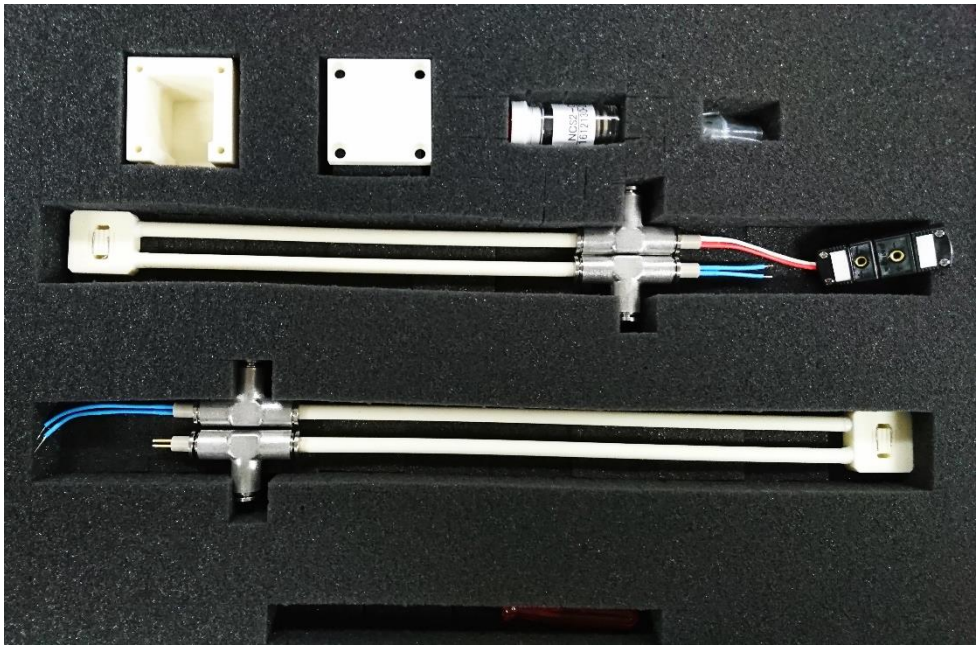
CHINO

Compact SOFC Test Holder

INSTRUCTIONS

This instruction manual contains all the **information** and **note** that is needed to handle and operate the Compact SOFC Test Holder and furnace.

File to not lose this instruction manual for correct operation.



CHINO

Table of Contents

Specifications

Dimentions	W40×D40×H39 mm
Weight	Approx. 350 g
Resisting heat	Holder Max 900 ºC / Metal joint Max 120 ºC
Gas flow rate	Max 1 L/min
Process and V/A connection Thermocouple	Gas inlet / outlet pipe （ϕ 6 one-tatch） Platinum wire for voltage （ϕ 0.5） Platinum wire for current （ϕ 0.5） R thermocouple (with exclusive connector)
Collector mesh	Equal to or lower than ϕ 9 t = 0.6 (Plus tolerance)
Heat/cool temp. speed	Equal to or lower than 5 ºC /min.
Installation	Horizontal direction with respect to the floor
Max. current	10 A

1. Introduction

Thank you for purchasing our Compact SOFC Test Holder with furnace.

This holder employs entirely ceramic structure to be free from metallic contamination. In addition, since the load structure of the ceramic spring is realized with a compact design, the cell can be durably tested in a space-saving manner.

To understand the product and prevent any trouble occurrence read this instruction manual before operation. This instruction manual describes notes when using, building and maintenance.

Caution

・Make sure to maintain exhaust gas roots so as using flammability gas like H_2.

→There might be a danger of ignition or poisoning.

・Purging by inert gas like N_2 before and after the testing. There might be danger of ignition and fire.

・Do not close flammable substances to the furnace during operation of the furnace.

→ There might be danger of fire. Take enough time to make the furnace cool down.

Precautions

・Be careful handling the Holder, which is made of ceramics only.

・Holder should be installed not to apply load to the exhausting tube as possible. Handling the Holder, it allows only grasping the body not tubes.

