

Automotive Glass Technology: **IOCCO** explains today's industry developments

1970 with the presentation of the acoustic windscreen: a solution that's capable of drastically reducing noise inside the passenger compartment - all to ensure greater driving comfort thanks to the absence of hissing and other noises which can be unpleasant whilst travelling. Indeed automotive glass has improved much over the years - becoming ever more technological and connected.

MILEAGE COVERED THUS FAR

Typically known as industry 3.0 and industry 4.0 respectively, the third and fourth industrial revolutions proved fundamental in making the production and installation of such innovative automotive glass possible according to increasingly restrictive specifications. The use of high-performance network protocols (BUS), robots combined with artificial vision systems, as well as innovative machinery for assembly and pre-lamination (de-airing), all made it possible to associate precision and reliability with high production ranges (flow rates). Now modern windshields have integrated radar and cameras that can detect

On today's car windows, the simple piece of protective glass for a wind shelter takes up progressively more space over an expanded vehicle surface. Now it guarantees up to 30 percent of the torsional rigidity of the car - which also significantly raises the structural task value. The revolution took place in



Identifying changes over time to the windshield -bringing it to where it is now- IOCCO recently explained to E-Tech Europe attendees how automotive is in constant flux respecting developments in car safety. The company was speaking at the trade show on evolving production machinery and its impact upon product evolution.

the presence of pedestrians, cyclists or animals, together with the head-up display which shows vehicle gear parameters on the windshield - thereby ensuring drivers keep their eyes trained on the road.

POLYMER DISPERSED LIQUID CRYSTAL TECHNOLOGY

Car makers have paid ever more attention to developing laminated car roofs in recent years. To date, cars with roofs made entirely of laminated glass are increasingly visible on the market. The electrochromic roof is among the most innovative features of the latest car models. A dynamic glass type, it's capable of modifying optical characteristics on command - thereby varying the shielding level

from solar and visible radiation. Here the automotive sector leveraged PDLC (Polymer Dispersed Liquid Crystal) technology. The latter is based upon a thin film containing polymers and liquid crystals on which a slight electric current is applied. As electricity passes through the central film the liquid crystals line up in an orderly manner to allow the passage of sunlight - making the glass transparent. While in their normal state, i.e. without electricity, the crystals arrange themselves randomly and give the crystal an opaque appearance.

