

Create the Future with Trust

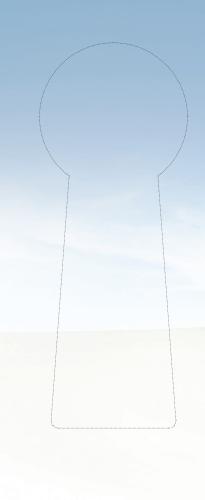
Global testing and certification organization to realize the dreams of customers





Contents

President Message	04
Business of KTC	06
Highlights of KTC	80
Gate to GROWTH	
Safety Certification	11
Reliability Assessment &	
Certification	12
Quality Certification /	
Testing and Assessment	13
Gate to INNOVATION	
Motors	15
Measuring Instruments /	
Thermal Fluids	16
Heavy Electric Equipment	17
Gate to FUTURE	
Medical Devices	19
Lighting Devices /	
Convergent Products	20
EMC/RF	21
Gate to CREATION	
New and Renewable Energy	23
Chemical Products,	
Environment	24
Overseas Certification	25
Global Network & Local Body	26



At KTC, customer satisfaction is at the heart of everything.

KTC brings growth and prosperity through testing and certification,

and contributes to creating a safer, more convenient and happier world.

A trustworthy partner for customers, that is KTC's ultimate goal.



KTC will open the door to growth, innovation, future and creation to enhance customers' global competitiveness.

For over 40 years since its establishment, KTC has grown along with Korea's industrial development, providing testing and certification services for machinery, electric and electronic devices, new and renewable energy equipment, chemicals and medical equipment.

The testing and certification industry is a knowledge-based service industry that requires the highest level of credibility and strong commitment to customer service. The rapid change in the global and domestic economic environment and the globalization of testing and certification services are demanding new changes. Therefore, KTC will develop a new growth driver based on ethics and science.

In particular, we will create value by maximizing potential through 'strategic, continuous, learning-based and across-the-board innovation', and become a testing and certification body providing the best service and information to customers. KTC, a trusted partner for customers, will open the door to growth, innovation, future and creation to strengthen our customers' global competitiveness.

President, Korea Testing Certification

KTC's Business Areas

For over 40 years since its establishment, KTC has grown along with Korea's industrial development, providing testing and certification services for machinery, electric and electronic appliances, new and renewable energy, chemicals and medical equipment.

By establishing the best infrastructure with around 500 experts in various fields and more than 3,700 testing equipment, KTC is devoted to strengthening the competitiveness of Korean companies.



Global strategy planning

Future business strategy

1970

Korea Electric Testing Institute established

970 1994

Acquired IECEE NCB/ Acquired accreditation internationally certified testing body (KOLAS)

CBTL accreditation

as internationally certified product certification body (KAS)

Korea Testing Certification established

1969

Meter and Petrochemical Testing and Research Institute established

ter and Designated as standardization capacity evaluation agency (Commenced KS evaluation)

as internationally certified testing body **(KOLAS)**

Independent Laboratory certification



Machinery measurement

- Measurement assessment
- Measuring instrument verification
- Machinery technology assessment

- Signed MoU with UL Japan
- Designated as product safety certification body by Korea Agency for Technology and Standards
- Signed MoU with QPS (Canada)
- Signed MoU with MET (U.S.)



Electrics and electronics industry

- Electric device safety assessment
- Electronic device safety assessment
- Functional assessment
- Component assessment



Energy industry

- Reliability assessment
- Lighting device safety assessment
- Optic technology assessment
- New and renewable energy assessment
- Rotating device assessment



ICTC



Certification industry

- Certification management
- Quality certification
- Overseas certification
- GMP evaluation



 Designated as testing and inspection body for environmentally hazardous substances (National Institute of Environmental Research)



IT industry

- Radio wave assessment
- Communication technology assessment
- Information technology assessment



- Designated as functional testing body for new and renewable energy equipment
- Signed MoU with Seoul National University of Science and Technology
- Designated as certification agency for electric and electronic components



2011

- Joint R&D business (Korea Specialty Chemical Industry Association)
- Testing, research and mutual cooperation (Korea Metal Tank Industry Cooperative)

Environmental and medical industry

- Medical devices
- Medical supplies
- Medical technology
- Chemicals and metals inspection
- Construction facilities



Regional support groups

- Heavy electric equipment business
- Chungcheong Province support group
- North Gyeongsang Province support group
- South Gyeongsang Province support group
- Honam support group



4 The best certification service for motors

KTC provides the best testing and certification services for motors, actively engages in R&D activities for motors and power generators and supports seminars and education sessions.

