



POLYCON OPEN CELL SPRAY FOAM INSULATION APPLICATION GUIDELINE

Product Design

PolyCon 450 High Yield and PolyCon 500 Open Cell systems are No Mix Class A (Class I) rated spray polyurethane foam systems designed to deliver high yield and low-density cost savings. These systems provide applicators with consistent, reliable performance and are engineered for broad application temperature ranges, ensuring versatility across diverse job site conditions.

Product Use

PolyCon 450 High Yield and PolyCon 500 form a durable air barrier within wall cavities and are designed to accommodate a wide range of stud thicknesses in a single-pass application. Both systems adhere to most common building materials, creating a seamless, fully bonded barrier that resists air infiltration for the life of the structure. When applied, PC 450 High Yield and PC 500 expand rapidly from liquid to form a monolithic, fully adhered blanket of insulation. This expansion fills every crack and crevice, eliminating potential pathways for air leakage. Air infiltration can account for up to 45% of energy loss in a typical building—making PolyCon spray foam systems a critical component for maximizing energy efficiency and occupant comfort.

Recommended Processing Guidelines

Mix Chamber	Maximum 02 / 5252
Ambient / Substrate Temp	40 -120°F / 4 - 49°C
Equipment Dynamic Pressure	1,000 - 1,500 psi
Preheat Temperature	115 - 145°F / 46 - 63°C
Drum Temperature	70 - 90°F / 21 - 32°C
Storage Temperature <i>No Sun Exposure</i>	60- 90°F / 15 - 32°C

Recommended Product Applications

- Interior Walls
- Cathedral Ceilings
- Attic Floor
- Sealed Crawl Spaces
- Between Floors
- Basement Walls
- Vaulted Ceilings
- Under Roof Deck

Material Shelf Life

Six (6) months when stored properly

Application Characteristics

When properly processed at the recommended 1:1 ratio, PC 450 High Yield and PC 500 will produce a consistent cell structure and uniform color throughout the installed foam system. Maximum recommended single pass thickness of 8".



Substrate Requirements & Preparation

- Surface moisture content must be 18% or less.
- If adhesion issues are observed, increase wait time and confirm dew point and humidity conditions
- Surface Preparation: Remove dust, oils, release agents, wax, rust, or other contaminants by mechanical abrasion or approved chemical cleaners
 - **Concrete** - Cure ≥ 28 days, verify $\leq 18\%$ moisture with meter, allow to dry before spraying
 - **Galvanized Metal** - Rinse, dry, and prime (epoxy/polyurethane) if long-term adhesion or delayed application
 - **Stainless Steel** - Lightly abrade with non-ferrous abrasive pad, wipe clean, and spray promptly to prevent re-contamination
 - **Waxy or Contaminated Surfaces** - Test adhesion in a small area first; abrade and solvent clean if needed

Spray Technique & Tips

- For improved results on vertical surfaces, spray from the bottom up, allowing rising warm air to help condition the substrate.
- Avoid applying foam into rising lifts or thick accumulations, as this may result in:
 - Excessive exothermic reaction
 - Surface discoloration or odor retention
 - Potential fire hazards

By following these guidelines, applicators can ensure consistent foam quality, strong substrate adhesion, and safe application across a variety of environmental conditions.

Temperature Adjustments

If foam begins to run or drip during application:

- Gradually increase hose and preheat temperatures in 3°F increments
- Allow time for the adjusted material to reach the spray gun before making further changes
- Maintain hose and preheat temperatures below 145°F for both the ISO and resin components

When spraying in cold temperatures (below $40^{\circ}\text{F}/4^{\circ}\text{C}$), warm substrates using indirect heat before application. Start with a flash coat ($\sim 1/2$ inch) to promote adhesion, especially on metal surfaces. Wait at least 15–20 minutes between lifts to allow adequate curing and temperature stabilization. Store drums in a temperature-controlled environment between $65\text{--}85^{\circ}\text{F}$ and use drum heaters or hot boxes as needed.

Troubleshooting Shrinkage or Poor Pass Adhesion

If shrinkage, delamination, or poor adhesion is observed during application of PC 450 High yield and PC 500, evaluate the following common causes:

1. Off-Ratio Material Mix:

- Check A-side and B-side pressures at the proportioner
- A pressure variance greater than ± 250 psi may indicate:
 - Material restriction
 - Clogged screens
 - Improper proportioner settings
- Off-ratio foam can result in weak adhesion, soft spots, or poor cell structure

2. Excessive Substrate Moisture

- Surface must be $\leq 18\%$ (check with moisture meter)
- High moisture may result from:
 - Ambient temperature fluctuations
 - Dew point condensation on surfaces, especially in cool or humid conditions

3. Material Overheating

- High material temperatures can alter the reaction profile, leading to
 - Brittle or overly soft foam
 - Discoloration
 - Surface irregularities

Solution: Reduce hose or preheat temperature in 3°F increments and observe results

- Allow time for changes to propagate through the system before further adjustments

Startup Procedure

Before charging equipment with new material, ensure that both A-side and B-side drums are within the recommended processing temperature range of 70–90°F. A target temperature of 85°F for both components is ideal for optimal performance. PC 450 High Yield and PC 500 can be recirculated to elevate drum temperatures.

