

Press Release

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60 years of gas chromatography GC pioneers of the first hour

**GC precision for consumer protection, environmental protection and product safety /
Shimadzu at the early forefront of development /
GC milestones: hardware and software, central systems, detectors and accessories**

Shimadzu, one of the world leaders in analytical instrumentation, celebrates its 60th GC anniversary in 2016. In Shimadzu's 140-year history, chromatography has set many milestones that have meanwhile become technical standards serving consumer protection, environmental protection and product safety today.

Since its commercial introduction, gas chromatography has evolved into an important analytical technology. Today tens of thousands of GC systems are in use in all areas of industrial and pharmaceutical development, basic research as well as in quality control. The separation of complex mixtures as well as identification and quantification of the individual components is still considered to be one of the most important tasks in instrumental analysis.

Shimadzu at the early forefront of the development

The practical implementation of the first gas chromatograph for the separation of complex mixtures via partition chromatography is generally attributed to the British scientists A.J. Martin and A.T. James, and Martin was awarded the Nobel Prize in 1952 for this. Shortly after, Shimadzu embarked on this technology and in 1956 developed the first gas chromatograph in Japan, which led to series production of the GC-1A in 1957. At 120 kg, it was a giant compared to today's much smaller, more powerful and more versatile instruments. With this development, Shimadzu pushed forward the legacy of the founding family of Genzo Shimadzu Junior, one of the ten most important inventors of Japan honored by the emperor at the time.

"Contributing to Society through Science and Technology" is Shimadzu's core philosophy. This includes continuous development of existing technologies to explore opportunities and to push existing technical boundaries. This has made Shimadzu a market leader and an established name in science and industry.

GC milestones: hardware and software, central systems, detectors and accessories

Much of what has been technically established in GC today has been achieved through hardware and software milestones. Between the first GC-1A and the current ultra-modern, universal Tracera system with its novel BID (barrier ionization discharge) detector that can detect all substances except helium and neon, there are numerous world premieres, advances in performance and innovations that have set technical and economic trends and standards.

- With the GC-3 series, Shimadzu introduces the first mini GC.
- The GC-4 marks the first step from isothermal to temperature-programmed chromatography and for the first time implements the patented dual-flow operation of two packed columns.
- Automated chromatogram evaluation starts with the C-1A integrator.
- The GC-8A is the first asbestos-free GC system.
- The GC-9A and 14B mark the triumph of capillary versus packed column chromatography. It is now possible to achieve separations of complex mixtures in a much shorter time.
- The GC-9A is the first gas chromatograph coupled to a mass spectrometer. In addition to quantitative evaluation, the mass spectrometer allows identification of unknown sample components and leads to new scientific findings in environmental, pharmaceutical and materials research.
- With the GC-17A, gas pressures and flows are now electronically adjustable and can be modified via flow and pressure programs.
- The GC-2010 has set a long-term standard with respect to detection limits. Its outstanding reproducibility remains undefeated today.
- The LabSolutions software with self-explanatory operation of the GC controls and novel diagnostics functions makes gas chromatography accessible to all users.
- The GC-2014 and GC-2025 models for routine analyses are reliable and robust, as well as being extremely cost-effective. The GC-2025 is the first system manufactured from RoHS-compatible components and is fully recyclable.
- The most recent development is the Tracera with its novel BID detector – innovative technology for the generation of a helium plasma combines sensitivity with up to now unrivalled robustness and long-term stability, opening up entirely new possibilities in trace analysis.

Wide range of GC systems

Today, routine as well as high-end systems define Shimadzu's product range – from small, versatile systems and ultra-sensitive and highly productive systems to instruments that break new technological ground, for instance the multiple heart-cut technology.

Many detectors with innovative technologies such as the BID helium ionization detector complete the picture. System solutions like detector-switching or splitting, back-flushing or autosamplers provide customized as well as flexible applications.

Web summary

Shimadzu celebrates its 60th GC anniversary in 2016. In 1956, just four years after this technology had been awarded the Nobel Prize, Shimadzu developed its first GC system in Japan. In the following years, the company has further developed the technology with numerous technical milestones that are standards today. This spirit of innovation is without bounds, as shown by, for example, multiple heart-cut technology or BID (barrier ionization discharge) detector, which can detect all substances except helium and neon. Developing technologies, exploring new avenues and surpassing previous technical limitations has made Shimadzu a market leader and an established name in science and industry.



Figure 1: Shimadzu celebrates its 60th GC anniversary in 2016. Being a pioneer, Shimadzu set many milestones that have meanwhile become technical standards serving consumer protection, environmental protection and product safety. Today, Shimadzu is one of the world leaders.

Web link: www.shimadzu.eu/60-years-gc



Eventuelle Rückfragen richten Sie bitte an:

Uta Steeger

Shimadzu Europa GmbH

Albert-Hahn-Str. 6-10

D-47269 Duisburg, Germany

Tel.: +49 (0)203-7687410

E-Mail: us@shimadzu.eu

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