제480호(1/5)

국제공인시험기관인정서

기 관 명 : 일진전기(주) 전선사업부

대 표 자 : 최 진 용

법 인 등 록 번 호 : 134811-0159279

사 업 자 등 록 번 호 : 124-86-67922

법 인 주 소 : 경기도 화성시 안녕동 112-83

사 업 장 소 재 지 : 경기도 화성시 안녕동 112-88

유 효 기 간 : 2011년 6월 23일 ~ 2015년 6월 23일

인정분야 및 범위 : 별첨 참조

상기 시험기관을 KS Q ISO/IEC 17025:2006 인정요건 및 국가표준기본법 제23조의 규정에 의거하여 국제공인시험기관으로 인정합니다. 또한 ISO-ILAC-IAF 공동성명(2009.1.8)에 언급된 바와 같이 인정된 분야 및 범위에 대한 기술적 능력과 시험기관 품질경영시스템이 적절함을 인정합니다.

2011년 6월 23일

한 국 인 정 기 구 장

"이면기재사항"

1. 2011. 6. 23 : 최초인정

3. 전기시험

3.001. 전선, 케이블, 전로용품

규격번호	규격명	시험범위 또는 검출한계
IEC 60228:2004	Conductors of insulated cables	0.000 1 Ω ~ 110 Ω
IEC 60229:2007	Electric cables - Tests on extruded oversheaths with a special protective function 3.1 D.C. voltage test	40 kV / 2 mA 30 kV / 15 mA
IEC 60230:1966	Impulse tests on cables and their accessories	3 600 kV / 270 kJ
IEC 60332-1-1:2004	Tests on electric and optical fibre cables under fire conditions - Part 1-1 : Test for vertical flame propagation for a single insulated wire or cable - Apparatus	1 mm
IEC 60332-1-2:2004	Tests on electric and optical fibre cables under fire conditions - Part 1-2 : Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame	1 mm
IEC 60332-1-3:2004	Tests on electric and optical fibre cables under fire conditions - Part 1-3 : Test for vertical flame propagation for a single insulated wire or cable - Procedure for determination of flaming droplets/particles	1 mm
IEC 60502-2:2005	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1,2 kV) up to 30 kV (U_m = 36 kV) - Part 2 : Cables for rated voltages from 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV) (제외) 19.10 Ozone resistance test for EPR and HEPR insulation 19.12 Oil immersion test for elastomeric sheath 19.17 Thermal stability test for PVC insulation 19.18 Determination of hardness of HEPR insulation 19.19 Determination of the elastic modulus of HEPR insulation 20 Electrical tests after installation	Rated voltages : 6 kV ~ 30 kV
IEC 60811-1-1:2001	Common test methods for insulating and sheathing materials of electric cables and optical cables Part 1-1 : Methods for general application - Measurement of thickness and overall dimensions, Tests for determining the mechanical properties	0.001 mm
IEC 60811-1-2:1985 AMENDMENT 1:1989 AMENDMENT 2:2000	Common test methods for insulating and sheathing materials of electric and optical cables - Part 1-2 : Methods for general application - Thermal ageing methods 8.1 Ageing in an air oven	Max. 300 ℃
IEC 60811-1-3:2001	Common test methods for insulating and sheathing materials of electric and optical cables - Part 1-3 : General application - Methods for determining the density - Water absorption tests - Shrinkage test 9.1 Electrical test 10 Shrinkage test for insulation 11 Shrinkage test for PE sheaths	A.C. 4 kV D.C. 2.5 kV 0.5 mm ~ 1 mm

