SENperc PV - Quality control solution with sample self alignment

Top notch quality control

Friedrich P Witek, Senior Manager at SENTECH, took time out to bring PES up-to-date with the progress of this innovative company. Their quality control (QC) solutions are second to none, rolled out world-wide and their market presence is rapidly expanding. They have come on leaps and bounds since our last interview in 2016. Read on to find out more.

PES: Welcome back to PES Solar, it's good to talk with you again. For the benefit of our new readers would you like to begin by giving us an overview of SENTECH?

Friedrich P Witek: In 1990, SENTECH was founded in Adlershof, Berlin and is part of the business campus Adlershof, Berlin. SENTECH Instruments develops, manufactures, and globally sells innovative capital equipment, centered on thin films such as in semiconductor technology, microsystems, photovoltaics, nanotechnology and materials research. Plasma process technology and thin film metrology are our business areas. Both market segments have some connection to photovoltaics. We provide innovative solutions for non-contact, non-invasive optical characterization using ellipsometry and reflectometry.

Push button operation

PES: We know you are active in many industries, how important is the solar industry?

FW: SENTECH Instruments operates in different business areas. About 15 years ago we sold the first standard ellipsometer for measuring anti-reflective coatings for photovoltaic applications. Today we offer a full product range for quality control in Si solar cells, and R&D.

In 2010/2011 the solar branch had a share of nearly 30% of SENTECH Instruments overall turnover. More than 500 quality control systems for single layer AR coatings have been sold. In the last 5 years there was a renewed growth of the solar market.

Therefore, we expect the PV products to contribute more and more to our turnover. The ongoing system change, into a world driven by alternative energies, will boost the demand for PV products and increase the business of the industrial solar cell manufacturers. That's why there will be an even greater need for quality control solutions like our ellipsometers.

PES: Last time we spoke the new quality control system for PERC, the SENperc PV, was about to be launched at the Intersolar 2016 in Munich, can you bring us up to date on its progress and take up?

FW: Due to special measuring solutions for the development and quality control of silicon solar cells, SENTECH is very successful in the field of photovoltaics. Our latest development in our PV product range is the SENperc PV. It is designed for quality control in PERC, HJT and TOPCON solar cell manufacturing.

This innovative product, which can make the QC of manufacturing companies more effective and efficient, has now arrived on the market. Well-known PV companies are our customers. First developed for measuring PERC cells, SENperc PV is now also used for HJT and TOPCON. In this way, the entire range of applications demanded by the market is covered. This led to a high level of interest and many orders for the device from industrial customers of the PV industry.

PES: What makes your solution SENperc PV stand out from the competition, what are the benefits to the end user?

FW: Most of our customers have one main problem: Functional thin films in PERC, HJT or TOPCON solar cells show process depending variations in film thickness and optical constants. They depend on deposition line operating time and cell location on the carrier. Our customers are requesting a fast and non-invasive measurement method to assure constant cell quality. Furthermore, manufacturers require an easy and fast measurement for QC.

Our SENperc PV is the solution for all the above mentioned. It utilizes contactless optical methods for accurate and precise measurement of both, the film thickness and optical constants. The user receives a fast and comprehensive message to determine the quality of the solar cell: within 2 seconds there will be the information on pass or reject.

This involves a twostep operation: place cell on device and push the 'Measure' button. There is no easier way to proceed quality control in this case.

PES: We have heard it has been particularly successful in China and India, why do you think this is?

FW: Asia in general is to seen as the decisive future market for alternative energies and will also be groundbreaking in the years to come. In many Asian countries, alternative energies are already far cheaper than coal. These countries will continue to develop this strategic advantage. China has been a

Friedrich P Witek

pioneer here for a long time and has a large market position.

But India is also working extremely innovatively in this area. For example, a gigantic new solar park is planned for the free and uninterrupted supply of the grass sector in a federal state, and floating solar power plants are under construction. Furthermore, India is one of the cheapest producers of PV products worldwide. This of course generates big international interest in Indian solar products.

The increasing production capacities of the PV players lead to an increased demand for products for QC which we can cover with our product portfolio. Our already existing partnerships in both countries and our long-term business contacts are one of our advantages.

We know the requirements of our trading partners in China and India very well and can cater to specific needs. In both countries we also have excellently trained service personnel, whose constant technical support is very much appreciated by our end customers.

PES: How important is the Chinese market to SENTECH how have you seen sales expand?

FW: China is one of our most important markets, especially for PV products. The production of solar panels was firmly anchored in China many years ago. Today 4 of the 5 largest solar panel producers are based in China. Many of them have been our customers for a long time.

The companies are extremely innovative and have gained large knowledge in terms of PV panel production. In 2021, a record number of new solar panels were installed in China alone. The production increased by around 30%; just the amount of demand in the country offers immense potential.

PES: Is research and development an integral part of your business?

QC for multi- and c-Si based solar cell manufacturing with the SENTECH SENperc PV

FW: We have our own research department that includes more than 20 engineers. These are almost exclusively dedicated to develop new applications but also to the requested customer applications.

In general, we always strive to recognize the current needs of the market and to enable these applications with our products. A large part of our products and their applications are precisely customized. Therefore, an innovative and functioning R&D department is essential for our company.

PES: What do you feel is the biggest challenge facing the PV industry today?

FW: Increasing order volumes make quality control in PV production an essential factor, which is where our tool comes in. 2021 will be the year of the accelerated expansion of renewable energies, which means it will be also the year with records in production volumes.

A lack of raw materials and simultaneously increasing demand could have an impact on the quality of the products. This is where it is particularly important to establish QC management. It's the only way to ensure the consistent quality of the products on offer.

PES: What sort of impact has the pandemic had on your company and do you see that changing as move forward in 2021?

FW: SENTECH was in the fortunate position that the pandemic did not cause any economic damage to our company. The sales of 2020 could be even increased, compared to 2019. During this difficult time, our employees were given maximum flexibility in their work. We can proudly report that all of our employees worked hard to achieve an outstanding result.

The demand for our innovative products continues unabated and we are pleased to say that the order books are full for 2021 as well. We look to the future with confidence. We also hope that the restrictions imposed by the pandemic will soon be over, to make personal meetings at exhibitions and professional events possible again.

PES: Where do you see Sentech in 5 years' time?

FW: We hope, especially with regard to the PV market, that our SENperc PV will be fully established in the market. We want to equip all major solar manufacturers with added value through our QC solutions.

This is the way we want to make our contribution to generate clean energy, because that is the topic that will shape our future, not only in the upcoming 5 years.

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QC for solar cell manufacturing SENperc PV