

New cable family for new power supply need in Aerospace environment.

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DRAKA FILECA has been manufacturing cables for aircraft for more than 40 years for both transmission and power supply. Company is known as a key supplier in the aeronautic world.

In the past years, the need of on board power has been increasing strongly. Solutions had to be found for addressing it without degradation of weight.

To do so, one way has been to introduce “High Voltage power supply” rather than increasing cross section.

In more recent programs as AIRBUS A350 and BOEING 787, 230 V AC power supply has been introduced for power generation in complement of the historical 115 V AC. Those aircrafts are flying with more electrical loads and networks than the former programs.

This innovation has been significant for cable design. The particular environment of Aircraft has driven to the characterization of cables in low pressure conditions and high temperature constraints.

Electric field can trig electronic movements in the cable insulation called Partial Discharge. The Paschen law is defining the threshold of PD ignition. They can decrease the life duration of the cable. Flying environment is the worst case.

The evaluation of existing series as EN2267-010 DR range has demonstrated that the probability of Partial Discharge phenomenon in low pressure conditions was real. With the 230 V AC power supply, the voltage brought in the cable could exceed the threshold and so, ignites PD and reduces the cable life.

The creation of a new series for harsher environment was necessary, The EN2267-012 DZ were born. While respecting all traditional requirements as physical, chemical, flammability, mechanical and safety aspects, this new series has been tested and confirmed as “DP free” at 45000 feet and 150°C which is the worst environment case. The risk of reducing the lifetime of the cable due to partial discharges is none.

In parallel, a similar activity has been done on Aluminum cables bringing the creation of the EN4681 AZ series.

Next step should be the introduction of Direct Current networks (HVDC) to embed even more electrical networks. Nominal voltages are ± 270 V and +540 V pulse width modulated. . The definition of the networks is in progress and the assessment of the cable technology as well. Reusing the HVAC knowledge is a pillar in the HVDC

Key words

EN2267; DR; DZ; EN4681; AZ, partial discharge; Paschen