International Institute of Reliability Assessment
Contents

Company Overview
Business and Service
Laboratory and Equipment
Company Overview
02. Signed tripartite MOU-joint venture among FRONTIS, SCH Univ., and CSZ
   Joint investment at test equipment of 50 billion won scale for 3 years

09. The second year, Setting up 2 types 3 test chambers

01. Got a certificate as KOLAS Qualified Institute
04. Setting up 5 type 8 test chambers
05. The third year, Setting up 4 types 5 test chambers
06. Executing a FSU (Functional Safety Consortium) MOU (KTL, KRRI, KATECH, Frontis, SureSoft)

02. Electric Vehicle sector testing Certification MOU (LG Chemical, Continental Automotive System, DT&C)
Name of Company

IIRA
Foundation: April 26th 2013

The number of Employees

Total 9 person
- Executives: 2 person
- Quality Officer: 1 person
- Technical Officer: 1 person
- Test Engineer: 4 person
- Finance/Administration: 1 person

CEO

Hyun-Suk, Chung
- Frontis CEO
- IIRA CEO
- KORAS (Korean Reliability Society) Vice-President
- American Society for Quality Reliability Engineer

Business Model

Accelerated Assessment Test/
Specialized Institute at Life Assessment
- Test Design
- Certification/Assessment
- R&D Support
Becomes a global testing organization!
Issued International Qualified Test Certificate through approved Korea Laboratory Accreditation Scheme (KOLAS: qualified office)

January 16th 2015
Got a certificate by KOLAS

ISO/IEC 17025 Quality Management System
Guaranteed quality through strict, systematic procedures based on a global standard: ISO/IEC 17025

Qualified standard on KOLAS
Qualified 7 fields: Electrical Test, Environmental and Reliability Area Standard

• KS R 9213 : 2007
• KS C IEC 60068-2-1 : 2010
• KS C IEC 60068-2-2 : 2014
• KS C IEC 60068-2-14 : 2014
• KS C IEC 60068-2-38 : 2014
• KS C IEC 60068-2-78 : 2002
• MIL-STD-810G : 31 October 2008
국제공인시험기관 인정서

[㈜] 국제신뢰성평가센터

인정번호: KO61
법인등록번호(또는 고유번호): 164811-0072376
사업장소개시: 충남도 아산시 신전면 수청항로 22(충남대학교 산학협력단 이103,이104,이204호)
최초인정일자: 2015년 1월 16일
인정유효기간: 2015년 1월 16일 ~ 2019년 1월 15일
인정분야 및 범위: 변형
발행일: 2017년 12월 21일


한국인정기준인증기관

한국인정기준인증기관은 국제시험기준협회(LAC)의 상호인증협정(MSA) 서명기관입니다.
Business and Service
As a specialized Institute of Accelerated Life Test and Life Prediction, we can test HW and product’s life prediction and design product warranties.

- Provide One-Stop Reliability Assessment Service from design production.

**Qualitative Accelerated Tests**
- HALT
- HASS/ HASA

**Quantitative Accelerated Tests**
- Reliability Prediction Analysis
- Reliability Conformity Assessment

**Certification Assessment**
- Simulate Environment
  - Climatic Condition
  - Mechanical Condition
  - Mechanical / Chemically Active Substances

**Specialized Institute of Accelerated Life Test and Life Prediction based on IEC62506**
- As a specialized Institute of Accelerated Life Test and Life Prediction, we can test HW and product’s life prediction and design product warranties.
- Provide One-Stop Reliability Assessment Service from design production.
Service Scope: Quantitative Accelerated Tests

**Standard Establishment**

- Build Process and Accelerated testing Standard Establishment of building design to guarantee trouble-free quality reliability in the life of the field.

**Life Prediction**

- Guarantee usage life prediction and lifetime warranty by product property and field condition in the field stage

**Test Design**

- Design the proper way to test for robust design before making a product having product property

**Reliability Prediction and WCA (Worst Case Analysis)**

- Analysis derating and reliability prediction based on BOM
- Analysis failure rate by stress range
Given stressed environment, test for detecting a factor which is causing the failure of the product or the way to test.

**What is HALT?**
Highly Accelerated Limit Test

**What is HASS?**
Highly Accelerated Stress Screening

Screening techniques for detecting faults in poor process before shipping or Control Errors.

