



Halogen Tester

JIC-510

Complies with IEC 61249-2-21 standard, meets testing requirements

■ Fully Automated

■ Fully Intelligent

■ Durable

■ Easy Operation

■ Product Overview

The JIC-510 Halogen Tester is a well-received instrument for halogen-free detection. It meets the latest demands for halogen control in electronics and manufacturing, simplifying the testing of fluorine, chlorine, bromine, and iodine content.

Halogen addition to polymers like plastics raises the ignition point to about 300°C and helps extinguish fires by releasing halogen gases that absorb oxygen. However, high chlorine levels can impair visibility and respiratory health, and combustion products can form corrosive hydrogen halides, damaging equipment and structures.

IEC, IPC, JPCA, and Samsung have set halogen-free standards. IEC 61249-2-21 requires bromine and chloride below 900 ppm, with total halogens under 1500 ppm. IPC aligns with IEC, while JPCA caps bromine and chloride at 900 ppm without a total halogen limit. Samsung also sets 900 ppm limits for both.

IEC 61249-2-21:2003 defines halogen-free materials :

| Substance | Permissible Limit (by weight) |
|--|-------------------------------|
| Bromine (Br) | 900 ppm (0.09%) |
| Chlorine (Cl) | 900ppm (0.09%) |
| Total concentration of: chlorine (Cl) + bromine (Br) | 1500ppm (0.15%) |

Table 1. IEC 61249-2-21:2003 specifies halogen-free material limits.

■ Product characteristics

- 1、 **Fully automated:** auto start-up, shut-down, maintenance, post-pump cleaning, sample sequence triggering, and eluent detection.
- 2、 **Fully intelligent:** Integrated with multiple self-developed sensors, hardware and software work together to achieve a fully intelligent sensing system for instrument status.
- 3、 **Auto-ranging:** Dual-polarity conductivity detector with a wide signal range, capable of detecting concentrations from 5ppb to 200ppm simultaneously without manual range selection or switching.
- 4、 **Eluent Detection:** Non-contact sensor monitors eluent in real-time, alerts when eluent is absent, and stops the pump after a preset delay.

- 5、 **Leakage Alarm:** High-sensitivity optical sensor detects micro-leaks, triggering an alarm and executing preset shutdown and pump stop procedures.
- 6、 **Automatic Post-Pump Flushing:** Auto-maintenance cleans system with two solvents, simplifying operations.
- 7、 **Flow Path Auto-Switching:** Auto-switching solvents for system cleaning, reducing manual labor.
- 8、 **Easy and Convenient Operation:** Professional software, easy to use.
- 9、 **Eluent Preheating:** Preheats eluent in the column oven to prevent pressure fluctuations and speed up baseline stabilization.

■ Scope of application

Main applications include electronics, PCB boards, cables, new energy, medical devices, plastic toys, printing inks, coatings, and packaging materials.

Detection Response:

F, Cl, Br, L

Analysis completed within 15 minutes for convenience and speed, aligning with internationally recognized standard methods.

Halogen-free analysis method:

Halogen-free testing complies with various domestic and international standards.

- ※ JIS K7392-2009-----Determination of total bromine content in waste plastics
- ※ GB/T 37861-2019-----Halogen Testing in E&E Products by IC
- ※ SNT 5254-2020-----Fluorine and Chlorine Analysis in Coal by HTH-IC
- ※ HJ/T83-2001-----AOX Analysis by IC
- ※ GBT39285-2020-----Chlorine in Palladium by IC
- ※ SNT5307-2021-----Fluorine, Chlorine, and Sulfur Analysis in Petroleum by DC-IC
- ※ GBT 40111-2021-----Fluorine, Chlorine, Sulfur in Petroleum by C-IC
- ※ CAS318-2018-----Polymer Halogen in Wire and Cable by OBC-IC

test standard: EN14582 or IEC61189-2006. Ion Chromatography and Oxygen Bomb Combustion recommended.

