Sandia National Laboratories

Epoxy Foam Production

POTENTIAL MARKET APPLICATIONS

Aircraft and Aerospace

Electronics

Construction/HVAC

BENEFITS

No PBA's or freons required
Allows for safer epoxy foam production

Large range of densities
Dependent only on reactant concentrations and reaction conditions

Low Curing Temperatures
50-80°C yield excellent foams

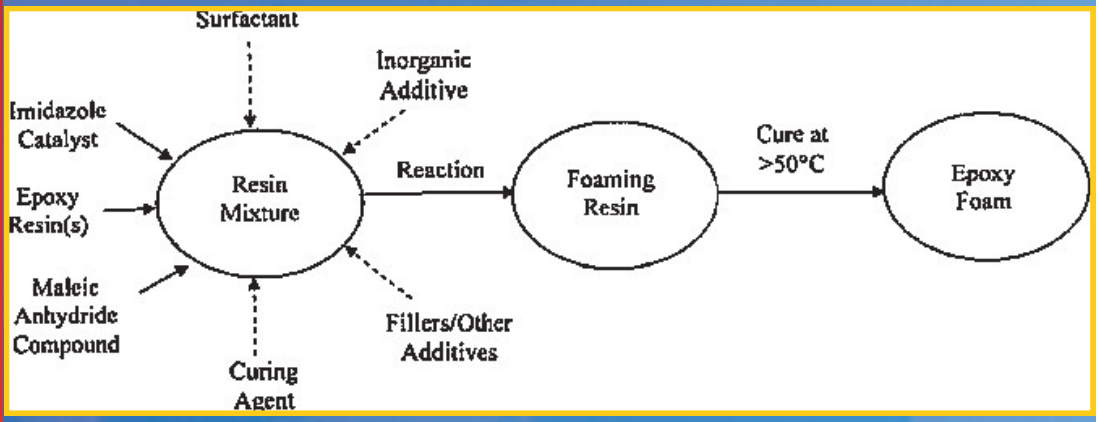
Cohesive with other additives
Use of multiple adhesives and additives results in foamed hybrid materials

INTELLECTUAL PROPERTY

US PATENT #8,003,730
SD# 10311

TECHNOLOGY SUMMARY

Epoxy foams are often used as encapsulents and in structures such as wind generator blades, windsurfing boards, and automotive spoilers due to their rigidity, adhesive strength, moisture resistance, and toughness. These foams allow for highly reliable strength to be added to a material through a relatively inexpensive process. However, these foams often require the use of hazardous chemicals such as physical blowing agents (PBA's) or freons in order to achieve adequate foaming of the epoxy material.



Sandia has developed a novel method for producing epoxy foams that does not require the use of PBA's or freons, while still maintaining the extent of foaming. This method uses maleic anhydride as a curing agent for the production of foamed epoxies with a large range of physical densities, depending on the concentration of maleic anhydride, initiators, surfactants, and reaction temperatures used. Another benefit afforded by this method is relatively low curing temperatures (below 100°C) and the ability to produce numerous foamed hybrid materials dependent on the types of additives used.

TECHNOLOGY READINESS LEVEL

Sandia estimates this technology to have a technology readiness level of approximately 4. Key elements of this technology have been demonstrated in a laboratory environment.

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National Nuclear Security Administration

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