IEC 60811-1-4:1985 AMENDMENT 1:1993 AMENDMENT 2:2001	Common test methods for insulating and sheathing materials of electric and optical cables - Part 1-4 : Methods for general application - Test at low temperature	Elongation test at low temperature : 0.1 ㎜
IEC 60811-2-1:2001	Common test methods for insulating and sheathing materials of electric and optical cables - Part 2-1 : Methods specific to elastomeric compounds - Ozone resistance, hot set and mineral oil immersion tests 9 Hot set test	0.01 ㎜
IEC 60811-3-1:1985 AMENDMENT 2:2001 AMENDMENT 1:1994	Common test methods for insulating and sheathing materials of electric and optical cables - Part 3-1 : Methods specific to PVC compounds - Pressure test at high temperature, Tests for resistance to cracking	0.01 ㎜
IEC 60811-3-2:1985 AMENDMENT 1:1993 AMENDMENT 2:2003	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 3-2 : Methods specific to PVC compounds - Loss of mass test - Thermal stability test 8 Loss of mass test for insulations and sheaths	(0.01×10^{-3}) kg
IEC 60811-4-1:2004	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 4-1 : Methods specific to polyethylene and polypropylene compounds - Resistance to environmental stress cracking - Measurement of the melt flow index - Carbon black and/or mineral filler content measurement in polyethylene by direct combustion - Measurement of carbon black content by thermogravimetric analysis (TGA) - Assessment of carbon black dispersion in polyethylene using a microscope 11 Carbon black and/or mineral filler content measurement in polyethylene - Direct combustion method	(0.1×10^{-6}) kg
IEC 60840:2004 ~	Power cables with extruded insulation and their accessories for rated voltages above 30 kV (U_m = 36 kV) up to 150 kV (U_m = 170 kV) - Test methods and requirements (제외) 10.11 Measurement of density of HDPE insulation 12.4.9 Ozone resistance test for EPR and HEPR insulations 12.4.11 Measurement of density of HDPE insulation 12.4.15 Determination of hardness of HEPR insulation 12.4.16 Determination of the elastic modulus of HEPR insulation 15 Electrical tests after installation	Rated voltages : 30 kV ~ 150 kV
IEC 60885-3:1988	Electrical test methods for electric cables - Part 3 : Test methods for partial discharge measurements on lengths of extruded power cable	Sensitivity (cable) : 10 pC or better Sensitivity (accessories) : 5 pC or better

IEC 62067:2006	Power cables with extruded insulation and their accessories for rated voltages above 150 kV (U_m = 170 kV) up to 500 kV (U_m = 550 kV) - Test methods and requirements (제외) 10.11 Measurement of density of HDPE insulation 12.5.9 Ozone resistance test for EPR insulation 12.5.11 Measurement of density of HDPE insulation 14 Electrical tests after installation	Rated voltages : 150 kV ~ 500 kV
KS C IEC 60228 :2005	절연 케이블용 도체	0.000 1 Ω ~ 110 Ω
KS C IEC 60229 :2005	특수 보호 기능을 가진 압출 케이블 외장에 대한 시험 3.1 절연 시스 시스템	40 kV / 2 mA 30 kV / 15 mA
KS C IEC 60230 :2005	케이블 및 그 부속품에 대한 임펄스 시험	3 600 kV / 270 kJ
KS C IEC 60332-1 :2002	전기 케이블의 난연성 시험 - 제1부 : 절연 전선 또는 케이블의 수직 배치 시험	1 mm
KS C IEC 60502-2 :2010	정격 전압 1 ~ 30 kV 압출 성형 절연 전력 케이블 및 그 부속품 - 제2부 : 케이블(6 kV 및 30 kV) (제외) 19.10 EPR 및 HEPR 절연체의 내오존 시험 19.12 천연 합성고무의 내유 시험 19.17 PVC 절연체의 열 안정성 시험 19.18 HEPR 절연체의 경도 결정 19.19 HEPR 절연체의 탄성 계수 측정 20 설치 후의 전기적 시험	정격전압 : 6 kV ~ 30 kV
KS C IEC 60811-1-1 :2002	전기 케이블의 절연체 및 시스 재료의 공통 시험 방법 - 제1부 : 시험 방법 총칙 - 제1절 : 두께 및 완성품 바깥지름 측정 - 기계적인 특성 시험	0.001 mm
KS C IEC 60811-1-2 :2002	전기 케이블의 절연체 및 시스 재료의 공통 시험 방법 - 제1부 : 시험 방법 총칙 - 제2절 : 열 노화 시험 방법 8.1 열 노화	Max. 300 ℃
KS C IEC60811-1-3 :2002	전기 케이블 및 광 케이블의 절연체 및 시스 재료의 공통 시험 방법 - 제1-3부 : 시험 방법 총칙 - 밀도 측정 방법 - 내수성 시험 - 수축 시험 9.1 전기 시험 10 절연체의 수축 시험 11 PE 시스의 수축 시험	A.C. 4 kV D.C. 2.5 kV 0.5 mm ~ 1 mm
KS C IEC60811-1-4 :2002	전기 케이블의 절연체 및 시스 재료의 공통 시험 방법 - 제1부 : 시험 방법 총칙 - 제4절 : 저온 시험 방법	저온인장 : 0.1 mm
KS C IEC60811-2-1 :2006	전기 케이블 및 광 케이블의 절연체 및 시스 재료의 공통 시험 방법 - 제2-1부 : 천연 합성 고무의 특성 시험 방법 - 내오존성 시험, 핫셋 시험, 내유 시험 9 핫셋 시험	0.01 mm
KS C IEC60811-3-1 :2002	케이블의 절연체 및 시스 재료의 공통 시험 방법 - 제3부 : PVC 컴파운드의 특별 방법 - 제1절 - 고온 하중 시험 - 내균열성 시험	0.01 mm

