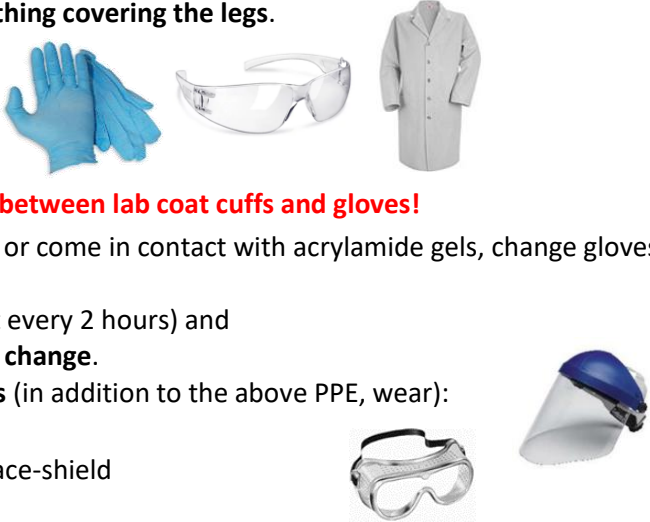


   Duke OESO Guidelines for Safe Use of PRE-CAST POLYACRYLAMIDE GELS   		
Hazards	Potential Hazards	• Acrylamide is used for polyacrylamide gel electrophoresis and DNA precipitation. • This guideline is for pre-cast polyacrylamide gels only. If casting your own gels, use the fillable version of this guideline instead. • Using pre-cast polyacrylamide gels eliminates the need to handle acrylamide monomer and polymerization catalysts, which are highly toxic. While pre-cast acrylamide gels are already polymerized, they can still contain residual amounts of the neurotoxic acrylamide monomer. All gels should be treated as though residual unreacted acrylamide monomer is present. Additionally, the running buffers and staining solutions used alongside pre-cast acrylamide gels often contain hazardous chemicals that can be harmful by skin/eye contact or inhalation. • Acrylamide monomer can easily penetrate intact skin. • Acrylamide monomer is known to affect the nervous system, with early signs of exposure including numbness, tingling, and tenderness to touch. Symptoms can be delayed several days to weeks, and if exposure continues (even in small quantities), other symptoms may arise including excessive sweating, blue-reddish skin, peeling of skin, and weakness in limbs. • Acrylamide is a Particularly Hazardous Substance because it is a probable human carcinogen. • Acrylamide may cause sensitization by contact with skin. • Animal studies have shown maternal and paternal reproductive health effects from exposure to acrylamide. • The OSHA Permissible Exposure Limit (PEL) for acrylamide is 0.3 mg/m³ for an 8-hr workday. • ACGIH has a Threshold Limit Value (TLV) of 0.03 mg/m³ (0.01 ppm). • Possible routes of exposure include skin and eye contact, inhalation, and accidental ingestion. Acrylamide is highly toxic via all routes of exposure (dermal, inhalation, oral). • Consult the Laboratory Chemical Safety Summary for acrylamide for additional hazard info.
	Selection & Purchase	• Use a safer alternative when possible (non-acrylamide gel matrices such as agarose gels or starch gels, if workflow does not require the high-resolution characteristic of acrylamide). • Purchase gels in quantities that minimize storage time and waste. • Purchase at the lowest concentration needed for work.
Hazard Controls	Storage & Transport	• Store and transport gels in original packaging or sealed secondary container. • Keep refrigerated if required by manufacturer. • Store in secondary containment in a well-ventilated area, away from heat and flame that could degrade gels. • Store away from incompatibles such as metals, oxidizing agents, reducing agents, acids, bases, and peroxides. • Store away from metals and do not store under the sink. • Store below eye level but not on the floor.  
	Engineering Controls	• An eyewash is required in the work area. • When working with large numbers of pre-cast polyacrylamide gels, use a chemical fume hood or an exhausted biological safety cabinet with negative pressure ductwork. 

Other	Work Practice Controls	• Use bench pads to cover areas that may become contaminated with running buffers during electrophoresis (may contain residual acrylamide) for easy clean-up. • Avoid contact with incompatible materials including metals, oxidizing agents, reducing agents, acids, bases, and peroxides. • Keep work with acrylamide gels away from heat and flame. • Keep gels and buffers contained to designated work areas. • Do not manipulate gels outside of normal electrophoresis or DNA precipitation procedures. • Heating, cutting, or tearing the gels can damage the gel matrix which could release and expose residual unpolymerized acrylamide monomer (which is highly toxic). If any of these actions are required, perform them in a chemical fume hood. • Dispose of gels promptly after use - Do not allow them to dry out on the bench top. • Clean and decontaminate work surfaces after use with detergent and water.
	Personal Protective Equipment (PPE)	• Wear closed-toed shoes and clothing covering the legs. • Minimum PPE: ○ <u>Extended cuff</u> nitrile gloves ○ Lab coat ○ Chemical safety glasses • Ensure there is no exposed skin between lab coat cuffs and gloves! • If gloves are splashed by buffers or come in contact with acrylamide gels, change gloves as soon as possible. • Change gloves regularly (at least every 2 hours) and wash hands at the time of glove change. • If handling large numbers of gels (in addition to the above PPE, wear): ○ Two pairs of nitrile gloves ○ Chemical splash goggles or face-shield 
	Medical Emergencies	• See Emergency Response Guide and/or lab-specific chemical hygiene plan. • For eye/skin exposure, flush with water for at least 15 min, then seek medical attention. • Contact Employee Occupational Health and Wellness (EOHW) at 919-684-8115 to report an exposure and obtain medical advice. • For medical advice without exposure, call 919-684-3136.
	Spills	• Pre-cast polyacrylamide gels that are dropped or “spilled” should be picked up using gloved hands and placed in designated chemical waste container with appropriate labeling. • Spills of buffers from acrylamide gels should be absorbed with spill pads. Place any clean-up materials into a bag and seal, then submit as chemical waste (see waste section below) through OESO Environmental Programs (call 919-684-2794 with questions). • Once spill is cleaned, clean and decontaminate the affected areas with detergent and water.
	Waste	• Dispose of used gels and running buffers as chemical waste through OESO. Follow your laboratory-specific chemical hygiene plan, Duke University’s Chemical Waste Policy and the Laboratory Chemical Waste Management Practices.
	Training	• Sign the signature page in the lab-specific chemical hygiene plan to indicate review.
	Questions	• Contact OESO Lab Safety at 919-684-8822 or labsafety@duke.edu.