX® assembly adhesives are designed to withstand environmental elements, chemicals, and temperatures, as well as assure excellent multi-substrate bonding and high resistance to impact and stresses.

Mission

- **Reduce Manufacturing Costs:** KRYLEX® adhesives help optimize your production process, saving you money.
- **Boost Product Performance:** Our innovative bonding solutions enhance the durability and functionality of your products.
- **Unmatched Durability:** KRYLEX® adhesives are formulated to withstand harsh environments, chemicals, and extreme temperatures.
- **Versatility & Strength:** These adhesives provide excellent multi-substrate bonding with high resistance to impact and stress.

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KURA-LOW™

Technology for Low Temperature Curing Applications

Consumer Electronic devices vary hugely in design and appearance depending on; the specific manufacturer, the electronic device, and the specific model. Depending on the target use market the manufacturer may select expensive or cheaper materials for the construction of the device. This diversity of specification and design means that a wide array of materials e.g. Metals, Plastics, glass, etc... are used in construction. As each manufacturer strives to make their device both aesthetically pleasing and comfortable, it is increasingly common for the selected construction materials to be sensitive to high temperatures. Anodized metal surfaces, many plastics, and different grades of glass are often unable to withstand the high cure temperatures of long-standing traditional heat cure adhesives.

Moreover, new adhesive technologies offering curing at temperatures as low as 80℃ are now at the edge of what can be tolerated due to reliability impacts thermal fatigue, and thermal budget concerns. The thermal budget is an important concept in the construction of electronic devices. It is used to characterize the susceptibility of processes or process flows for diffusion effects. It is a measure of the thermal energy used in a process flow and is used to determine the remaining temperature-time window at each stage of the process flow.

Often the solution to achieve adhesive bonding for applications that cannot exceed 80℃ is to use alternative cure chemistry adhesives that do not require heating to elevated temperatures. These are typically 2-part adhesives that react rapidly at RT or UV or UV+ dual cure systems. These alternative chemistries all have drawbacks and limitations and can often not be used:

Measurement Condition	2K RT Cure	Moisture Cure PUR	UV Cure	Dual Cure UV + Heat	80℃ Heat	KURA-LOW 60℃ Heat
Work Life (Hours)	Minutes	Minutes	> 8 Hours	> 8 Hours	> 8 Hours	> 8 Hours
Fine Pitch Dispensing	No	No	Yes	Yes	Yes	Yes
Shadow Cure	Yes	Yes	No	Yes	Yes	Yes
Plastic Adhesion	Good	Good	Good	Good	Good	Good
Metal Adhesion	Excellent	Moderate	Good	Good	Good	Excellent

KURA-LOW® Technology
KD7000 Series

KURA-LOW® Dual cure systems for active alignment offer rapid UV cure kinetics to maximize UPH efficiencies in the manufacturing line (2 seconds) and secondary thermal cure temperatures anywhere between 55 -70 C, compared with the industry standard of 80 C. The lower cure temperatures offer the advantage of preserving the available thermal budget for the sensitive plastic components used in the CCM construction.

KD7000 series adhesives for Active Alignment are highly engineered to provide best-in-class processing and high levels of reliability performance e.g. Temperature cycling, drop testing, and Tumble testing.

Measurement Condition	KD7009LVF-W1	KD7009LVF-W44	KD7009LVF-W45
Unlimited Viscosity (cP) 10rad/s @25°C	11,800	12,000	12,200
Unlimited Viscosity (cP) 20rad/s @25°C	8,400	9,200	9,200
Thixotropic Index	3.84	4.00	3.60
Glass Transition Tg[°C], DSC 10°C/min	24.0	24.1	23.1
On-set Temperature Heat Only (°C)	62.6	58.9	60.7
RT Stability (Hours)	168 (7 days)	120 (5 days)	120 (5 days)

KURA-LOW® Low Temp Cure with Heat, UV or Both.

KRYLEX® KD7000 series is a hybrid adhesive that utilizes Chemence® patented KURA-LOW® technology. KURA-LOW enables heat curing at low temperatures which is important when using heat-sensitive substrates e.g., LCP/ PC/ Anodized Al/ OLED panels. KD7000 series can cure at an industry-leading 60°C.

KURA-LOW® Technology

KE2000 Series Thermal “ONLY”

KURA-LOW® Technology can be supplied both as a thermal-only cure system and also a dual cure capable UV + Thermal cure system (see Active Alignment Technical Bulletin).

KE2000 series, ‘Thermal only’ heat cure KURA-LOW® Technology products are available to cure at temperatures as low as 55°C but are also able to offer rapid ‘snap cure’ at elevated temperatures of approximately 100 - 130°C. Also depending on the formulation design the product is stable at ambient conditions for anywhere between 72 hours or several weeks. The KURA-LOW® chemistry platform offers excellent adhesion and reliability performance.

KE2000 Excellent Adhesion & Reliabilty

Measurement Condition	KE2000-23	KE2000-50
Viscosity (cP) 2rad/s @25°C	81,773	40,274
Viscosity (cP) 10rad/s @25°C	30,111	19,281
Viscosity (cP) 20rad/s @25°C	21,738	15,107
Thixotropic Index	3.76	2.67
Specific Gravity	1.23	1.17
Onset Point Temperature (°C, Heat Only)	61.8	61.5
Work Life @25 °C (+120% Viscosity Change)	5 Days	5 Days
Particle Size (Finished Goods) - Fineness Guage	10	10
60°C/60 min Cure Conditions		
Volume Shrinkage, %	1.72	-0.56
Hardness Shore D	70	60
Elongation at Break [%]	44.1	36.5
Tensile at Break [MPa]	14.3	17.9
Tensile Modulus [MPa] Instatron	541	1,188
Storage Modulus [MPa] @25°C, DMA	1,015	375

