

Members' Profiles

Taiatsu Techno Corporation

1. Introduction

Taiatsu Techno is engaged in the design, manufacture, and sales of pressure vessels for equipment used in research and development. Our company is unique in that all its design and manufacturing departments are concentrated at the Taiatsu Engineering Laboratory in Saitama City of Saitama Prefecture, allowing for close communication between designers and engineers in the machining department and enabling us to incorporate various user requirements for advanced technological development in tangible products. We have a product line of pressure vessels that employ glass in the structure. With much experience in manufacturing these pressure vessels and through an accumulation of various tests, we have succeeded in developing a window seal mechanism – for which we obtained a patent (No. 3354886) – that allows for internal observations and optical measurements under high temperatures and pressures. We believe our long track record and accumulated technologies on pressure vessels will provide reliable assistance for users conducting advanced technological development in the fields of high-pressure instruments and equipment.

2. Expanding into Instruments for Researching Supercritical Fluids

Taiatsu Techno first became involved in supercritical fluids more than fifteen years ago while designing vessels for withstanding high temperatures and high pressures. Today we develop and design a wide range of vessels and systems suitable for supercritical applications from the demanding conditions of maintaining a water in a supercritical state to the relatively milder temperature and pressure conditions required for maintaining carbon dioxide in a supercritical state. Through input from our customers and tests conducted with actual equipment, we understand that the materials and seal packing used in the body of vessels designed for supercritical fluids must be treated differently from those in common reactors. We have incorporated this knowledge into our equipment designs and have accumulated much expertise through the years in manufacturing supercritical instruments.

In response to requests from our customers, we began to develop vessels and cells with windows that allow direct observation of supercritical media, hiring dedicated technicians for this purpose. As a result, we established and acquired a patent for a window seal mechanism that is reliable under high temperatures and pressures and that facilitates setup and operations. Many users have adopted instruments employing our window seal mechanism, and it is our hope that the capability to visualize supercritical fluids under harsh conditions with such systems will continue to contribute to research on supercritical fluids.

In addition to responding to customer demands for visual observation, we hope to provide sound solutions for customer issues through integrated management of our knowledge and expertise on the design and manufacture of supercritical instruments. We understand that there are a large number of possible combinations of pressures, temperatures, fluids, and control methods in supercritical fields required by our customers. Therefore, our efforts in

R&D are not merely focused on the body of the pressure vessel, the centerpiece of the research equipment, but also on peripheral equipment and how to propose optimum combinations and systems.



Cell system for visual observation of supercritical mixtures
(jointly developed with Takafumi Aizawa, senior research scientist at AIST Research Center for Compact Chemical System)

We also introduced a compact process vessel designed for supercritical experiments on carbon dioxide. The vessel can be used prior to installing an actual system as an initial step for assessing the research potential of the supercritical fluid. Once provided with a rough description of the experiment and its objectives, we can select the necessary peripheral equipment and advise the customer on the need for any new purchases other than the compact process vessel, enabling the customer to begin conducting experiments on a relatively low budget.

We continue to develop products to meet all our customers' needs in research on supercritical fluids, from entry level to advanced, and are engaged in the design and manufacture of pressure vessels that are safer and easier to use.

3. Conclusion

Taiatsu Techno believes that safety issues must be thoroughly addressed, even in relatively small pressure vessels designed for testing and research. Through conformance to regulations pertaining to pressure vessels and repeated verification of operation and handling procedures, we are striving to create a safer environment for users of high-pressure vessels. Furthermore, we are constantly studying improvements to the clamp mechanism and exploring other systems for improving the safety of the temperature control system without a loss in operability in an effort to design and develop instruments that strike the best balance between safety and user-friendliness.

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