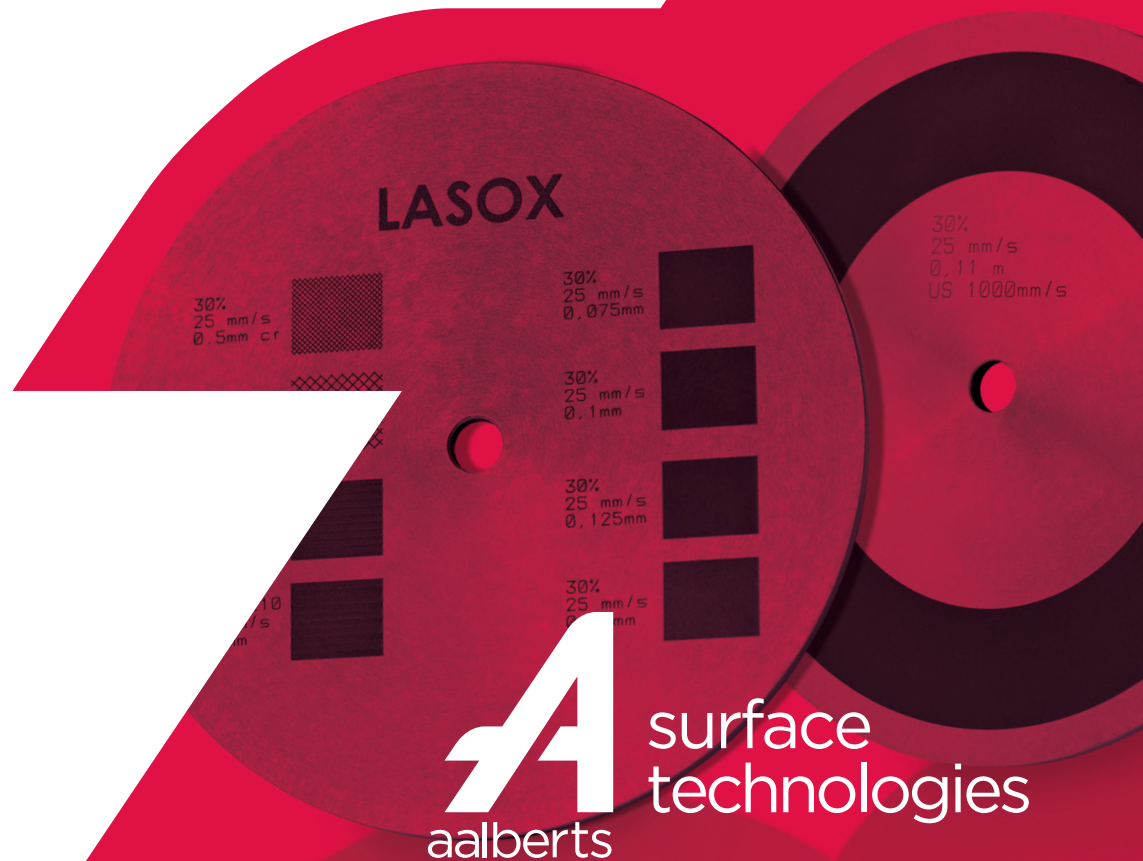


LASOX-COAT[®]

selective oxidation of aluminum surfaces
via laser technology



surface
technologies

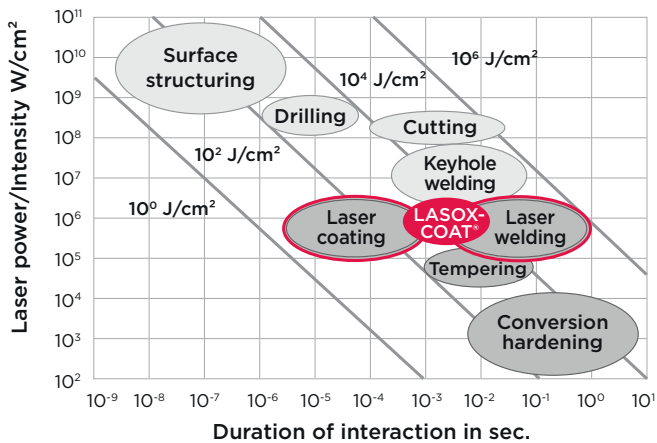
LASOX-COAT®

LASOX-COAT® is an innovative coating process for the oxidation of aluminum surfaces without the use of chemicals. With this process components can be protected selectively against wear and corrosion. What is special about this process is the use of a laser in an oxygen atmosphere, targeted along the surface of the workpiece to be coated. The surface is treated line by line. The laser starts to melt the alloy and some particles will vaporize. On the remelt area an aluminum oxide layer is formed (corundum). The distance of laser lines affects the degree of cover and the roughness of the surface.

The duration of treatment is proportional to the treatment area of the workpiece. It can be accelerated by the use of several laser beams simultaneously.

The possibilities of the selective coating are plenty, like writings, single lines, complex forms or patterns.

The major advantage of this process in contrast to galvanic processes lies in the complete abandonment of chemicals. Thus the authorization of a LASOX-COAT® installation does not cause problems. This is of particular interest with regard to the integration of LASOX-COAT® into existing production lines.



The LASOX-COAT® process in comparison to other laser processes for material treatment.



Aluminum workpiece with surfaces coated with the LASOX-COAT®-process.

LASOX-COAT®	process details
Suitable materials	In principle, all aluminum alloys can be coated. For alloys containing silicon (Si >8 %) the hardness can be increased by about 50 % compared to the hardness of the original alloy. Also, aluminum alloys with silicon contents above 20 % can be coated with LASOX-COAT®. Furthermore, die cast alloys become harder due to the surface treatment. Silicon particles in the base material actually support the development of a thicker although slightly rougher layer.
Duration of coating	proportional to the coating area, pilot plant 40 seconds for 1 cm ² , standard coatings 3 seconds for 1 cm ²
Roughness	in laser tracking direction R _a of 1 µm, perpendicular to laser tracking direction more than double (depending on the alloy)
Duration of interaction (laser beam with surface)	ca. 0.005 seconds
Layer thickness	Corundum layer approximately 6 to 10 µm, remelt area about 100 µm. On die-casting alloys corundum layers of >20 µm are possible but the roughness increases to R _a >10 µm.
Hardness of the aluminum oxide	ca. 2,000 HV
Applications	housing edges, pump impellers, laser labeling and laser lettering, pneumatic valves, proportional valves, brake pistons, hydraulic and pneumatic sliders
Benefits	partial wear protection, corrosion protection, production of labels, patterns, shapes and lines; no use of process chemicals