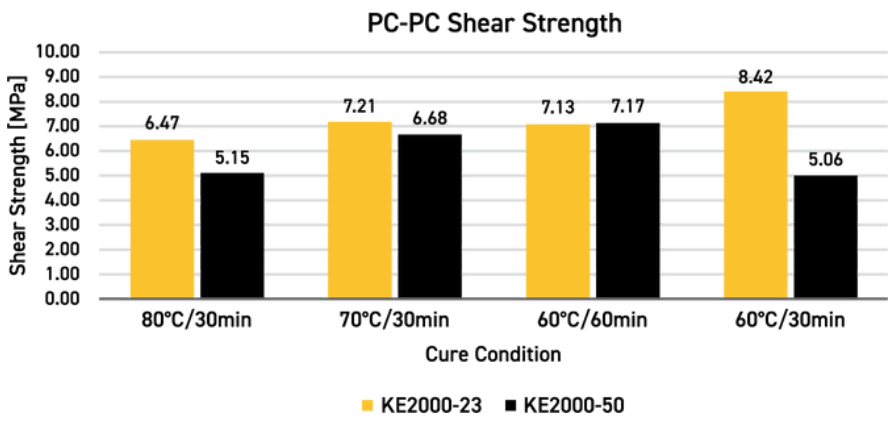
Click Below For More Formalations

Biocompatibility

Low Storage Modulus

CNT-Based Electrical

PC-PC Reliability



KURA-LOW® Technology

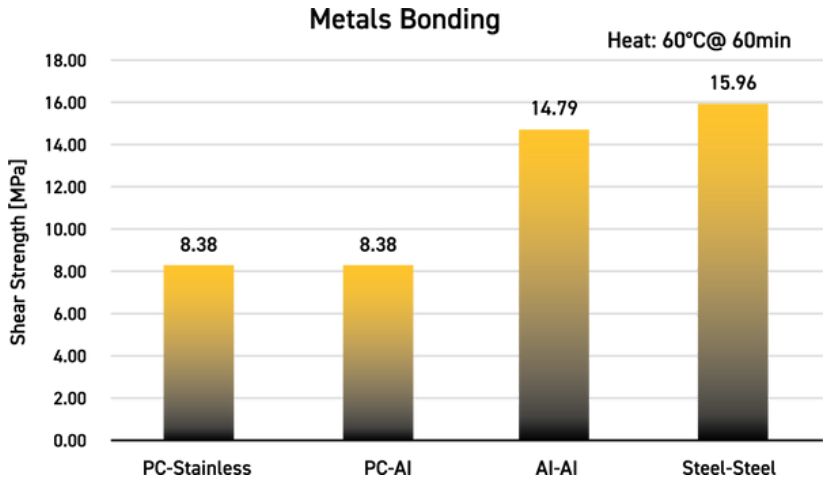
KE 2000 Overlap Shear Strength

Overlap Shear Strength		Unit [MPa]
PC	PC-PC (80℃/30min)	6.47
	PC-PC (70℃/30min)	7.21
	PC-PC (60℃/60min)	7.13
	PC-PC (60℃/30min)	8.42
	PC-PC (55℃/30min)	8.16
Stainless Steel	PC-SS (60℃/60min)	8.38
	PC-SS (60℃/30min)	8.79
Aluminum	PC-Al (60℃/60min)	8.38
	PC-Al (60℃/30min)	8.29
	Al -Al (60℃/60min)	14.79
	Al -Al (60℃/30min)	15.43
Steel	Steel-Steel (60C/60min)	15.96
	Steel-Steel (60C/30min)	15.37

KURA-LOW® Technology is an innovation that is enabling customers to use much lower cure temperatures than was previously available in a 1-part pre-mixed adhesive system. The novel chemistry adheres well to a variety of high and low surface energy substrates and offers excellent reliability. Benefits of KE2000 Series:

- Excellent dispense characteristics – fine pitch dispensing.
- Jet or needle dispense capable.
- Highly stabilized at Room temperature for long work life.
- Cure at temperatures as low as 55˚C.
- Snap curable at temperatures of 100˚C or greater.
- Excellent adhesion to plastics, metals, and glass.
- Excellent reliability performance (drop/ Temp cycle, etc.....).
- OHS/ REACH Compliant.

KE2000 Drop Weight Impact Testing

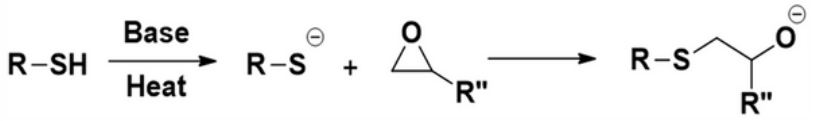


KURA-LOW™ Temperature Heat Cure

Low Storage Modulus 1-K Epoxy

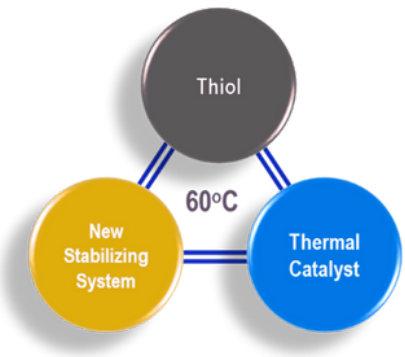
Krylex KE2000 series, “Thermal only” heat cure products are designed to cure at temperatures as low as 55xC. These formulations are also able to offer rapid ‘snap cure’ at elevated temperatures of approximately 100 - 130xC. Depending on the formulation design, the product is stable at ambient temperatures for anywhere between 72 hours and several weeks.

The KURA-LOW® chemistry platform offers excellent adhesion and enhanced shock absoption.