**What is HASA?**
Highly Accelerated Stress Audit

Monitoring Tool for detecting products' potential defects (weakened) if target product of products on the production phase occurred in manufacturing process or not.
Service Scope (Industry Field) : Certification/Assessment

- Components, modules, early fault detection system and reliability by building generalized reliability environment test / building environment test assessment system
- Building test assessment system for a standard test in Electric / Electronic, military/defense, automotive/rail, etc.

Certification / Assessment

- Defense
- Communication Equipment
- Medical Device
- Automotive Electronics
- Home Appliances
- Aviation Sector
Laboratory and Equipment
Laboratory Status : Test Lab. #1 to #5

Temp & Hum / Power Temperature Cycle
- High or low temp test
- Temp & Hum test
- Power Temp Cycle test
- Frost test

HALT / Thermal Shock / Walk In Chamber / Immersion
- HALT / HASS / HASA
- Constant Temp & Hum
- Thermal Shock test
- Immersion test

Combined Vibration / Salt Spray
- Sine wave/Random Vibration
- Shock test
- Combined Vibration test
- Composite Corrosion test (Salt Spray)

Dust / Water Spray / Thermal Shock
- Dust/Sand
- Water Spray (IPX1,2,3,4, IPX9)
- Thermal shock test

Battery Cycler / Temp & Hum / Power Temperature Cycle / Combined Vibration
- Combined Vibration test
- Temp & Hum test
- Power Temp Cycle test
- Battery Cycle test

Test Laboratory Real-time Integration Monitoring System
**Test Equipment**

- **Mechanically, Chemically Active Condition**
  - **Vibration**: 3 ea
    1) M5044A - PA255 - LST1000M (5 ton)
    2) MPA403 / M124M (4 ton)
    3) M5044A - PA14 (1 ton)
  - **Agree Chamber**: 2 ea
    1) AVHS - 32 - 15-15 – SC / WC
    2) CVH - 32 - 6 - 6SC / WC

- **Mechanical Condition**: 3 ea
  - **Test Equipment**
    - HALT / HASS
      1) TC 2.5 : 1ea
      2) TC 4.0 : 1ea

- **Climatic Condition**: 3 ea
  - **Test Equipment**
    - Dust
      1) ST - 1000U 2 ea
    - Salt Spray
      1) CCX 3000 1 ea

- **Battery Cycling**: 1 ea
  - **Test Equipment**
    - **Battery Cycler**
      1) FTV - 300 - 100 : 2 ea

- **Highly Accelerated Limit Test (HALT)**
  - **Test Equipment**
    - Temperature & Humid Chamber
      1) ZPH - 32 Series : 3 ea
      2) ZPH - 16 Series : 3 ea
      3) ZPH - 8 Series / AC : 1 ea
      4) ZPH – 64 Series / AC : 1 ea
      5) Walk - in (WWTH504) : 1 ea
  - **Thermal Shock Chamber**
    1) VTS Series : 2 ea
    2) TS - 300 : 1 ea
  - **Water Spray**
    1) IPX 1,2,3,4, S1,S2 / R1,R2 : 1 ea
    2) IPX 9 K : 1 ea
  - **Water Immersion**
    1) IPX7K : 1 ea
Result Status

- By Industry
- By Equipment
**Market Share of industry**

- **Automotive Electronics**
  - 50%

- Defense
  - 10%

- Aviation Sector
  - 5%

- Other
  - 9%

- Home Appliances
  - 26%

**Top 5 of Main Trading - Market Share of corporate performance**

- Delphi Connection System (Automotive electronics)
- Hyundai - Mobis (Automotive electronics)
- Continental Automotive System (Automotive electronics)
- Hyundai / Kia Motors (Automotive)
- Humax (Home Appliance)
## Project Contents

