

## Status of industrial "high temperature" superconductors for energy applications

**Dr. BRUZEK Christian Eric**

*Nexans France, Jeumont, France.*

Nexans is involved in the production of high temperature superconductors from the starting precursor to the final conductor. The first generation of HTS (High Temperature Superconductor) fabricated with bismuth- cuprate (BSCCO) is now the current standard for applications such as SMES (Storage Magnetic Energy System) or power cables. These reinforced conductors can be produced with long lengths (kilometrics) and a high quality level. The two compositions currently developed are  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_x$  (Bi2212) and  $\text{Bi}_2\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_y$  (Bi2223) depending on the application. Bi2223 tapes with  $J_c$  (engineering current density) higher than  $100 \text{ A/mm}^2$  77 K, self field are now available for power cables and Bi2212 tapes with  $J_c > 300 \text{ A/mm}^2$ , 5T, 20K can be a good candidate for applications where high magnetic fields are required such as magnets (SMES) or motors.

After a presentation of the "OPIT" (Oxide Powder In Tube) process used for the first generation HTS fabrication, this paper will report the last results and comparisons of different conductors performances. The challenges for the conductors of different projects will be also discussed. The status of a 500 KJ SMES project for the French DGA (Délégation Générale pour l'Armement) will be an example.

Finally, the last results obtained at Nexans of the emerging second generation of HTS called "coated conductors" (CC) using the  $\text{YBa}_2\text{Cu}_3\text{O}_z$  ceramic will be presented and compared to the first generation conductors.