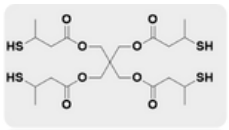
Anionic thermal reaction based on Thiol-Epoxy Click Chemistry

LTCA	Conventional Epoxy		Chemence KURALOW
Part	2-Part Epoxy	1-part Epoxy	1-Part Epoxy
Service Temperature	Room Temperature	60 °C or above	60 °C or above
Room Temperature Stability	<30min	<24 hours	Min.72hrs~weeks
Work ability (Dispensability)	No	<24 hours	72~120 hours
On-set Point Control	No	Limited	Yes *Cure-on-Demand*
Adhesion Performance	Similar to High Temp Cure	Weak compared to HT cure product	Comparable to HT cure product



Thiol (Sulfur) Crosslinker

- **Curable at RT without a stabilizer**
- **Dark-side curing (oxygen insensitive)**

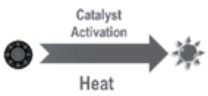


Stabilizing System

- **Capsulating active species to depress the reaction**
- **Control an on-set temperature**

Thermal catalyst

- **Thermally activating (deblock) ~50oC**



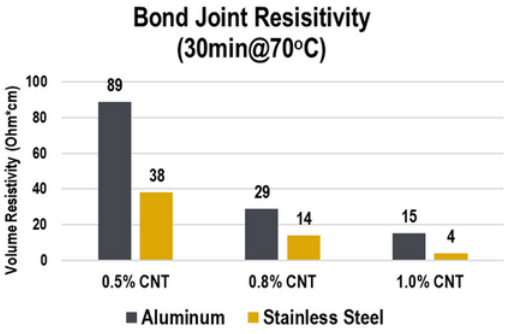
KRYLEX™

KURA-LOW™ Temperature Heat Cure

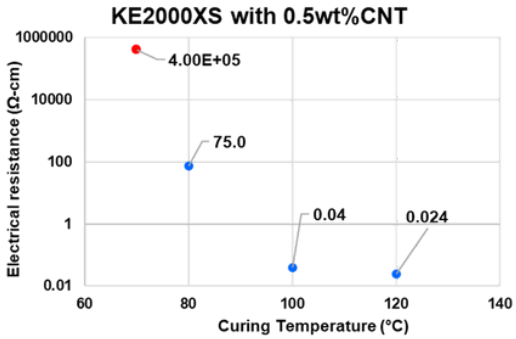
CNT-based Electrically Conductive 1-K Epoxy

Krylex KE2000 series, “Thermal only” heat cure products are designed to cure at temperatures as low as 55xC. These formulations are also able to offer rapid ‘snap cure’ at elevated temperatures of approximately 100 - 130xC. Depending on the formulation design, the product is stable at ambient temperatures for anywhere between 72 hours and several weeks.

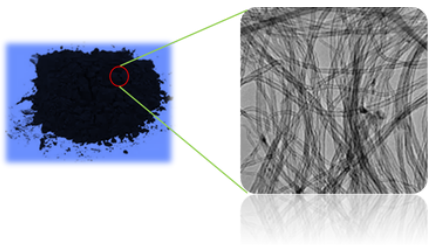
The CNT-based electrically conductive formulations can be applied as a conductive grounding material for heat-sensitive electrical devices.



Conductivity based on CNT Content



Conductivity based on Curing Temperature



Microscope image for CNT

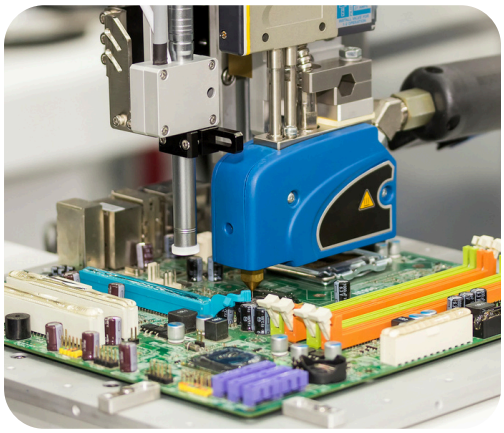
Overlap Shear Bond Strength of 0.5wt% CNT		
Cure Temp (1hr)	Aluminum	Stainless Steel
100°C	14.0 MPa	16.3 MPa
80°C	10.9 MPa	15.4 MPa
70°C	11.6 MPa	14.8 MPa

Shear Strength based on Curing Temp

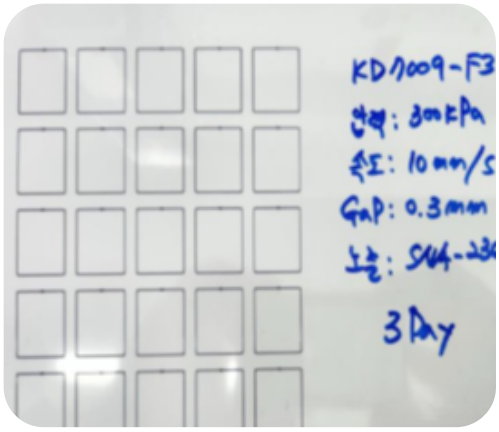
KURA-LOW® Technology

KE2000 v. Conventional Adhesives

Our product boasts exceptional dispense characteristics, allowing for precise application even in fine-pitch dispensing scenarios. Whether you prefer jet or needle dispensing methods, our adhesive is capable of meeting your needs with ease.
With outstanding stability at room temperature, it offers an extended work life, ensuring that you have sufficient time to complete your projects without the rush.



For those requiring rapid curing, our product offers snap curability at temperatures of 100°C or greater, facilitating quicker turnaround times without compromising on quality.



One of the key advantages of our adhesive is its superior adhesion to various substrates including plastics, metals, and glass, ensuring robust bonding in diverse applications.

