

5.4 Testing of Transmission Cable Systems:

The testing of transmission cable systems is dictated primarily by international, national and user specifications with procedures grouped into five categories:

- (a) routine tests on cables and accessories;
- (b) special (sample) tests on cables requested by the purchaser;
- (c) prequalification tests for XLPE cable and accessories;
- (d) type tests on cables and accessories;
- (e) site tests on systems after installation.
 - Electricity Boards for cables of the paper and PPL insulated type, primarily self-contained fluid-filled cables and cables with polymeric insulation for system voltages of 33 kV and above for non-submarine use.

Paper And Polypropylene Paper Laminate (PPL) Cables:

- Most specifications require electrical tests along the lines illustrated below for fluid filled (FF) cables.
- The DLA is measured at ambient temperature and corrected to 20°C. The voltage range is from U_0 to $2U_0$ for cables up to a U_0 of 87 kV and $1.67U_0$ for higher voltage cables.

Table 39.1 Test voltage and DLA for FF cables

Cable voltage (U_0/U) (kV)	Highest voltage for DLA test (kV)	Maximum DLA				Maximum difference in DLA from U_0 to highest voltage $\times 10^{-4}$		A.C. withstand test (kV)
		$U_0 \times 10^{-4}$	Highest voltage $\times 10^{-4}$					
		<i>Paper</i>	<i>PPL</i>	<i>Paper</i>	<i>PPL</i>	<i>Paper</i>	<i>PPL</i>	
19/33	38	35	–	43	–	10	–	53
38/66	76	35	–	43	–	10	–	86
76/132	152	33	–	40	–	8	–	162
160/275	230	30	14	34	16	5	4	275
230/400	385	28	14	31	16	4	4	395

- The DLA and high voltage tests for gas-compression and gas-filled cables are carried out at any gas pressure up to 2bar. These cables normally operate at a pressure of approximately 14bar and, as the reduced pressure is not representative of normal service conditions, the test voltages are accordingly reduced.

