

**TSKguardgel Series
for Stainless-Steel Columns**

**INSTRUCTION
MANUAL**





TOSOH CORPORATION

Safety Precautions

To help protect your property from potential damage and ensure personal safety, please read this manual thoroughly before using the product.

[Notational Conventions]

Notation	Explanation
 WARNING	Alerts the user to the potential for serious injury or death.
 CAUTION	Alerts the user to the potential for damage to hardware or bodily harm.

WARNING

■ **Keep away from fire.**

Take proper precautions when using flammable solvents. There is the potential for fire, explosion, or poisoning.

CAUTION

■ **Use only in well ventilated areas.**

In case of insufficient ventilation, flammable and toxic solvents can cause fire, explosion, or poisoning.

■ **Do not spill solvents.**

Spillage and leakage can cause fire, electric shock, poisoning, injury, and corrosion. When cleaning up a spill, wear appropriate protective gear.

■ **Wear eye protection and protective gloves.**

Organic solvents and acids should not come in direct contact with the skin.

■ **Handle package with care.**

Inappropriate handling may cause rupturing and splattering.

■ **Only use this product as intended.**

This product is for separation and purification, do not use for any other purpose.

■ **Confirm compounds are safe.**

Check that obtained compounds and solutions after separation and purification are safe.

■ **Proper disposal.**

Dispose of in accordance with local laws and regulations.

NOTE

Keep this manual for future reference.

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1. Introduction

When samples to be separated contain impurities which are adsorbed by the packing materials, column performance tends to decline as impurities accumulate on the inlet side of the column. In such a case analytical columns can be protected from contamination by connecting guard columns before the analytical columns. It is highly recommended to use guard columns, especially in the separation of biological substances. The TSKguardgel and TSKguardgel kits were developed for ion-exchange columns and TSKgel Phenyl-5PW for the separation of biopolymers such as proteins and nucleic acids. Please use these kits as much as possible in order to prevent possible trouble occurrence.

2. Specifications of TSKguardgel and TSKguardgel kit

2-1 TSKguardgel

Cat. No.	Type	Vol. (mL)	Columns for connecting	Slurry solvent
07207 07208 13070	TSKguardgel DEAE-5PW TSKguardgel SP-5PW TSKguardgel CM-5PW	5	TSKgel DEAE-5PW TSKgel SP-5PW TSKgel CM-5PW	methanol/water(50/50)
07643 07645 07647 07649	TSKguardgel SP-SW TSKguardgel QAE-SW TSKguardgel DEAE-SW TSKguardgel CM-SW	5	TSKgel SP-2SW TSKgel QAE-2SW TSKgel DEAE-2SW TSKgel DEAE-3SW TSKgel CM-2SW TSKgel CM-3SW	CH ₃ CN(suction dry)
07651 08644	TSKguardgel Phenyl-5PW TSKguardgel Ether-5PW	5	TSKgel Phenyl-5PW TSKgel Ether-5PW	methanol/water(50/50)
13130	TSKguardgel HA-1000	5	TSKgel HA-1000	10mmol/L Phosphate buffer (pH 6.8)
08648 13122 13124 13126 13128	TSKguardgel Chelate-5PW TSKguardgel Heparin-5PW TSKguardgel Blue-5PW TSKguardgel Boronate-5PW TSKguardgel ABA-5PW	5	TSKgel Chelate-5PW TSKgel Heparin-5PW TSKgel Clue-5PW TSKgel Boronate-5PW TSKgel ABA-5PW	H ₂ O

Each guardgel has the same ion-exchanger or corresponding group of the corresponding column.

