

Casting Dam

Models DAM23, DAM20 and DAM13

Operating and Maintenance Manual 7217461 Rev. 0



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DAM23, DAM20, DAM13

MANUAL NUMBER 7217461

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Important Read this instruction manual. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance. ▲

Caution All internal adjustments and maintenance must be performed by qualified service personnel. ▲

Statement of Proper Use: Use this product only for its intended purpose as described in this manual.

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Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.



Hot surface(s) present which may cause burns to unprotected skin, or to materials which may be damaged by elevated temperatures.



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Section 1 General Information

The Casting Dam is utilized in conjunction with horizontal gel casting systems. The casting dam blocks off a portion of the UVT gel tray to allow shorter gels to be cast and run in one device. There is no need for tape. This innovative design provides a fast and easy casting method with a durable and reliable electrophoresis system. The casting dam is manufactured of a high quality aluminum that seals the agarose upon contact. A convenient knob for handling and finger depressions provide easy maneuverability. Because the casting dam is free standing, the chosen gel length is not restricted.

Gradient agarose gels may also be cast utilizing the casting dam. This may be accomplished by two methods either by sliding the casting dam a set distance within the gel tray, pouring agarose, allowing the agarose to cool and repeating for each gradient or with multiple casting dams at fixed distances, then pour agarose in between dams, allowing the agarose to cool and then pouring other gradients into the voids.

The casting dam is available in 13cm, 20cm and 23cm lengths to be used with horizontal systems A1, A2, D3-14, A6 and A3-1.

Unpack and Check Your Order

Before starting, unpack the unit and inventory your order. If any parts are missing, contact Technical Services within 7 days of purchase.

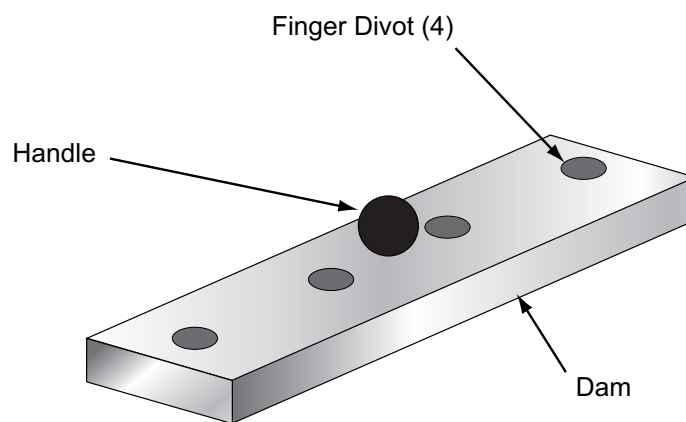


Figure 1-1. Component Identification

Section 2 Setting Up

The Casting Dam allows you to pour a short gel using your existing agarose gel tray and to easily pour horizontal gradient gels.

On the top side of the dam, there are four finger divots. These divots aid in moving the casting dam in a parallel motion in the gel tray, using either one or two hands. The two divots closest to the handle are helpful for one handed operation, while the divots at the ends of the dam are helpful for two handed operation, one on either side of the tray.

Gel Casting (Single Percentage Gels)

1. To cast a gel using the Chameleon™ Casting Dam you will need desired comb(s) (see the applicable Owl Operator Manual) and UVT gel tray with the appropriate gel caster (see table below).

Applicable Gel Casting Systems

Horizontal System	Model Number	Casting System
A1	DAM13	buffer chamber or external caster
A2, A5	DAM20	gasketed end gates
D3-14	DAM23	external gel caster
A1, A3-1, A6	DAM23	gasketed end gates

2. Place the UVT gel tray on a level surface or on a leveling platform. Set up the UVT gel tray as specified in the appropriate system manual.
3. Place the casting dam inside the UVT gel tray at the appropriate distance from the end of the UVT gel tray for the length of gel desired.
4. Pour cooled (lower than 60°C) agarose into UVT gel tray.
5. Place comb(s) into tray at desired positions.

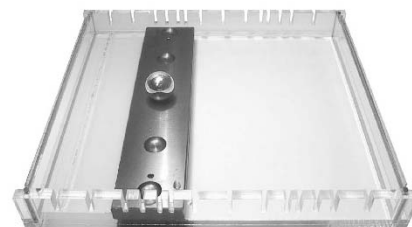


Figure 2-1. Dam In Use

Section 3 Using the System

Gradient Gels

There are two methods of gradient gel formation possible using the casting dam; a Variable Step and Even Step gradient.

