HEALTH AND SAFETY PLANNING RESOURCES

For Envelope Retrofit Contractors utilizing Two-Component Spray Polyurethane Foam Insulation

Created on NYSERDA's behalf, by TRC

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1.1 About this Packet

This packet was created for envelope retrofit contractors within NYSERDA's home performance programs (EmPower+ and Comfort Home) that utilize two-component low- or high-pressure spray polyurethane foam insulation (SPF) as part of their retrofit services as a supplemental resource to assist businesses with developing or improving their health and safety plans under new program requirements.

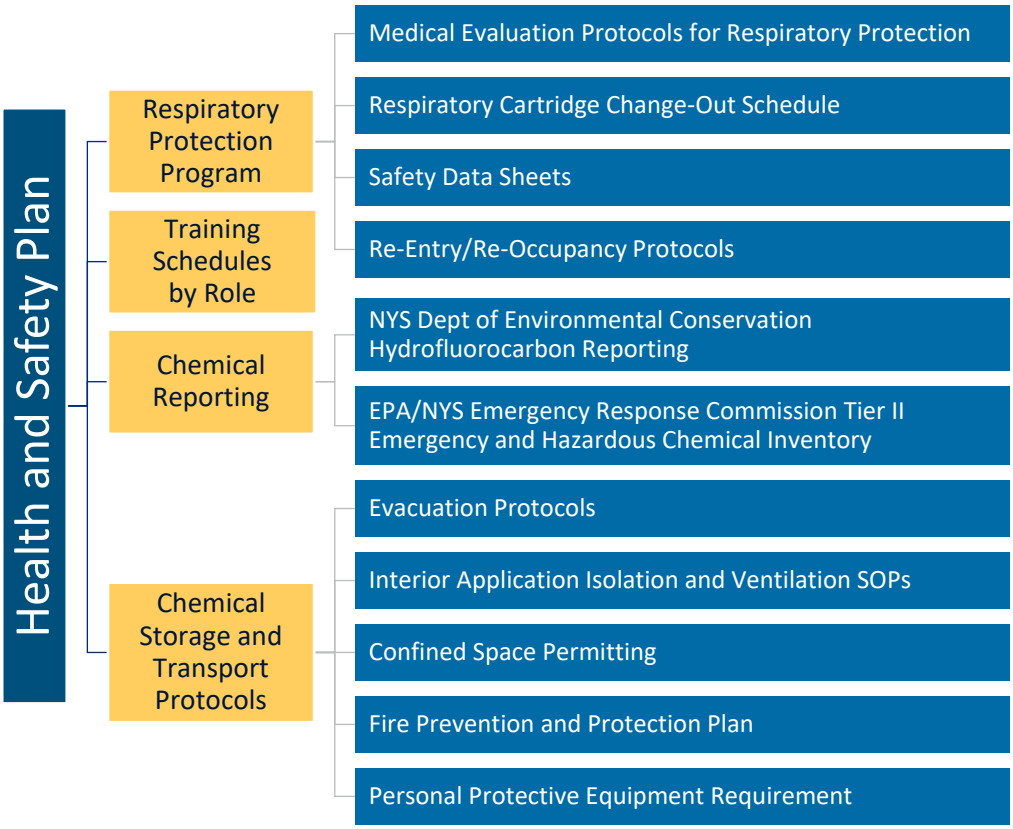
The resources within this packet draw from federal, state, and industry sources, including the Occupational Safety and Health Administration, the New York State Department of Environmental Conservation, and the American Chemistry Council's Center for the Polyurethane Industry. They offer a wide spectrum of support for SPF contractors in developing a culture of safety within their organizations, including providing information about available training for employees, templates for job site safety planning reporting daily activities, and links to online tools for developing a health and safety plan.

Disclaimer

This guide is provided for informational purposes only and is intended to aggregate resources from several available sources for easy reference to assist contractors in developing and implementing their health and safety plans. Complying with this guide does not ensure compliance with all applicable laws and regulations. Contractors are ultimately responsible for their own compliance with all applicable laws and regulations.