KS C IEC60811-3-2 :2002	전기 케이블의 절연체 및 시스 재료의 공통 시험 방법 - 제3부 : 합성 수지 화합물의 시험 방법 - 제2절 : 질량 손실 시험 및 열 안정성 시험 8 절연체 및 시스 가열 감량 시험	(0.01×10^{-3}) kg
KS C IEC60811-4-1 :2006	전기 케이블 및 광 케이블의 절연체 및 시스 재료의 공통 시험 방법 - 제4-1부 : 폴리에틸렌 및 폴리프로필렌 화합물의 시험 방법 - 환경 응력 내균열성, 용융 지수의 측정 - 직접 연소법에 의한 폴리에틸렌의 카본블랙과 무기물 충전재 함유량 측정 - 열질량 분석법(TGA)으로 카본블랙 함량 측정 - 현미경에 의한 폴리에틸렌의 카본블랙 분산 평가 11 폴리에틸렌에서 카본블랙과 무기질 충전물의 함량 측정 - 직접 연소법	(0.1×10^{-6}) kg
KS C IEC 60840 :2006	정격 전압 30 ~ 150 kV 이하 압출 절연 전력 케이블 및 그 부속품 - 시험 방법과 요구 사항 (제외) 10.11 HDPE 절연체의 밀도 측정 12.4.9 EPR과 HEPR 절연체에 대한 내오존성 시험 12.4.11 HDPE 절연체의 밀도 측정 12.4.15 HEPR 절연체의 경도 측정 12.4.16 HEPR 절연체의 탄성 계수 측정 15 설비 후 전기적 시험	정격전압 : 30 kV ~ 150 kV
KS C IEC 60885-3 :2003	전기 케이블의 전기적 특성 시험 방법 - 제3부 : 압출 절연 전력 케이블의 부분 방전 측정 방법	케이블 감도 : 10 pC 이상 부속재 감도 : 5 pC 이상

끝.

No.480(1/5)

CERTIFICATE OF ACCREDITATION

Name of Laboratory : ILJIN Electric Co., Ltd. Cable Division

Representative : Choi Jin-yong

Address of Headquarters : 112-83, Annyoung-Dong, Hwasung-Si, Kyunggi-Do, KOREA

Address of Laboratory : 112-88, Annyoung-Dong, Hwasung-Si, Kyunggi-Do, KOREA

Duration : June 23, 2011 ~ June 22, 2015

Scope of Accreditation

(Scope of Accreditation is described in the accompanying Annex)

This testing laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025 : 2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated 8 January 2009).

June 23, 2011

Huh. Kyung

Administrator,
Korea Laboratory Accreditation Scheme(KOLAS)

