



Data sheet PCO[®] 12 - white (stated: 04/19)

Surface treatment of magnesium alloys

Goal: Creation of a light-coloured corrosion-resistant surface

Procedure: Plasmachemical oxidation (PCO[®]) including pre-treatment and coating in a calibrated electrolyte system

Initial state demands:

- Flash-free work pieces with oil-free and ungreased surfaces
- Free from separating agents and/or residual paint
- Signposting of contacting points on the engineering detail drawing

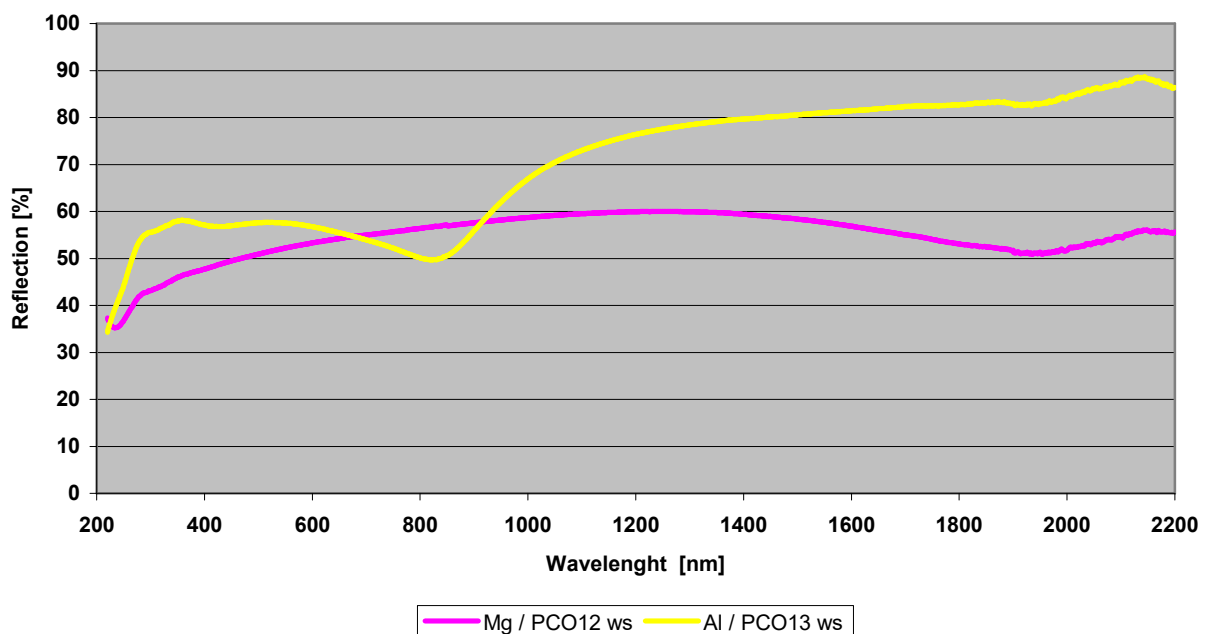
Alloys:

- Suitable for all available magnesium alloys
- Examples: AZ31, AZ61, AZ80, AZ91, AM20, AM50, AM60, ZK60, HK31

Layer properties:

- Reflectance plot (ultraviolet- / visible- / ir- radiation):

Total reflection of bright PCO- layers on aluminium and magnesium



Layer composition:

- Anorganic layer characteristics by material based oxides and spinels as well as embedded subgroup elements; fulfils the directive 2002/95/EG enacted on 27th January 2003 without exceptions (RoHS).



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<u>Layer thickness:</u>	Adjustable between 4 µm and 15 µm Preferred range: 5 µm +/- 2 µm up to 10 µm +/- 3 µm ¼ anchoring ratio and ¾ epitaxial ratio
<u>Roughness:</u>	Based on initial state roughness properties and layer thickness desires R _a values between 0,8 µm to 5,5 µm were observed.
<u>Examples:</u>	Die-casting work piece made of AZ91: Initial roughness: R _a : 0,99 µm, R _z : 2,96 µm Deposited (4 µm): R _a : 0,97 µm R _z : 3,18 µm
<u>Corrosion resistance:</u>	Corrosion-resistant fulfilling DIN ISO 9022-16-01. With a 10 µm PCO [®] 12white coating also DIN EN ISO 7253 is fulfilled enduring 100 h in a neutral evaporised saline solution test.

General properties:

- Visual beamless surface
- Electrically isolating
- Resistant against constant temperature up to 523 K
- UV - resistant
- Wiping-proof
- Machinable
- Possibility of partial deposition
- Constant layer development, coatable through-holes with diameters between 1 mm and 5 mm
- Reconstruction coatings possible
- Non-resitant versus ultra-sonic treatment