5 The highest market share in Korea's safety certification market

KTC leads the safety certification market for electric products with the highest market share in 12 product segments such as electric devices, electronic office equipment and lighting devices.

6 Korea's only type approval and inspection authority in the metrology area

As Korea's only type approval and inspection authority in the metrology area, KTC actively performs type approval and inspection of meters such as volumetric meters, mass meters and electric meters.

Testing body specializing in new and renewable energy

KTC was designated as a new and renewable energy testing body by the Korea Agency for Technology and Standards and the







Korea Energy Management Corporation and performs functional inspection of new and renewable energy devices such as solar inverters and modules, secondary cells and motors.

8 AMCA Seal certification for fans

KTC possesses functional test equipment for fans, which conform to international standards and have the world's highest capacity. KTC also has a mutual recognition agreement with the Air Movement and Control Association International (AMCA International).

Testing and inspection body on the widest range of medical devices in Korea

KTC is the designated testing and inspection body for 25 types of medical devices including in vitro diagnostic devices. Also, as a KOLAS testing body recognized for its electric and mechanical safety in the area of medical devices, KTC performs testing of medical devices and reviews technical documents.

10 Great accessibility from anywhere in Korea

KTC offers the highest accessibility to customers. In addition to its headquarters in Gunpo, it provides regional support and has the best business environment.











A safer and healthier society based on trust

By performing safety certification on products and electric devices used in everyday life, KTC ensures product safety for consumer protection and contributes to enhancing product quality. In particular, KTC owns the widest range of international standard-compliant safety equipment in the area of electrics and electronics in Korea, and provides fast and reliable testing and certification services using these equipment.

□ Safety certification, safety verification and supplier conformity confirmation for electrical products

 Cable and power cord, switch for electric devices, capacitor and noise filter, accessories and connecting parts for electric equipment, parts for protection of electric products, insulation transformer, electric devices, electrical motors, audio and video applications, IT and office equipment, lighting equipment, electric products connected to a DC power device or an electric charger, etc.





□ Safety certification, voluntary safety compliance and safety labeling of products

- Safety certification: Pressure cookers for home use, water play equipment, children's play equipment
- **Voluntary safety compliance verification**: Anti-freeze, household chemicals, adhesives, automobile brake fluid, tricycles for children, bicycles, toys, batteries, hot packs, etc.
- Supplier conformity confirmation: Flexible polyvinyl chloride hoses, children's accessories, motor boats, walking canes, leather products, textile products for home use, etc.









Safety inspection of rides and playground equipment for children

To create a safe and healthy play environment for children, KTC performs safety inspection, installation inspection and safety evaluation for 15 types of children's rides and playground equipment. Also, as Korea's only safety inspection authority on children's amusement rides and equipment, KTC is committed to establishing a safe play environment for children by providing fast and accurate safety tests.



□ Playground equipment subject to safety and installation inspection

- Swings, slides, suspended rides, rotating rides, swinging rides, space nets, jungle gym, combination playground equipment
- Climbing equipment: Chin-up bars, parallel bars, rock climbing walls, etc.
- Crossing equipment: Monkey bars, balancing beams, etc.



☐ Amusement rides and equipment subject to safety inspection

- Driven rides: Monorails, trains, mini sports cars, etc.
- Fixed rides: Swing rides, pirate ships, 360 degrees rotating rides, etc.
- Theater-type rides : Adventure theater, fairy tale theater, etc.
- Activity facilities: Maze, wave pool, water play facilities, etc.



Reliability Assessment & Certification



Corporate support from reliability assessment to fire safety

KTC is a reliability assessment body for electronic products and provides professional services to enhance product durability and reliability. Its services include assessment of electric and electronic parts and products' failure modes, nondestructive testing and testing of life span and failure rate.



□ Major reliability assessment services

- **Reliability assessment criteria**: Support for setting core technology and parts' reliability assessment standard
- **Reliability certification**: Certification through assessment based on reliability assessment standards
- Fire and electric shock testing of home appliances: Support for testing of failures (fire, etc.) due to product aging and setting safety guidelines.
- **Commissioned services**: Provision of reliability assessment services commissioned by the public and private sectors to enhance reliability.