3. Electrical Test

3.001. Cables, Wires and Equipment for Use Electrical-line

Test method	Standard designation	Test range or Limits of detection
IEC 60228:2004	Conductors of insulated cables	0.000 1 Ω ~ 110 Ω
IEC 60229:2007	Electric cables - Tests on extruded oversheaths with a special protective function 3.1 D.C. voltage test	40 kV / 2 mA 30 kV / 15 mA
IEC 60230:1966	Impulse tests on cables and their accessories	3 600 kV / 270 kJ
IEC 60332-1-1:2004	Tests on electric and optical fibre cables under fire conditions - Part 1-1 : Test for vertical flame propagation for a single insulated wire or cable - Apparatus	1 mm
IEC 60332-1-2:2004	Tests on electric and optical fibre cables under fire conditions - Part 1-2 : Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame	1 mm
IEC 60332-1-3:2004	Tests on electric and optical fibre cables under fire conditions - Part 1-3 : Test for vertical flame propagation for a single insulated wire or cable - Procedure for determination of flaming droplets/particles	1 mm
IEC 60502-2:2005	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1,2 kV) up to 30 kV (U_m = 36 kV) - Part 2 : Cables for rated voltages from 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV) (Exception) 19.10 Ozone resistance test for EPR and HEPR insulation 19.12 Oil immersion test for elastomeric sheath 19.17 Thermal stability test for PVC insulation 19.18 Determination of hardness of HEPR insulation 19.19 Determination of the elastic modulus of HEPR insulation 20 Electrical tests after installation	Rated voltages : 6 kV ~ 30 kV
IEC 60811-1-1:2001	Common test methods for insulating and sheathing materials of electric cables and optical cables Part 1-1 : Methods for general application - Measurement of thickness and overall dimensions, Tests for determining the mechanical properties	0.001 mm
IEC 60811-1-2:1985 AMENDMENT 1:1989 AMENDMENT 2:2000	Common test methods for insulating and sheathing materials of electric and optical cables - Part 1-2 : Methods for general application - Thermal ageing methods 8.1 Ageing in an air oven	Max. 300 ℃
IEC 60811-1-3:2001	Common test methods for insulating and sheathing materials of electric and optical cables - Part 1-3 : General application - Methods for determining the density - Water absorption tests - Shrinkage test 9.1 Electrical test 10 Shrinkage test for insulation 11 Shrinkage test for PE sheaths	A.C. 4 kV D.C. 2.5 kV 0.5 mm ~ 1 mm

IEC 60811-1-4:1985 AMENDMENT 1:1993 AMENDMENT 2:2001	Common test methods for insulating and sheathing materials of electric and optical cables - Part 1-4 : Methods for general application - Test at low temperature	Elongation test at low temperature : 0.1 ㎜
IEC 60811-2-1:2001	Common test methods for insulating and sheathing materials of electric and optical cables - Part 2-1 : Methods specific to elastomeric compounds - Ozone resistance, hot set and mineral oil immersion tests 9 Hot set test	0.01 ㎜
IEC 60811-3-1:1985 AMENDMENT 2:2001 AMENDMENT 1:1994	Common test methods for insulating and sheathing materials of electric and optical cables - Part 3-1 : Methods specific to PVC compounds - Pressure test at high temperature, Tests for resistance to cracking	0.01 ㎜
IEC 60811-3-2:1985 AMENDMENT 1:1993 AMENDMENT 2:2003	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 3-2 : Methods specific to PVC compounds - Loss of mass test - Thermal stability test 8 Loss of mass test for insulations and sheaths	(0.01×10^{-3}) kg
IEC 60811-4-1:2004	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 4-1 : Methods specific to polyethylene and polypropylene compounds - Resistance to environmental stress cracking - Measurement of the melt flow index - Carbon black and/or mineral filler content measurement in polyethylene by direct combustion - Measurement of carbon black content by thermogravimetric analysis (TGA) - Assessment of carbon black dispersion in polyethylene using a microscope 11 Carbon black and/or mineral filler content measurement in polyethylene - Direct combustion method	(0.1×10^{-6}) kg
IEC 60840:2004	Power cables with extruded insulation and their accessories for rated voltages above 30 kV (U_m = 36 kV) up to 150 kV (U_m = 170 kV) - Test methods and requirements (Exception) 10.11 Measurement of density of HDPE insulation 12.4.9 Ozone resistance test for EPR and HEPR insulations 12.4.11 Measurement of density of HDPE insulation 12.4.15 Determination of hardness of HEPR insulation 12.4.16 Determination of the elastic modulus of HEPR insulation 15 Electrical tests after installation	Rated voltages : 30 kV ~ 150 kV
IEC 60885-3:1988	Electrical test methods for electric cables - Part 3 : Test methods for partial discharge measurements on lengths of extruded power cable	Sensitivity (cable) : 10 pC or better Sensitivity (accessories) : 5 pC or better