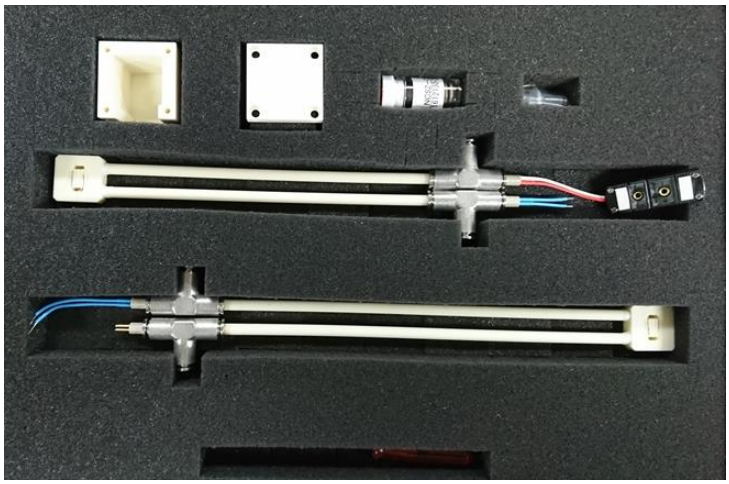
→ It may cause damage to the Holder.

・This Holder is not a structure of proof against pressure. Please keep the vent open (pressure to be zero) when inject gas to the Holder due to burst and failure.

・It not allows setting the values more over:

heat up speed (max. 5 ºC/min), gas flow (max. 1L/min), current (max. 10 A).

2. Contents

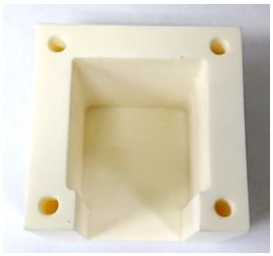


Manifold ;

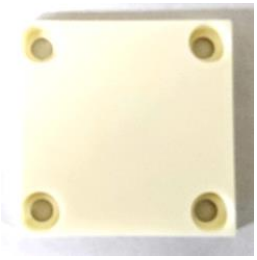
Gas Inlet and Outlet

Airtight terminal
(Connection port
Current, Voltage, Thermocouple)

Holder - 2
Details
Manifold - 2
Gas Inlet and Outlet - 2
Current wire - 1
Voltage wire - 1
Thermocouple - 1



Alumina fixture chest - 1



Alumina fixture lid

Ceramics spring - 1
※Deflection 2.5 mm max

Ceramics clincher - 4

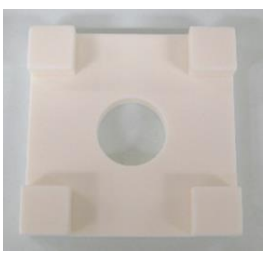
Anode current collector, Ni - 1

Cathode current collector, Ag - 1

Anode gas seal for ϕ16 - 5

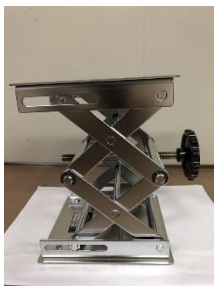
Cathode gas seal for ϕ16 - 5

Hex driver - 1



Ceramics spacer (1) -1

Ceramics spacer (2) -1



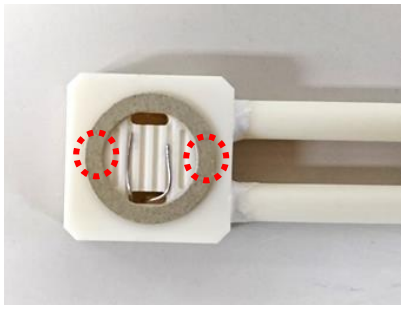
Lab jack - 1

３．ホルダの組立方法

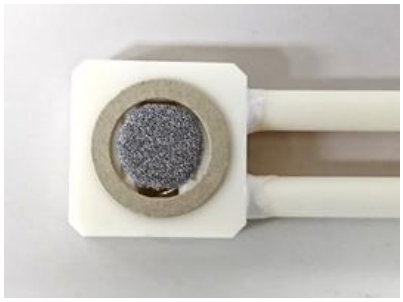
The bellow describes how to build a holder.