Comparison of Current LTCA V KURA-LOW®

	① Conventional Exposies	②	③ KURA-LOW®
Part	2-Part Epoxy	1-Part Epoxy	**1-Part Epoxy**
Service Temp	Room Temp	60℃ or Above	**60℃ or Above**
Room Temp Stability	< 30 min	< 24 Hours	**Min 72 hrs ~ weeks**
Work Ability	None	< 24 Hours	**72 - 120 Hours**
On-set Point Control	No	Limited	**Yes** ***Cure-On-Demand***
Adhesion Performance	Similar to High Temp Cure	Weak	Comperable

CHEMISTRY *X*

Adhesive Technology Overview

KRYLEX® material scientists have produced a range of novel, patented chemistry, self-foaming adhesives that provide best-in-class performance and eliminate many of the common problems associated with other foaming product formats. KRYLEX® Chemistry *X* technology is utilized to produce both high-performance foaming adhesives and also non-foaming, structural adhesives. The products are supplied in a two-component syringe format and cure at ambient temperature offering ease of use and superior adhesion performance.

KRYLEX® Self Foaming Adhesives for Electronics Assembly

KRYLEX® Adhesive foams are a type of adhesive that expands as they cure, creating a strong and reliable bond between the target substrates. Chemistry *X* technology is utilized to produce both high-performance self-foaming adhesives and also non-foaming, structural adhesives. KRYLEX® Self-foaming adhesives do not require any gas injection step like that commonly seen with traditional foaming adhesive solutions. The benefits of not requiring gas injection are numerous but ultimately result in a more robust application process and a more reliable foamed adhesive structure.

The benefits of Chemistry *X* foams can be summarized:

- **No gas injection step**
- **Ultra-fast, room temperature curing, typically 5 – 30 minutes depending on the formulation.**
- **Low to no odor**
- **Adhesion to a variety of surfaces**
- **Easily foamed without the need for gas injection.**
- **No isocyanates**
- **Inherent fire resistance**
- **Low sensitivity to mix ratio**
- **Low sensitivity to ambient temperature cure conditions**
- **Tolerate to substrate surface contamination.**
- **Excellent moisture barrier properties.**
- **Chemical resistance to a wide range of common chemicals.**

Chemistry *X* Adhesives

Self Foaming Adhesive Formulations

KRYLEX® Self-foaming adhesives do not require any gas injection step, like that commonly seen with traditional foaming adhesive solutions. The benefits of not requiring gad injection are numerous but ultimately result in a more robust application process and a more reliable foamed adhesive structure.

Benefits:

- No gas injection step
- Ultra-fast, room temperature cure (5-30 minutes typically)
- Low to Zero Odor
- Adhesion to range of substrates
- Easily foamed without the need for gas injection
- No isocyanates
- Inherent fire resistance
- Low sensitivity to mix ratio
- Tolerant to substrate surface contamination
- Excellent moisture barrier properties
- strong resistant to range of chemicals

High Adhesion Substrates

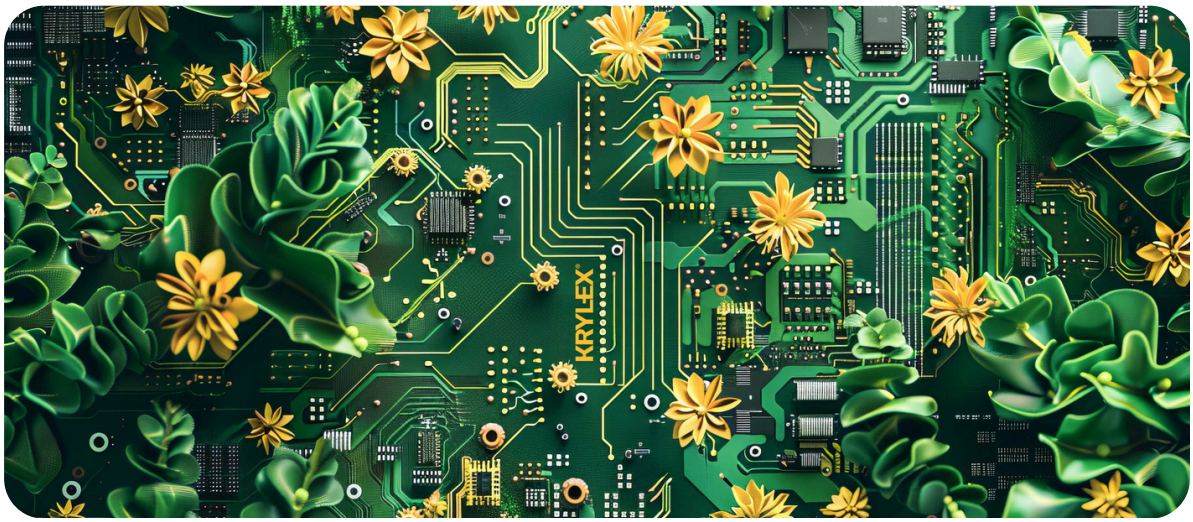
- Aluminum
- Steel
- Iron
- PC
- ABS
- Acrylic
- Nylon
- Glass
- Ink coated glass

Chemistry *X* Adhesives

Two Componement Foaming Adhesive Formulations

Foaming adhesives are used for electronic device assembly to provide various benefits, such as:

- Easy application
- Bond different types of materials, such as metal, plastic, ceramic, and glass, with high strength and durability.
- Fill gaps and voids in the electronic components, improving the thermal and electrical conductivity, as well as the protection against moisture, dust, and vibration.
- Reduce the weight and size of the electronic devices, as they require less material and space than conventional adhesives or mechanical fasteners.
- Cure at low temperatures, avoiding damage to the heat-sensitive electronic parts.
- Provide acoustic dampening performance for electronic device speaker assemblies, reducing energy loss and noise pollution.
- Offer both waterproofing performance and chemical resistance.