1.2 Health and Safety Plan

It is the contractor’s responsible to follow all State and Federal laws and regulations. A written health and safety plan should be in place as part of your company’s procedures. The following material is recommended as a reference when a company creates their safety plan.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2 General Health and Safety Plan Guidance

2.1 OSHA General Guidance

The Occupational Safety and Health Administration offers extensive resources around developing safety and health programs for a variety of organizations. These include:

Recommended Practices for Safety and Health Programs at https://www.osha.gov/sites/default/files/publications/OSHA3885.pdf

Safety and Health Programs Step-by-Step Guide at: https://www.osha.gov/safety-management/step-by-step-guide

Sample programs at: http://www.osha.gov/dcsp/compliance_assistance/sampleprograms.html#OSHA

The OSHA Small Business Safety and Health Handbook at: https://www.osha.gov/sites/default/files/publications/small-business.pdf

2.2 EPA's SPF Contractor Guidance

In addition, the Environmental Protection Agency offers two thorough tools created uniquely for SPF contractors evaluating their health and safety protocols.

The EPA Contractor Checklist: Guide to Safer Workplace Practices for Installing High-Pressure Two-Component Spray Polyurethane Foam (SPF) Insulation is available at http://www.epa.gov/dfe/pubs/projects/spf/spray_polyurethane_foam.html

The SPF Contractor Workplace Practices Self-Evaluation Tool describes strategies to promote the safe use of SPF insulation and to protect workers and building occupants, as well as assisting companies in periodically evaluating their practices and technologies. It is not a regulatory compliance tool, but some of the best practices included in the checklist may be required under local, state or federal worker protection or other regulations. It is available at https://www.epa.gov/sites/default/files/2015-08/documents/spf_contractor_workplace_practices_evaluation_tool.pdf

3 Respiratory Protection Program Resources

3.1 General Respiratory Guidance

The Center for the Polyurethanes Industry's Guidance for Developing a Written Respiratory Protection Program is available at: https://www.americanchemistry.com/industry-groups/center-for-the-polyurethanes-industry-cpi/resources/library/guidance-for-developing-a-written-respiratory-protection-program

3.2 Medical Evaluation Protocols for Respiratory Protection

See Section 6, Attachment A subsection IIIa, and Appendices I, II and III of CPI Guidance for Developing a Written Respiratory Protection Program

OSHA's Medical Evaluation Questionnaire:
https://www.osha.gov/sites/default/files/publications/OSHA3790.pdf

3.3 Respiratory Cartridge Change-Out Schedule

OSHA has requirements for Change Schedules. The following is a synopsis of some of the requirements of the standard.

- Employers develop cartridge and canister change schedules based on available data or information. Such information includes the exposure assessment and information based on breakthrough test data, mathematically based estimate and/or reliable use recommendations from the employer's respirator and/or chemical suppliers.
- Reliance on odor thresholds and other warning properties will not be permitted as the primary basis for determining the service life of gas and vapor cartridges and canisters.
- OSHA emphasizes that a conservative approach is recommended when evaluating service life testing data. Temperature, humidity, air flow through the filter, the work rate, and the presences of other potential interfering chemicals in the workplace all can have serious effect on the service life of an air purifying cartridge or canister.

OSHA provides an eTool for determining Respirator Cartridge Change Schedules, available at:

https://www.osha.gov/etools/respiratory-protection/change-schedules

Of particular use are the decision flow trees linked at the bottom of the page.

The MultiVapor app is also available from NIOSH, to be used for estimating breakthrough times and service life of air-purifying respirator (APR) cartridges manufactured to remove toxic organic vapors (OV) from breather air. Available at:

https://www.cdc.gov/niosh/npptl/multivapor/multivapor.html

See also Attachment A subsection IIIe of CPI Guidance for Developing a Written Respiratory Protection Program.

3.4 Safety Data Sheets (formerly MSDS)

OSHA provides the following brief on reading and understanding Safety Data Sheets (now SDS) using the relatively new Hazard Communication Standard (HCS), including the UN Globally Harmonized System of Classification and Labeling of Chemicals.

Safety Data Sheets, created and provided by chemical manufacturers, distributors and importers, provide critical information about both Part A and Part B of two-component spray polyurethane foam insulation.

https://www.osha.gov/sites/default/files/publications/OSHA3514.pdf

3.5 Re-entry/Re-Occupancy Protocols

Based on information provided by product manufacturers via their SDS as well as their proprietary trainings, re-entry and re-occupancy times are product dependent.