① When you unpack, firstly make sure lead wires are inserted in groove of diffusion plate. (Both side anode and cathode)

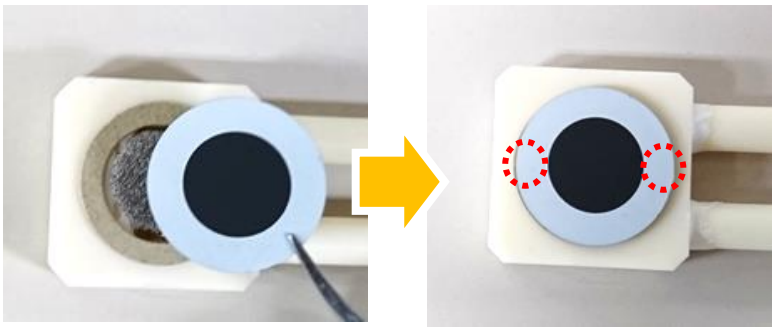
② Place gas seal to the holder flame.　It is recommended that gas seal is 2 places with adhesive. (both side anode and cathode)



③ Place anode current collector to set on inside of gas seal.　（ϕ 12, t = 0.6）



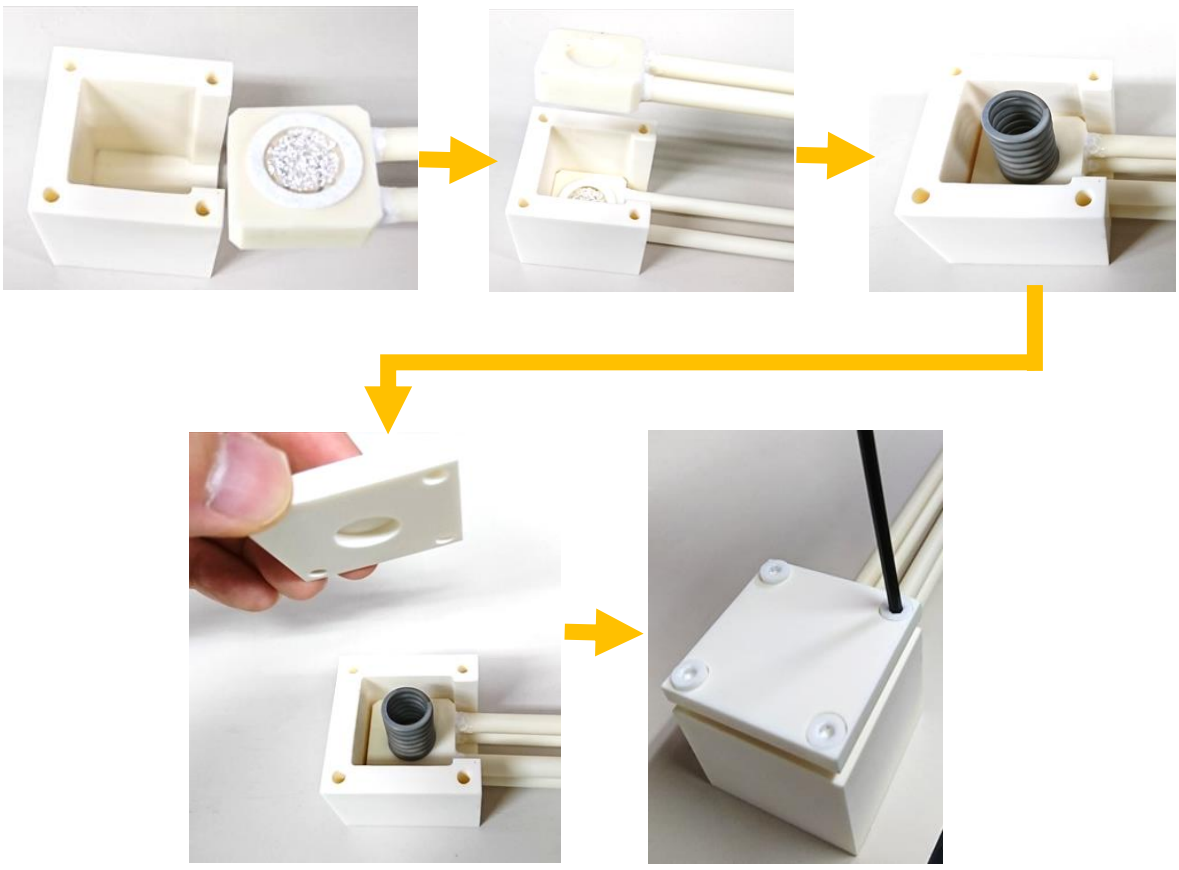
④ Put quick adhesive for temporary adhesion to the gas seal of the anode side. Put to position cell and seal edge.