Despite the numerous benefits, traditional ‘gas injected’ foams also have significant problems that need to be considered -

- Inconsistent dispensing and application as a function of the gas injection process.
- Outgassing is the gradual escape of captive gases from injection-molded thermoplastics, which can cause bubbles to build up. This can result in unsightly blisters, delamination, or peeling of the adhesive.
- Foam stability is the ability of the foam to maintain its structure and properties over time and under different conditions. Foam stability can be influenced by factors such as gas type, gas-oil ratio, oil saturation, pressure, temperature, and shear rate.

The extent to which the adhesives ‘foam’ after dispense is influenced by product design, and in most cases an additional processing step of gas injection. KRYLEX® material scientists have produced a range of novel, patented chemistry, self-foaming adhesives that provide best-in-class performance and eliminate many of the common problems associated with other foaming product formats.

KRYLEX® ‘Chemistry-*X*’ technology is utilized to produce both high-performance foaming adhesives and also non-foaming, structural adhesives. The products are supplied in a two-component syringe format and cure at ambient temperature offering ease of use and superior adhesion performance. In addition, Chemistry-*X* technology offers an excellent safety profile for the use along with inherent flame retardancy for applications that have UL regulatory requirements.

PUR Reactive Hot Melt

KH9000 Series Adhesives

KRYLEX® KH9000 Series Products are novel Polyurethane (PUR) Reactive Hot Melt Adhesives that deliver a variety of performance benefits in the assembly of Consumer Electronic portable, mobile devices, wearable devices (both consumer and medical), and device accessories.

Novel, proprietary resin technology, enables KH9000 Series to offer very low moisture absorption and excellent chemical resistance that outperform other standard Reactive Hot Melt Polyurethane (RHM PUR) adhesives

KRYLEX® KH9000 Series Sustainability:

Increased sustainability is becoming an ever-increasing important area of focus for electronic device manufacturers as companies and wider society push toward reducing carbon emissions and other negative environmental factors such as waste to landfills.

Bio-based resin constituents replace traditional fossil fuel raw materials used to manufacture adhesives. KH9000 series contains high bio-content resins as part of the formulation design, which is seen as a way to lower the carbon footprint of adhesives used in the assembly of electronic devices. Eliminating or reducing the use of traditional fossil fuel raw materials has several positive, sustainable benefits:

- ***Reduced carbon footprint.***
- ***Savings in energy during production.***
- ***Reduction of non-biodegradable waste.***
- ***Non-renewable sources are preserved.***

KH9000 Series Products

KH9001 Moisture Barrier PUR Adhesive

KH9001 is a long open time, high performance Reactive Hot Melt Adhesive that offers outstanding Chemical resistance to a variety of chemical as well as offering low and stable dielectric constant for use in the construction and assembly of wearable antenna's or other applications where High Radio Frequencies are used.

- **Low, stable dielectric constant.**
- **Excellent chemical resistance.**
- **Excellent Impact performance.**
- **Highly Flexible**
- **Reworkable**
- **High Bio-content, approx. 50%**
- **ROHS compliant.**
- **Long open time for easy use in HVM**
- **10993-5 Bio-compatabile**
- **Low MVTR**

KH9005 Moisture Barrier PUR Adhesive

KH9005 is a long open time, high performance Reactive Hot Melt Adhesive that offers outstanding moisture barrier performance and Chemical resistance to a variety of chemicals. This makes it a great PUR adhesive for bonding and sealing enclosures of high performance, Hand Held and wearable, electronic devices:

- **Chemical resistance.**
- **Bubble free post cure.**
- **Excellent Impact performance.**
- **Highly Flexible**
- **Reworkable**
- **High Bio-content, approx. 50%**
- **ROHS compliant.**
- **Long open time for easy use in HVM**
- **10993-5 Bio-compatabile**
- **Low MVTR, 0.256 g/hr-m2**

KH9035 Rapid Green Strength PUR Adhesive

KH9035 is a high structural strength Reactive Hot Melt adhesive. The product develops green strength rapidly and has excellent jet dispense performance enabling HVM efficiencies to be maximised.

- **Best-in-class 'Jet' dispense performance.**
- **No minimal bond line bubble formation.**
- **Excellent Impact performance.**
- **'High' modulus.**
- **High strength to metals and plastics**
- **ROHS compliant.**
- **Rapid green strength development,**
- **10993-5 Bio-compatible**

K-FILM Technology

Adhesive Technology Overview

KRYLEX K-Film Technology is a thermoplastic film/tape adhesive that incorporated novel and proprietary resin technology to deliver exceptional strength to a variety of substrates including metals, plastics, fabrics and glass. The adhesive is available in two standard thicknesses, 75 and 150 microns. The film itself doesn't stick to itself at ambient temperatures and so can be supplied without the need for release liners, vastly reducing waste in high volume production environments.

KRYLEX® K-FILM Technology

KRYLEX K-Film polymers combine the adhesive properties of a highly functionalised resin with the processing and handling characteristics of a thermoplastic. The resin chemistry can be characterised by its high strength and high elastic modulus.
KYRLEX K-FILM KF-2047 offers high strength, high rigidity and toughness, while next generation K-FILM technology will provide adhesion strength on both polar and non polar substrates as well as increased flexibility and higher Glass Transition Temperature (Tg).