Quality assurance based on ethical and scientific reliability

KTC's product certification system secures consumer trust and supports the standardization of newly launched products and enhancement of product quality through conformity assessments on products launched in the market. In particular, KTC provides the most optimal services to customers through various quality certifications such as the TC Mark Certification, Q Mark Certification, KS Certification and V Check Certification.



Major quality certification services

- TC Mark Certification: 3rd-party conformity assessment
- Q Mark Certification : Support for product quality enhancement
- KS Certification : KS certification review and product review
- V Check Certification : Electrical safety and reliability of type approved products
- EMF Certification : Electromagnetic field environment certification

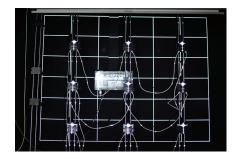






The best testing environment using high technology and knowledge

KTC has established a testing and assessment service system that covers a wide range of industries such as machinery, metals, electrics and electronics, lighting devices, chemicals, environment, construction and shipbuilding. In addition, KTC can also provide various functional testing on software and software product reliability tests as requested by the manufacturer.



□ Major testing and assessment services

- **Functional testing**: General testing and functional testing, casino equipment testing, administrative network conformity testing, etc.
- **Environment**: Eco-friendly product testing, IPX rating, vibration, temperature and noise testing and assessment, etc.
- **Energy efficiency**: Energy efficiency rating testing, high efficiency equipment testing, standby power testing, etc.
- **General machinery and parts assessment**: Assessment of machinery components, part components, pipe materials, PM, etc.



Gate to **INNOVATION**

Innovation opens the door to becoming a leader in the era of infinite competition. KTC is continuously innovating to provide fast and convenient testing and certification services to customers. Through its specialized technical capacity, KTC is expanding its business domain and creating value for customers. KTC will offer great opportunities for innovation through the best testing and certification services in Korea.





The best testing and certification and R&D infrastructure in Korea

From the design and development of motors to functional assessment and reliability certification, KTC is a testing and research body specializing in motors. AT KTC, M.A. and Ph.D holders perform design and development activities and certified testing personnel provide comprehensive solutions from technical development to testing and certification. In particular, at its motor testing facility, KTC has expanded its equipment and functional assessment system for small to large motors and power generators to strengthen its capacity for international mutual recognition agreements (MRA).

☐ Major services in the area of motors / power generators

- Development and functional testing of high-power motors and controllers for EV/HEV
- Functional testing of motors for electric and electronic devices (ISG, EPS, Compressor, CWT, CWL, Pump, etc.)
- Development, functional testing and safety testing of motors for pumps and fans
- Development and functional testing of wind powered-generators and water-powered generators
- Functional testing of AC and DC motors
- Development and functional testing of special motors (SRM, IPM, SPM, Axial Gap Motor, etc.)
- Testing of three-phase induction motors for high-efficiency, premium and super premium energy efficiency rating certification
- Development, functional assessment and certification testing of motors and controllers for electric bicycles, electric motorcycles
- Certification testing for high energy efficiency of single-phase induction motors
- Functional assessment testing of motors for large-scale transportation devices (large green cars, green ships, railway vehicles)
- Functional assessment testing for ultra high-speed motors for dental devices, super chargers and spindles (100 000 r/min)
- Measurement testing of permanent magnet-type motor cogging torques (15 mNm ~ 15 Nm)







Measuring Instruments



Type approval and verification body for legal measuring instruments

As a type approval and verification body for legal measuring instruments, KTC contributes to fair commerce by supporting product quality enhancement and new product development. In addition, by operating an issuance system for certifications under the OIML Mutual Acceptance Arrangement (OIML-MAA), KTC helps Korean companies acquire overseas certifications and expand their presence in overseas markets.



☐ Testing and inspection of measuring instruments

- Type approval and verification of 12 types of legal measuring instruments: Non-automatic weighing instruments, weights, water (hot water) meter, heat meters, gas meters, electricity meters, fuel dispensers, etc.
- Functional testing of measuring instruments : Water meters, heat meters, electricity meters, gas meters, etc.
- **Reliability testing of meters** : Electricity meters, gas meters, water meters, etc.





Testing and certification services using the best testing facility

As Korea's only KOLAS testing body with Korea's best pump testing facility, KTC performs testing on fan function and noise based on the world's best testing capacity. KTC uses state-of-the-art equipment to enhance corporate technology and product quality, and also engages in standardization activities including participation in the ISO/TC 117.



