CENOSTAR
CORPORATION

CENOSTAR CENOSPHERES IN ELECTRIC CABLE JOINT COMPOUNDS

CENOSTAR RECOMMENDED GRADE

ES500 and ES300 are the most suitable.
Additional grades can vary as there is no exact level needed. The variation will be defined by the importance of low density, cost and flow characteristics but typical levels of 10-25% are suitable.

APPLICATION AND TECHNQUES

There are several techniques for jointing electric cables but the use of a resin (usually polyurethane or methacrylate) is common. Systems using a resin will usually be either a two pack or three pack system. In both cases, cable is fed into a joint box from either end and the two cables are jointed using a mechanical fixing. Once this is done the resin is mixed with a hardener and poured into the joint box to completely encapsulate the joint and protect it. The size of the joint boxes can be anything from a few hundred milliliters to over a hundred liters.

The two pack system is the most expensive and used for small to mid-sized joints. A cable joint is supplied with the joint box, mechanical fasteners and the resin in a pouch. The resin pouch contains both the resin component and hardener (isocyanate for example in the case of a polyurethane resin) separated by a membrane. To mix the resin and hardener, the pouch is squeezed which breaks the membrane and the two ingredients can be mixed by hand. The amount of mix and hardener will be the correct level to completely fill the joint box and encapsulate the joint.

The three pack system consists of separate containers of resin, hardener and pre-blended fillers. This system is less expensive since the proportion of filler used is higher and is used for medium to larger joints. The resin, hardener and fillers can be mixed in a simple way using a stick of can be mixed with a mechanical mixer.

In both systems, the resin is filled with various fillers that will usually be some combination of silica, sand, calcium carbonate and microspheres. The choice of filler is made with reference to cost, overall weight, flow and most importantly, electrical properties.

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ADVANTAGES

Cenospheres have been found to be excellent fillers for this application for a number of reasons:

a) **Cost** - it is well known that microspheres have the lowest binder demand due to their spherical shape. As a result, less binder can be used for the same viscosity with the result of lower cost.

b) **Flow** - the spherical shape of cenospheres means that the resin mixture flows easily and well into all areas around the jointed cables. This is essential since voids in the resin mix will result in premature breakdown of the joint.

c) **Low shrinkage** – the higher filler volumes and shrinkage control properties of microspheres result in low shrinkage with resulting good strength.

d) **Electrical properties** – Cenospheres's alumina silicate composition yields a resin mix with excellent electrical properties that are normally superior to joints using only sand and carbonate.

e) **Lower weight**- Although not an important issue for small joints, the lower density and hence lower weight of medium to large scale joints is a valuable asset for workers resulting in easier mixing and handling of resin mixtures.

This is an excellent application for cenospheres and we have found the coarser grades such as ES500 and ES300 to be the more suitable. Addition levels can vary as there is no exact level needed. The addition level will be defined by the importance of low density, cost and flow characteristics but typical levels of 10-25% are suitable.

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