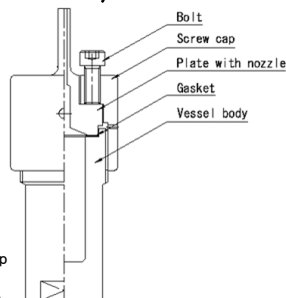


High Pressure Vessel HMS-25/50

Thank you for purchasing the SAN-AI KAGAKU Reaction - Decomposition Vessel Series. If this product is handled incorrectly, correct test results may not be obtained. Not only that, but it is extremely dangerous and may cause injuries such as burns. When using the product, please carry this instruction manual with you and familiarize yourself with how to use it. Also, please be sure to keep this manual at hand.



[How to use]

How to set

Install the gasket, plate with nozzle, screw cap, and bolts on the vessel body in this order. Just screw in the screw cap by hand until it stops lightly. ※ No tools required.

Screw the bolt by hand until it touches the plate with nozzle.

If you are not using the nozzle, please attach the closing cap (sold separately).

※ Bolts and screws may become galled due to high temperature and pressure, and may become impossible to remove. Anti-seize cloth (commercially available) is highly recommended.

Tightening method

Fix the bottom of the container body in a vise (sold separately), and tighten the bolts evenly using a torque wrench (sold separately). The torque wrench requires a hexagon socket (width - across flats 6.0mm) (sold separately).

※ Tightening torque value → 40N.m (PTFE gasket → 25~30N.m)

※ Tighten the bolts diagonally, and do not apply the maximum torque all at once, but gradually in several steps.

Opening method

Fix the bottom of the container body in a vise, loosen the bolts, and then remove the screw cap.

※ Be sure to wear safety goggles and heat-resistant/acid-resistant gloves.

※ Make sure that the vessel temperature has cooled down sufficiently before opening the vessel.

※ Open the package in a draft chamber, glove box, and be fully prepared in case of gas erupting.

※ If internal pressure remains, there is a risk of the sample blowing out.

■ Caution / Warning / Strictly Observe (Risk of explosion or burns)



An abnormal rise in pressure within the container may cause the container to break or the container to erupt, leading to a serious accident!

● Maximum operating temperature: 300°C (PTFE gasket: 200°C)

● Maximum operating pressure: 20MPa

● In the case of a decomposition reaction method using acids, alkalis, etc., an unexpected increase in internal pressure may occur. Please limit the dry weight of the sample to approximately 500mg, and keep the amount of both solution and sample as small as possible.

● Even in cases that do not involve intense decomposition reactions, such as solvothermal - synthesis and hydrothermal penetration tests, please keep the amount of preparation to around 70% and try as small a quantity as possible at the initial stage of the experiment.

● Special attention must be paid to the reaction and decomposition of organic matter in this container. Be sure to perform preliminary decomposition before conducting experiments in which large amounts of organic matter or reactive gases are expected to be generated. [Preliminary decomposition] The sample and solution are reacted in the open to degas.

● Stainless steel outer cylinders may undergo hydrogen embrittlement and stress corrosion cracking due to repeated high-temperature, high-pressure experiments involving non-oxidizing acids such as hydrochloric acid and sulfuric acid, and chlorides.

If there is any corrosion on the inner wall that causes the PTFE container to stick, pitting corrosion or cracks that penetrate the bottom plate, or cracks on the vessel body or other parts, please stop using the product immediately.

● There is a risk that the sample leaking from this container may catch fire for some reason. Please use explosion-proof equipment for heating.

● Please note that the temperature near the hot air vent of a forced circulation oven may exceed the set temperature.

● Please note that the temperature near the heater wire of an electric furnace or mantle heater may exceed the set temperature.

● When wrapping a ribbon heater or band heater directly around a container, be sure to please install an overheating prevention sensor.

● Please refrain from using perchloric acid or keep it to a minimum amount.

● Never put explosive samples such as gunpowder into the container.

● Please alert those around you when starting heating.

● Even if the vessel temperature has dropped, internal pressure remains and there is a risk of gas spewing out when the container is opened. Be sure to wear safety goggles, heat-resistant and acid-resistant gloves, and perform in a well-ventilated area.

● Please open the package in a draft chamber, glove box, etc., and be fully prepared in case gas spouts out.

● The tips of stainless steel parts are sharp. Please be careful of cuts.

● Please do not repair or modify the product without permission.

● Do not use parts other than those manufactured by San-Ai Kagaku Co., Ltd.

● If the stainless steel outer cylinder becomes deformed and becomes impossible to open, do not force it. Please let us know.

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