Variable Step

With the Variable Step method, agarose (<60°C) is poured and allowed to solidify between one side of the casting dam and the end of the blocked off UVT gel tray before the next concentration can be poured.

1. Place the Casting Dam into the UVT gel tray, at the desired distance from the blocked end of the UVT gel tray for the length of the first gel %. Pour agarose into the appropriate space.
2. When the gel has solidified, place or slide the Casting Dam at the desired length for the second gel% from the edge of gel in Step 1. Pour the second gel between the bottom edge of first gel and the Casting Dam then allow it to solidify.
3. When the gel has solidified, place or slide the Casting Dam at the desired length for the third gradient from the edge of gel in Step 2. Pour the third gel between the bottom edge of first gel and the Casting Dam then allow to it solidify.
4. This process is repeated for the number of desired gel % segment in the gradient, Steps 3 and 4.

Note Combs should be placed in the UVT gel tray at desired positions after agarose is poured into the UVT gel tray. Combs can only be placed when the agarose is in a liquid form. ▲



Figure 3-1. Step 1

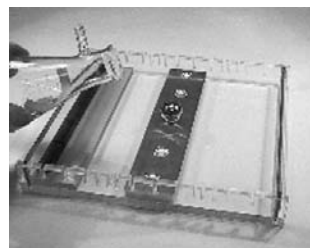


Figure 3-2. Step 2



Figure 3-3. Step 3

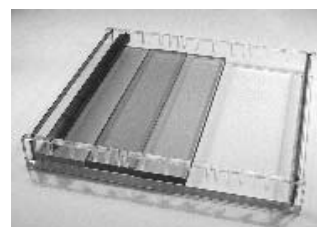


Figure 3-4. Step 4

Gradient Gels (continued)

Even Step

The Even Step has agarose on either side of a Casting Dam. Once the agarose has cooled, the casting dam is removed, leaving a void. This void is filled by a different percentage. The initial agarose could be the same or different on either side of the gel. Depending on the overall gel length made, two or more dams can be used to form two or more voids.

1. If three different percentage steps are required, gels A, B, and C, then, place or slide the dam in the UVT gel tray to the required distance from the end gate. Pour gel-A on one side of the dam and gel-C on the other side of the dam and allow to solidify.
2. After the casting dam is removed, gel-B would be poured into the void formed by the casting dam.

Note Combs should be placed in the UVT gel tray at desired positions after agarose is poured into the UVT gel tray. Combs can only be placed when the agarose is in a liquid form. ▲

Note The volume of gel required by the casting dam can be found in Table 4-2. ▲

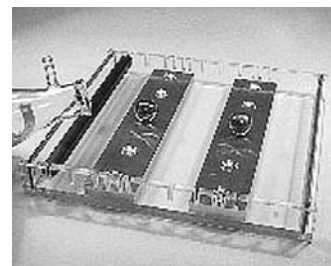


Figure 3-5. Step 1

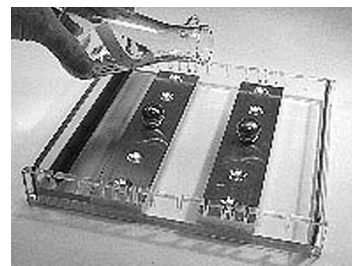


Figure 3-6. Step 2

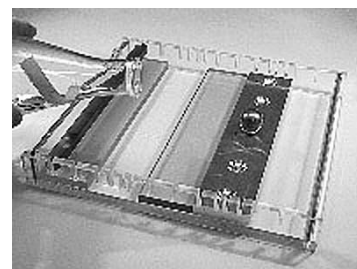


Figure 3-7. Step 3

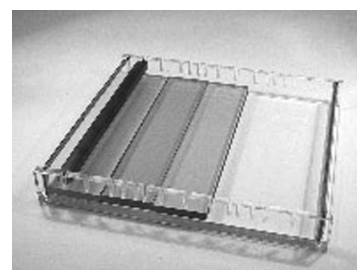


Figure 3-8. Step 4

Section 4 Technical Tips

Different percentages of agarose (or starch) gels used with the dam

Less concentrated agarose solutions are less viscous and take longer to solidify, due to the greater distances between agarose molecules. The lower viscosity material is more likely to leak through the side gaps between the casting dam and the UVT gel tray sides than a thicker, more viscous solution. The material used to manufacture the casting dam took this into account, whereby some leakage would quickly gel, forming a contact seal.

