

ACTEGA Kelstar Technical Bulletin

Plate Wear

Plate Basics

All modern litho plates are made from pure aluminum or one of its alloys. While alloys differ, the aluminum is still soft and subject to oxidation. This softness or malleability allows the plates to run for long periods under stressful conditions on press without cracking or breaking. The plate surface will not last for long without modifications.

Aluminum Coils to Litho Plates

While the exact details of the process vary, most metal plates are made in a similar way because they must all do the same job.

•**Graining** – The rolled aluminum sheet is smooth and not very good at carrying that important film of water. During graining the surface area is increased by electrochemical etching or abrasion with brushed and fine sand. The exact surface roughness and profile determine whether the plates are deep or fine grain. These common litho terms describe how much of the surface area has been changed.

•**Anodizing** – Think about the blades of grass on your lawn. They are very soft and easily bent or broken off much like the rough surface after graining. Anodizing is an electrochemical conversion of aluminum metal to a form of its oxide. This thin coating of aluminum oxide has a MOHS hardness of 9 which is only one level below diamond at 10! The original aluminum hardness was only about 2.5. This new anodic layer will resist wear and damage much longer than the original aluminum.

•**Hydrophilic Treatment**– To ensure that the anodized surface is kept water receptive or hydrophilic, the plates are treated with something like sodium silicate. This treatment should bond and keep the non-image area water receptive for its life. Certain CTP plate treatments are less effective which explains why some CTP plates have sensitivity issues. The metal plate is now ready for the polymer image to be applied.

•**Image Wear and Loss** - Usually the small dots tend to go first. To verify what is happening to the plate, you must determine if the dots have become blind (no longer ink receptive) or are gone. Image loss is caused by two different processes:

•**Chemical Attack**– Conventional negative plates have very good chemical resistance. You can use most washes, alcohol replacements or plate cleaners with confidence. CTP images are often much weaker and can be removed or softened by using the wrong product. Be sure to test press chemistry yourself or to consult with your suppliers for compatibility.

•**Mechanical Wear**– Mechanical wear is certainly an issue with plates that are not post baked. To minimize wear, keep the form rollers in good condition and do not set the stripes any wider than needed for good ink transfer.

Polishing and Non-Image Wear

Wear and friction on the aluminum non-image area will eventually break through the hard anodic layer. The upper portion of the grain peaks wear first and then gradually deeper into the plate surface. With today's fountain solution running near pH 4, this wear is never chemical, but always a mechanical process.

Longer running plates usually have a thicker anodic layer that lasts longer. To compare two plates, put them side by side and gently rub across the grain with an ink eraser. Look at the scratching with a loupe to compare each plate. Adjust the pressure and number of rubs as needed. Stronger anodic films show only very light scratching.

Minimize friction by setting the form rollers lightly. Piling increases friction and squeeze so keep the blankets washed. Choose a fountain solution / alcohol replacement that has more NPA and lubricants to reduce friction.

•**Contact ACTEGA Kelstar** at 856 829 6300 or info.actega.kelstar@altana.com for additional information or technical assistance.