Fluid machinery and freezing and air conditioning machinery assessment

- Assessment of fans and fan noise: KS B 6311, AMCA standard 210, etc.
- Dampers and louvers for air conditioning: AMCA standard 500 L/D, etc.
- Air controller and heat exchanger : AHRI 410, 430
- Cooling tower testing: Korean Association of Air Conditioning Refrigerating and Sanitary Engineers certification testing
- Multi air conditioner and air conditioner testing: KS C 9306, KS B ISO 15042, etc.
- Pump testing: Efficiency testing such as KS B 6301

Heavy Electric Equipment



High-standard testing and certification technology and state-of-the-art facilities

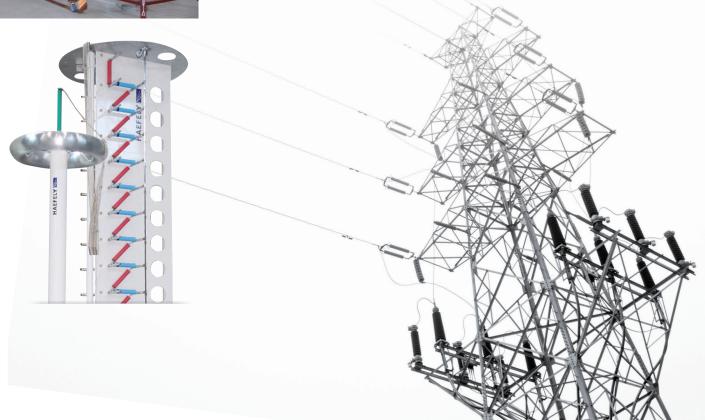
KTC is Korea's only testing and certification body for heavy electric equipment. With its state-of-the-art testing equipment including high-reliability short circuit breaking testing facility (52 MVA), high-capacity SPD testing facility and 22.9 kV high-voltage cable testing facility, KTC supports heavy electric equipment testing and also contributes to Korean manufacturers' competitiveness.



☐ Testing equipment for high-reliability heavy electric equipment

- Short circuit breaking testing equipment : 52 MVA:52 MVA (480/240 V : 50 kA, 120 V : 25 kA)
- On/off testing equipment :110/220/380/460/600 V, Max. 750 A
- Overload testing equipment (Max. 2 000 A)
- Leakage pulsed direct current testing equipment, tripping characteristic testing equipment, instant trip testing equipment (Max. 15 000 A)
- Surge Generator : 8/20 μs (Max. 200 kA), 10/350 μs (Max. 100 kA)
- Transformer efficiency measurement testing











Safety assessment of medical devices and equipment

KTC performs testing and inspection on the safety and functions of medical devices. Also, to diversify its testing services, KTC is expanding testing and inspection required for overseas certification such as CE Marking for medical device exporters. In addition, KTC provides customized testing and inspection for companies such as used medical device inspection and manufacturer-commissioned testing.

Medical device assessment

- Medical device testing and inspection for marketing authorization: Testing and inspection in accordance with the Medical Device Act and the Regulations for Approval, Notification, and Review of Medical Devices
- Testing and inspection of used medical devices: Testing and inspection of manufactured and imported used medical devices based on the Medical Device Act
- **Commissioned testing and inspection**: Commissioned testing and inspection for quality management of medical device manufacturers and importers
- KS testing for electrically powered beds and manual adjustable beds for the elderly





☐ Medical supplies assessment

- Testing and inspection for reviewing technical documents on medical devices
- Testing and inspection on marketing authorization of medical devices (manufactured, imported)
- · Commissioned testing for manufacturers and importers' voluntary quality control
- Biological safety testing of medical devices
- Safety testing: Expiration date setting, sterilization validation testing, etc.
- Environmental monitoring: Measurement of suspended particles, aerial falling germs, floating germs, surface germs, etc.
- Technical support and research for development of medical device products

□ GMP evaluation

- GMP evaluation and issuance of GMP certification based on the guidelines on the manufacture and quality control of medical devices
- GMP evaluation for all medical devices : Initial evaluation, periodic renewal evaluation, change evaluation

☐ Medical technology

- Review of technical documents for medical devices: Review of technical documents on products designated by the Minister of Food and Drug Safety among those listed as grade 2 medical devices in the attached table of the Regulations for Product Classification of Medical Device and Class by Product
- Review of change in technical documents on medical devices: Evaluation of change in review result reports such as technical documents on medical devices, and evaluation of change in technical documents on products that acquired marketing authorization







Promoting quality improvement of lighting device products

KTC performs safety certification, KS certification and overseas certification for lighting devices. We provide high-efficiency testing on LED lighting devices using mirror-type goniophotometer and type A goniophotometer, provide up-to-date information on overseas certification such as CB, CE and Energy Star to companies and support the overseas certification of domestic lighting device products.



