

CSS 2

Monitoring the cleanliness of XLPE/PE insulation during the production of HV and EHV power cables



CSS 2

Flawless insulation for highest quality

Camera system for monitoring the cleanliness of the XLPE insulation melt during the production of high and extra-high voltage cables

Absolute purity is the top priority when it comes to high voltage cable productions. With the CSS 2, for real time monitoring and detection of contamination in the polymer melt, SIKORA guarantees process stability and product quality for the manufacturing line. Only extremely pure XLPE/PE material ensures the highest dielectric strength of the cable and an acceptable detection of the wall thickness. Faulty batches, which are caused by contamination and are usually only detected after the discharge test, are a thing of the past due to this measuring technology. Quality demands for high voltage cables are met optimally and costs, caused by inclusions in the insulating material, are reduced significantly.

Contamination have no chance

The innovative camera system CSS 2 is used for the detection of dirt particles of various sizes and concentrations in the XLPE/PE materials. Contamination in the material occur especially due to the "material handling" respectively due to metal chips resulting from the wear of the barrel extruder. Also,

the cleaning of the barrel extruder causes dust particles, which cause tiny pores or inclusions in the material. Last but not least, contamination in the form of combustion particles such as amber and scorches, which occur due to the long-term operation of the plant. Contamination in the XLPE/PE material hold high safety risks regarding breakdowns. The CSS 2 eliminates this risk as component of a super clean concept in the production line.

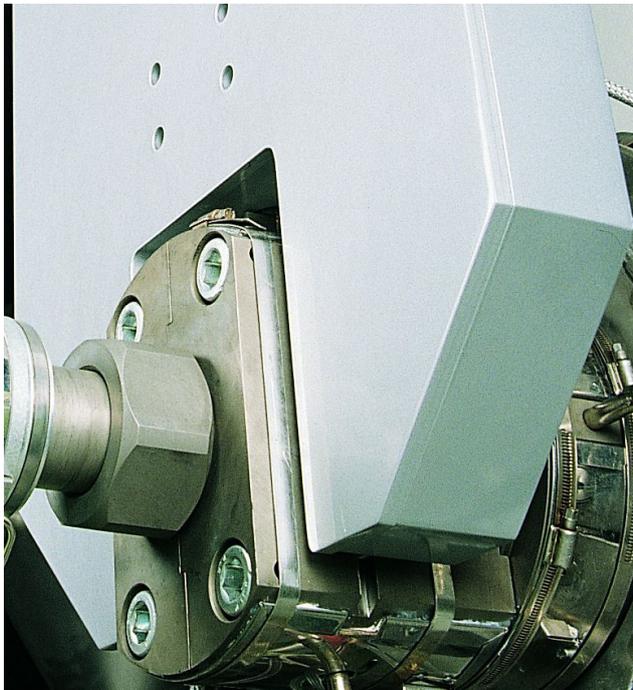


Installation of the CSS 2 in the production line

Objective process monitoring and quality assurance

Instead of performing timely and locally delayed laboratory analyses, the measuring principle offers a complete quality assurance prompt and online. The intelligent system monitors the XLPE/PE melt in the flow channel regarding purity up to 100% and enables a direct interference in the production process. For this technology, the flow channel between the extruder and the crosshead is equipped with inspection glasses and an optical CCD camera system, which screens the insulation material. The high-resolution CCD color camera detects particles from a size of 20 μm in the XLPE/PE melt. The identified constituents are classified with regard to their size. Particles that exceed the specified tolerance value for particle sizes are analyzed by the CSS 2 with highest precision.

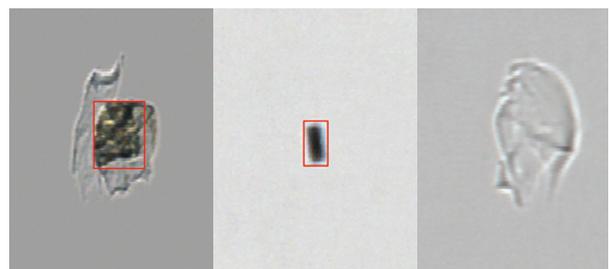
The particles are displayed graphically and colored in their surroundings on a display. In addition, the vertical and horizontal dimensions as well as the light absorption are shown. Measuring values regarding the contamination are registered on a hard disk for follow up inspections. Next to the graphical display of the detected particles and their surroundings, the



The CSS 2 continuously measures the purity of the XLPE/PE materials

monitor pictures show the complete material flow (live) – even if the selected tolerance layer is not exceeded – as well as a trend curve on particles per liter. After the analysis of the data, the results are displayed in a histogram regarding particle size and quantity. These information make the production process more transparent – always under the aspect of optimal material purity.

The system informs the user simple, fast and precise about the best starting point for the production and if the tolerance value is exceeded and an intervention in the production process is necessary. In contrast to the solely pellets inspection, the system detects contamination in the material caused by handling, wear of the extruder or combustion particles early on – even before the cable is manufactured. Therefore, the technology concept CSS 2 is an extremely powerful and efficient partner for the high voltage cable production.



The CSS 2 detects ambers, metallic particles as well as inhomogeneities in the XLPE/PE melt (f.l.)

Typical features

- Continuous online monitoring of the polyethylene melt for 100% cleanliness
- Quality assurance

Technical Data CSS 2

Measuring Principle
Optical, with high-resolution CCD camera
Application
100% monitoring of the insulation material for impurities (such as metal, wood, amber, scorches) during high voltage and extra-high voltage cable production
Maximum Material Flow
350 kg/h
Minimum Size of Detected Contaminant
20 µm (depending on type of contamination)
Power Supply
230 AC, +7%, -10%, 50 to 60 Hz

Additional components for a super clean concept

PURITY SCANNER

The purity of XLPE pellets, as they are used for the insulation of medium, high, and extra-high voltages cables as well as for on- and offshore cables, is a decisive characteristic for the quality of the end product. Breakdowns that are caused during the discharge test due to contaminated material can easily cause costs in the 6-digit range. Therefore, the use of highly clean material as well as the continuous detection and sorting out of contaminated pellets before they get into the extrusion process is of essential importance.

With the PURITY SCANNER, SIKORA provides an unrivaled, user oriented system for a 100% online inspection and automatic sorting of XLPE pellets for raw material producers as well as for end user for example cable manufacturers.

PURITY CONCEPT

Quality standards in the plastic processing industry are permanently increasing. Accordingly high is the demand to inspect and analyse the raw material already before it enters the production process. Contamination, color anomalies and inhomogeneities have to be detected reliably. Developed for the different requirements of the Compound-, Masterbatch- and Recycling Industries the innovative, modular PURITY CONCEPT Systems from SIKORA promise above all: highest material quality and stable processes.

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