Avoid exposing drums to direct flame or uncontrolled heat sources. Consistent storage conditions and proper drum conditioning are critical to maintaining product quality and ensuring reliable application results.

Flushing Procedure

Before introducing PC 450 High Yield or 500 into any proportioning or spray equipment, it is critical to thoroughly purge all lines and components of any previously used materials to prevent cross-contamination, which can negatively impact product performance and equipment function.

1. Shut Down Transfer Pumps:
 - Turn off & disconnect air supply to all transfer pumps
2. Remove and Clean Drum Pumps:
 - Remove drum pumps from the ISO and Resin drums
 - Wipe pumps and dip tubes clean.
 - Ensure the resin pump housing is completely empty
3. Reconnect and Purge:
 - Insert the cleaned drum pumps and dip tubes into the new PolyCon ISO and PC 450 High Yield or PC 500 Resin drums.
 - Reconnect air and activate the drum pumps
 - Prior to the PC 450 High Yield or PC 500 and PC ISO reaching the spray gun begin spraying off target to prevent any contaminated or mixed foam to be applied onto the intended target
 - Note: The purging process typically produces 1 to 2 gallons of waste material, depending on the length and size of the hose
4. Flush the Resin (B-Side) Line:
 - Before switching products, flush with 3–4 gallons of water or compressed air.
 - Do not use water or air on the ISO side (risk of hazardous reaction/equipment damage)

This flushing procedure should be followed precisely each time the system is transitioned between materials or restarted after extended downtime.

Shutdown Procedure

For any shutdown period exceeding four (4) hours, follow these steps to ensure system integrity and material preservation:

1. Follow Manufacturer Recommendations
 - Adhere to the equipment manufacturer's specific shutdown procedures for the proportioner, hose, and spray gun
2. Seal Material Drums
 - Ensure that all A-side (ISO) and B-side (resin) drums are tightly sealed to prevent moisture contamination, pressure loss, or blowing agent degradation
3. Protect from Temperature Extremes
 - Store drums in a climate-controlled environment between 65–85°F (18–29°C) and away from direct sunlight or sources of heat/cold
4. Secure Hoses and Gun
 - Depressurize the system. Ensure all lines are properly capped or positioned to avoid air or moisture ingress

Tip: For extended shutdowns of 4 weeks or more, consider recirculating or flushing per manufacturer protocol to prevent ISO Side crystallization inside hoses or equipment.



Handling and Safety

Respiratory protection is mandatory during all spray foam application activities. Applicators must take all necessary precautions to avoid occupational exposure and ensure the safety of all personnel on or near the jobsite.

Personal Protective Equipment (PPE) Requirements:

- Supplied-air respiratory protection with a NIOSH-approved full-face mask
- Chemical safety goggles
- Protective, non-absorbent gloves
- Fully enclosed Tyvek® suit, secured at wrists & ankles

Ventilation Requirements:

- Maintain positive-pressure mechanical ventilation to limit vapor buildup
- Even with adequate ventilation, interior spaces should be treated as confined spaces and approached with caution

Exposure Limits & Health Hazards:

- Atomized vapors must not exceed the Threshold Limit Value (TLV) of 0.02 ppm for isocyanates
- Individuals with sensitivities/allergies must not be exposed
- In the event of inhalation, move the individual to fresh air immediately. If breathing difficulty occurs, administer oxygen and seek medical attention
- Avoid contact with skin, eyes, and clothing. Wash thoroughly with soap & water following any exposure

Safe Handling Practices:

- Open containers slowly to release pressure
- Wash used clothing before reuse
- Applicators must post high-visibility warning signs to restrict access during application/curing

Additional Resources

For detailed safety guidelines and jobsite hazard prevention, refer to:
Center for the Polyurethanes Industry (CPI): www.polyurethane.org
Spray Polyurethane Foam Alliance (SPFA): www.sprayfoam.org
Phone: (571) 748-5003

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Hot Work Precautions:

- No welding, soldering, or torch cutting within 45 ft of exposed or freshly installed spray foam
- If hot work must be performed, foam must be:
 - Fully cured
 - Covered with an approved fire blanket or welders shield
 - Monitored by a designated fire watch

Risks of Improper Application

Improper application of PC 450 High Yield and PC 500 spray foam can result in serious safety hazards and reduced product performance. Potential issues include:

- Excessive heat buildup, which may lead to combustion or fire
- Offensive or lingering odors due to incomplete reaction or overheating
- Poor insulation performance from:
 - Off-ratio mixing
 - Improper lift thickness
 - Spraying into rising or uncured foam
 - Uneven cell structure or density defects

High-Mass Application Warning:

- Avoid creating large, monolithic foam masses
- If large accumulations occur: Remove from site, cut into smaller sections, wet with water, and cool completely before disposal

(Failure to follow these precautions may result in smoldering or fire)

Fire preparedness:

- A Class ABC fire extinguisher should be readily accessible in the work area at all times during application and for a cooling period afterward

Note: PC 450 High Yield & PC 500 is approved only with PC ISO. Use with other ISO will void warranty.



PolyCon LLC
1755 Transcentral Court, Suite 400
Houston, Texas 77032

1-855-PC1-FOAM
www.polyconspf.com