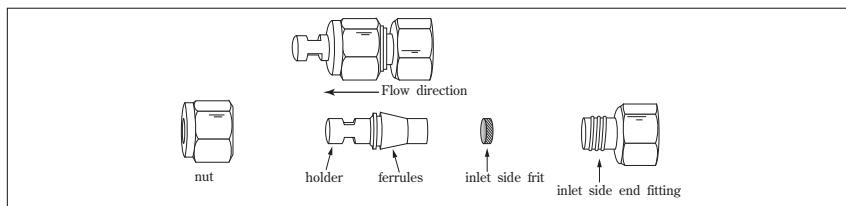
2-2 TSKguardgel kit

Cat. No.	Type	Contents of kit *
07210	TSKguardgel DEAE-5PW kit	TSKguardgel DEAE-5PW
07211	TSKguardgel SP-5PW kit	TSKguardgel SP-5PW
13069	TSKguardgel CM-5PW kit	TSKguardgel CM-5PW
07644	TSKguardgel SP-SW kit	TSKguardgel SP-SW
07646	TSKguardgel QAE-SW kit	TSKguardgel QAE-SW
07648	TSKguardgel DEAE-SW kit	TSKguardgel DEAE-SW
07650	TSKguardgel CM-SW kit	TSKguardgel CM-SW
07652	TSKguardgel Phenyl-5PW kit	TSKguardgel Phenyl-5PW
08643	TSKguardgel Ether-5PW kit	TSKguardgel Ether-5PW
13129	TSKguardgel HA-1000 kit	TSKguardgel HA-1000
08647	TSKguardgel Chelate-5PW kit	TSKguardgel Chelate-5PW
13121	TSKguardgel Heparin-5PW	TSKguardgel Heparin-5PW
13123	TSKguardgel Blue-5PW kit	TSKguardgel Blue-5PW
13125	TSKguardgel Boronate-5PW kit	TSKguardgel Boronate-5PW
13127	TSKguardgel ABA-5PW kit	TSKguardgel ABA-5PW

* Including one set of holder, frits and joint

2-3 Holder, Frits

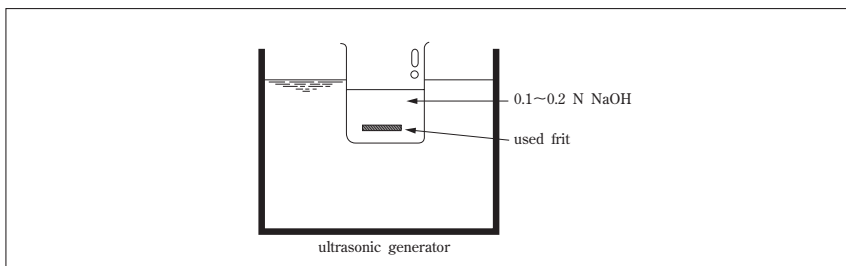
Type	Remarks
TSKguardgel holder	empty guard column : 6mmID×1cmL with 2 spare frits
TSKguardgel frits	10 inlet frits



Configuration of TSKguardgel holder (empty guard column)

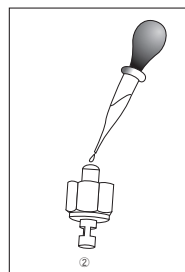
3 . How to Use the Guard Gel

- 3-1. The ferrules are not fixed when a TSKguardgel holder is shipped.
Fully insert the holder into the inlet side end fitting and fix the ferrules.
- 3-2. Connect the guard column between the injection valve and analytical column.
- 3-3. Replace the guard gel and inlet side frit once a week in everyday use. The used frit can usually be regenerated by ultrasonic treatment in 0.1~0.2N NaOH for ca. minutes.

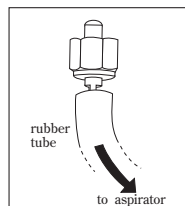


4 . Preparation of Guard Gel

- 4-1. Stir a slurry of TSKguardgel, after adding 5~10mL of slurry solvent.
- 4-2. Fill the holder with the gel slurry using a fountainpen filler.

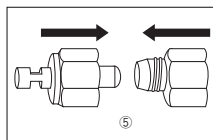


4-3. Suck the slurry solvent with an aspirator fitted with a rubber tube.



4-4. Refill the holder with gel slurry. (Packing is usually completed by the process described above. If the packing has not completed yet, repeat 4-3 and 4-2.)

4-5. Attach inlet-side end fitting to the holder.



4-6. Connect the guard column to the pumping system and feed distilled water or buffer of low concentration to the guard column at a flow rate of at least 1mL/min until air bubbles are completely expelled from the guard column.

* 1 Since outlet side frit is not removable, make sure to feed solvent in the correct direction.



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