

Mini Blot Module



Green benefits

- Less hazardous: generates 74% less methanol waste
- Energy efficient: runs at room temperature; doesn't require cooling blocks or chilled buffer

Introduction

Thermo Fisher Scientific is committed to designing our products with the environment in mind—it's part of how we support our mission to enable our customers to make the world healthier, cleaner, and safer. This fact sheet provides the rationale behind the environmental claims that use of the Invitrogen™ Mini Blot Module results in 74% less hazardous waste generated and greater energy efficiency compared to other models because it can run at room temperature and requires neither cooling blocks nor chilled buffer.

Product description

The Mini Blot Module (Figure 1) is a wet transfer device designed for blotting of mini gels; it enables efficient, reliable transfer of proteins from mini gels to membranes. The device is easily inserted into the Invitrogen™ Mini Gel Tank in place of a gel cassette assembly. Its universal connection and molded gasket make the Mini Blot Module easy to use, while the inner core requires less methanol-based transfer buffer, generating less hazardous waste



Figure 1. The Mini Blot Module and included accessories.

compared to the Bio-Rad™ Mini Trans-Blot™ Cell. At the recommended conditions and constant voltage, each module can be used to transfer protein from one mini gel to a nitrocellulose or polyvinylidene difluoride (PVDF) membrane, typically in 30 to 60 minutes, using only 250 mL of 1X transfer buffer. The Mini Blot Module also helps save energy since it is designed to run at room temperature, eliminating the need for cooling blocks and chilled buffer.

Green features

Less hazardous

Wet transfer of proteins from mini gels to membranes requires use of a methanol-based transfer buffer. Methanol is a highly flammable solvent that is toxic if swallowed or inhaled; it causes damage to organs through prolonged or repeated exposure [1]. The Mini Blot Module, with a half-inch buffer chamber within its core, has been designed to reduce the volume of methanol required and thereby decrease the hazardous waste generated. A typical transfer for each Mini Blot Module uses 250 mL of 1X methanol-based transfer buffer and generates that same volume of hazardous waste at the end of the transfer process, compared to the Mini Trans-Blot Cell requiring 950 mL of buffer and generating that same volume of waste—reducing the hazardous waste from this buffer by 74% (Table 1).

Reducing the volume of methanol needed for blotting transfers also helps save money. A typical lab of six staff members each running four transfers per week would save 175 L of methanol each year. This would reduce the lab's hazardous waste generation by 3,485 L annually and provide potential cost savings of \$5,260 per year from purchasing less methanol, assuming a purchase cost of \$120 per 4 L bottle.

Energy efficient

The ability of the Mini Blot Module to run at room temperature using ambient-temperature buffers—rather than requiring a frozen cooling unit and chilled transfer buffer like the Mini Trans-Blot Cell does—enables energy-saving benefits from a product lifecycle standpoint.

Cold storage represents a critical energy efficiency opportunity for labs, due to the significant energy required to power laboratory-grade refrigerators and freezers. A 2015 study on laboratory energy consumption by the Center for Energy Efficient Laboratories (CEEL) [2] determined that laboratories in the state of California alone use at least 800 GWh of energy each year—equivalent to the yearly greenhouse gas emissions from 127,489 passenger cars [3]. According to the CEEL study, cold storage makes up approximately 25% of the energy consumption within a typical lab. The ability to run the Mini Blot Module at room temperature with room temperature buffers represents one small but important step forward in enabling more efficient use of resources for laboratory cold storage.

Designing the Mini Blot Module to save energy and use less methanol to generate less hazardous waste is a win for our customers, our company, and the planet.

Table 1. Comparison of solvent usage and hazardous waste generation for the Mini Blot Module compared to the Mini Trans-Blot Cell.

Blot transfer device	Methanol used (for 20% v/v buffer)	Volume of transfer buffer required	Hazardous waste generated	Reduction in methanol used	Reduction in hazardous waste generated
Mini Blot Module	50 mL	250 mL	250 mL	74%	74%
Mini Trans-Blot Cell	190 mL	950 mL	950 mL	–	–

References

1. Safety Data Sheet, Methanol. fishersci.com/msds/A412500
2. Allison Paradise (2015) Market Assessment of Energy Efficiency Opportunities in Laboratories. etcc-ca.com/sites/default/files/reports/ceel_market_assessment_et14pge7591.pdf, accessed January 2019.
3. U.S. EPA Greenhouse Gas Equivalencies Calculator. epa.gov/energy/greenhouse-gas-equivalencies-calculator, accessed January 2019.

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