

## Aluminium bonding

Generally, metals have, thanks their high surface energy, good adhesion properties. Exceptions are the metals aluminium, chrome and nickel. On these surfaces, high adhesion strength as well as aging resistant bonded compounds can only be obtained after a preliminary treatment of the surfaces. Examinations referring to the long-term stability of bonded aluminium compounds have shown that a uniform adhesion of adhesives with aluminium alloy (initial state: rolled, drawn, founded or forged) was not aging resistant without a previous pre-treatment procedure. The main causes for the lack of adhesion strength of the adhesives are oxide films, release agents and lubricants, cutting oil, etc. due to the production process.

In order to obtain optimal adhesion properties on these surfaces, such remainders must be removed before starting with bonding.

- Mechanical methods of surface pre-treatment (grinding, brushing, compressed air streams) first cause abrasion and therefore a fresh and chemically more active surface. But analytical evaluations show that this activation is not sufficient for permanent aging resistant bonding. Furthermore, due to the mechanical method of pre-treatment on the complete surface, there is a risk that in some places impurities are spread on the surface, and this would altogether worsen the adhesion properties.
- Degreasing/de-oiling of the metal surfaces with the usual solvent cleaners is not sufficient, too.
- As we have decades of experience, supported by different investigations, e.g. of universities, we consider that the best possible pre-treatment of aluminium alloys is chromate- or phosphate coating or anodic treatment. Furthermore, with chemical pre-treatment methods, such as corroding in chromosulfuric acid or caustic soda solution, you can also obtain optimal results.
- Another method is permanently successful as well: the use of "wash primers" for the surface pre-treatment can also be recommended (2-component primers, self-corroding). But we would like to point out that here especially the „chemistry of primers and adhesives“ should be taken in account, as priming can have a lasting influence on the features of the adhesives.
- As alternative to these „wash primers“, you also can sound out the application technical possibilities and carry out tests with the primer system **COSMOPLAST VP 1618** to be use for the pre-treatment of bright aluminium surfaces.  
In the further adhesive process, you can obtain high adhesion properties and aging resistant compounds with the adhesive systems **COSMOPUR**, **COSMOFEN** and **COSMOPLAST**.
- As a further reliable method of pre-treatment for the bonding of aluminium surfaces, different powder coatings have proven successful for years (Basis: polyester lacquer, epoxy lacquer, PUR-lacquer); however, we would like here to point out the TGIC-problem with polyester powder coatings, please refer to our technical information „Bonding of TGIC-free powder-coatings“.

In any event, directly before starting with priming, the surfaces to be pre-treated should be cleaned from impurities, dust, grease, etc., e.g. with **COSMOFEN 60**.

***As it is difficult to distinguish aluminium surfaces (bright or pre-treated), we recommend you to principally first ask your supplier to furnish you with sufficient information, so that you can then decide for the best suitable and optimal pre-treatment. At all events, sufficient qualifying examinations are necessary and meaningful.***

For questions or wishes or advices concerning this important matter, our application technique is pleased to be at your disposal (direct dialling: +49(0)2773/815-274).

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These documents replace former issues