

THE **CleanSpot**

A PCR/UV Work Station



- ✓ **Controls PCR Contamination**
- ✓ **^{32}P Irradiation Protection**
- ✓ **Cycle Sequencing Set Up**

COY
LABORATORY
PRODUCTS INC.

THE CleanSpot

DESIGNED TO FULFILL A VERY IMP

DNA sequences often contaminate reagents, buffers, equipment, tubes and tips commonly used for PCR* reactions, resulting in needless lost time and expense.

For years it has been known that UV light can damage DNA. UV exposure of 30 minutes or less in the CleanSpot can prevent unwanted amplification of contaminant DNA. The combination of unique reflectors and powerful overhead UV lights introduces pyrimidine dimers and other photodamage into the contaminating target sequences, making them non-amplifiable.

The amplification process produces large quantities of DNA that are handled at various analysis stations, and even laboratories using extreme care in handling the samples will have the product DNA permeate through the lab. One copy of this product DNA or other extraneous DNA in an experimental reaction mixture can be amplified, leading to false positives or erroneous results. This contaminant DNA is typically introduced during reaction set up, being carried into the mixture by:

1. contaminated tubes, tips, pipettes;
2. airborne particles laden with DNA;
3. fouled reaction components.

The CleanSpot is designed to combat the three major contaminant pathways. Reaction preparation and equipment/supply storage is performed in the "clean", enclosed, still air chamber, thus minimizing airborne and supply-borne contamination. During reaction preparation, part of the reaction mix is exposed to the UV light, thus decontaminating any fouled reaction components. Since this exposure bathes the chamber and its contents, they are "cleaned" at the same time. By keeping the doors latched, the enclosed chamber and supplies are ready for the next use.

Multiple Item Irradiation

Large enclosed work area permits continuous irradiation of many items simultaneously.

More Effective Irradiation of Reaction Mixtures, Reagents and Supplies

Unique light reflector allows all UV light to be directed to the work area, providing more effective irradiation of reaction mixtures, reagents, pipette tips, and pipettors.

Eliminates Falsely Primed Products in 30 Minutes or Less

The shelf can be used as an exposure area to reduce decontamination time.

Reduced Operator Exposure to UV

Safety device switches off the lamps preventing user exposure inside chamber. Acrylic absorbs UV light for added safety.

White Light Illumination

Overhead white light illuminates the work area for non-UV light applications.

³²P Workstation, Ideal for Cycle Sequencing Preparation

Thick 3/8 inch acrylic front panel is an effective beta shield, providing protection from beta radiation emitted from ³²P.

Isolating Environment

The enclosed benchtop work area provides a convenient, "clean", still air environment in which to set up reactions.

Easy to Install and Clean

The chamber breaks down into 4 component parts without the use of tools.

Advantages Over Other Methods

In addition to enjoying cost advantages over laminar hoods, the CleanSpot can have performance benefits due to the enclosed work area and UV lights. The amplified DNA is not altered as with chemical decontamination methods. An important facet in preventing contamination, the isolated, "clean" set up area is missing when trans-illuminators or crosslinkers are used as radiation sources. Also, these light sources may not emit light at a high enough intensity or at the proper wavelength to efficiently inactivate the contaminant DNA.

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IMPORTANT NEED: GREATER CONTROL OF PCR* CONTAMINATION

Performance Information

A. Pure Target - 100% of sequences can be amplified. 10 ng of a previous PCR product resuspended in 4 µl of distilled H₂O were aliquoted into a series of tubes. All tubes were run through UV light irradiation and 1 tube was removed every 10 minutes. Each tube was then cycled through 30 rounds of PCR using primers specific to the material PCR and 10 µl of each reaction was run on an agarose gel. Tubes were on their sides and capped.

B. Human Genomic DNA Target

1. Repetitive sequence DNA primers were used on total genomic DNA which was irradiated over a time course of 10 to 30 minutes. One tube was removed every 10 minutes and each tube was cycled through 30 rounds of PCR using repetitive DNA primers. 10 µl of amplified DNA was run on an agarose gel. 20 minutes of irradiation was required to deactivate 20 ng of target. Tubes were on their sides and capped.

2. 50 ng of total human DNA resuspended in 4 µl of distilled H₂O was irradiated over a time course of 10 to 30 minutes. Each tube was cycled through 30 rounds of PCR using a primer set specific for a single gene. 20 minutes completely deactivated the template.

The irradiation times given in A and B above can be reduced by placing the items to be decontaminated on the shelf in the chamber. Since the light is

about two times more intense on the shelf, the time required to deliver the same amount of energy to the items is 1/2 that at the chamber base where tests A and B were done.

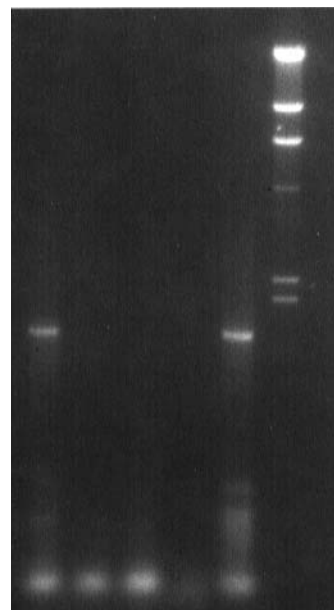
Suggested irradiation times take into account the intensity given off by the UV lights and the natural decay in this intensity over time. A decrease of 20% in intensity is seen after 1500 hours of continuous operation. Since this decay is accelerated by switching the bulb on and off, we suggest changing the bulbs every year.

Current users are finding the CleanSpot very useful in eliminating contamination problems in labs where amplification of the same gene has been done for a long time.

Technical Specifications

Dimensions:	18" L x 24" W x 28" H (46cm x 61cm x 71cm)
Weight:	31 pounds (16 kg.)
Light Source:	2 UV bulbs - 254 nm white fluorescent bulb
Electrical:	110 V/60 Hz, 1.2A 220 V/50 Hz, 0.6A
Warranty:	6 months
Safety Device:	Reed switch prevents operation of UV lamps

1 2 3 4 5 6



Inactivation of Target DNA by UV Irradiation

10ng of a 1.5 kb fragment was exposed to UV irradiation for 0, 10, 20 and 30 minutes (lanes 5, 1, 2, 3), then amplified for 30 cycles. Lane 4 shows primer in absence of other reaction components. Lane 6 is lambda DNA cleaved with Hind III.

*PCR (polymerase chain reaction) is covered by patents held by Hoffman-LaRoche

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of Reports Utilizing UV Irradiation and/or Containment to Minimize Carry-over Contamination in DNA Amplification

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