»QD« television - What are the benefits of the new display technology?

In Germany, football fans remember July 13 of 2014. This was the day Germany defeated Argentina in the football world cup finals with a 1-0-win. The winning goal, shot within extra time in the 113th minute of the game, electrified the nation. Eleven minutes later, Germany was football world champion of 2014.

Most German football fans will be able to recall that winning goal, whether they have actually seen it or not. So, does one have to have seen the goal to know what it was like?

More details due to quantum dots

How well player and ball are visible depends on the quality of the display. The abbreviation HDR stands for High Dynamic Range. HDR-enabled devices reveal more image details. So even during a fast passing game the ball stays visible, the movements of the players can be made out much clearer. One simply sees more.

With QLED, a new abbreviation is warming up on the sidelines. Every now and then, it is even being substituted in the game. »Q« stands for quantum dots which are being discussed as the next big thing for use in the display industry.

»Our research goal is to develop pure quantum dot LED displays," explains Dr. Armin Wedel, head of the research department Functional Polymer Systems at the Fraunhofer-Institute for Applied Polymer Research IAP, »so far, quantum dots are only used for color improvement in displays. Only when the quantum dots are electrically stimulated and emit light like the organic materials in the OLED displays, we can dream of the title «

New possibilities for image display and display production

Industry experts discussed the advantages of the technology and how the quantum dots can be implemented for the display market at the members' meeting of the German Flat Panel Forum (DFF) on June 13 and 14 at the Fraunhofer IAP.

More than 40 representatives of national and international players in the display industry highlighted different technical concepts and materials, ways of display production, analysis methods and the current market situation. Staying with the football analogy: they discussed different game tactics.

»We look back on a successful event«, says Professor Karlheinz Blankenbach, longtime chairman of the DFF. »The magic is in the mix. We unite representatives of the entire value chain of the display industry under one roof, which of course creates exciting and enriching discussions. Add to that the great atmosphere that prevailed here at the Fraunhofer IAP in Potsdam-Golm. I am convinced that we can gain more members with our approach and thus strengthen the industry-wide exchange.«

The participation of a representative of Seoul National University (SNU) was particularly pleasing for the organizers. Korea is one of the leading display technology countries, and a joint project with SNU is being planned.

Lower costs for better pictures

Scientists at the Fraunhofer IAP have been researching materials and technologies for displays for many years. Organic light emitting diodes (OLEDs) and quantum dot technologies for the display market are in focus.

Among other things, the researchers succeeded in synthesizing competitive cadmium-free quantum dots for use in quantum dot LEDs for a new display generation. With its indium phosphide-based quantum dots, Fraunhofer IAP offers future-proof technology for the display industry. Through the development of networkable charge transport structures for the construction of quantum dot LEDs at the institute, OLEDs and quantum dot LEDs can even be printed.

The use of quantum dots and special printing processes can reduce the cost of displays.

So, will we soon see more of one football game by watching »QD-TV«?

Watching the games of the 2018 FIFA world cup, viewers with HDR or even QLED devices will see some passes more clearly than others do. With quantum dot LED displays, the proportion of these viewers will increase and the pictures they see will be improved. To get the live experience, though, display experts also visit the stadium or the fan mile.

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