When the **Stencil** Meets Semi-Conductor Technology

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Constantly increasing requirements for stencil technology both advance and challenge the continuous improvement process. This applies, above all, when apertures and/or the distance between the apertures are further reduced. This is primarily the case for stencils used in semi-conductor technology.

At Christian Koenen, a solution has been developed for improving the transfer behaviour particularly for constantly smaller apertures or deposit sizes. Here, our in-house designed plasma coating is used, which can be applied to screens, stencils and squeegees. The plasma coating is a classical plasma-enhanced chemical vapour deposition, which has been used as the established method in semi-conductor technology for years and is the state of the art.

But what, actually, is a plasma? In physics and chemistry, plasma refers to the 4th fundamental state of matter. A substance, preferably gases or gas mixtures, is broken down into its basic components. During the decomposition, ions and free charge carriers are produced. Figure 1 illustrates the different fundamental states of matter and the designation of the phase transitions.

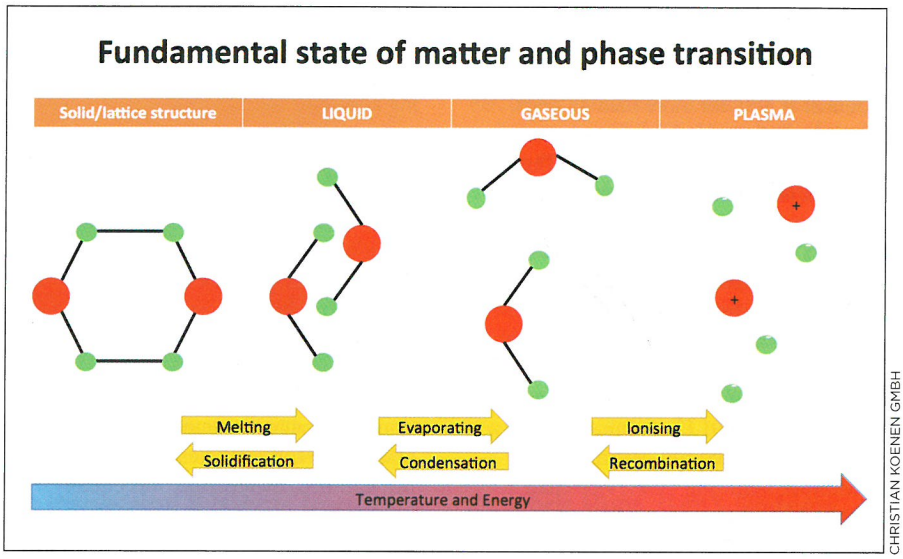

Figure 1: States of matter and phase transitions.

What is a plasma-enhanced chemical vapour deposition? In the plasma-enhanced chemical vapour deposition, the process media are broken down into the elementary components. These deposit on the surface and react chemically to form a new compound.

Consequently, the plasma coating permits significant adjustment of the surface characteristics of the stencil. This results in an improved contact angle or respectively reduced adhesive forces on the stencil and in the aperture. Figure

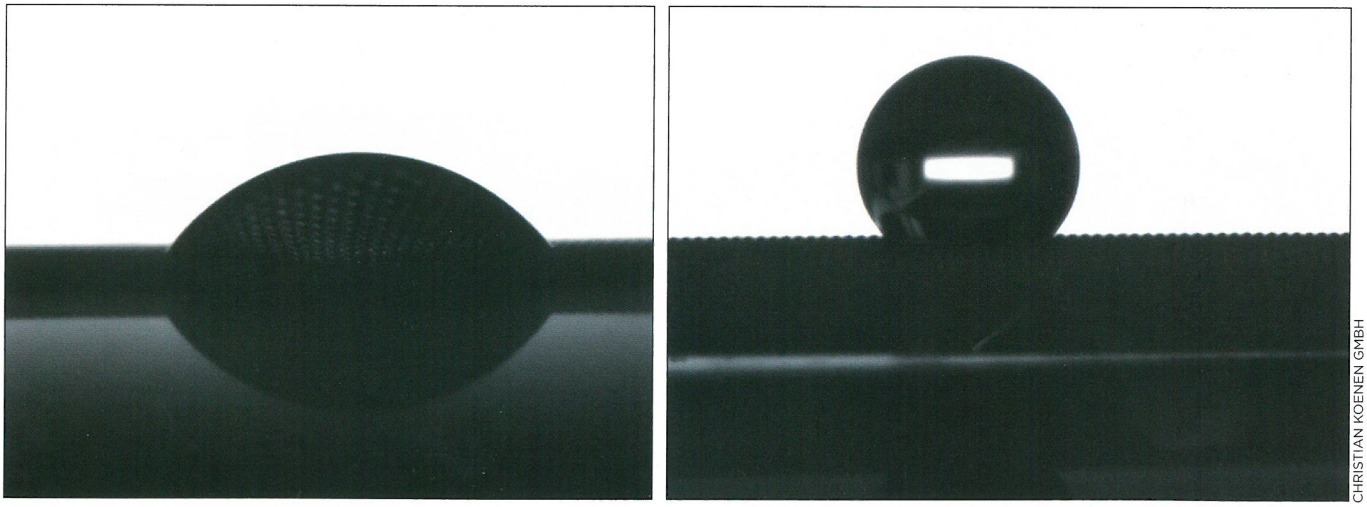

Figure 2: Difference in contact angle; right ... left.