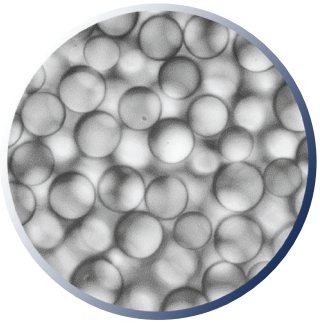
ADVANCED MATERIALS

# Catalyx®

A product of Calyxia

## Reactive materials microcapsules

With our Catalyx microcapsules product line, we make sure that reactive materials (accelerators, initiators, catalysts, crosslinkers, hardeners...) are fully contained in non-porous microcapsules, that they do not react prematurely in the process, and that they are released at the right time and site for maximum performance.



**Applications include:**

- Crosslinking of rubbers
- Curing of thermoset materials
- Polymerization
- Polymer functionalization (grafting, visbreaking, etc.)

## Catalyx® Heat-activated microcapsules

- Full protection of reactive ingredients against degradation, hydrolysis, oxidation and cross-reaction even in the most demanding conditions
- Extended shelf life of the formulation while providing a high reactivity
- Decrease in curing time and temperature
- Possibility to go from 2K formulations to 1K formulations
- High ease of use and improved flexibility in supply chain and final use

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# Catalyx®H

## Heat-activated microcapsules

Catalyx H grades are heat-activated microcapsules containing reactive materials which provide extended shelf life, pot life and high reactivity during curing even at low temperatures for numerous applications:

- **Composites**
- **Coatings**
- **Adhesives & Sealants**
- **Plastic & Rubbers**
- **Many others!**

# Features

- Easy to incorporate size-controlled microcapsules
- Can be processed even in extreme conditions (extrusion, compression, injection molding, ...)
- Deliver the reactive material only at a specific temperature
- Long term stability even in harsh chemical environments

# How does it work ?

Catalyx H grades are heat-activated microcapsules containing a reactive material. These grades are able to fully contain and protect the reactive material even in extreme process conditions. During the curing step at high temperature, the Catalyx H grades open and deliver the reactive material, activating the polymerization.

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# Catalyx®H

## Heat-activated microcapsules for epoxy resins

**Catalyx®H110** substituted urea accelerator for epoxy resins (120-160°C curing)

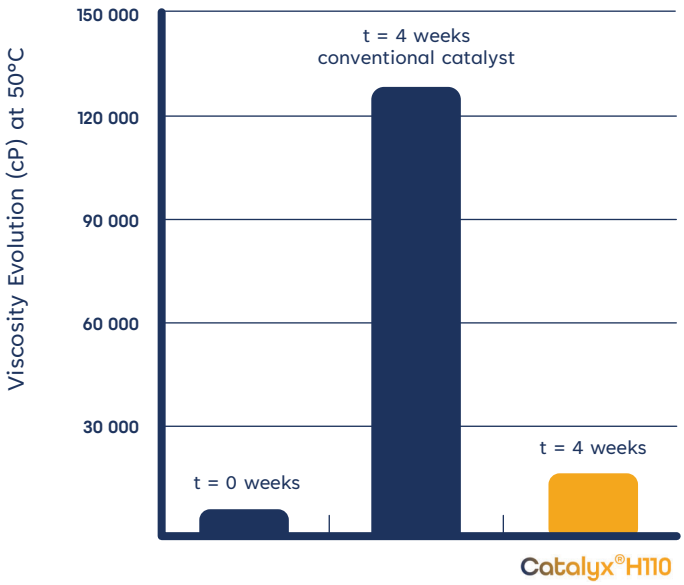
**Catalyx®H210** imidazole accelerator for epoxy resins (80-120°C curing)

**Catalyx®H310** polyamine accelerator for epoxy resins (80-120°C curing)

Catalyx H grades enable our customers to launch one-component systems with maximized shelf life to increase production rate and flexibility in supply chain. Catalyx H also allows higher reactivity at lower curing temperatures, bringing value in shorter curing times and lower curing temperatures. Catalyx H grades are also used to move from two-component systems to one-component systems for easy handling and improved reproducibility.

## 1 - Outstanding Shelf Life

Without Catalyx H110, when combining the epoxy resin with the accelerator, there is a premature reaction causing early polymeriza-tion and a massive viscosity evolution. Catalyx H110 can be combined in a 1k epoxy resin system for up to 4 weeks at 50°C without any premature reaction. This demonstrates full protection and containment of the accelerator, ensuring an extended shelf life of the system.




Shelf-Life Stability of 1-component system by Viscosity Evolution (cP) at 50°C

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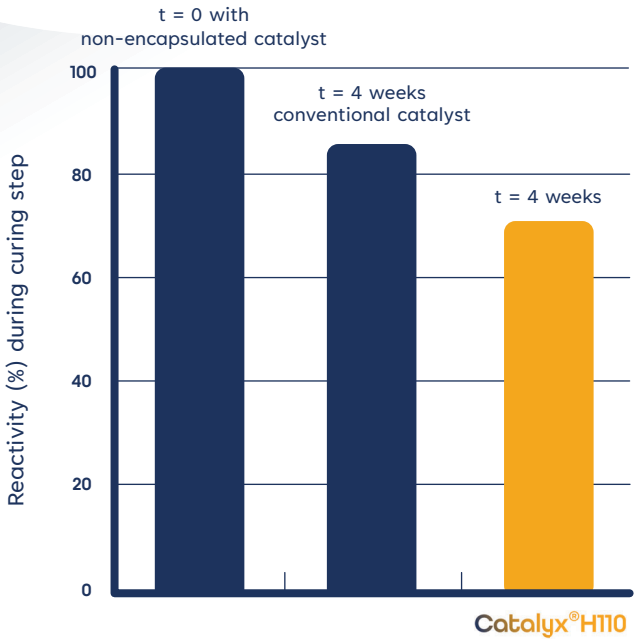
# Catalyx®H

## Heat-activated microcapsules for epoxy resins

## 2 - High reactivity




Catalyst Reactivity (%) during curing step as a function of shelf life

Adding Catalyx H protects the active ingredient from premature reaction for up to 4 weeks. With traditional catalysts, premature reactions can occur as early as 2 weeks at room temperature, causing reduced reactivity during the curing step.

With Catalyx H grades, the reactivity of the accelerator and thus the polymerization rate is fully retained after 4 weeks and extrusion processing. Catalyx H grades fully protect the accelerator against premature reaction & deliver it at the optimal time and site for maximum performance.

- Extended shelf life of the formulation for optimized processability
- High reactivity for shorter curing cycles and lower temperature



Calyxia Advanced Sustainable Chemistry