Plant construction

Woltering has designed, constructed and sold fluorination plants for more than 10 years. We have realized a vast range of different facility sizes so far, including laboratory facilities with a volume of 100 litres up to production facilities with a capacity of up to 20 m³. Woltering Verfahrenstechnik GmbH manufactures stainless steel chambers in the respective sizes required for this purpose as well as residual gas neutralising systems.

WOLTERING
PROCESS ENGINEERING

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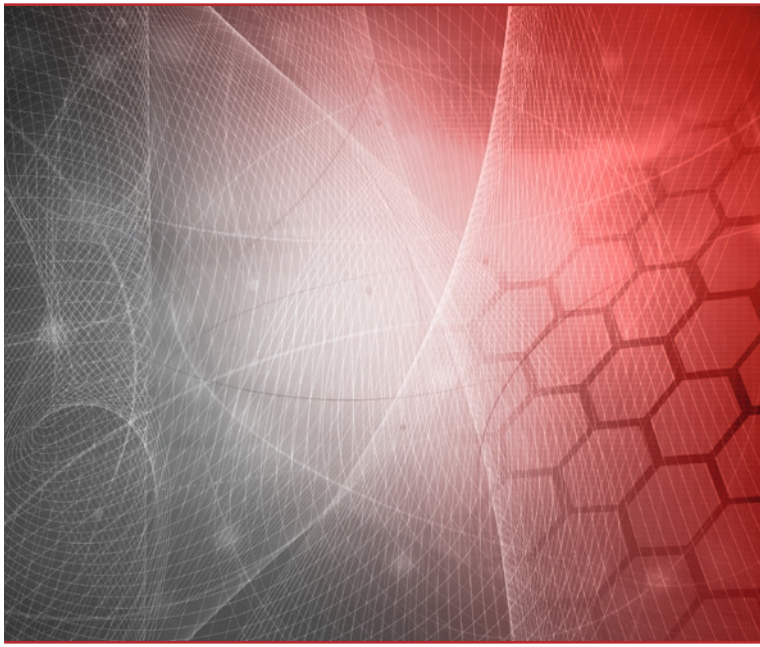
WOLTERING
PROCESS ENGINEERING



Fluorination

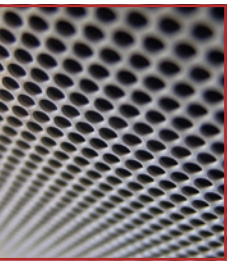
- Finish plastic products
- Optimize polymer surfaces
- Enable adhesion of adhesives and lacquers

Managing Director
Alfred Woltering

We focus completely on the issue of fluorination. The key areas of expertise of our company include gas phase fluorination, barrier fluorination, and oxyfluorination. We provide fluorination services to industrial companies on a contract basis and manufacture and deliver entire fluorination facilities with a size of up to 20 m³.

Gas phase fluorination

Polymer surfaces are activated at a high level with long-term stability within the scope of the gas phase fluorination process. A reproducible, dry chemical reaction takes place at the polymer surfaces in the course of which hydrogen atoms are partly substituted by fluorine atoms.



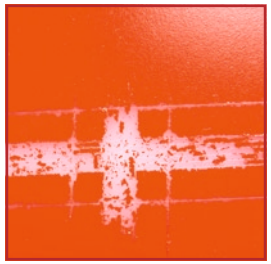
The gas has the ability to access the entire exposed surface, including all gaps, and with the treatment occuring in a vacuum, components even with complex geometry´s can be covered and treated homogenously. Very small gear wheels, pressure pieces or pins in bulk can be activated as well as fan guards, cover parts, handles, operator's controls, containers, etc. The improved wetting of components is ensured at all angles, edges, openings, through holes, and blind holes.

Barrier fluorination

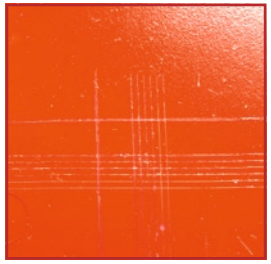
If the reaction described takes place without oxygen, only fluorine atoms attach to the free radicals which have emerged. This pre-treatment procedure serves to provide plastic containers, cans, bottles and tubes, for instance, with barrier layers which prevent components of the product filled in from migrating through the wall. These layers are created simultaneously and homogeneously at the inside as well as at the outside as a result of the vacuum process. This effective way of modifying properties of packaging enables the use of light materials, which save resources, for various contents to be filled in.

Oxyfluorination

If the reaction chamber is not completely evacuated for the fluorination process, the remaining oxygen will also be available for surface reactions. In addition to fluorine atoms, oxygen-containing groups, which also increase the surface energy in the long term, will be created and will be incorporated into the polymer chain. In addition to the fluorine atoms, such hydroxyl and carboxyl groups are available as reaction partners to lacquers and adhesives.



without oxyfluorination



with oxyfluorination

Oxyfluorination makes sure that

- even water-based lacquer systems can be applied without primer.
- printing inks stick to the surface.
- flock coating on elastomers or polyolefins does not come off.
- adhesions can be realized properly even at components with difficult geometries.

Label comes off without barrier fluorination

Label sticks to surface with barrier fluorination