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Changes from previous version:

Section	Summary of Changes	Change Control Number
ALL	1. New document	

	<p style="text-align: center;">STANDARD OPERATING PROCEDURE</p> <p style="text-align: center;">Use of AGAR 6 cm Synthesis Column</p>	<p>Document: PRD001-1 Effective Date: 15Nov2023 Status: Effective Page 1 of 11</p>
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## 1. PURPOSE

An instructional document that provides directions on how to assemble, disassemble, pack and unpack the Agar (AMW-AV6) 6 cm synthesis column for oligonucleotide synthesis.

## 2. SCOPE

A written procedure an operator can use to run any synthesis within the Agar (AMW-AV6) 6 cm Synthesis Column.

## 3. INTERNAL REFERENCES

Document ID	Title
QA001	Quality Policy

## 4. EXTERNAL REFERENCES

Document ID	Title
AMW-AV6-MAN	AMW-AV6 Process Scale Column 6 cm I.D.

## 5. RESPONSIBILITIES

Job Function and/or Department	Responsibility
All Personnel	All staff is responsible to maintain and be trained on the use of this equipment.

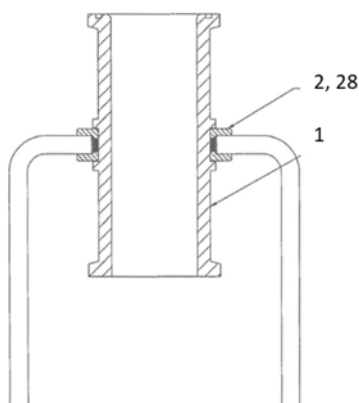
## 6. DEFINITION

Term	Definition

## 7. PROCEDURE

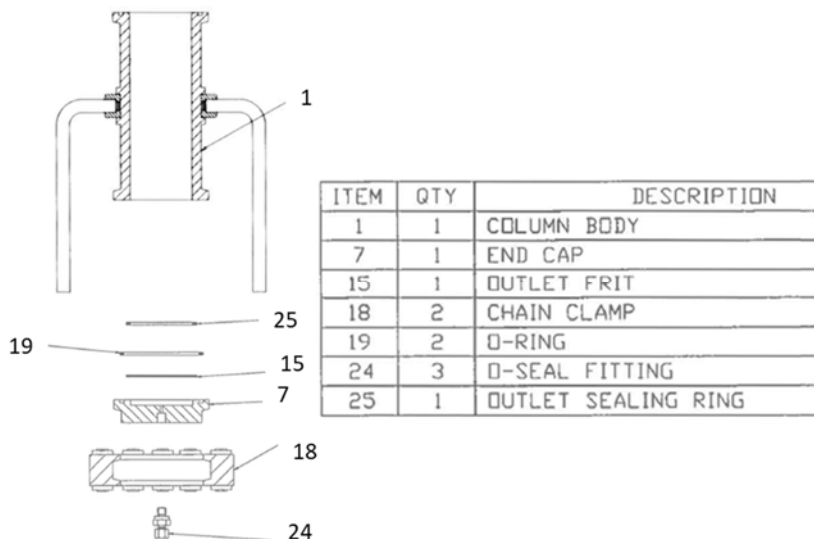
### 7.1. AMW-AV6 Column Assembly

#### 7.1.1. Column body is not typically disassembled.



ITEM	QTY	DESCRIPTION
1	1	COLUMN BODY
2	1	COLUMN DOLLY WELDMENT
28	2	SOC HD CAP SCREW

#### 7.1.2. Assemble the End Cap following the diagram in figure.



7.1.2.1. Install the O-Seal Fitting (24) into the End Cap (7) and tighten.



