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Technical Reference

Topic: TECTRON™ Low Acid Removal Cells

Proper acid balance is a key component of a smooth-running e-coat system. In electrocoating, liquid paint molecules are broken down into their component parts: resin, acid, and water. The paint resins are deposited on the part being painted, and the acid and water remain in the paint bath. Acid can build up and cause the paint bath chemistry to go out of balance, causing problems in paint deposition quality.

Acid can be removed from the paint bath in one of four ways: through the anode cell (approximately 70%); as part of the permeate waste stream (approximately 10%); as part of the permeate drag-out (approximately 10%); and as part of the deposited film (approximately 10%).

Acid is always being removed when electrical current is flowing. However, the levels at which it is removed can affect the quality of the paint. Recent improvements in paint formulations and e-coat equipment can inadvertently promote excessive acid removal. This can be addressed in the following ways: direct acid additions; using bare electrodes; and by using TECTRON Low Acid Removal Cells.

Direct Acid Additions: This is the most basic way to remedy excess acid removal. The e-coater tender routinely measures the paint bath acid level and adds acid based on his findings. However, this method is time consuming and is prone to operator error.

Bare Electrodes: As the name suggests, bare electrodes are stainless steel tubes or plates without a membrane covering. They have two undesirable side effects, though. First, heavy metal ions enter the paint bath as the anodes dissolve. These ions act as a catalyst in the paint, causing changes in the paint flow during cure. This can cause a rough appearance and thinly-coated edges. Second, bare electrodes produce a sludge-like material on their surface. This "dirt" can settle on the part being painted and result in the need for sanding of the primed part.

Low Acid Removal Cell: Using a proprietary membrane, the Low Acid Removal Cell passes electrical current, but does not remove acid from the paint bath. When a ruthenium oxide coated titanium or other inert electrode is used, the water that permeates the membrane can be returned to the paint by simple gravity overflow.

The Low Acid Removal Cell is used in combination with the ion-selective TECTRON Membrane Electrode Cells to fine tune acid balance.

For more information call UFS Corporation and the phone number shown above.

Think and act in a safe manner. Always disconnect power and use a lockout before you work on the E-coat system. Observe any confined space conditions. Use the appropriate safety equipment & clothing for the task.