

Business *Awareness*

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Lonza's High Performance Materials complement the Life Science Portfolio

The aerospace, electronics, construction and automotive industries are not normally associated with Lonza. But with the products of its High Performance Materials business, manufactured in Visp (Switzerland) and Liyang (China), Lonza develops innovative solutions for these high-tech applications.

What do the Airbus A 380, satellites and Formula 1 racing cars have in common? They all contain Primaset® cyanate esters from Lonza. Our Primaset® esters contribute to the temperature stability and low weight of key components, which are designed to be long-lasting in highly-stressed environments. For these reasons, this material class is one of the best for high tech applications.

Primaset® products are typically used in a class of materials called composites. Composites are a relatively young material class, composed of a mixture of materials. They are increasingly used as substitutes for metals, especially when lightweight construction is of major importance. Lighter weights mean less fuel consumption. Nowadays, with fuel prices skyrocketing, airplane, train and car manufacturers

are fighting for every kilogram of weight reduction that can be achieved. Of course, less fuel consumption also translates into lower emissions of greenhouse gases like CO₂, which helps to safeguard the climate and the environment.

Composite materials are a mixture of a polymeric resin (e.g. Primaset®) and a reinforcement, which is predominantly a fiber structure made of glass or carbon. Both resin and fibers are combined in special processes, transformed into the desired shape and last but not least thermally cured – in technical jargon, “polymerized”. As a result the final part is very light, but nevertheless extremely stable, durable and much more corrosion resistant than most metals.

Lonza's High Performance Materials group of the business unit Performance Intermediates within the Life Science Ingredients sector is highly active in the above mentioned industries. The products, which are used in the composite industry, include the Primaset® cyanate esters as well as Lonzacure® anilines, produced in the multi-purpose ALPHA plant in Visp.

Life Science Ingredients	Exclusive Synthesis & Biopharmaceuticals		Bioscience
Nutrition Ingredients	Small Molecules	Mammalian Operations	Cell Therapy
Microbial Control	Peptides	Biopharma Services	Rapid Testing
Performance Intermediates	Biochemicals	Microbial Operations	Media
			Cell Discovery
			Molecular Biology



An Airbus Built of Cyanate Esters?

The Primaset® cyanate esters are practically non-burnable, which makes them the material of choice for highly demanding aerospace applications. As an example: Primaset® PT-30S is used in the construction of air ducts for the entire Airbus fleet.

The new flagship Airbus 380 is an enormous challenge for the composite industry. Primaset® sets new standards for passenger safety in aerospace.

Primaset® materials are:

- very light (energy savings)
- high temperature resistant up to 400°C
- highly flame retardant (high passenger safety in airplanes, trains and on ships in case of a fire)
- very resistant to many solvents and to radiation (increased safety for hazardous applications)



With the development of new competitive production processes at Lonza, these materials are becoming more and more attractive for even more cost-sensitive applications, like the general automotive and industrial sectors.

Lonzacure® brings Polymers up to Speed

Lonzacure® products find their main applications in two different polymeric applications. They are used as hardeners for both epoxy resins (used for composites) and in polyurethane/poly-urea. Composites are especially suitable for certain aerospace applications, where they provide light and stiff structures with excellent mechanical properties. A combination of epoxy resins with Lonzacure® hardeners meets the state-of-the-art needs of modern aircraft technology for structural parts and delivers a sound match for this performance profile.

Lonzacure® also exhibits major advantages in polyurea. Polyurea is spray-on coating with excellent durability and flexibility, high abrasion resistance, and high chemical resistance. These advantages can be used for applications such as rendering potable water and gas pipes corrosion resistant – but polyurea also contributes to the safety of bridges. Concrete bridge decks frequently deteriorate from the corrosion of reinforcing steel, with potentially high risks for the safety of human lives and traffic. Polyurea is an easily applied material used to coat concrete structures and prevent water ingress right from the start. Thanks to Lonzacure® this long term protection can be applied neatly and quickly.



Examples of End Applications in Specialized Niches:

- Primaset® in exhaust pipes and brakes for Formula 1 cars and motorbikes (high temperature and fire resistance)
- Primaset® in the construction of satellites (high radiation resistance in space and dimensional stability)
- Primaset® for high performance condensators (excellent dielectrical properties and hence little waste of energy)
- Primaset® for aircraft interior parts like air ducts
- Lonzacure® in the construction of helicopter blades
- PMDA for flexible printed circuit boards used in mobile phones
- Lonzamon® as adhesion promoter for architectural coatings

Lonza in Your Pocket?

Pyromellitic dianhydride (PMDA) is another interesting product from the High Performance Materials portfolio – and the first one to be produced in our Chinese site at Liyang. PMDA is predominantly used for heat resistant polyimide resins, which are increasingly used for producing small, flexible electronic circuit boards, commonly found in mobile phone. So, it's very possible that you have Lonza's PMDA at the reach of your fingertips!

Components in Environmentally Friendly Paints for Houses

Lonzamon® is another product line of Lonza's High Performance Materials business with end use application in the construction area. The success of many buildings' exterior appearance is obtained through its painted surface. In addition to this decorative effect, the protective function also plays an important role in choosing an exterior coating. Exterior house paints are constantly exposed to environmental stresses and temperature chang-

es. Another important property is to avoid efflorescence. Paint properties like color retention, resistance to color changes or resistance against aggressive chemicals (as present in cement) have a tremendous impact on a buildings' exterior appearance and the ability of the paint to adhere to the surface. Our Lonzamon® products are frequently used components in environmentally friendly, solvent-free, high-quality paints in order to provide improved paint adhesion, increased hardness and durability, and better resistance to bad weather, moisture and lower dirt pick-up. At the end of the day customers enjoy their freshly painted houses for a longer period of time at constant quality and color strength over the years.

While these products don't normally fit into the classical meaning of life sciences, it is clear that they have the ability to improve people's safety and comfort. In this way, they provide a definite contribution to the quality of life.



Lonza