AGRO Test Laboratory.

Your centre of excellence for testing.

The test laboratory of your reliable and competent partner.

AGRO
Member of KAISER GROUP

AGRO AG – The test laboratory of your reliable and competent partner

For 70 years now, AGRO has been developing and manufacturing **high-quality cable entry and cable installation products and systems** at its Hunzenschwil headquarters in Switzerland, for the mechanical engineering industry, for plant and equipment construction and for professional electrical installation work in buildings of all kinds.

Since the invention of the modern cable gland in the 1950s by AGRO's founder, Alfred Grossauer, the company has further developed and perfected its know-how and capabilities in this area. A team of over one hundred dedicated employees works to supply our customers with state-of-the-art products that comply with all applicable standards. In our own certified testing laboratory, we make sure that the products you receive from us are reliably of top quality. We also offer testing and product evaluations for your own specific applications, and testing of customised products. Whether relating to a particular product or the use of a special cable – our laboratory can undertake the appropriate testing in accordance with relevant standards or your own specific requirements.

AGRO has been part of the KAISER group of companies since 2002, enabling our customers to benefit from the resulting synergies – both nationally and internationally. The **KAISER, AGRO, HELIA and ATTEMA brands** consistently offer you installation solutions that meet the needs of the market, supporting you in your daily work. Our test laboratory is the main point of contact for product qualifications and testing for the entire KAISER GROUP, and carries out evaluation, testing and certification of a wide range of products from across the group.

The test laboratory fulfils the relevant requirements of IECEE OD-2048 and OD ECS 035 / OD ECS 037 relating to the acceptance of test reports in the CTF/MTL procedure. Our laboratory complies with the applicable requirements of ISO/IEC 17025:2017 (General Requirements for the Competence of Testing and Calibration Laboratories). AGRO AG's test laboratory has the necessary knowledge of the appropriate standards, enabling it to test products quickly and reliably.

Website

Group of companies

Video

Certifications

In-house certifications

Further certifications

CTF-certified test laboratory in accordance with IECEE OD-2048 and OD ECS 035 / OD ECS 037 for the acceptance of test reports in the CTF (Customer Testing Facility) procedure. The laboratory complies with the applicable requirements of ISO/IEC 17025:2017.

Certified laboratory within the framework of the TDAP (Test Data Acceptance Program) for the test methods and standards listed in the TDAP scope.

We offer

- Testing in accordance with general test standards or individual client specifications
- Planning, organisation and carrying out of the tests
- Performance testing of your specific cable in combination with our cable gland

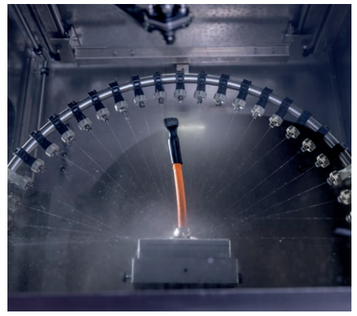
Our laboratory is equipped for the following types of testing:

- Water tests:
  - Water pressure resistance
  - Resistance to splash water and water jets
- Temperature and climate tests
- Material tests
- Tensile strength
- Glow wire resistance
- Lateral pressure
- Flexural fatigue strength
- Impact tests
- Dust tests
- Media resistance tests:
  - Oil Spray Test
- Electrical and EMC tests
- Corrosion tests

Standards typically applied In the course of our work:

- IEC/EN 62444
- IEC/EN 60670-1
- IEC/EN 60670-21
- IEC/EN 60670-22
- EN 50085-1
- EN 50085-2-1
- IEC/EN 60079-0
- IEC/EN 60079-1
- IEC/EN 60079-7
- IEC/EN 60079-31
- UL 514B

Water tests



IPX3 and IPX4 – Splash water with swivel tube

Performance data:

- IPX3 – Splash water at an angle of up to 60°
- IPX4 – Splash water from any direction
- Water flow rate: 0.6 – 1.75 l/min
- Water pressure: ~0.8 – 1.2 bar

IPX5 and IPX6 – Water jet

Performance data IPX5:

- Water jets from 2.5 m – 3 m
- Nozzle: 6.3 mm diameter
- Water flow rate: 12.5 l/min
- Water pressure: ~0.5 bar

Performance data IPX6:

- Water jets from 2.5 m – 3 m
- Nozzle: 12.5 mm diameter
- Water flow rate: 100 l/min
- Water pressure: ~1.2 bar

IPX7 and IPX8 – Submersion

Performance data:

- E.g., water pressure > 0.1 bar (submersion 1 m)
- Duration: > 30 min
- Water pressure of up to 100 bar possible