Certification and testing of lighting devices

- Products subject to compulsory certification and safety certification: Lamp holders, general lighting devices, lamp controllers, self-ballasted lamps
- **Products subject to safety certification**: Starters for fluorescent lamps, lighting devices, discharge lamps, other lighting devices, etc.
- Overseas certification testing : CB, CE Marking
- KS certification testing
- High energy efficiency equipment certification
- · Efficiency management equipment testing
- Public Procurement Service-commissioned testing



Convergent Products



Establishing an infrastructure for core ICT convergent products

As Korea's only credit card reader security testing body, KTC has many experts in this field and is leading the development of IC card security testing technology. To evaluate the security of convergent products, KTC provides consulting on security testing of financial IC cards in addition to testing and certification services, and offers consultation services for security evaluation of information security products.



□ Security evaluation of major convergent products

- Korea's only credit card reader security testing body
- Received Korea Institute of Information Security and Cryptology's award the best paper.
- Exhibited testing equipment for smart card security vulnerability at international conference
- Designated as security evaluation body for EAL5 high-level information security products
- Designation as IoT (M2M) standard conformity testing body pursued
- Designation as international testing body for EMVCo security pursued





Electromagnetic compatibility (EMC) testing and certification body

KTC performs domestic and overseas testing and certification on the electromagnetic compatibility of electric and electronic devices, lighting devices, lifts, medical devices, etc. Also, KTC operates an internationally certified electromagnetic testing center registered at the IECEE CB scheme and ILAC.



☐ Testing and certification of electromagnetic compatibility

- Conformity assessment on the National Radio Research Agency's broadcasting and telecommunication equipment (Registration).
- Testing of the Ministry of Food and Drug Safety's medical devices
- Electromagnetic wave testing of lifts
- KS and other commissioned tests
- Overseas testing and certification (CB, CE, U.S. FCC and Vietnam's MRA, etc.)
- Electromagnetic wave testing on toys







Internationally certified Radio Frequency (RF) testing and certification body

KTC performs domestic and overseas testing and certification of devices using all Radio Frequency (RF) methods including LTE, WCDMA, wireless LAN and Bluetooth, and also operates an internationally certified wireless telecommunication testing center registered at the National Radio Research Agency and KOLAS.



□ Wireless telecommunication (RF & SAR) testing and certification

- Conformity assessment (conformity certification) on National Radio Research Agency's broadcasting and telecommunication equipment
- Testing and functional assessment of all wireless telecommunication devices including Bluetooth speakers, headsets, tablet PCs, mobile phones and toys.
- Overseas testing and certification (CB, CE, U.S. FCC, Vietnam's MRA, Japan's TELEC certification, etc.)
- Domestic and overseas certification of wireless telecom device functions and specific absorption rate (SAR)







Established solar power generation system testing infrastructure

The demand for testing and certification to supply high quality solar power generation equipment is on the rise, and KTC is acting fast to meet corporate demand for testing and certification of new and renewable energy equipment. In particular, KTC has established high quality infrastructure on testing and assessment of PV inverters, a core equipment that links a solar energy generation system to the electricity grid.

□ Solar inverter testing equipment

- KTC has the optimal testing equipment for assessment of high-capacity grid connected solar inverters and independent solar converters
- AC Simulator : EMV D60000 / PAS
- Photovoltaic Simulator: PVS 200000
- Analyzer Reference System: ARS 16/3, AIP 75/3/P/K
- KTC has the optimal testing equipment for assessment of low-capacity grid connected solar inverters, independent solar inverters and micro solar inverters.
- AC Simulator & Photovoltaic Simulator & Analyzer Reference System

□ Solar module testing equipment

- KTC has a wide variety of testing equipment for class AAA solar simulators and solar modules
- Pulse Type Solar simulator (Class AAA)
- Steady State Solar simulator (Class AAA)

