The experts for surface structuring

OPE journal portrays PVF Mesh & Screen Technology GmbH – a company that has transformed from a supplier for compact disc manufacturers to a high-tech screen printing technology provider for applications in the organic electronics sectors

Company owner Peter V. Fleischer and his daughter Julia Fleischer with the PVF team

Finest mesh structures up to 13µm – high modulus mesh from NBC Meshtec inc. Japan

The year was 1997, the film "Titanic" inspired the masses and the tragic death of Princess Diana was the media event of the year. At that time, a certain industry was booming like never before: the compact disc (CD) sector. PVF, at that time known under the name of MP+L Produktions GmbH, delivered thousands of print-ready screens to renowned CD manufacturers such as Sony, Bertelsmann and Polygram at that time. The screen printing process was used to enhance the surfaces of millions of CDs with graphic designs in 4-colour halftone print and to equip them with fine writings. This was quite a challenging process …

At the same time, a new industry was in its infancy: the photovoltaics business. In 1997, 200µm wide structures (fingers) on silicon wafers could already be printed with conductive pastes. Meanwhile, together with the Fraunhofer Institute for solar energy systems ISE, precision screens manufactured by the PVF predecessor MP+L were already used to print 70µm fine structures on silicon wafers. This functioned by means of the finest synthetic threads with 23µm in diameter, interwoven from the unique mesh material V-Screen. Mass production of the 70µm thin structure at solar cell manufacturers started no less than about nine years later.

Family-owned and solution-oriented

PVF GmbH is headquartered in Neufinsing, which is close to Munich, Germany. Today, the company can be characterised as an internationally active, German family-run business that specialises in screen printing and filtration applications. The company was originally founded by Peter Vinzenz Fleischer (initials PVF) in 1985 and is currently headed in the second generation by his daughter Julia Fleischer. As a provider of precision meshes and manufacturer of MICRON precision screens for technical screen printing, PVF claims to deliver what few can offer: a perfect product portfolio for highly demanding applications.

The screen printing market in the 1980s was dominated by the Swiss mesh manufacturers SST, SSZ and ZBF. Japanese screen printing meshes were still mostly unknown at that point. Peter V. Fleischer worked together with the Japanese mesh manufacturer NBC Meshtec inc., in order to introduce the first highly module polyester screen printing meshes on the European market. The precision and quality of these meshes can convince many customers instantly – even the circuit board giant Philips. Until today, the sale of high-quality screen printing meshes is a central business field of PVF GmbH.

In the middle of the 1990s, the requirements and demands of the screen printing applications were rising at a dramatic rate. Many conventional screen clamping services could not meet these requirements in the manufacture of printing screens and were not able to seize the full potential of the high-quality Japanese mesh materials. It

became more and more necessary in the view of Peter V. Fleischer to establish his own screen production. In 1997, the first MICRON precision screens were produced in Munich under the manufacturer's name of MP+L Produktions GmbH and sold to customers such as Giesecke & Devrient.

MICRON precision screens for technical printing

Clean-room for highest quality requirements

In 2012, PVF GmbH moved to company-owned buildings. In the process, the MICRON screen production was raised to the highest quality level with its four-zone cleanroom technology. Finally, in 2014, it was economically beneficial to integrate MP+L Produktions GmbH into the PVF Mesh & Screen Technology GmbH.

The screen printing business is an exciting market, which is constantly undergoing changes. Graphic screen print, as it has been popular in the past, only exists in a limited manner, or does not exist at all anymore. Digital printing has replaced screen printing almost completely here. In order to remain successful, PVF GmbH has specialised from the very beginning in technical screen printing applications as well.

By means of newly or further developed mesh technologies and a unique production process, PVF GmbH is creating new application fields for screen printing such as sensors, antennas, electroluminescent areas, solar cells, OLED's, displays, medical test stripes, flexible switches, batteries, transistors, diodes and resistors. On top of that, it is the task of the company to convince decision-makers from the industry in favour of the screen printing method.

Higher requirements

The requirements and demands in screen printing technology and therefore also in print screens are continually rising and become increasingly diverse. Generally the requirements on components for example for "Printed Electronics" can vary greatly. Conductive, insulating and functional pastes and inks have to be printed onto a wide and diverse range of substrates like flexible films or abrasive wafers with different conditions. Very high as well as ultra-thin paste lay downs, interruption-free structures, homogenous surfaces, dimensional accuracy or finest lines and gaps down to 25µm requires the use of variously different high performance materials and process parameter in screen manufacturing.

The experts at PVF GmbH rely on their knowledge and long-term experience in the handling of highly-module polyester, stainless steel, V-Screen, tungsten and 3D meshes: The MICRON precision screens are reported to fulfil these different requirements and demands.

The changing markets and new challenges such as Internet of Things, the complexity of processes, ever smaller building parts in different fields of application such as printed electronics all require a constant change and innovative force. PVF GmbH evaluates the processes of its customers and tries to work out holistic solutions. The experts develop the fitting printing screen for a particular paste, machine and application together with their customers.