IPX9/IPX9K – High-pressure, high-temperature water

Performance data:

- Water flow rate: 15 l/min
- Water pressure: ~90 bar
- Spray angles: 0°, 30°, 60°, 90°
- Water temperature: 80°C
- Rotary table (5 rpm)

Typical standards / test procedures

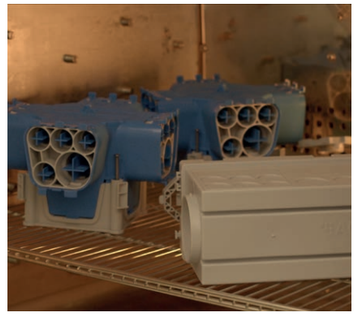
- IEC/EN 60529
- UL 50E
- ISO 20653
- NEMA 250

Temperature and climate tests

Climate cabinet

Performance data:
- Volume: 256 l
- Temperature range: -42°C to +190°C
- Temperature adjustment rate: Up to 10 K/min
- Setting accuracy at up to 99.9°C: 0.1°C; At 100°C and above: 0.5°C
- Humidity range: 10 % to 98 % RH
- Control of test specimens possible via a pipe feed-through

Dimensions of test chamber:
- 640 x 600 x 670 mm (W x D x H)



High-temperature testing

Performance data:
- Chamber volume: Approx. 110 l
- Temperature range: 10°C above room temperature up to +300°C
- Setting accuracy at up to 99.9°C: 0.1°C; at 100°C and above: 0.5°C
- Maximum mass of test specimen: 175 kg

Dimensions of test chamber:
- 560 x 400 x 480 mm (W x D x H)

Low-temperature testing

Performance data:
- Chamber volume: 35 l
- Temperature range: Down to -85°C
- Setting accuracy: +/- 1°C

Dimensions of test chamber:
- 425 x 300 x 280 mm (W x D x H)

Environmental testing in accordance with IEC/EN 60068
- Low temperatures, dry heat, temperature variations, damp heat, cyclic testing, preconditioning and accelerated ageing of specimens

Typical standards / test procedures
- IEC/EN 60068-2-1
- IEC/EN 60068-2-2
- IEC/EN 60068-2-14
- IEC/EN 60068-2-30
- IEC/EN 60068-2-38
- IEC/EN 60068-2-67
- IEC/EN 60068-2-78

Dust and corrosion tests

Dust chamber

Performance data:

- Volume of chamber: Approx. 900 l
- Base area: 950 x 950 mm (W x D)
- Maximum mass of test specimen: 50 kg
- With talcum dust in accordance with DIN EN 60529

Typical standards / test procedure

DIN EN 60529 for the following protection classes:

- IP5X (Dust-protected – Dust chamber without negative pressure)
- IP6X (Dust-tight – Dust chamber with negative pressure, max. 20 mbar)

Further tests in accordance with DIN EN 60529

- IP1X – IP4X: Protection against solid foreign objects

Corrosion test chamber / Salt spray testin

Performance data:

- Volume: Approx. 500 l
- Temperature range: Up to 55°C
- Temperature accuracy: 0.5 K
- Maximum mass of test specimen: 300 kg
- Chamber heating and air humidification

Dimensions of test chamber:

- 1100 x 670 x 760 mm (W x D x H)

Condensation test chamber / Corrosive gas testing

Performance data:

- Volume: Approx. 415 l
- Temperature range: Up to 55°C
- Temperature accuracy: 0.5 K
- Floor water-filling function, floor flushing system and automatic gas dosing

Dimensions of test chamber:

- 850 x 600 x 760 mm (W x D x H)

Typical standards / test procedures

- DIN EN ISO 9227
- DIN EN 60068-2-11
- ISO 6270-2
- ISO 6988
- ISO 2249
- NEMA 250
- UL 50E

Tensile and compression testing:

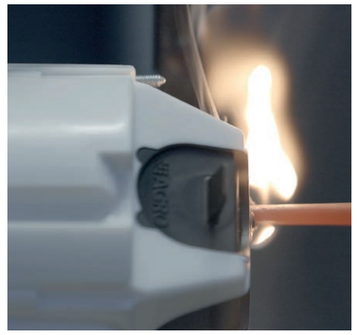
Performance data:

- Test force in tension/compression: 2.5 kN
- Crosshead height: 235 to 1065 mm
- Crosshead speed: 0.1 to 1000 mm/min
- Depth: 105 mm
- Width: No limitations

Impact testing and mechanical stress testing

Performance data:

- **Vertical impact:** Weights 0.2 kg, 1 kg, 2 kg at a height of up to 1 m
  Impact energy from 0.2 to 20 joules
- **Pendulum hammer:** Weight 250 g
  Effective pendulum length: 1 m
  Impact energy: 0.14 to 1.0 joules
- **Vertical impact in accordance with EN 62262:** IK8 - IK10
  Weights 1.7 to 5 kg
  Impact energy: 5 to 20 joules



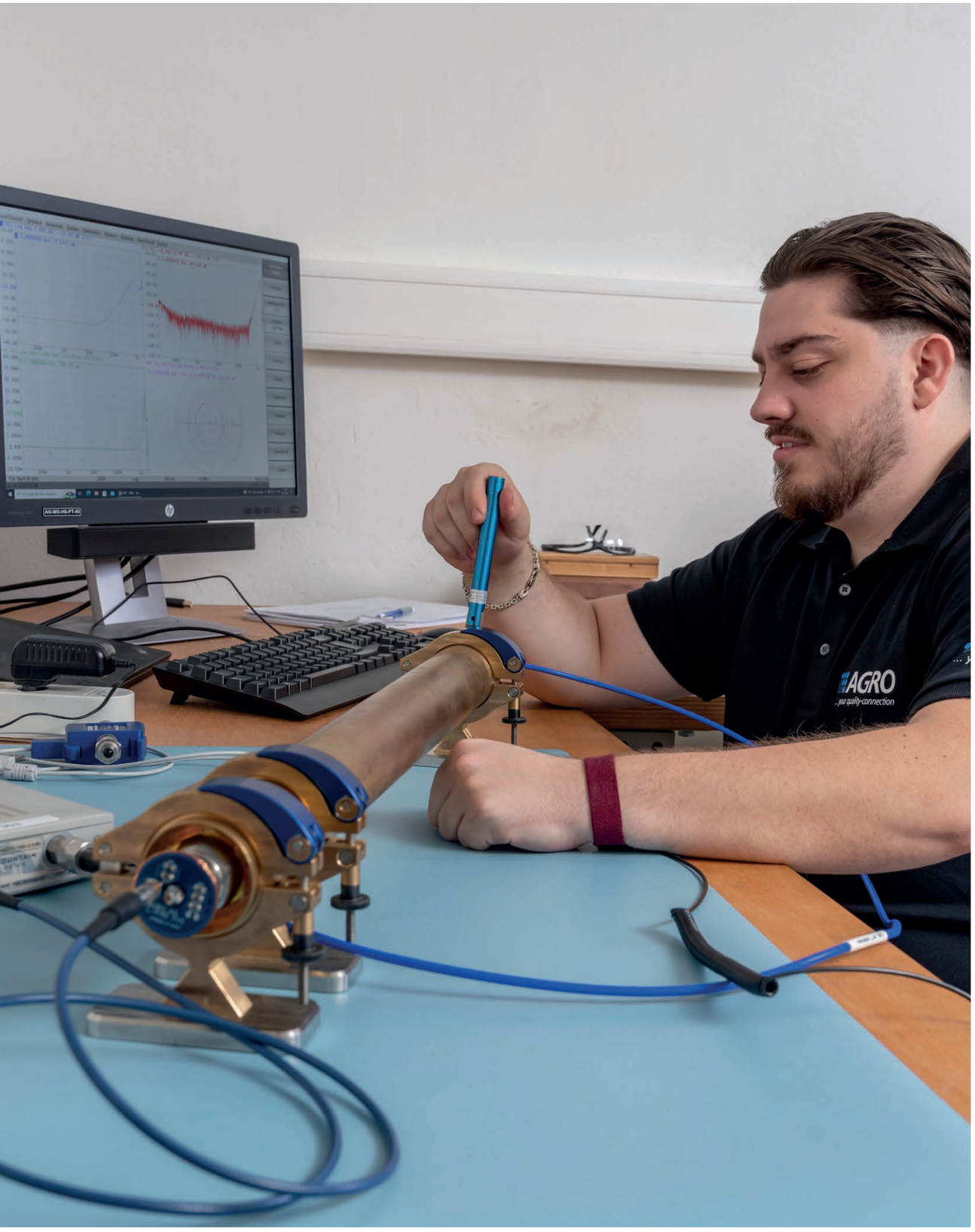
Glow wire testing

Performance data:

- Glow wire loop of nickel-chromium
- Temperatures up to 960 °C
- Rail system for test specimens
- Contact force: 1 N
- Penetration depth timer and display