The ability to draw off heat and create the fast contact seal is dependent on both the temperature of the agarose and the temperature of the casting dam. For most applications, a casting dam in a warm room is fine, given the agarose temperature recommended for the trays. For some lower percentage gel, in a warm lab (25°C), the casting dam should be cooled. It may be kept in the refrigerator, freezer, or just on ice, beside the UVT gel tray. Table 4-1 lists some of the temperatures of both the agarose and casting dam that formed a leak-free gel for different agarose percentages. Sometimes, a bit of agarose will make its way to the end of the casting dam, but is generally a small amount (less than 250µl).

Table 4-1. Recommended Gel Pouring Conditions

Agarose Temp°C	Agarose %	Dam Temp, °C/°F	Sealed	Yes/No
49	0.50	20.0	68.0	Yes
51	0.50	21.0	69.8	Yes
60	0.50	19.3	66.7	No
60	0.50	25.7	78.3	No**
60	0.50	10.7	51.3	Yes
60	0.50	21.5	70.1	Yes
65	0.50	23.8	75.0	No
91	0.50	20.0	68.0	No
94	0.50	3.2*	37.8	Yes
70	0.75	23.8	74.8	No
70	0.75	21.7	71.1	Yes
70	0.75	20.0	68.0	Yes
63	1.00	20.5	68.9	Yes
70	1.00	21.3	70.3	Yes
70	1.00	34.0	93.2	No
70	1.00	30.0	86.0	Yes**

*Chilled casting dam

**100µl made its way to the other side of the casting dam.

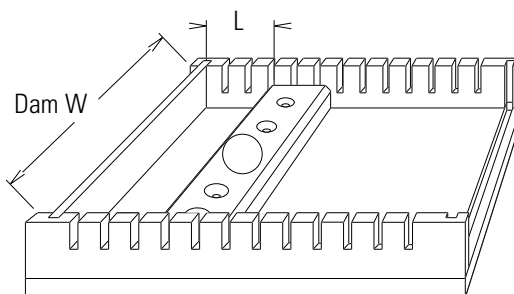


Figure 4-1. Dimensions

When using this casting dam, several gel volume types will be encountered: a single gel of a single percentage agarose, multiple, equal gels of differing agarose percentage, and multiple: gels of differing size and agarose percentage. In all cases, the volume may be determined as follows:

$$\text{Gel Volume} = (\text{Dam Width}) \times (\text{Gel Length}) \times (\text{Gel Height})$$

Casting dam **Width** is determined by which system you have, and is given in Table 4-2 below, as “Dam W cm” (see Figure 4-1).

Gel Length is how long (the direction of sample migration) you desire a given gel to be. For gradient gels, the gel segments that make up each of the different percentages in the overall gradient can be of different lengths from one another (see Figure 4-1).

Table 4-2 uses a constant gel length of 5.1cm. This is the length of this casting dam. Therefore, these volumes can be used for the Even Step casting method, or whenever your desired gel is the same length as the casting dam.

Gel Height is specified by you. It is generally 0.5cm, but to increase the volume of sample that can be loaded into a well (with a given comb), the height may be higher.

Table 4-2. Volume of Gel Required

System	Dam L cm	Dam W cm	ml @ .5cm	ml @ .75cm	ml @ 1cm
A3-1	5.1	23.0	58.4	91.0	116.7
A6	5.1	23.0	58.4	91.0	116.7
D3	5.1	23.0	58.4	91.0	116.7
A2	5.1	20.0	50.7	79.2	101.5
A1	5.1	13.0	33.0	51.5	66.0

Section 5 Maintenance

Troubleshooting	
Problem	Solution
Agarose is leaking between the casting dam and gel tray	The agarose may leak if the room temperature is higher or a low percentage gel is used. The casting dam may need to be cooled under certain conditions. Refer to Table 4-1.

Care and Cleaning

Clean the Chameleon casting dam with warm water and a mild detergent.

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