Strong partner for advanced distribution transformers

Trends change technologies. The same is true of distribution transformers: compactness and environmental compatibility are two of the claims that now characterize modern generations of transformers. Behind the scenes in production, transformer manufacturers cooperate with experienced partners such as the KREMPEL-GROUP. This group of companies manufactures insulation materials for the global electrical engineering industry and brings its many decades of expertise to bear on this work.

Distribution transformers as reflected in the markets

“Electrical insulating materials for distribution transformers must satisfy various requirements during production and while in operation. That has always been the case, but this is now becoming even more comprehensively significant in view of the changes in power generation and distribution,” stated Thomas Gilke, Vice President of the KREMPEL Transformer & Motor Insulation Division.

More than half of the world’s population now lives in towns and cities, and urbanization is advancing continuously. At the same time, and to a growing extent, electricity is being generated from renewable energy sources. According to the 2015 Global Status Report, almost 28 percent of the generating capacity installed worldwide now exploits renewables. While the demand for energy continues to rise,
environmental compatibility issues will continue to gain in importance. These and other factors are changing the global power networks.

“These developments affect the requirements governing power grid systems and their components,” explained Frank Kübler, Manager of the Application Engineering Transformer & Motor Insulation team at KREMPEL. “Two examples: In densely populated areas, every square meter of building land is scarce and expensive. The physical dimensions of the transformers being used here are therefore becoming ever more compact. For locations where environmental protection needs are exceptionally high, the rising trend favors dry transformers or transformers that use alternative insulation fluids.”
Variety for liquid-filled transformers

For these and other applications, KREMPEL offers state-of-the-art insulation materials. The core skills of the materials specialist include the manufacture of presspaper and pressboard for liquid-insulated distribution transformers.

“One advantage of presspaper over kraft paper is the fact that it is produced from several thin layers of cellulose. This basically provides greater safety,” explained Frank Kübler. “For example, for the purpose of layer insulation, we manufacture various types of presspaper in thicknesses of 0.04 mm to 0.5 mm to cover a diverse range of requirements. For compact transformer designs, thinner insulation materials measuring between 0.04 mm and 0.15 mm are preferred. For these, we produce papers bonded together in two layers that can reduce the overall thickness while still retaining the same insulation capacity.”

KREMPEL also takes full account of particular material stresses and strains. “Above all, the increased volume of ‘green power’ causes major load fluctuations on modern power grids. Nonetheless, distribution transformers need to achieve long life time,” stated Thomas Gilke emphatically, “which is why we supply all presspapers alternatively in thermally upgraded versions to provide enhanced protection against overloads.” All variants of presspaper and pressboard are easy to process, by virtue of their high tensile strength, elongation resistance and other related properties,” added Frank Kübler.

As well as layer and winding insulation, the KREMPEL range of pressboard and presspaper extends across all insulation components needed for liquid-filled distribution transformers: strips and corrugated board for cooling channels, supports, outer bandings, insulation for coil connections and a great deal more. These are equally compatible with all commonly used insulation liquids, ranging from mineral oils to synthetic and natural esters.

Flexibility for dry transformers

KREMPEL also supports the manufacture of dry transformers with a user-friendly range of services. “Due to their design, dry transformers are subject to comparably higher levels of thermal load. Our flexible multi-layer insulation materials are ideally suited for these and for other demanding and application-specific requirements. To achieve optimum production efficiency, we can..."
match their processing characteristics to customer-specific processes,” reported Thomas Gilke.

Frank Kübler offered this example: “To achieve the required mechanical strength in transformer coils, the aluminium or copper band and layer insulation are bonded together with adhesive. For this manufacturing step, we coat our surface insulation materials with reactive adhesive resins. When required to do so, we can adapt these resin formulations to suit the requirements of our customers in terms of storability, curing temperature and time.”

KREMPEL has gained its expertise from its decades of experience as the sector’s leading prepreg manufacturer, and through its strong focus on market developments and customer needs. “Higher cost efficiency is currently one of our dominant preoccupations. We service this with a transformer prepreg as a cost-effective as well as a quality-tested alternative for the layer and winding insulation of low voltage coils,” stated Gilke. Other special solutions such as insulation cylinders with thicknesses of up to 1.5 mm can be found in the multifaceted KREMPEL range of dry transformers which includes supports, spacers, outer bandings and reinforcements.

Products & knowledge from a single source

To exploit the many options for customer-specific adaptation with optimum precision, the company conducts in-depth application engineering support for each product group. Here you can for example learn about how glass fibre reinforcements for dry transformers can be adapted more flexibly to suit special applications. Kübler provides a tip about this: “Here too, resin is the key. By the way, at KREMPEL there is a tradition to put the wheels in motion – for technology with a future.”

Further information on the KREMPEL-GROUP:

As a family-owned company, the KREMPEL-GROUP is an independent producer of high-quality semi-finished products and a leading global systems supplier of modern materials. The group enjoys an excellent reputation worldwide and is among the global market leaders in many areas with its electrical insulations, solar materials, composite materials, electronic materials and special laminates. Approximately 1,150 employees work in its production sites in Germany, England, Poland, Brazil and China. Sales companies in Austria, Great Britain, the USA, Thailand and China ensure a fast local service.

Contact – Sales Team:
KREMPEL GmbH
Transformer & Motor Insulation Division
Tel. +49 7042 915-0
Fax +49 7042 15985
electrical-insulation@krempel-group.com

www.transformers-magazine.com