7.1.2.2. Install the outlet O-Ring (19) into the groove on the End Cap (7).



7.1.2.3. Install the Outlet Frit (15) into the counter bore on the End Cap (7) with the fine side facing upward.



7.1.2.4. Install the Outlet Sealing Ring (25) over the Outlet Frit (15).



7.1.2.5. Invert the Column Body (1) and place in the containment tray.

7.1.2.6. Invert the end cap assembly and slide over the column flange.



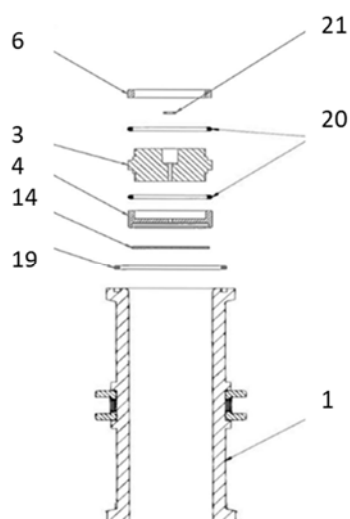
7.1.2.7. Wrap the Chain Clamp (18) around the flanges, center the cap and tighten the chain bolt. When tightening the bolt, finger tighten first before using a wrench.



7.1.2.8. Stand the column upright and place back into the containment tray.

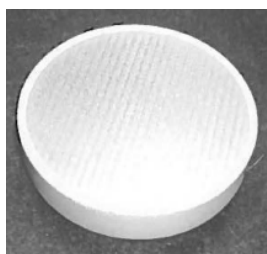


7.1.3. Assemble the compression head following the diagram in figure.



ITEM	QTY	DESCRIPTION
1	1	COLUMN BODY
3	1	COMPRESSION HEAD
4	1	FRIT SEAL BODY
6	1	COMP. HEAD TOP CAP
14	1	INLET FRIT
19	2	O-RING
20	2	O-RING
21	1	O-RING

7.1.3.1. Place the Frit Seal Body (4) on a flat clean surface with the grooved side up as shown. Insert the Inlet Frit (14) with the fine side up into the inner groove of the Frit Seal Body (4).



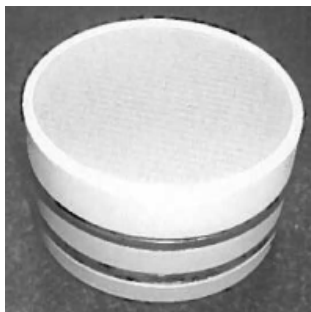
7.1.3.2. Place the two O-Rings (20) onto the Compression Head (3) as shown.



7.1.3.3. Screw the Top Cap (6) on the upper rim of the Compression Head (3).



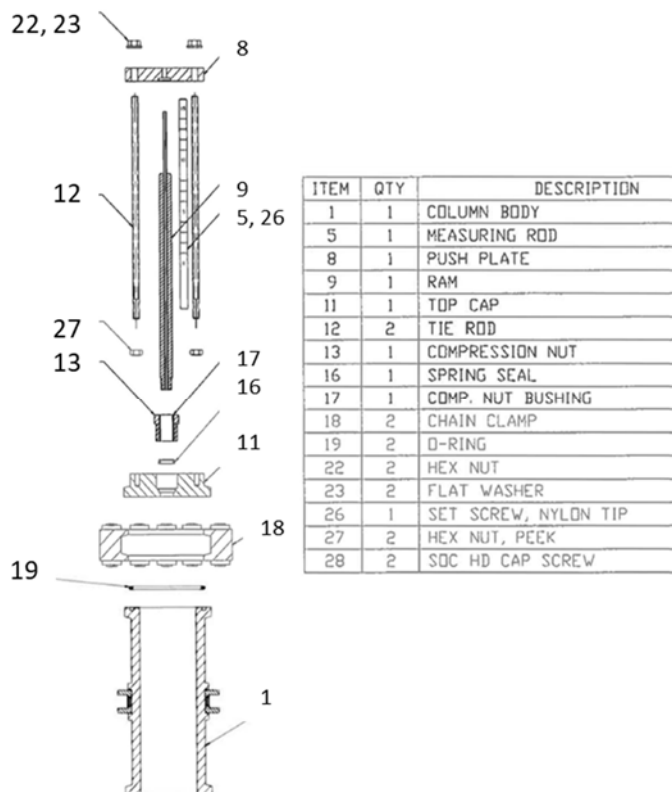
7.1.3.4. Invert the Compression Head (3) and screw the frit seal assembly onto the opposite side of the Compression Head (3) as shown.



