Report of experience

Application of FRIZLEN – steel grid resistors on board of vessels and along the coast

1. Steel grid resistor elements and conducting rolls

Steel grid resistor elements are made from chromium alloyed and heat- resistant steel sheets of alloy X10 CrAl 13 (material 1.4724)

Advantages: low temperatur coefficient, that means, the resistance value increases only approx. 15% between cold and operating temperature, which has no disturbing effect on a resistor in action.

Although the material is not belonging to the class of stainless steels, it has a good rust- and corrosion resistance!
It is possible, that it comes to a red-brown discolouration of the surface, but the developping oxide layer is stable, that means there is no burst of material and therefore no reduction of the cross section.

Remark: The use of stainless steel (material 1.4301) will result in a higher temperature coefficient and respectively the resistance value increases approx. 30 - 35%.

Conducting rolls between the resistor elements are out of stainless material 1.4305

2. Enclosures of resistors

a) Standard design:
Corrosion level 1 — Enclosure out of hot galvanized steel sheet. Under wet conditions the protection element zinc forms a galvanic cell with steel and protects even bare cutting edges over a certain distance. Therefore you get good rust-resistance. The mounting material is galvanized too. (Hot galvanized steel sheet has twice the zinc layer compared to electrolytic galvanized steel sheet and therefore double rust-resistance)

b) Special design in 2 steps, for a even better rust resistance:

Corrosion level 2: additional protection through priming and painting, mounting material out of stainless steel (material 1.4301)

Corrosion level 3: enclosure and mounting material out of stainless steel (material 1.4301)

3. Proved on and at the sea

Since more than 2 decades **FRIZLEN GmbH u. Co KG.** manufactures resistors for vessels (for mounting on lower deck) and crane applications inshore which have proved a good rust-resistance.

The experience in applications like

- bow thruster resistors
- load resistors
- starting and braking resistors

is part of the high product quality.