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Adhesives developed that allow the use of high-frequency induction for hardening; hardening facilities established

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Nagase & Co., Ltd. and Nagase ChemteX Corporation have jointly developed a one-part epoxy adhesive that hardens by means of high-frequency induction.

A process used in the hardening and shrink fitting of metals, high-frequency induction allows metals to be heated instantaneously with excellent energy efficiency. For these reasons it had often been considered as a method for hardening adhesives, but because no adhesive had been able to withstand the rapid temperature increases, successful application had not been feasible.

XNR3628 and XNR3630 adhesives newly developed by Nagase ChemteX do not blister even when their temperature is instantaneously raised to a working temperature of 250 to 260°C by high-frequency induction. XNR3628 hardens in less than twenty seconds, and the fast-hardening type XNR3630 hardens in less than ten seconds. What's more, these adhesives offer superb heat resistance with a glass transition temperature (T<sub>g</sub>) of 150°C along with excellent heat cycling characteristics.

Nagase has established high-frequency induction hardening facilities at its Mishima Branch and, jointly with customers, is engaged in applications development in the areas of motors, electric components, magnet adhesion for speakers and other applications, coil fastening, and adhesion of other metal products. The company plans to further develop high-frequency induction hardening facilities jointly with high-frequency generator manufacturer Showa Kikai Shoji Co., Ltd. and to actively meet customer requirements for automated mass-production facilities.

Features of the adhesive hardening system:

1. Rapid hardening

Hardens a one-part epoxy adhesive in seconds (hardening using conventional methods requires hours)

2. Energy savings

Energy consumption is 1/5 to 1/10 that of the conventional convection method

3. Space savings

Requires 1/10 the space of convection-based continuous ovens

4. Reduction in fixtures use