■ Technical parameters

| | | |
|--|--|--|
| HP Dual-Piston Pump PEEK pump head for pH 0–14 eluents and solvents | Flow Rate Range | 0.001 ~ 9.999mL/min;Maximum Pressure : $\geq 35\text{MPa}$ (5000psi) |
| | Flow Precision | $\leq 0.1\%$ 、Max Flow Error $\leq 0.1\%$ 、 Pressure Pulse: Less than 1.0% of system pressure |
| | Auto Post-Pump Cleaner | Auto-cleans pump after use, extends service life |
| Smart Eluent Alert System | Smart Eluent Alert | Real-time eluent monitoring with auto-shutdown and alert |
| | Auto-flow Switch | Auto-maintenance with solvent switch at end of experiments |
| Suppressor Auto-Electrolysis Membrane Suppressor | Suppressor PR | $\geq 7\text{Mpa}$ |
| | Suppression Capacity | $\geq 100\text{mmol/L NaOH}$ |
| Column PEEK anion column set with guard for hydroxyl eluents | High-Efficiency Column Capacity | $\geq 195\mu\text{mol/piece}$ |
| Temp-Comp Conductivity Detector Signal Output: Digital Dual-Channel Auto-Range | Full-Range Signal Output | 0-45000 $\mu\text{S/cm}$ 、 Detector Resolution: $\leq 0.0023\text{nS/cm}$; Instrument Linearity ≥ 0.9999 |
| | Auto-Range | Direct detection from 5ppb to 200ppm without range conversion or dilution |
| Ops & Software Microsoft® Office-based interface with integrated controls for easy setup and operation | Adaptive startup with editable parameter files for various hardware | |
| | Intelligent Maintenance: Auto-maintenance with part replacement, ready to use after setup | |
| | Intelligent Shutdown: Schedule or instant shutdown, with OS closure option, all smartly configurable | |
| Integrated Column Oven Fiberglass insulated column oven with PID algorithm for precise ramping | Column oven preheats eluent for stable column temperature and reliable data | |
| | Temp Setpoint Error: $\leq \pm 0.05^\circ\text{C}$ 、 Column Oven Temperature Stability: $\leq 0.02^\circ\text{C}$ | |
| Auto Liquid Handler Automatically prepares samples, dilutes liquids precisely, adds standards and controls, and handles liquid transfers and mixing for analysis | Standard Curve Precision: Linearity $R \geq 0.9990$ over 1000-fold concentration range | |
| | Sample Volume: Minimum $\leq 15\mu\text{L}$, Maximum $\geq 3\text{mL}$ per draw | |
| | Sample Mixing: Equipped with both gas-liquid and liquid-liquid mixing modes, adjustable according to liquid properties | |
| | Workflow: Set sequences for dilution and automated sample mixing, spiking, and transfer | |

| | | |
|--|-------------------------|---|
| Eluent Maker (Optional) Connect to pure water to generate acidic or basic eluents via electrolysis for isocratic or gradient elution | Eluent Types | KOH/NaOH |
| | Eluent Range | 0.1-120 mM/L or wider |
| | Flow Rate Range | 0.1-5.0 mL/min or wider |
| | Pressure Range | 5-20 MPa or wider |
| | Safety Setup | Integ. Leak, Charge, Pressure Devices |
| Auto Sampler (Optional) 3D autosampler for ion chromatography, starts sampling post-stabilization, upgradable for dual-channel or loop switching | Max Samples | ≥67 Sample Positions |
| | Vial capacity ≥ 12 ml | Caps protect samples from contamination and evaporation |
| | Needle Wash Program | Needle wash with reverse purge for cleaning and emptying |
| | Vial Missing Alert | Detects missing vials, alerts, logs, and skips to the next sequence |
| | Sample/Eluent Detection | Detects empty vials or missing wash liquid, with user-settable response to skip or stop |

■ Configuration manifest

| DESCRIPTION | QTY | UNIT | REMARKS |
|--------------------------------------|------------|-------------|----------------|
| Host Unit JIC-510 | 1 | Unit | |
| Anion Chromatography Column | 1 | piece | |
| Anion Guard Column | 1 | piece | |
| Anion Suppressor | 1 | set | |
| Dedicated Chromatography Workstation | 1 | set | |
| Eluent Detection Module | 1 | set | |
| Flow Switch Maintenance | 1 | set | |
| Preheating Column Oven | 1 | set | |
| Gas-Liquid Separator | 1 | piece | |
| Leak Protector | 1 | piece | |
| Parts and Tools Kit | 1 | set | |
| Sample Prep Station | 1 | set | |
| Surrounding configuration | QTY | UNIT | REMARKS |
| Pure Water System | 1 | set | |
| Oxygen Bomb Combustion Unit | 1 | set | |
| Sintered Filter Assembly | 1 | set | |
| Computer and Printer | 1 | set | |

■ After sales service

- 1、 Product warranty for 12 months, with lifetime maintenance support.
- 2、 Comprehensive tech support from pre-sale to after-sale.
- 3、 Pre-sales: Addressing application needs, offering expert solutions, and providing on-site demonstrations.
- 4、 Professional engineers for installation and training: Substance background, operation, maintenance, lab practices, waste handling, and sample grading
- 5、 Operation Training: Full manuals, media guides, WeChat support, and free training every few months.
- 6、 Customer Follow-up: Quarterly customer check-ins for feedback and problem-solving
- 7、 Service Response: 4-hour response, 24-hour resolution or loaner instrument provided.
- 8、 Upgrade Service: Provide customers with free software upgrades for life.
- 9、 Offer detection and control services for environmental directives with expandability.
- 10、 Customize analysis methods to meet user quality control and halogen-free standards, providing detection solutions and risk analysis for special materials.