

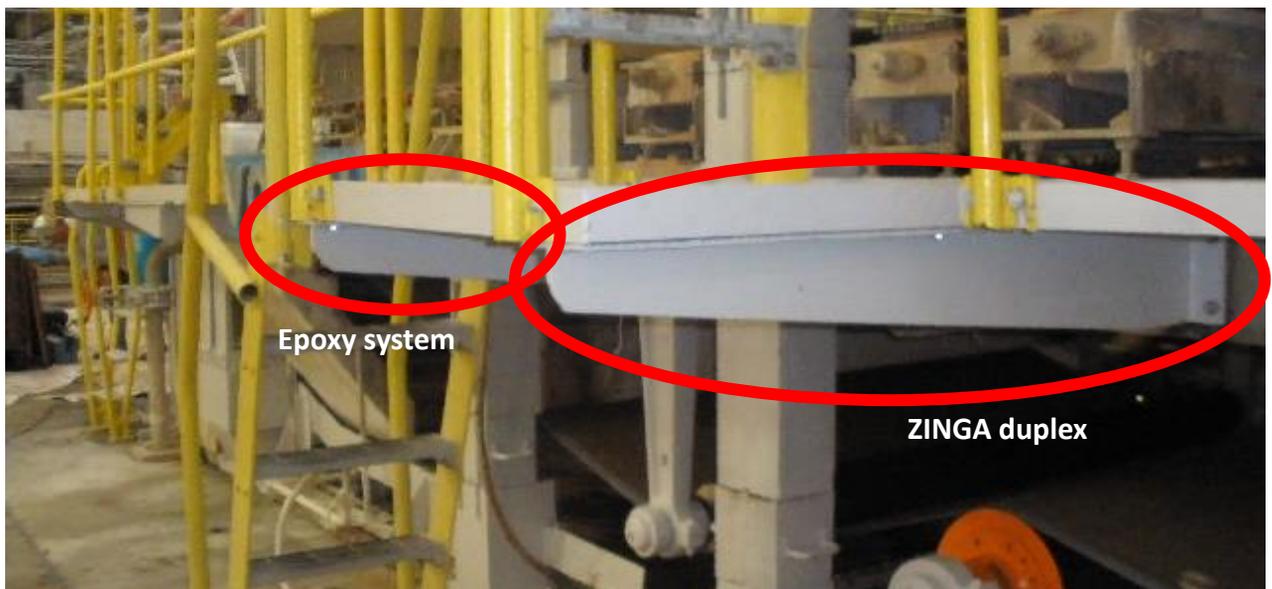
PAPER MANUFACTURING PLANT – PAPIRUS – BRAZIL

PAPIRUS was founded in 1952 when the Italian **Ramenzoni** family, which enjoyed a great tradition in the making of hats (Ramenzoni) and shirts (Bantan), decided to produce the raw material to wrap their products. They acquired a cardboard factory in the countryside of São Paulo that in few years became the family's core business. In 1972, they built their current industrial plant in Limeira, 131 km from São Paulo. Nowadays **PAPIRUS** relies on 372 collaborators, and about 24 outsources personnel, with a production of 92,000 net tons per year of cardboard that it sells in Brazil and exports to Europe, Asia, North America, Africa, and especially Latin America.

In December 2010, a test application was performed at the paper producing plant – a hot and humid indoor facility.

A test area was decided, and two systems were compared:
A **ZINGA** duplex system (**ZINGA** + epoxy)
and a conventional epoxy system
(2 layers epoxy).

The application conditions were not ideal: the surface could not be optimally prepared, and hand tools were used (steel brush), obtaining ST3 cleanliness.



9 months after ZINGA application



12 months after application



24 months after ZINGA application



After 24 months, the ZINGA system showed no signs of corrosion. All supports not treated with ZINGA received the ZINGA system after 18 months

The conclusion of maintenance manager was that after 18 months ZINGA system had at least tripled expected time period between maintenances.



Left & Right:
The ZINGA team during inspections after 24 months of exposure in the paper mill.



Below: Overall view of the wet end of the paper machine (control side): maintenance and production management adopted ZINGA as standard coating for the paper machine.



In 2015, **5 years after the test application**, maintenance kept concluding that **ZINGA** multiplied by 5 the time in between maintenances, even with the less than recommended surface preparation.

Comments:

- Maintenance team concluded that the desirable surface treatment is SA2½ and roughness profile above 40 µm obtained with steel grit blasting in the shop, as best results of system performance were obtained.
- Surface treatment with needle hammer produced insufficient standard resulting in eventual coating failure (photo 1 right).
- Surface treatment with steel brush mechanical tools reached ST3 standard resulting in better (not best) coating protection with very few coating failure points, an acceptable situation as it multiplied the times between maintenances (photo 2 right).



Photo 1: needle hammer treatment results



Photo 2: ST3 surface preparation results



Roof over the wet end of paper machine #4 was totally rebuilt in 2008 using HDG carbon steel structure. In December 2010, the renewed roof using galvanized structure (only after 2 years) showed signs of oxidation. **ZINGA** was applied in December 2010 directly over galvanization, and showed no signs of corrosion after 12 months and after 24 months. In 2015, 5 years later, there was no need of maintenance.

Surface preparation

ST3 (at best)

System:

ZINGA	1 x 60 µm DFT
Commercial Epoxy	1 x 80 µm DFT

Eventually the good results obtained in the paper mill on both machines and secondary structures, **PAPIRUS** decided to use **ZINGA** on concrete rebars of several of its buildings.