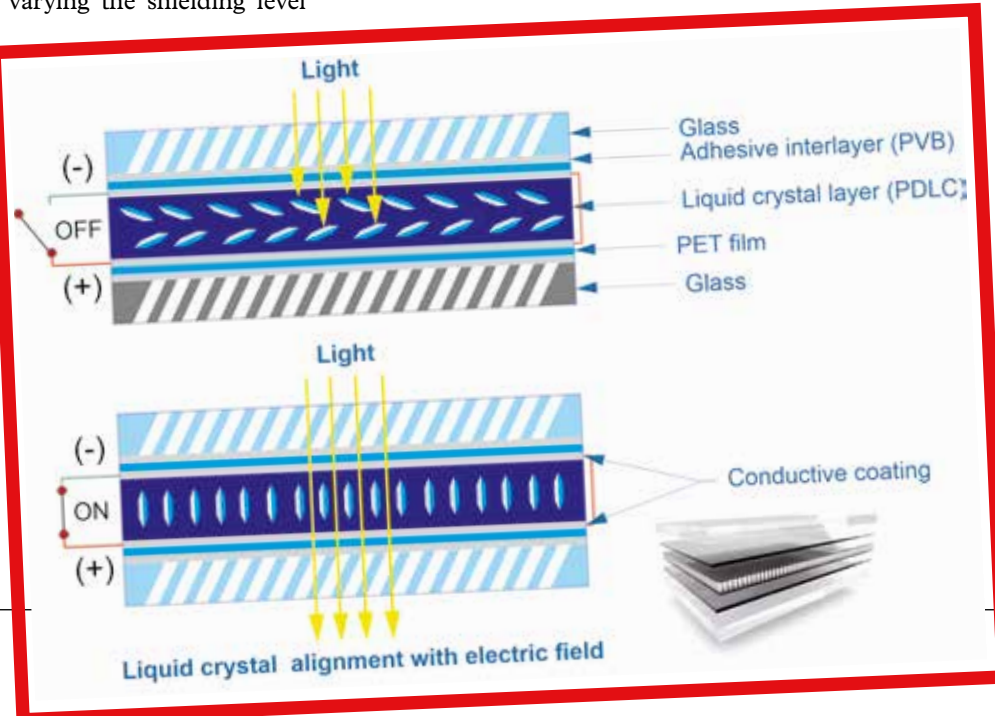
CONTRIBUTION TO THE INDUSTRY

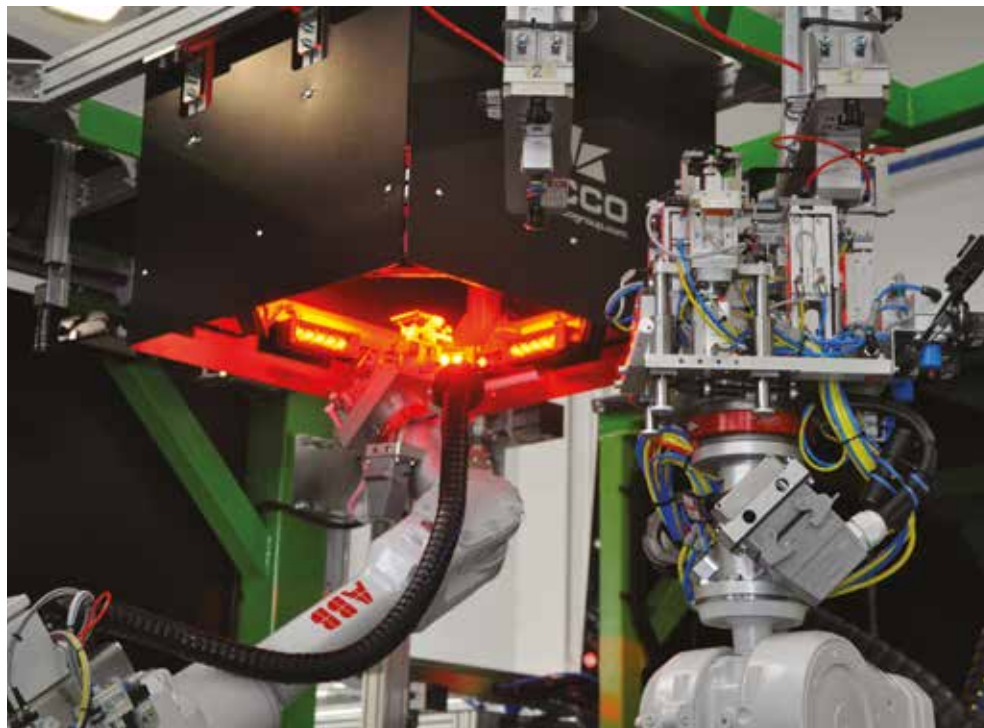
To assemble this interlayer type IOCCO de-



veloped complex, robot-based systems combined with artificial vision systems. The production process phases most relevant in respect of tech-

nological production innovation are those of assembly and pre-lamination (namely, the de-airing process). Here's why the R&D team at IOCCO has continuously developed solutions in line with these trends since 2012 - placing highly productive assembly and pre-lamination systems on the market which are unique worldwide. These allow for precise assembly phases and the subsequent phase of air extraction inside the laminate as well as the fusion and encapsulation of these technological interlayers. To date this system can produce windshields, side windows and sun-roofs with production rates of up to 18 sec-





coated glass use with high solar radiation shielding parameters. Added value operations is another production phase that's constantly evolving - continuously generating engineering solutions. This production phase is linked to every ADAS innovation regarding the assembly of all brackets, supports and such devices as Rain Sensors, cameras, antennas, GPS as well as the installation of those gaskets necessary for assembly on the car. In sum, automotive glass is in a continuous evolution - and here engineering solutions are the key to opening new ways to process it.

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onds per glass. Thanks to advanced sensors and intelligent software the plant is able to calculate the correct production parameters while tracing the technological process for each particular product and changing set-up

in the event of unforeseen anomalies. Conformant with current European Commission directives regarding Industry 5.0 that's an important step usability-wise. The software here has been designed and developed to

make it easily usable, to set up the machinery and maintain it as well as to evaluate and adapt electrical absorption when it exceeds the production requirement.

LIGHTWEIGHTING

Another step forward for automotive laminated glass has been that of substituting standard glass with ultrathin glass - thus reducing car weight and, by extension, CO2 emissions. The use of laminated glass for cars also affords the advantage of

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