IEC 62067:2006	Power cables with extruded insulation and their accessories for rated voltages above 150 kV (U_m = 170 kV) up to 500 kV (U_m = 550 kV) - Test methods and requirements (Exception) 10.11 Measurement of density of HDPE insulation 12.5.9 Ozone resistance test for EPR insulation 12.5.11 Measurement of density of HDPE insulation 14 Electrical tests after installation	Rated voltages : 150 kV ~ 500 kV
KS C IEC 60228 :2005	Conductors of insulated cables	0.000 1 Ω ~ 110 Ω
KS C IEC 60229 :2005	Electric cables - Tests on extruded oversheaths with a special protective function 3.1 D.C. voltage test	40 kV / 2 ㎃ 30 kV / 15 ㎃
KS C IEC 60230 :2005	Impulse tests on cables and their accessories	3 600 kV / 270 kJ
KS C IEC 60332-1 :2002	Tests on electric and optical fibre cables under fire conditions - Part 1 : Test for vertical flame propagation for a single insulated wire or cable	1 ㎜
KS C IEC 60502-2 :2010	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1,2 kV) up to 30 kV (U_m = 36 kV) - Part 2 : Cables for rated voltages from 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV) (Exception) 19.10 Ozone resistance test for EPR and HEPR insulation 19.12 Oil immersion test for elastomeric sheath 19.17 Thermal stability test for PVC insulation 19.18 Determination of hardness of HEPR insulation 19.19 Determination of the elastic modulus of HEPR insulation 20 Electrical tests after installation	Rated voltages : 6 kV ~ 30 kV
KS C IEC 60811-1-1 :2002	Common test methods for insulating and sheathing materials of electric cables and optical cables Part 1-1 : Methods for general application - Measurement of thickness and overall dimensions, Tests for determining the mechanical properties	0.001 ㎜
KS C IEC 60811-1-2 :2002	Common test methods for insulating and sheathing materials of electric and optical cables - Part 1-2 : Methods for general application - Thermal ageing methods 8.1 Ageing in an air oven	Max. 300 ℃
KS C IEC60811-1-3 :2002	Common test methods for insulating and sheathing materials of electric and optical cables - Part 1-3 : General application - Methods for determining the density - Water absorption tests - Shrinkage test 9.1 Electrical test 10 Shrinkage test for insulation 11 Shrinkage test for PE sheaths	A.C. 4 kV D.C. 2.5 kV 0.5 ㎜ ~ 1 ㎜
KS C IEC60811-1-4 :2002	Common test methods for insulating and sheathing materials of electric and optical cables - Part 1-4 : Methods for general application - Test at low temperature	Elongation test at low temperature : 0.1 ㎜

KS C IEC60811-2-1 :2006	Common test methods for insulating and sheathing materials of electric and optical cables - Part 2-1 : Methods specific to elastomeric compounds - Ozone resistance, hot set and mineral oil immersion tests 9 Hot set test	0.01 ㎜
KS C IEC60811-3-1 :2002	Common test methods for insulating and sheathing materials of electric and optical cables - Part 3-1 : Methods specific to PVC compounds - Pressure test at high temperature, Tests for resistance to cracking	0.01 ㎜
KS C IEC60811-3-2 :2002	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 3-2 : Methods specific to PVC compounds - Loss of mass test - Thermal stability test 8 Loss of mass test for insulations and sheaths	(0.01×10^{-3}) kg
KS C IEC60811-4-1 :2006	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 4-1 : Methods specific to polyethylene and polypropylene compounds - Resistance to environmental stress cracking - Measurement of the melt flow index - Carbon black and/or mineral filler content measurement in polyethylene by direct combustion - Measurement of carbon black content by thermogravimetric analysis (TGA) - Assessment of carbon black dispersion in polyethylene using a microscope 11 Carbon black and/or mineral filler content measurement in polyethylene - Direct combustion method	(0.1×10^{-6}) kg
KS C IEC 60840 :2006	Power cables with extruded insulation and their accessories for rated voltages above 30 kV (U_m = 36 kV) up to 150 kV (U_m = 170 kV) - Test methods and requirements (Exception) 10.11 Measurement of density of HDPE insulation 12.4.9 Ozone resistance test for EPR and HEPR insulations 12.4.11 Measurement of density of HDPE insulation 12.4.15 Determination of hardness of HEPR insulation 12.4.16 Determination of the elastic modulus of HEPR insulation 15 Electrical tests after installation	Rated voltages : 30 kV ~ 150 kV
KS C IEC 60885-3 :2003	Electrical test methods for electric cables - Part 3 : Test methods for partial discharge measurements on lengths of extruded power cable	Sensitivity (cable) : 10 pC or better Sensitivity (accessories) : 5 pC or better

The end.