

HIGH VOLTAGE ELECTRICAL SYSTEMS LABORATORY



UKAS ACCREDITED LABORATORY, EQUIPPED FOR MATERIAL, MECHANICAL AND ENVIRONMENTAL TESTING

ORE Catapult's High Voltage Laboratories are designed for mechanical, electrical and non-electrical testing of submarine cables and their component parts. Our laboratories provide accelerated ageing, type testing and fault investigation services.

ELECTRICITY TEST CAPABILITIES		ADDITIONAL INFORMATION
Lightning impulse (wet and dry)	1200kV	<ul style="list-style-type: none"> • Main lab dimensions: 26m (l) x 24m (w) x 12m (h) • Ferranti lab: 10m (l) x 6m (w) x 5m (h) • Three high current laboratories and associated measurement systems • Testing to all relevant BS EN, IEC, ANSI standards
AC voltage (wet and dry)	600kV (3A at 600kV)	
AC voltage partial discharge	600kV	
AC voltage capacitance tan delta	600kV	
DC voltage (wet and dry)	1MV, 10mA	
AC current (temperature-rise test)	Up to 8000A	
AC voltage (500 Hz)	120kV	

ELECTRICAL TEST LABORATORY

Lighting impulse, high voltage, high current, partial discharge, corona protection, RIV, thermal cycling, temperature rise and power quality test facilities.

SUBSEA TESTING ENVIRONMENT

Test tank facilities for water immersion for trialling of electrical equipment and systems.

MATERIALS TEST LABORATORY

Full suite of non-electrical type tests on cables rated up to 500 kV, both single core and three-phase cables, to the following standards: IEC 60502-2, IEC 60840, IEC 63026, IEC 62067. Full spectroscopic, microscopic, and physical testing facilities available for materials characterisation, analysis, and validation. Including cable water tree analysis, moisture determination of solid insulation and oil profiling.

MECHANICAL TEST ENVIRONMENT

Full scale representative test platform with tensile bend, tensile pull, handling (outdoor or indoor – with 20 m indoor hook height) and fatigue testing on full scale three core system samples.

ENVIRONMENTAL TEST LABORATORY

Cyclic temperatures and humidity exposure – environmental chamber (-40°C to +180°C and 10% to 98% RH) with internal HV live testing capability, high humidity/salt corrosion, assessment/studies, salt, corrosion, assessment/studies, chemical resistance, ingress protection (IP) and HV wet testing.



TESTING SERVICES

- Type certification of HV cable systems, switchgear and other HV insulation systems
- Cable accessories (joints, splices, connectors) integrity and type testing
- Product development, testing and certification support
- HV bushing and transformer performance testing
- Accelerated ageing testing, including live environmental, mechanical and electrical stresses
- Materials and coating selection, testing investigations, salt water corrosion, and oil analysis
- Thermal Analysis: TGA / DSC
- FTIR / TGA – investigate effects on chemical bonds, composite batch analysis and degradation
- Tensile test (compression, 3-point bend, peel) – comparing virgin material, aged samples and wet energised samples
- Impedance – measuring complex dielectric properties on small scale samples
- HV breakdown strength testing on small or large scale (up to 600 kV AC, 1MV DC)
- Microscopy (inc. staining) to identify voids and other physical degradation in insulation
- Dynamic HV cable fatigue, small scale component or full scale three core
- Thermal / environmental ageing capability, UV ageing, weathering analysis
- Moisture content analysis
- Density measurements
- X-ray fluorescence – metallic content analysis
- FTIR – materials analysis
- Karl Fischer – moisture analysis
- Dynamic Mechanical Analysis (DMA)
- Comparative Tracking Indexing (CTI)

ADDITIONAL SERVICES

- Fault finding, failure investigation and diagnostics of cable, accessories and bushings
- Power systems advice – insulation co-ordination studies, field plotting, technical support, and market consultations
- Feasibility and market studies
- Collaborative R&D projects and SME product development support
- Arrhenius curve calculations on HV insulation
- Sample preparation for examination, slice sample to view breakdown, water tree analysis – and general 2D/3D microscopy.

CLIENT SUPPORT AND SITE FEATURES

- 30 tonne ceiling hoist crane, cherry picker, scissor lifts, 5 tonne forklift, and tele-handler
- Wide portfolio of mechanical actuation and test equipment to complement electrical services
- Operational technical support team: electricians, mechanical fitters and plant operatives
- Engineering support team: civil, mechanical, electrical, marine, instrumentation and control/ SCADA technical disciplines
- Indoor and outdoor assembly and storage areas
- Exclusive and secure onsite office and workshop facilities
- Full health and safety support
- Full waste disposal support
- Mobile tower lighting and flat-bottomed work boat