The American Chemistry Council's Spray Foam Coalition put out this Information Sheet on Reentry and Reoccupancy Times when Installing Spray Polyurethane Foam Insulation and Sealants, available at https://www.spraypolyurethane.org/wp-content/uploads/2018/08/Info-Sheet-on-Reentry-and-Reoccupancy-Times-when-Installing-SPF-Insulation-and-Sealants.pdf

For those interested in more information about ongoing research around re-occupancy times, product emissions, and ventilation rates, the following indoor air quality testing protocols are available, for a fee, from ASTM's International Subcommittee D22.05:

D7859 Standard Practice for Spraying, Sampling, Packaging, and Test Specimen Preparation of Spray Polyurethane Foam (SPF) Insulation for Testing of Emissions Using Environmental Chambers (astm.org)

4 Chemical Reporting Resources

4.1 New York State Department of Environmental Conservation (NYS DEC) Hydrofluorocarbon Reporting

The NYS DEC requires the reporting of hydrofluorocarbon use and storage within the state. These regulations have already been adopted and can be reviewed at the website below under “Adopted Regulations” Part 494, Hydrofluorocarbon Standards and Reporting.

https://dec.ny.gov/regulatory/regulations/proposed-emergency-recently-adopted-regulations/climate-change

4.2 EPA/NYS Emergency Response Commission Tier II Emergency and Hazardous Chemical Inventory

Under Section 312 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), the EPA and its state representative, the New York State Emergency Response Commission, have reporting standards around the warehousing of Part A over 10,000 lbs, or roughly 15 55-gal drums. Contractors are expected to submit Tier II Emergency and Hazardous Chemical Inventories to the NYS Emergency Response Commission.

New York State is strongly encouraging facilities to use E-Plan as the basic Tier II reporting methodology. By using E-Plan, those required to report will satisfy the Tier II submission to the State. The decision to accept online reporting to LEPCs and fire departments has been left up to each individual jurisdiction.

Reporting guidance material for NYS is available at https://dhses.ny.gov/tier-ii-reporting.

The Tier II Inventory Form and instruction are available on the EPA website at https://www.epa.gov/epcra/tier-ii-forms-and-instructions.

5 Chemical Storage and Transport Resources

5.1 General Product Stewardship Guidance:

The Center for the Polyurethanes Industry put out its Health and Safety Product Stewardship Workbook for High Pressure Application of Spray Polyurethane Foam, available at: https://www.spraypolyurethane.org/wp-content/uploads/2017/08/SPF_2016_PS-Workbook-Final-v2.pdf

Of particular interest, is Chapter 5 Good Practices, which includes information about many of the topics in this section.

5.2 Evacuation Protocols:

Clear communication with clients and occupants about evacuation of the job site and length until reoccupation is a critical component of pre-work planning.

Templates for client communication are available from the Spray Polyurethane Foam Alliance at: https://huntsmanbuildingsolutions.com/en-US/sites/en_us/files/2019-10/spfa-contractor-training-program.pdf

While the entire document has good information, the building envelope templates are pages 16-23 of the pdf.

See also Sections 5.2.1 Site Preparation and 5.2.2 Occupant Outreach, as well as Appendix D Discussing Spray Foam Application with Building Owners and Occupants, in the Health and Safety Product Stewardship Workbook for High Pressure Application of Spray Polyurethane Foam, available at:https://www.spraypolyurethane.org/wp-content/uploads/2017/08/SPF_2016_PS-Workbook-Final-v2.pdf

5.3 Interior Application Isolation and Ventilation SOPs:

The American Chemistry Council's Center for the Polyurethanes Industry provides this very thorough guidance on setting up isolation and ventilation for interior applications of SPF.

https://www.americanchemistry.com/content/download/5195/file/Ventilation-Considerations-For-Spray-Polyurethane-Foam-Guidance-On-Ventilation-During-Installation-Of-Interior-Applications-Of-High-Pressure-Spray-Polyurethane-Foam.pdf

In addition, the EPA provides a more abbreviate version:
https://www.epa.gov/sites/default/files/2015-08/documents/spf-ventilation.pdf