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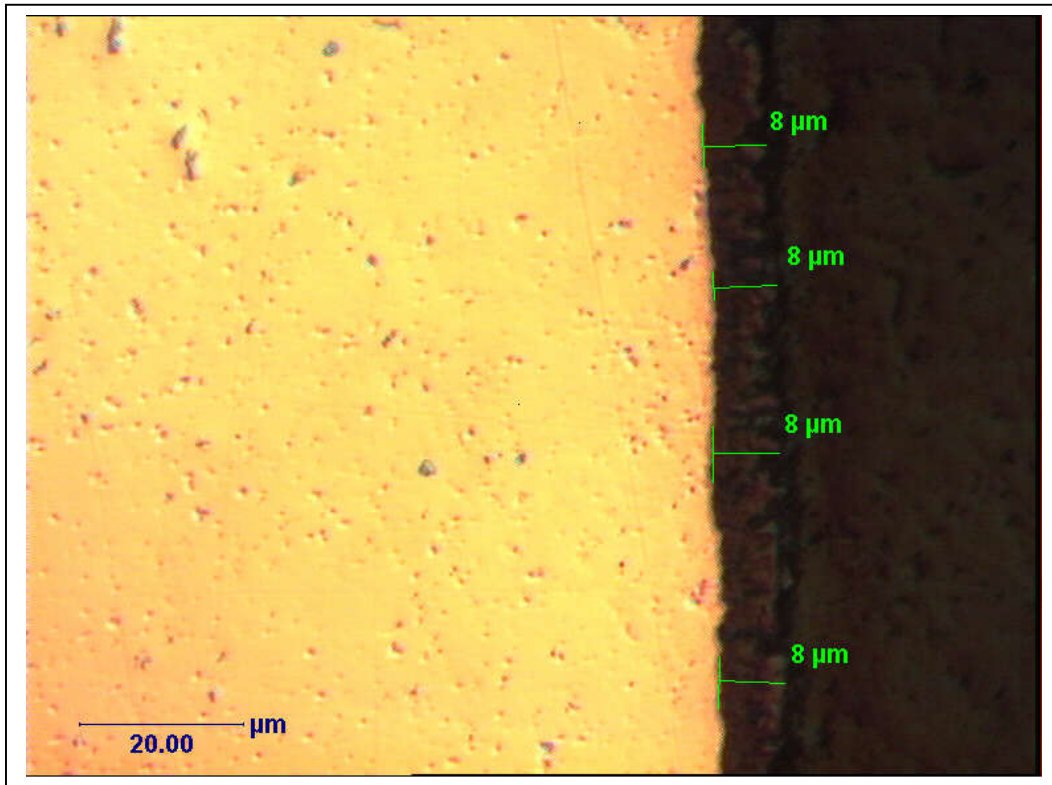


Figure 1: Cross-section polish of a PCO[®] 12 white – coating on AZ91

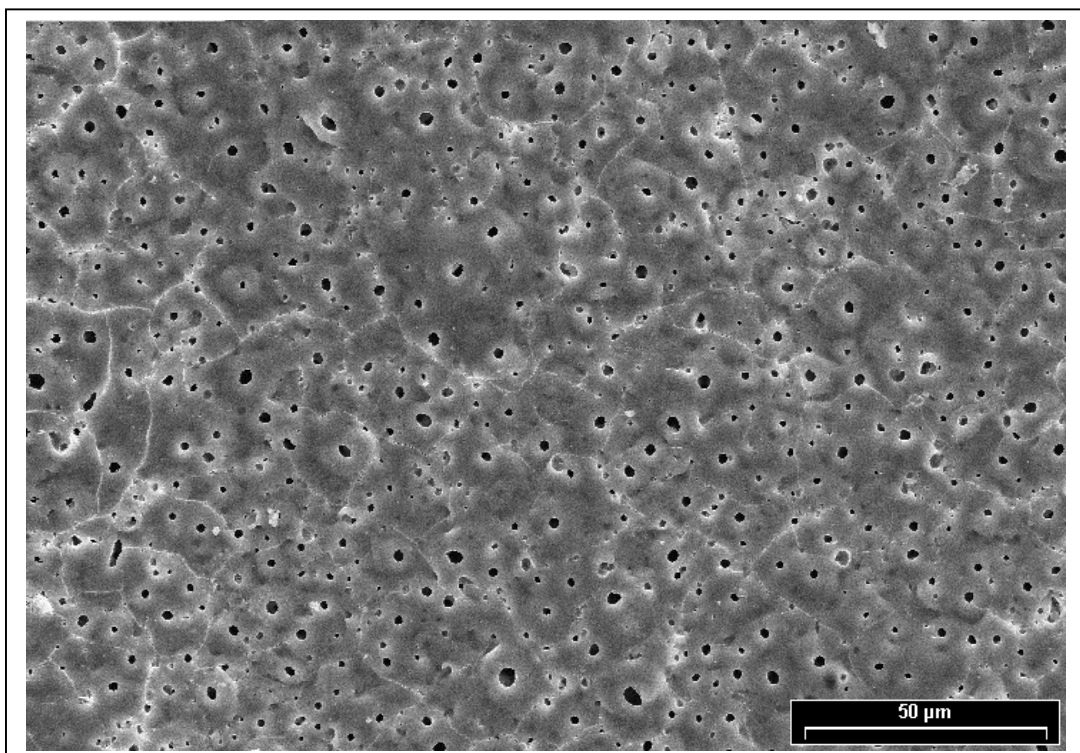


Figure 2: SEM – picture of a PCO12 – coated surface on AZ91