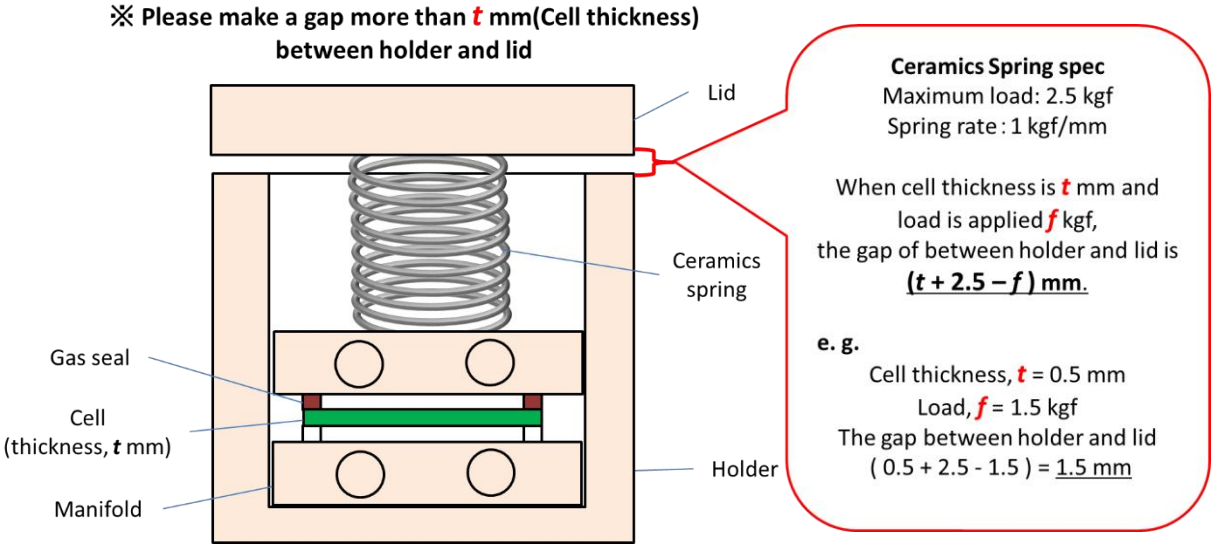
⑤ Place cathode current collector (40 x 40, t = 0.6) on the seal position of cathode side holder.

⑥ Set cathode side holder in alumina fixture chest. Stack anode side holder on the cathode side holder after checking that the cell doesn't fall the anode side. Insert ceramic spring to the counterbore of anode side holder and set alumina fixture lid on the ceramic spring. Insert ceramic clincher to the hole of the lid and tighten with a hex driver. Then, tighten each clincher little by little so that the gap between the container and the lid becomes uniform.