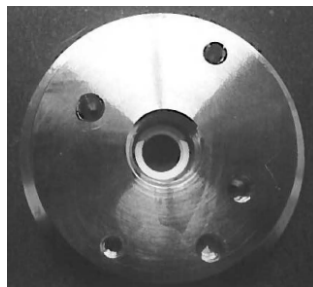
7.1.3.5. Invert the compression head and the frit seal assembly and place the -008 O-Rings (21) into the groove inside the threaded hole on the top of the Compression Head (3).



7.1.3.6. Assemble the top plate following the diagram in figure.



7.1.3.7. Place the Top Cap (11) on a flat clean surface. Drop the Spring Seal (16) into the threaded counter bore on the top of the cap with the spring facing down.



7.1.3.8. Screw the Compression Nut (13) into the Top Cap (11) until the nut touches the Spring Seal (16). Slowly tighten the Compression Nut (13) to push the Seal into the Cap until the nut bottoms.



7.1.3.9. Insert the tube end of the Ram (9) through the Seal and Nut from the bottom side of the Cap as shown.





- 7.1.3.10. Insert the O-Ring (19) into the O-ring groove on the top of the Column Body (1).



- 7.1.4. Introduce the solid support slurry if this is the column packing, or skip this step if this is the column assembly for the leak test.

- 7.1.5. Place the compression head assembly into the bore of the column and press down evenly using the heel of the palms. Continue pushing until the top of the compression head is flush with the column flange.

NOTE: Beware of liquid coming out of the bore on the compression head if slurry is added.



- 7.1.6. Screw the Ram (9) and End Cap into the Compression Head until the Ram bottoms on the Head.



7.1.7. Slide the Cap down the Ram until it rests on the top flange of the Column. Wrap the Chain Clamp (18) around the top flange. Close the chain and tighten the bolt to seal the End Cap. When tighten it, finger tighten first before use wrench.



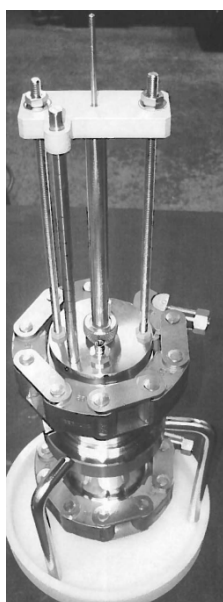
7.1.8. Install the 1/8" O-Seal Fittings (24) into the Top Cap (11).



7.1.9. Insert the Measuring Rod (5) and Tie Rods (12) onto the Top Cap. Secure the Tie Rods (12) via PEEK Nuts (27) and Measuring Rod with the Set Screw (26).



7.1.10. Slide the Push Plate (8) over the Tie Rods (12) and Measuring Rod (5). Use the Nuts and Washers (22, 23) to maintain bed length after the column is packed.



**NOTE:** Use a PEEK ferrule on the Ram side of the fitting as it is removal during servicing. **DO NOT USE SWAGelok TYPE FITTING.**

7.1.11. To push the piston down, refer to equipment manual on use ~10 psi air. Follow the following instructions to use synthesizer to push the piston up and down.

7.1.11.1. To push the piston down, pump ACN from the synthesizer via one of the two fittings on the Top Cap to the hydraulic chamber. The other fitting on the Top Cap should be sealed and the two fittings on the Ram or End Cap should be opened. Once the correct bed height is achieved, seal both fittings on the Top Cap.


**NOTE:** Be aware of ACN spill from column bed.

7.1.11.2. To read bed height, read from the **top** of the Push Plate (8).

7.1.11.3. To push the piston up, pump ACN from the synthesizer via one of the column inlet fittings. The other inlet fitting should be sealed, and the fittings on the Top Cap should be unsealed to allow ACN in the hydraulic chamber out.

## 7.2. AMW-AV6 Column Unpack

7.2.1. If this is after the leak test, take out the piston by pushing the piston all the way up and unwrap the Chain Clamp (18). Lift the Top Cap and compression head assembly to access the column bed.

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7.2.2. If this is to access the solid support inside the column bed, carefully remove the End Cap Chain Clamp (18). Have a large container, e.g., pitcher to catch the solid support. Once all of the solid support is recovered, take out the End Cap.

7.2.2.1. Reassemble the End Cap.

7.2.2.2. Push the piston up to take the compression head assembly out from the top of the column.