Henkel Excellence is our Passion

Press Release

2014/08/27

Henkel showcases GL-certified adhesives technology for rotor blade production at the WindEnergy trade fair in Hamburg

Polyurethane adhesives bring wind of change

Over the past years, development work on advanced adhesives has made it possible to build ever more efficient wind power plants. At the WindEnergy 2014 show from September 24 to 26 in Hamburg, Germany, Henkel will be presenting innovative adhesive, sealant and lubricant technologies to meet challenging applications in wind power that will help to support the energy transition by accelerating the expansion of renewable energies.

With a new adhesive technology for the production of rotor blades, Henkel has made a remarkable entry into the wind power market. The portfolio of adhesives engineered under the Loctite brand is based on polyurethane technology (PUR). The new adhesives come with a variety of benefits: They can reduce the energy required for bonding rotor blades, shorten the production time and thus reduce overall costs. In addition, as a result of their ability to fully cure at room temperature, they combine utmost process reliability with automation potential, particularly in bonding applications involving small components or poorly accessible joints.

Although new to wind turbines, polyurethane adhesives have long been demonstrating their remarkable performance potential in other industrial sectors. In shipyards, for example, they have been exhibiting resistance to temperatures as low as –180 °C in marine applications for about 40 years. In refrigerated superstructures on truck semitrailers they provide additional structural strength. And the solvent-free PUR adhesives are also used to manufacture mobile homes and snowboards. Henkel, the world market leader in adhesives, invested around four years of intensive research in this technology which is totally new to the wind power sector. The outcome so far is five Loctite-brand adhesives, all of which have been tested by Germanischer Lloyd under various criteria and are now certified.

A decisive advantage of PUR adhesives for production processes is the reduced exothermy of their reaction, and hence low shrinkage, compared to the established epoxy resin technology. Although polyurethane adhesives are capable of curing without any additional energy, the process is usually accelerated by applying external energy. While epoxy resin adhesives need a relatively high heat input, polyurethane adhesives cure at a lower heat, thus substantially reducing energy needs and taking less time.

The speed of curing and thus of production can be varied via the amount of heat introduced. As a rule of thumb, an increase of 10 °C in temperature cuts the curing time by half. This rapid, catalysis-controlled setting behavior is now being exploited in repair and component bonding. In addition, the setting behavior of Loctite products can be flexibly adjusted, and polyurethane bonds can be relied on to fully cure.

The comparatively low curing temperatures and the low exothermic reaction temperature are kind to the bonded materials. For example, rotor blade half-shells bonded with PUR adhesives show less stress cracking in the course of time. The adhesives' elasticity also has an appreciable supportive effect. PUR technology also exhibits superior fatigue and aging behavior.

Henkel will be exhibiting at WindEnergy jointly with its distributor Hillmann & Geitz in Hall B7, Stand 618.

Henkel operates worldwide with leading brands and technologies in three business areas: Laundry & Home Care, Beauty Care and Adhesive Technologies. Founded in 1876, Henkel holds globally leading market positions both in the consumer and industrial businesses with well-known brands such as Persil, Schwarzkopf and Loctite. Henkel employs about 47,000 people and reported sales of 16.4 billion euros and adjusted operating profit of 2.5 billion euros in fiscal 2013. Henkel's preferred shares are listed in the German stock index DAX.

Photo material is available at http://www.henkel.com/press

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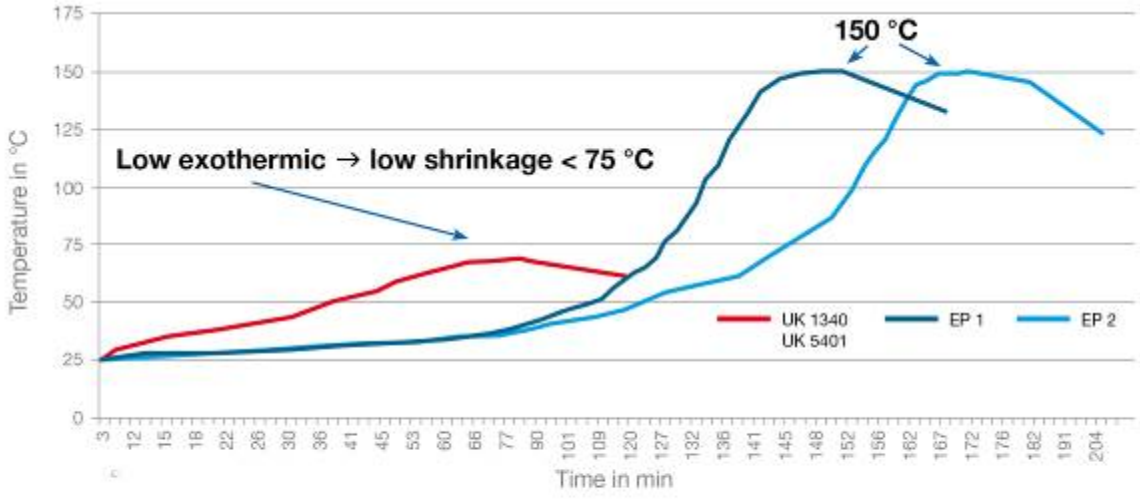
Henkel AG & Co. KGaA

The following photo material is available:

Wind turbines in operation.

Rotor blade cross-section with adhesive application points (red).



Loctite **UK 1340**

- Shows a drastically lower exothermic peak
- Has an excellent wetting capability

Reduced exothermy and hence low shrinkage.