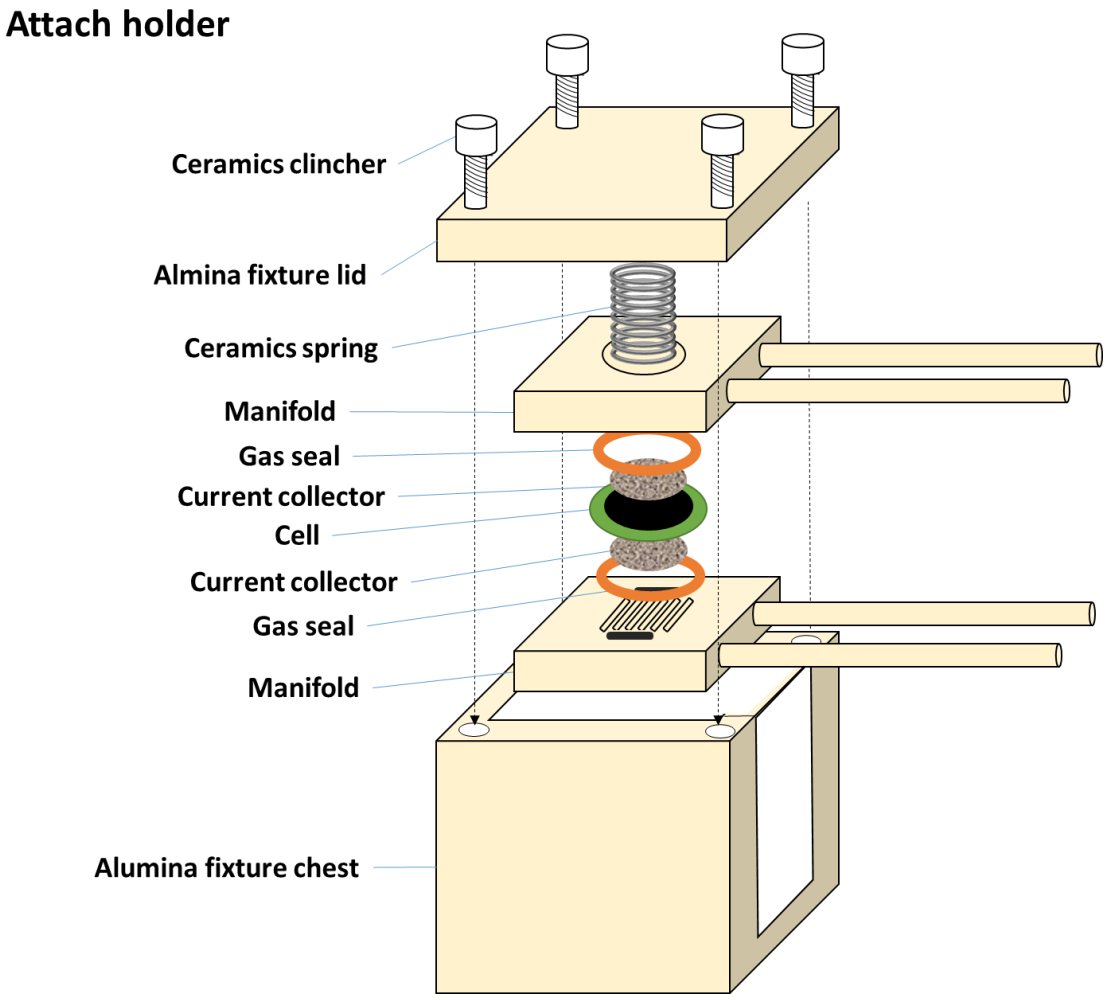
※Since wear of clincher can be reduced, it is recommended to apply grease to crests of ceramic threads.



◎ About the load of Compact SOFC Holder



⑦ Holder building is finished.



4. Location in the furnace

The below describes how to locate the holder in the furnace

- Position the holder so that the depth is the mark of almina piping overlaps the outside of the insulating block, and center in the left-right direction. Adjust the height of the holder with setters.

- Insert the insulation block, tighten the fixture, heat the insulation block by filling the gap with the insulation material.

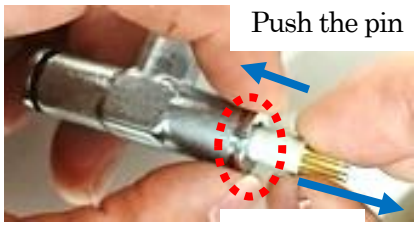
※ It is recommended to use a flexible tube to reduce the load on the gas introduction pipe for connection to piping. After wiring and tube connecting, heat furnace in a speed within 5 ℃ /min.

5． How to change lead wire

Lead wires might have deteriorated after repeated testing.
Replace lead wire if deteriorated state be founded.

① Start work with the cell, gas seal, current collector removed.

② Remove airtight terminal from metal fitting. At this time, remove the airtight terminal while pushing the pin of the photo ○ part. Pull out slowly while pushing the tip of the lead wire in the main body holder with tweezers or the like.



③ Fuse the solder part of the airtight terminal and pull out the used wiring.

④ Cover by insulation tube not to conduct between connector and wires , let new wires into sealing terminal.

⑤ Solder new wires let into sealing terminal.

• Contact

CHINO Corporation

URL　http://www.chino.co.jp

1, Mori, Fujioka-shi, Gunma

Fujioka factory, System Configuration Dept.

TEL 0274(42)2114

FAX 0274(42)7441