WHY STAINLESS STEEL?

IS5899B

PER Corporation (Filtrex's predecessor) and Filtrex, Inc., manufactured carbon-steel tanks for several years, up until 1976 (Filtrex's last carbon-steel tank). It was certainly an attractive option as it lowers material costs by 40- 60% depending on filter model. The main problem with a carbon-steel tank is field longevity. Our stated goal in manufacture is that our products should give "an effective service life equal to that of the facility itself." This, in our opinion, cannot be achieved with carbon-steel construction regardless of surface treatments, coatings, linings, and processes.

In general, unprotected carbon steel fares poorly in swimming pool filter and recirculation systems. It suffers from both oxidative and chloride-mediated corrosion processes. Coatings and surface treatments may be a partial answer in sand filters, balancing tanks and the like. However, the factors involved in a modern regenerative filter render these solutions temporary at best.

The two main factors, which tend to thwart the use of surface treatments and coatings are flow velocity and pre-coat-recycling surface-ablation. Flow velocities, especially in the lower portion of a regenerative filter (below the inlet distributor), are quite high (8-10 times higher than found in a typical sand filter); moreover, the flows are highly turbulent with some locally concentrated vectors producing flow "hot spots." In addition, during pre-coat recycling, the liquid in the closed loop may contain up to 10,000 PPM silica (D.E. or perlite) particles. This, in effect, "sand-blasts" areas in the filter, leading to ablation and eventual coating-failure. Although this effect is transitory in nature, it tends to roughen the coating surface leading to further erosion.

We have, over the years, tried vulcanized rubbers, vinyls, urethanes, and a variety of epoxies (filled and non-filled) in our testing lab. Our testing protocols simulate 1 year of operation (8750 hrs) under normal conditions. Coatings are evaluated with a thickness-tester and are optically examined with a stereo microscope. We have observed ablation rates in these materials between 8-36 MPY (mils per year): The poorest being the urethanes and the best being with the filled epoxies.

The above-cited problems combined with normal application issues [surface bonding, pinholes, voids, cracks (cracking being particular to epoxy treatments) and uniform coating of the complex geometries of the inlet distributors] in our opinion do not lead to adequate protection against corrosion. In fact, they can, under some circumstance exacerbate corrosion problems.

By contrast, premium grades of stainless steel (used in conjunction with proper welding alloy/practices, shielding gas, and post-fabrication passivation) will produce a filter tank with a lifespan which can and will (if maintained properly) outlast the facility in which it is installed.

While our competitors may make many claims for their coated, carbon-steel products over stainless-steel construction (we have seen their arguments with respect to corrosive effects on 300-series stainless steel and find them rather specious and hyperbolic, as they do not pertain to water chemistries typical of recreational water venues), based on our experience (35 "leak-free" years), they will not pass the test of time. In short, the bottom line is the bottom line.