También incluye la orientación en Español:

https://www.epa.gov/sites/default/files/2016-01/documents/spf-ventilation_spa_final.pdf

5.4 Confined Space Permitting:

According to OSHA, "a confined space is a space whose configuration and/or contents may present special dangers not found in normal work areas. Confined spaces may be poorly ventilated and, as a result, contain insufficient oxygen or hazardous levels of toxic gases. Working

in a tight space can prevent a worker from keeping a safe distance from mechanical and electrical hazards in the space. Fumes from a flammable liquid that is used in a poorly ventilated area can reach explosive levels. Such hazards endanger both the workers in the confined space and others who become exposed to the hazards when they attempt to rescue injured workers"

"Because confined spaces are potentially dangerous, employers must evaluate all confined spaces in which their employees work to determine whether hazards exist or whether the work to be done in the space can create hazards. If a confined space contains an actual or potential hazard that can cause death, injury or acute illness, incapacitation, entrapment, or otherwise interfere with a worker's ability to leave the space in an emergency, it is a permit-required confined space, or permit space. Employers must take certain precautions whenever workers enter a permit space. These include (1) specifying the precautions to be taken to protect the workers in the space; (2) training the workers who are covered by the standard to give them the knowledge to protect themselves and others; and (3) planning how to rescue injured workers promptly and safely."

The above definition and additional guidance can be found in the Protecting Construction Workers in Confined Spaces: Small Entity Compliance Guide provided by OSHA at https://www.osha.gov/sites/default/files/publications/OSHA3825.pdf

OSHA also provides the OSHA Confined Spaces Advisor online Tool at https://webapps.dol.gov/elaws/confined.htm

As well as the OSHA FactSheet: Confined Spaces in Residential Construction at https://www.osha.gov/sites/default/files/publications/OSHA3914.pdf

5.5 Fire Prevention and Protection Plan:

The Spray Polyurethane Foam Alliance provided a free webinar on Fire Safety for SPF Contractors, which is still available on-demand for free to non-members at https://www.sprayfoam.org/content.asp?contentid=510

In addition, OSHA provides guidance around Fire Prevention Plans, per CFR 1910.39, at https://www.osha.gov/etools/evacuation-plans-procedures/emergency-standards/fire-prevention

Also, the Alliance for the Polyurethanes Industry, part of the American Plastics Council, put out the following guide for "Hot Work" around SPF insulation: https://www.foamsulate.com/wp-content/uploads/2015/12/AX236-Six-Steps-For-Fire-Safety.pdf

5.6 Personal Protective Equipment Requirements:

See section 5.3 Personal Protective Equipment (PPE) of the Health and Safety Product Stewardship Workbook for High Pressure Application of Spray Polyurethane Foam, available at: https://www.spraypolyurethane.org/wp-content/uploads/2017/08/SPF_2016_PS-Workbook-Final-v2.pdf

Information about breakthrough time for various types of PPE is available from the Alliance for the Polyurethanes Industry at AX178-PDMI-User-Guidelines.pdf (foamsulate.com)

6 Additional Considerations and Templates

6.1 Equipment Maintenance Schedules

Equipment maintenance schedules should be based on the recommendations of the equipment manufacturer and the SPF product manufacturer. Many equipment distributers offer equipment maintenance support. Be sure to speak with your supplier about potential warranties and maintenance programs, since SPF equipment is put through rigorous conditions on a daily basis. Identify who (what role in the company) is responsible for each item's maintenance, on what cycle, and where records of the maintenance will be kept. Your equipment maintenance schedule should include your:

- Transfer system
- Air compressor
- Heated hose assembly
- Electric generator
- Gun assemblies
- Truck and trailer

SPFA provides this guidance document for a fee. SPFA-137 Spray Polyurethane Equipment Guidelines

6.2 Drum Disposal and Reconditioning

Drum Disposal and Reconditioning Locations in New York and surrounding areas.See also www.reusablepackaging.org for up-to-date information.