<table>
<thead>
<tr>
<th>Project Performance</th>
<th>Period</th>
<th>Company’s name</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Verification for initial reliability predication, EMI simulation/ Apply the HALT Guideline to Car Black Box for Japan and verified its margin</td>
<td>2 years</td>
<td>Joutec</td>
</tr>
<tr>
<td>• For secure the reliability of electrical equipment, Set up the in-house HALT guideline and build the HALT process according to in-house guideline</td>
<td>1 year</td>
<td>Ssangyong Motors</td>
</tr>
<tr>
<td>• Develop a technology for Cooling &amp; Heating Car Sheet as localization by Frontis: Build the HALT process for Cooling &amp; Heating Car Sheet module</td>
<td>1 year</td>
<td>Daewon</td>
</tr>
<tr>
<td>• Build accelerated testing standard to verify the Quality and Reliability on life time of field about set-top box</td>
<td>1 year</td>
<td>Humax</td>
</tr>
<tr>
<td>• Verification of life warranty testing design, HALT standard establishment, and goods about wireless relay system</td>
<td>2 years</td>
<td>Solid</td>
</tr>
<tr>
<td>• Verification for HALT standard establishment and margin before and after comparison about control of household appliances for export and power module</td>
<td>2 years</td>
<td>Daewoo Electronics</td>
</tr>
<tr>
<td>• Set up HALT Standard, reliability prediction about broadband users’ network equipment core modules</td>
<td>1 year</td>
<td>Dasan Networks</td>
</tr>
<tr>
<td>• Verification for EMI simulation, HALT standard establishment and margin of products about optical medical devices for international</td>
<td>1 year</td>
<td>Huvits</td>
</tr>
<tr>
<td>• Life warranty testing design, progress and Life Prediction about using environmental condition of military navigation sensor module</td>
<td>6 months</td>
<td>Micro Infinity</td>
</tr>
<tr>
<td>• Reliability cause analysis of Marine controller and HW-SW integrated accelerated testing design (SW testing in progress)</td>
<td>4 years</td>
<td>HTF/Daewoo Shipbuild</td>
</tr>
<tr>
<td>• Published reliability guideline and various national reliability assessment standard establishment (performed Reliability Innovation Center, Kilt)</td>
<td>2 years</td>
<td>Samsung Electro-Mechanics</td>
</tr>
<tr>
<td>- Samsung Electro-Mechanics : Design improvement and process improvement through reliability analysis</td>
<td>2 years</td>
<td>LG Electronics</td>
</tr>
<tr>
<td>- Samsung Electro-Mechanics : material, structure improvement and process improvement through failure analysis of film capacitors</td>
<td>8 months</td>
<td>Suwon Univ.</td>
</tr>
<tr>
<td>- LG Electronics : build basic reliability of LED packages, modules, and products (Testing equipment, reliability methods, building analysis tool)</td>
<td>5 years</td>
<td></td>
</tr>
<tr>
<td>- RIC (Reliability Innovation Center) : participated in 52 types of reliability guideline establishment, developed 4 types among 52 types, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Test Lab Monitoring System and Management</td>
<td>1 year</td>
<td>Hyundai/Kia Motors</td>
</tr>
</tbody>
</table>

- Charge of Functional safety Consortium HW TEST
- Hyundai Accelerated Research Members (the first participation on private company)
- Signed MOU among LG Chemical, Audi, BMW, DT&C, etc.
Business Cooperation/MOU


LG chem. & Audi Automotive EV Battery Testing Assessment & Certification MOU Agreement

Continental Automotive System Assessment Certification MOU Agreement
Laboratory

360 ° image

1. https://youtu.be/JEW8ym0AoQ
4. https://youtu.be/3TBupQJRtt4c
Direction to Entrepreneurship Building at SCH Univ.

Map of Korea

- **Driving Directions from Seoul**
  Take free way 1 (south bound) and exit the free way from Cheonan toll gate, and follow the signs leading to Asan and Soochunhyang University.
  
  Take free way 15 (south bound) and exit the free way from West Pyeongtaek tollgate (28) and follow the signs leading to Asan and Soochunhyang University.

- **Public Transportations from Seoul**
  Take the inter-city bus to Asan at any major inter-city bus terminal in Seoul and then transfer to a local bus to Soochunhyang University.
  
  Or take the KTX to Cheonan-Asan station and take the campus shuttle at the station to Soochunhyang University. (Campus shuttle bus is in service only during semester time.)

- **Subway**
  Take the line number 1 subway. Get off the subway at Soochunhyang University station (Shinchang station). It takes 140 min from Seoul station, 80 min from Suwon station, 20 min from Cheonan station to Soochunhyang University station.
  
  Once you arrive at Soochunhyang University station, you can either walk or use free school shuttle buses to SCH.
We will be a partner in the best client’s perspective, overcome and growth together