K-Film Benefits:

- **Dry to the touch – No refrigeration necessary.**
- **Low application process temperatures.**
- **Short Cycle times for bonding.**
- **Reworkable.**
- **No release linear required.**
- **Thermoformable.**
- **Bond a wide variety of substrates e.g. Plastics/ Metals/ Glass/ Fabric,**
- **Adhesion to polar substrates - KF2047.**
- **Adhesion to both polar and non-polar substrates – Next Generation K-Film.**
- **Optically Clear - KF2047.**
- **Cohesive Tensile Peel Strength – Next Generation K-Film e.g. > 5 N/mm**
- **High strain to failure.**
- **Base resin available in formats other than film**

K-FILM Technology

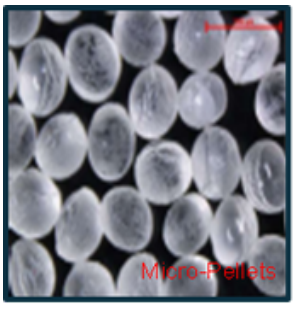
Target Applications

KRYLEX K-Film Technology is a ideal for structural and enclosed bonding applications between metals, plastics and fabrics. Examples include: smart watches, cell phones, AR/VR headsets, smart glasses, and earbuds. It is also suited for fabric bonding in wireless chargers, cables and connectors.

Property	KF-2047	Development
Physical Property	100% Amorphous	Varies
Tg	80°C	15 - 90°C
MFI (Melt Flow)	10,30	Variable
Processing Temperature	80 - 120°C	20 - 200°C
Adhesion to Polar Substrates	Excellent	Very Good
Adhesion to Non-Polar Substrates	Poor	Good
Elongation at Break	40%	> 100%
Yield Stress	58 MPa	TBD
Break Stress	47 MPa	TBD
Modulous	2.7 GPa	TBD

Micro Pellets vs Monofiliment

KRYLEX K-Films utilize a resin technology which can be produced in both micro pellets and monofiliment. The pellet format is provided at 3-mm pellet size and the Micro pellets are available in 500 micron dimensions. The pellets are able to be used in standard traditional injection molding systems and are fully extrudable at lower processing temperatures than alterative product chemistries.



The KTL resin chemistry is able to be coated onto monofilament or yarn. Providing the resin system onto coated yarn enables time and labor savings versus applying wet adhesive and the need for subsequent curing steps. The product is able to be used for precision stitching and improved strength when consolidated in the fabric/substrate.

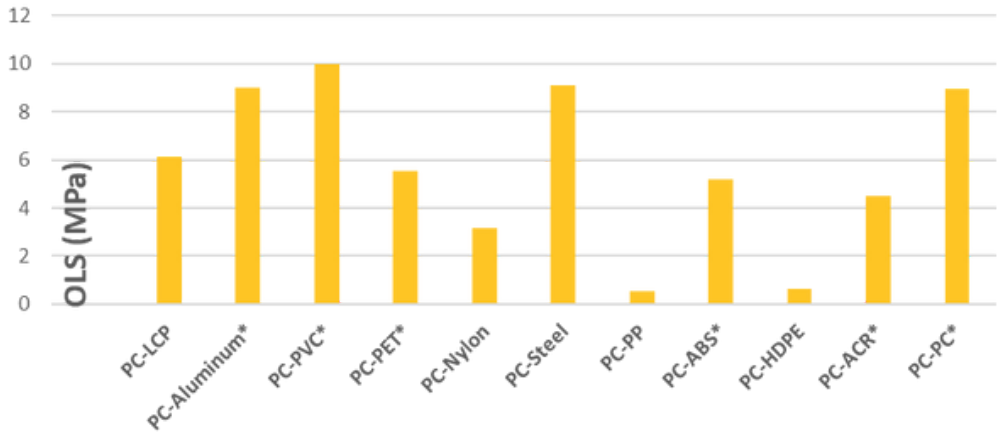
UV Curable Acrylate Adhesives

KU 5100 Series : Camera Modules

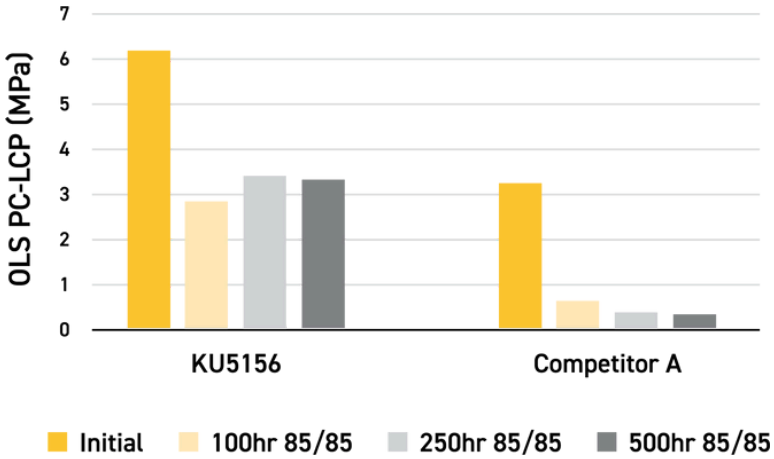
KU5100 series adhesives are UV-curable adhesives designed to have excellent adhesion to difficult to bond to plastics, like LCP, and have exceptional impact performance. The products contain proprietary technology to promote a highly flexible structure while maintaining excellent adhesion. This high flexibility leads to superior performance in impact events and is ideal for use in mobile device assembly.