https://www.bronsteincontainer.com/
Bronstein Container Co. Inc.
1313 Rams Gulch Road
Jamesville, NY 13078
Phone: (315) 469-6191

http://harbisonbrothers.com/
Harbison Brothers
32 Appenheimer Avenue
Buffalo, NY 14214
Phone: (716) 892-3290

http://www.kearnysteel.com
Kearny Steel Container Packaging Specialists
401 South Street
Newark, NJ 07105
Phone: (973) 589-2070

http://www.mauserpackaging.com
Mauser Packaging Solutions
20 Harmich Road #A
South Plainfield, NJ 07080
Phone: 908-756-2200

http://www.tunnelbarrel.com
Tunnel Barrel and Drum
85 Triangle Boulevard
Carlstadt, NJ 07072
Phone: (201) 933-1444

6.3 Additional Planning and Daily Log Templates

The following two examples of templates are provided to reduce administrative burden. They are not required to be used in NYSERDA's programs but are provided here for optional use at the contractor's discretion. The first, a Job Hazard Analysis form, is used to assess a property's potential risks to proactively prevent injury and plan ahead for potential hazard containment.

The second is an SPF Application Daily Work Record, for maintaining comprehensive information about each day's work and conditions when application takes place and to encourage the review of equipment, materials, tools, and PPE on a regular basis, to keep crews safe and working efficiently.

JOB HAZARDS ANALYSIS

Date:

Activity:

Activity Location:

Prepared By: _____

RISK ASSESSMENT CODE MATRIX (RAC)

E = Extremely High Risk H = High Risk M = Moderate Risk L = Low Risk		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
Severity	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Job Steps	Hazards	Actions to Eliminate or Minimize Hazards	RAC Level

SPF Application Daily Work Record

Crew & Rig		Date	
Project Name		Customer Name	
Project Address		Customer Phone	
Project Type	New Remodel	Area in Sq. Feet	

Employees on Site (Identify Safety Officer with *)

Name	Assignment/Task

Safety, Substrate & Set-up

Type of Substrate		Substate Temp	
Substrate Condition	Clean? Yes No Dry? Yes No Properly fastened? Yes No		
Substate Preparation Required			
Spray zone signs up, secured from unprotected access, masked off? Yes No			
Vents Blocked? Yes No		Primer Required? Yes No	
Spray Zone Vented to Outside? Yes No		Protective Coating Required? Yes No	
Ventilation stayed in placed until specified time to occupancy? Yes No # hrs to ventilate			

Material Information

	Manufacturer	Foam Type	Begin Time	End Time	Batch and Lot #	Actual Area sprayed
A-Side #1						
B-Side #1						
A-Side #2						
B-Side #2						

Equipment & Processing Information

Proportioner Type		Stroke Count	Estimated		Actual	
Hose Lengths		Gun Type				
½”	3/8”	Mixing Chamber				
Time	**Ambient Temp & % Rel. Humid**	**Hose Temp**	**A Pressure**	**A Temp**	**B Pressure**	**B Temp**
: am						
: .						
: pm						

Equip Maintenance or application problems:

Daily log completed by:

Test Results						
Density Test	Mass	g	Volume	mL	Density = g/mL x 62.43 =	lbs/ft^3

Adhesion Test **Pass** **Fail**	Installed Thickness Ceiling	# Passes	Installed Thickness Wall	# Passes
Test Completed by				

Equipment Safety Check List (check appropriate column)			
Good	**Needed**	**Repair**	**Description**
			Ladder safe and in good condition
			Scaffold safe and in good condition
			End wrenches (SAE or Metric)
			Hex wrenches (SAE or Metric)
			Socket set (SAE or Metric)
			Nut driver (SAE or Metric)
			Bung wrench
			Screwdriver set (Standard)
			Screwdriver set (Phillips)
			Adjustable wrench
			Water pump pliers
			Vice grips or Channel lock
			Voltage/OHMs/Amp meter
			Laser thermometer
			Stick thermometer (calibrated)
			Hammer stapler (2) or pneumatic staplers
			Sheet rock knife
			Fire extinguisher
			First aid kit stocked and clean
			Eye wash station operable
			Mirror clean
			Apron for solvents
			Face shield for solvents
			Chemical resistant gloves
			Hearing protection
			Absorbent materials for spills
			Portable spill clean-up kit – Iso activator (ammonia, dish soap & 5-gal bucket)
			Rags and/or towels
			Duct tape
			Electric tape (black)
			Red tape
			Blue tape
			4 or 6 mil plastic sheeting
			Staples