Typical standards / test procedures

- EN 62262
- EN 60068-2-75
- EN 60695-2-10
- EN 60695-2-13+A1

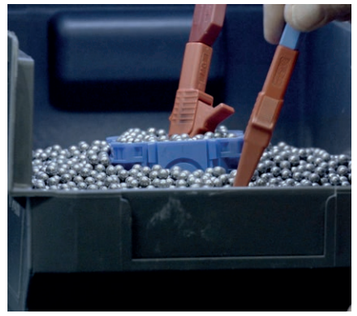


Electrical tests – EMV

High-voltage testing

Performance data:

- Test voltage: Up to 5000 V AC
- Voltage ramping: Up to 5000 V/s
- Current detection to 100 mA
- Resolution: 2 µA



Insulation testing

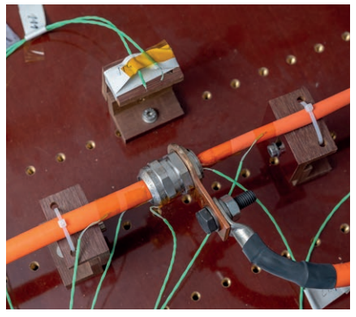
Performance data:

- Test voltage: Up to 1050 V DC
- Voltage resolution: 1 V
- Test current: Limitation < 5 mA
- Insulation resistance: Measuring range up to 99.9 GΩ
- Resistance resolution: 0.1 MΩ

Transfer impedance / Shield effectiveness

Performance data:

- Modular measuring system: Triaxial measuring tube in accordance with IEC 62153-4-X
- Measuring range (DC): Up to 6.5 GHz
- Frequency resolution: 1 Hz
- Measurement bandwidth: Up to 1 MHz
- Dynamic range (frequency-dependent): Up to 140 dB



Current-carrying capacity

Performance data:

- Test setup in accordance with EN 60512-5-2
- Current sources up to 160 A (DC)
- Automated measurement with up to 15 temperature sensors

Typical standards / test procedures

- IEC 62153-4-3
- IEC 62153-4-10
- IEC 62453-4-4
- EN 60512-5-2

Special testing – UL 514B

Flexing test

Performance data:

- Automated bending of the specimen with up to 1000 cycles
- Bending by 90° in both directions
- Test radii of 127 mm and 254 mm

Oil spray test (sealing performance)

Performance data:

- Oil in accordance with NMX-J-235/2ANCE
- Closed circuit
- Up to four specimens tested simultaneously
- Integrated timer (30 min test duration)
- Flow rate: 7.6 l/min
- Nozzle 254 mm from specimen and with a diameter of 9.5 mm

Pull-out force

Performance data:

- Pull-out force: Up to 156 N
- Weights from 1 to 15.875 kg
- Loading for min. 1 minute

Testing in accordance with UL514B specifications

- Different sequencing of tests: Sequences A and B
- Individual tests possible
- Combined with climate testing (ageing) and material testing of the elastomers

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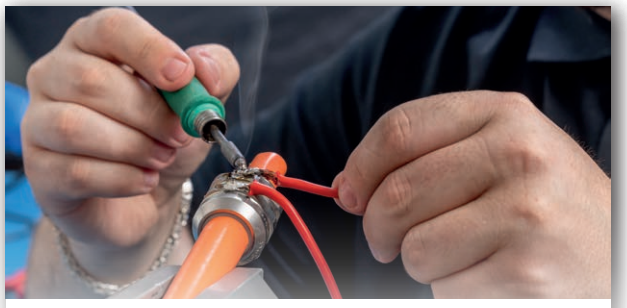
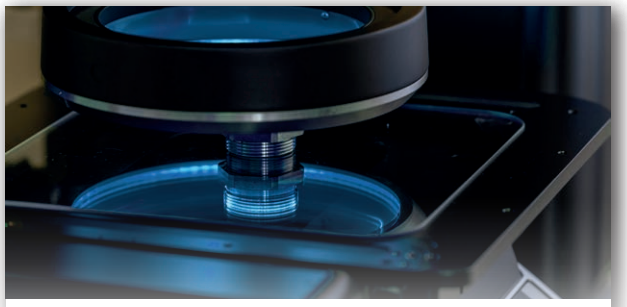
Professional, reliable and customer-oriented



Preparation by professionals …

… using the right equipment …



… with high precision …

… and with pleasure …

E-mail enquiry

… for our customers

Just ask us – we will be happy to support you!

Your AGRO Team

Technical information and advice

For further information about our products, system solutions and communication media, please visit our website. **www.agro.ch**

Our team of technical advisors will be happy to answer any questions you may have or to provide further information, and looks forward to hearing from you: **+41 (0)62 889 47 47**

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