Lens to Barrel Bonding Adhesive

KU5156 OLSS Adhesion Data on a Variety of Substrates:



KU5156 Heat and Humidity OLSS Strength:

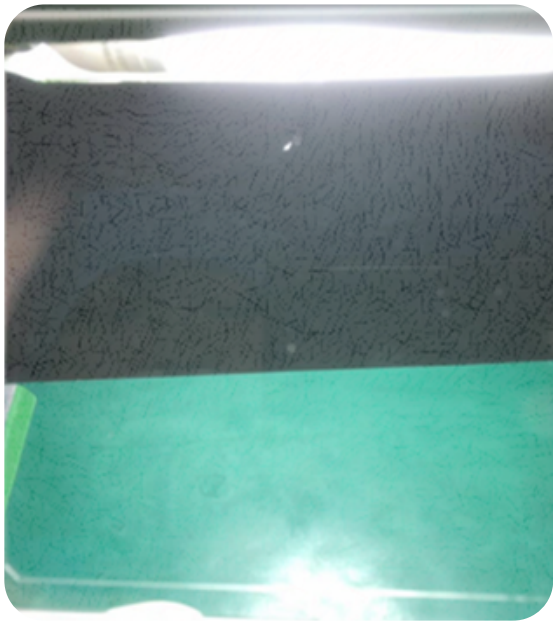


KU5100 series adhesives are UV-curable adhesives designed to have excellent adhesion to difficult to bond to plastics, like LCP, and have exceptional impact performance. The products contain proprietary technology to promote a highly flexible structure while maintaining excellent adhesion. This high flexibility leads to superior performance in impact events and is ideal for use in mobile device assembly.

UV Curable Acrylate Adhesives

Opitically Clear Adhesives for IR Filter Bonding

KU5146
Optically Transparent



Competitor
Hazy and Yellow

The KRYLEX® Camera Module Assembly Adhesive range ensures:

- High manufacturing throughput achieved through on-demand curing UV technology
- Excellent optical performance and low shrinkage
- RoHS-compliant, isocyanate-free, and solvent-free
- Excellent dispensability
- Excellent mechanical properties leading to outstanding reliability and functionality

Specific to optical bonding, KU5146 is formulated to be used in IR glass bonding applications:

- The refractive index of ~1.56
- Adhesion to glass
- Optically clear (non-yellowing) formulation

UV Curable Acrylate Adhesives

Flexible Printed Circuit (FPC) Ahesives KU517X Series

KRYLEX® Development chemists have created a range of new, UV-curable adhesives designed to deliver next-level performance in bonding FPC's – KU517x Series.
The KU517x liquid adhesives are developed to have tightly defined rheological properties to make dispensing and wet out a consistent, repeatable process, from adhesive batch to adhesive batch, and also have rapid cure kinetics meaning the product can be rapidly reacted in <5 seconds, when the appropriate intensity of UV/ Visible light is applied. In addition to environmental conditioning, the products retain excellent mechanical properties.

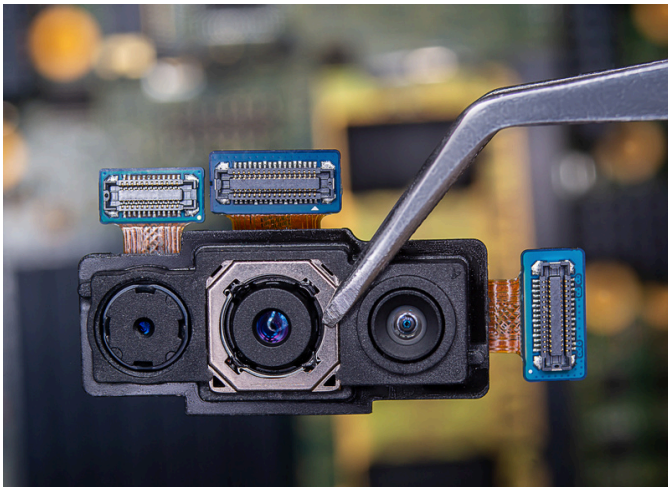
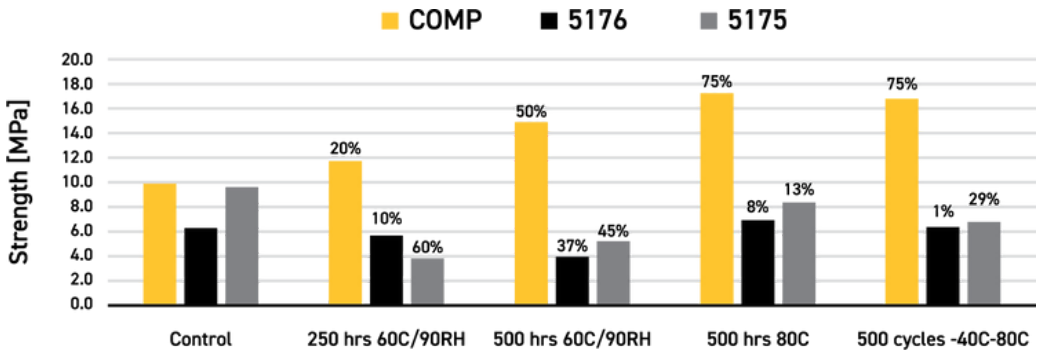


Figure 1: The effect of accelerated environmental aging on adhesive Modulus for KU5176 & KU5175 versus competitor sample – Increasing Modulus versus accelerated aging demonstrates increasing rigidity and increased brittleness (lower peel strength)