□ Secondary batteries

- **Assessment**: Function and safety of lithium batteries (CB and self-regulatory safety confirmation, etc.)
- CB : IEC 62133 CBTL
- Safety certification: Self-regulatory safety confirmation of manufactured products (Annex 5, Part 1) Primary batteries, Self-regulatory safety confirmation of electric appliances Sealed-type secondary batteries, portable sealed-type secondary batteries
- Commissioned tests: IEC 61960, IEC 61951, IEC 62660, UL 1642







Chemical Products, Environment



Creating an environment safe from hazardous materials

KTC performs analysis of environmentally hazardous materials, environmental testing and functional testing of construction materials, testing and inspection of environmentally hazardous substances in establishments for children, environmental analysis of indoor air quality, analysis of marine pollution control chemicals, etc. As such, KTC analyses the hazardousness of various chemical products to perform material property and function testing for product quality enhancement and new product development.





☐ Testing and inspection of environmental chemicals

- Testing and inspection of environmentally hazardous substances in establishments for children
- Analysis of environmentally hazardous substances: Hazardous elements, volatile organic compounds, polycyclic aromatic hydrocarbons, bromine-based flame retardants, etc.
- Material property and function testing for construction materials: Concrete, aggregates, waterproof materials, asphalt, interior and exterior materials, etc.
- Measurement of indoor air quality: Volatile organic compounds, formaldehyde, toluene, asbestos, fine dust, etc.
- Testing of auto care product quality and function: Windshield washer fluid, antifreeze, etc.
- Restriction of Hazardous Substances Directive (RoHS) compliance testing and inspection: Lead, cadmium, mercury, hexavalent chrome, bromine-based flame retardants, etc.
- Product testing and inspection based on the Special Act on the Safety Management of Children's Products
- Testing and inspection of water works materials and products for compliance with sanitation and safety standards
- Water quality analysis testing
- Petroleum product testing
- Type approval and functional testing for marine pollution control chemicals
- · Cosmetics quality testing



