PATcat 7001 Best Mercury Replacement Catalyst

PATCHAM

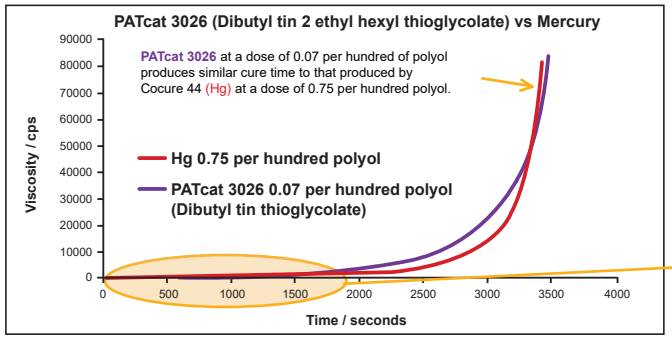
Many industrial polyurethane applications require a delay from mixing to the onset of the gel reaction. This allows a period time of in which the system maintains fluidity essential for processing. After that, there should be a sharp gelation profile “snap cure” with or without the assistance of heat. Mercury based compounds provided this long induction period (“Pot Life”) followed by a good snap cure but due to their inherent toxicity replacements were essential.

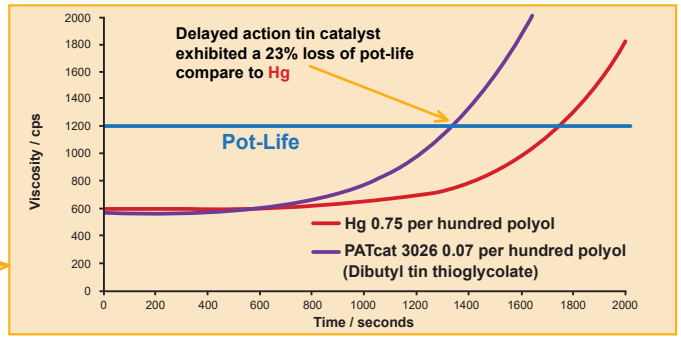
PATcat 7001 provides the closest cure profiles to those produced by mercury.

Verification was carried out in an elastomeric formulation.

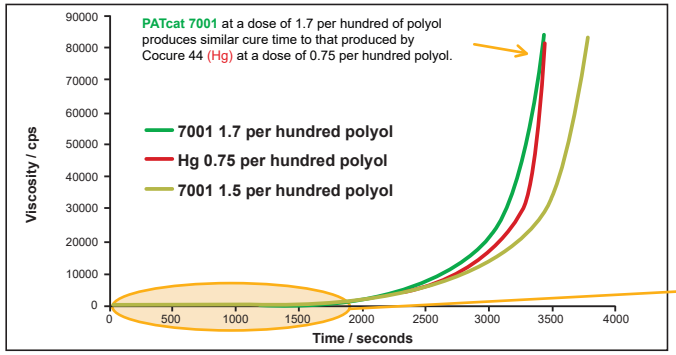
		Wt
Castor oil	OH = 164	82
Polyether polyol mol wt 4000	OH = 28	18
Catalyst		Dosage
MDI 32% ISO	for 110 index	36

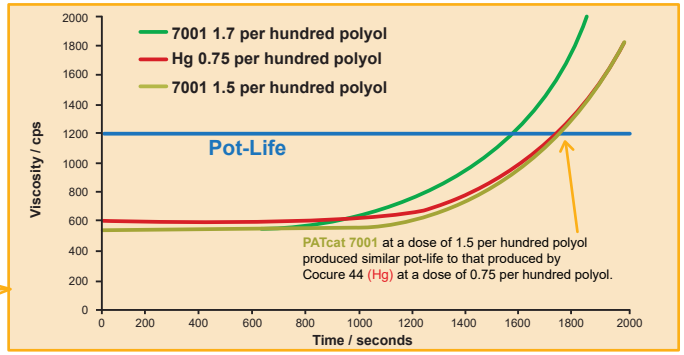
Ambient Temperature viscosity vs time plot





Tin catalysts can give similar cure to that produced by a typical mercury catalyst but at a considerable reduction in pot-life; chilling would be required to compensate for this. Small doses of tin catalysts are required which gives rise to inconsistencies through small weighing errors.

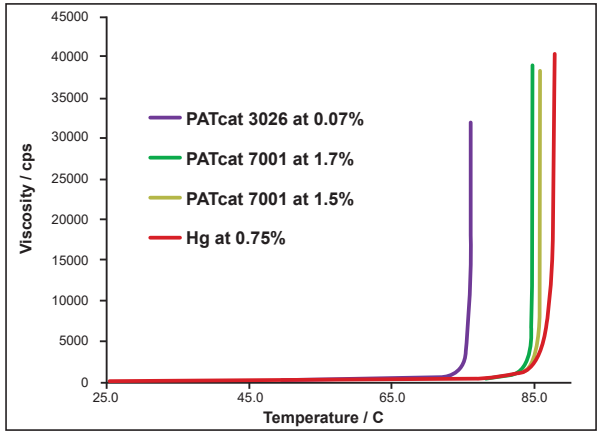




PATcat 7001 at a dose of 1.7 per hundred polyol provided similar cure times as produced by a mercury catalyst at a dose of 0.75 per hundred polyol.

PATcat 7001 at a dose of 1.5 per hundred polyol produced the same pot-life as a mercury catalyst at a dose of 0.75 per hundred polyol.

Elevated Temperature Cure



This test system required elevated temperature to bring about final cure.

Systems with PATcat 7001 as the catalyst performed similar to the one containing mercury catalyst.

System based on tin thioglycolate catalyst (PATcat 3026) displayed curing at far lower temperature than that produced with mercury catalyst.

Conclusion

PATcat 7001 can be used in place of typical mercury catalyst with minimal change in performance and processing.

A dose of approximately PATcat 7001 2:1 Mercury (20% metal content) catalyst by weight is a good starting point for performance in other systems.