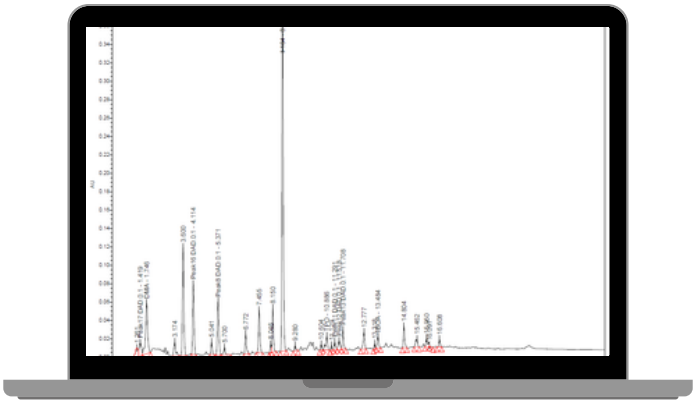
BIOCOMPATIBLE HIGH PERFORMANCE ADHESIVES

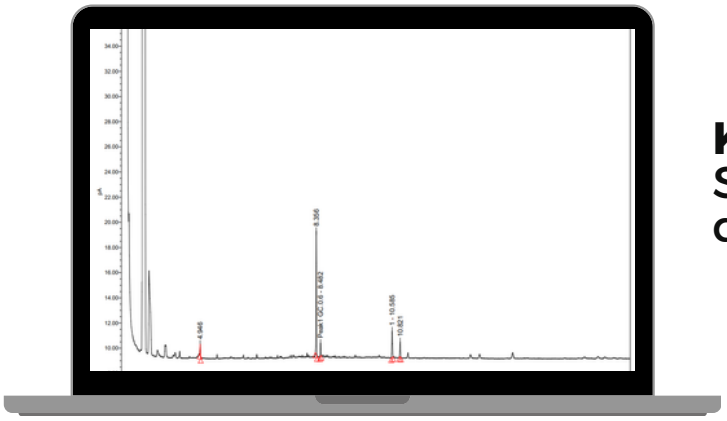
Low Extractable UV Curable Formulations

KRYLEX® UV curable adhesives with low residual organic constituent and ionic extractable content are designed for bonding applications that will be used close to human skin. After cure they have shallow detectable chemical peaks when analysed by HPLC and as such have an excellent safety profile making them ideal for wearable electronic and mobile device assembly.

The adhesives are designed to be free of IBOA, Phenol, and DMA and formulated to be ROHS and REACH-compliant and irritant-free. The adhesives are designed to have fast UV cure kinetics and, depending on the formulation, have targeted performance on both high and low-surface energy substrates

Competitor's Formulation:
Many detectable peaks





KRYLEX KU5165:
Significantly fewer detectable peaks

Our KRYLEX® line of medical device assembly adhesives is tested and certified to ISO 10993 and USP Class VI biocompatibility standards. Many of our products have been found to pass critical standards including:

- ISO10993-4: Hemolysis
- ISO10993-5: Cytotoxicity
- ISO10993-6: Implantation
- ISO10993-10: Intracutaneous Sensitization and Irritation
- ISO10993-11: Systemic Toxicity
- Substrates and Adhesion

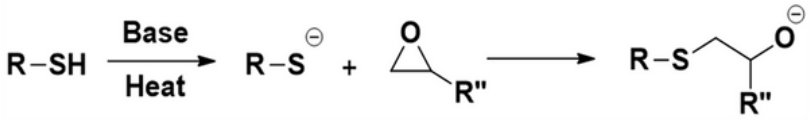
RADTECH UV+EB 2024

RadTech USA 2024 Best Paper Award

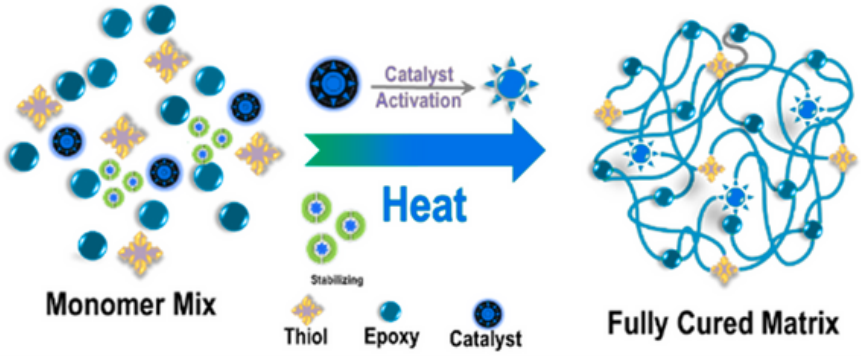
BIOCOMPATIBLE HIGH PERFORMANCE ADHESIVES

Low Extractable Epoxy Formulations

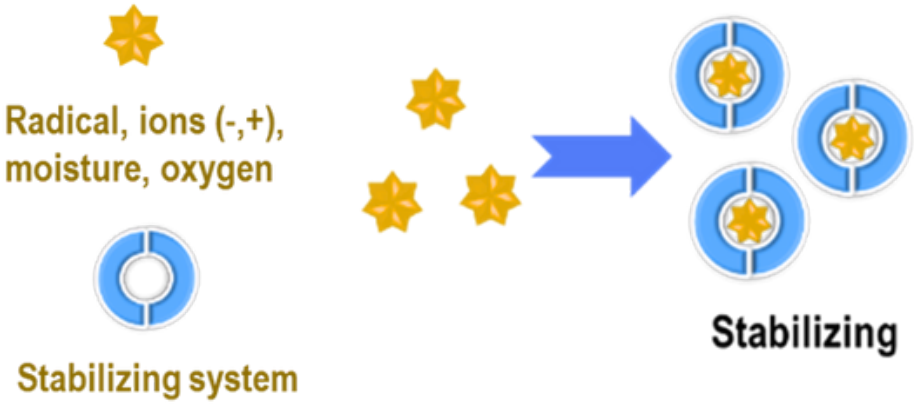
KRYLEX® Kura-low KE2000 formulations are 1-component epoxy can fully cure at a minimum of 50°C for 70 minutes, making it suitable for use in devices with an embedded battery. Strong bonding to Surgical grade SUS316 part. ISO 10993-5 (Biocompatibility grade<2), Grade1 (KE2000)



Anionic thermal reaction based on Thiol-Epoxy Click Chemistry



On-set temperature control of reactions through the encapsulated thermal catalyst and the ion trap



Chemence's ion trap technology
(Patent pending for designing stabilizers and its low temperature epoxy formulation)

Programmed thermal activation by encapsulating a thermal catalyst

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