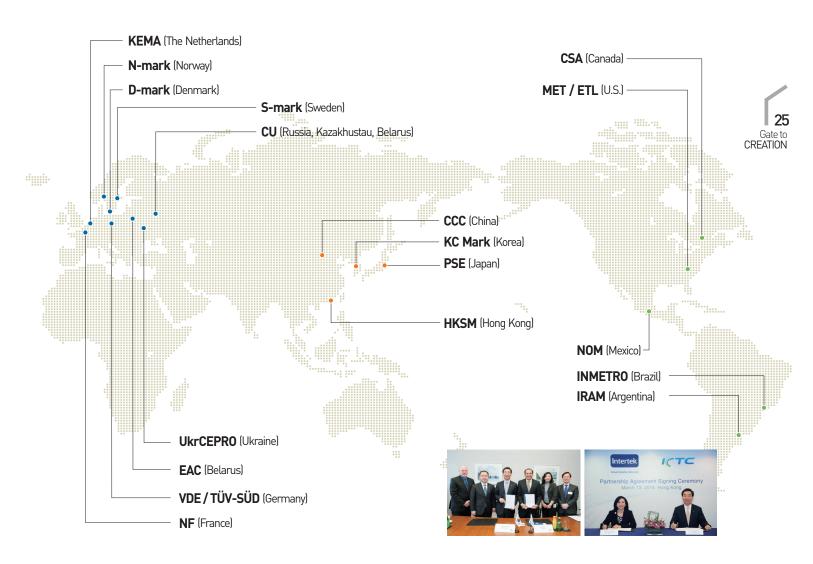




KTC, an overseas certification partner for Korean exporters

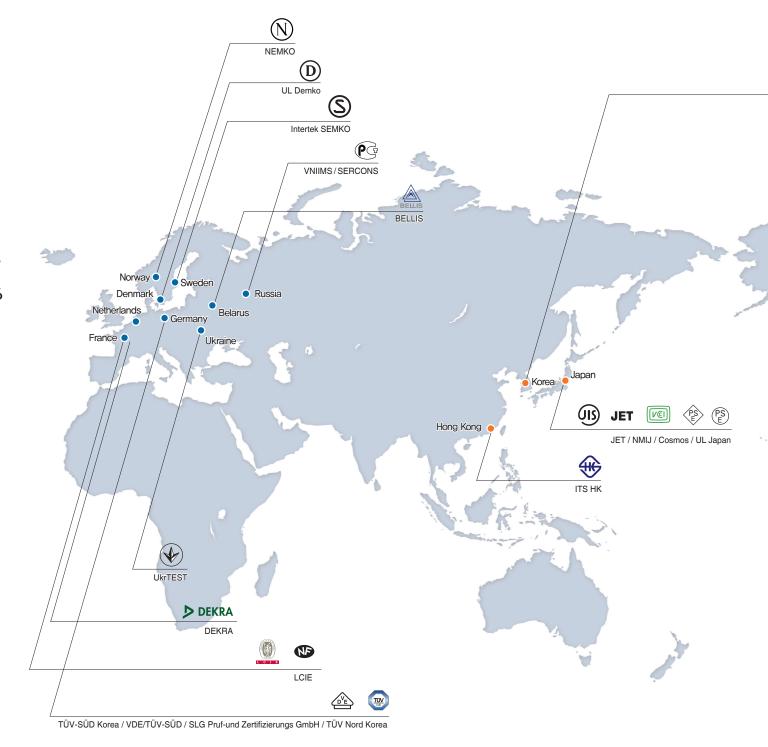
To enhance Korean exporters' competitiveness, KTC has established a database on the certifications required in major export destination countries, and provides support so that Korean exporters can acquire overseas certification fast and at a low cost. KTC has agreements with 30 bodies in 17 major export destinations around the world for mutual accreditation of KTC's testing certification reports to support the export of domestic companies.

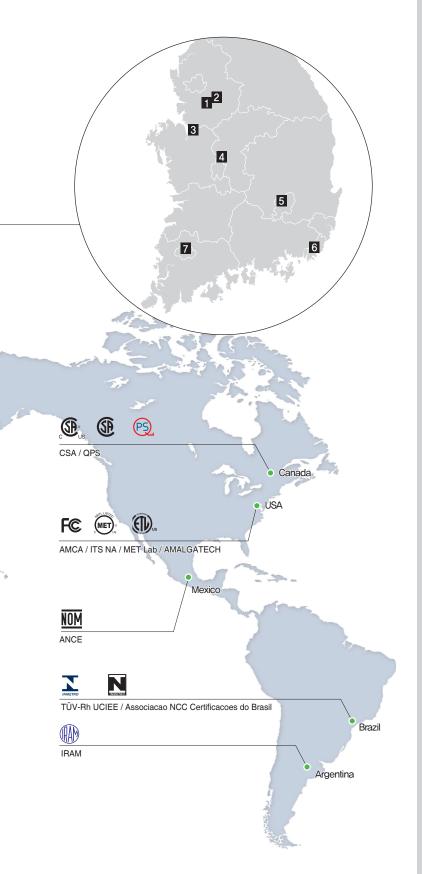
Acquisition of certification marks of major overseas certification bodies



KTC's Global Network

To support Korean companies' entry into the overseas market, KTC provides customized testing and certification services that are suitable for the products and characteristics of each market.





Local Body



1 Gunpo Office

22, Heungan-daero 27 beon-gil, Gunpo-si, Gyeonggi-do, Korea Tel : 82-1899-7654, Fax : 82-31-455-7307



2 Bundang Office

55, Gungnae-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea Tel : 82-31-785 -1203, Fax : 82-31-785 -1219



Machinery Test Center

82, Pyeongtaekhang-ro 156 beon-gil, Poseung-eup, Pyeongtaek-si, Gyeonggi-do, Korea Tel: 82-31-681-0541, Fax: 82-31-681-0549



4 Chungcheong Support Office/ Heavy Electric Test Center

57, Yangcheong 3-gil, Ochang-eup, Cheongwon-gu, Cheongju-si, North Chungcheong Province Tel: 82-43-216-6190, Fax: 82-43-216-6192



5 Gyeongbuk Support Office

1303 E&C Inno-Biz Tower, 559, Dalseo-daero, Dalseo-gu, Daegu, Korea Tel: 82-53-566-4605, Fax: 82-53-558-8129



6 Gyeongnam Support Office

457, Geumgok-daero, Buk-gu, Busan, Korea

Tel: 82-51-336-1566, Fax: 82-51-336-1567



Honam Support Office

B-605 Gwangju High-Tech Center, 313, Cheomdamgwagi-ro, Buk-gu, Gwangju, Korea Tel: 82-62-944-1094, Fax: 82-62-944-1095