



ICP Group Continues Testing on Low Pressure Polyurethane Foam Emissions

HVLP (High Volume Low Pressure) Dispensing of SPF Drum Foam

Introduction

As an industry leader in low pressure foam dispensing, **Innovative Chemical Products has gone to great lengths to substantiate the benefits of using low pressure polyurethane foam products in residential and commercial applications.** Along with convenience of use and portability advantages, dispensing foam using low pressure static mixing techniques has proven to be a safer method for workers and building occupants. Through extensive lab and job site testing, ICP has already demonstrated the lower environmental health and safety (EH&S) risks and the personal protective equipment (PPE) required with foam cans, kits, and refillable cylinders.

Now, the ICP Group is focused on testing newer forms of dispensing low pressure foam, especially at higher volumes. The latest results from job site testing of foam emissions from the **HandiFoam® HVLP system further confirm the advantages of low pressure foam dispensing.**

Emissions Testing of HandiFoam® HVLP Drum Foam Dispensed Through the Nitrosys Plus Unit

Low pressure mixing of polyurethane insulation foam, defined as < 250 psi using a static mixer, results in a non-aerosolized foam mixture that is actually polymerizing to heavier molecules as the mixture leaves the spray tip. Chemical emissions are predictably much lower from foam dispensed through high pressure methods (> 1000 psi, impingement mixing). Low pressure foams also typically possess lower exotherms than high pressure (although exceptions may exist) and are generally processed at lower temperatures. **Many of these factors work favorably to reduce foam emissions.**

Given that polymeric methylene diphenyl diisocyanate or MDI presents a clear exposure hazard, the Occupational Safety and Health Administration, or OSHA, sets short-term (ceiling) and full shift (8-hour) exposure limits. The National Institute of Occupational Safety and Health (NIOSH) also sets recommended exposure limits for MDI, and the American Conference of Governmental Hygienists (ACGIH) publishes Threshold Limit Values (TLVs) as time-weighted values for an 8-hour period. Thus, measuring MDI emissions during foam application is of primary importance. ICP presents a summary in the next section of our findings regarding these critical exposure limits obtained in a field study where HandiFoam® HVLP drum foam is dispensed through the always-on-ratio Nitrosys Plus HVLP foam dispensing unit and the durable HandiGun® II plastic disposable gun. On a final note, ICP continues to conduct job site testing for all HVLP foam emissions as a means for providing a solid EH&S/PPE database for this emerging new foam dispensing method.





Summary of Job Site Testing for MDI on a Large Residential Project Test Site

An independent, well-recognized industrial hygiene (IH) consulting firm, Unger & Assoc., was employed to conduct ICP's most recent MDI monitoring. **Nitrosys Plus HVLP dispensing equipment was used to spray HandiFoam HVLP MD drum foam as the primary insulation in a new 7,000-square-foot residential home in Kirtland, Ohio.** Dispensing guns included the HandiGun II plastic disposable gun, and the Spray Foam Systems N+ steel gun. Both guns use static mixers located in the nozzles for mixing. **Foam outputs through these guns ranged between 10–13 lbs./min.** The Nitrosys Plus unit was mounted on a mobile cart, providing the advantage of extra mobility in the field, particularly in structures such as a high-rise building, but unnecessary on this job site as the 210 feet of heated hose gave sufficient reach. Three rooms were sprayed using mostly natural ventilation, along with one 12-inch tube fan vented outward in the room being sprayed. Test readings for MDI were taken on the applicator, at 10 feet from the applicator, in an adjacent room, and 1 hour after spraying. All personnel wore proper PPE.

Results

Summary of Job Site Testing for MDI on a Large Residential Project Continued

Once the test had been completed, readings and observations were taken at the site. **MDI levels were not detected in adjacent rooms, were below PELs and OELs at a 10-foot distance, and were not detected at all 1 hour after spraying was completed.**

Thanks to the new application methods using the plastic Handi-Gun II (which the lead sprayer described as super lightweight with no downtime), overspray was minimal, and the chemical "smell" after spraying the foam was reported to be low to none. **Other contractors worked around the job site all day and each day the spraying was done, and they reported no smell, overspray or concerns about the application from their perspectives.**

The applicators used the recommended PPE, including a cartridge respirator, full face mask, Tyvek suit and gloves for the applicator, and a half-face cartridge respirator for the helper. The rooms were ventilated to the outside (away from trade workers) using a professional fan, with the goal of reaching 20 air changes per hour (ACH). **Workers can re-enter the work zone after one hour, and re-occupancy by homeowners or building occupants is allowed after 2 hours for open-cell foam and 4 hours for closed-cell foam.**

The house was completely insulated in approximately the same amount of time that was forecast if a high-pressure dispensing system was used (one E-30 machine).

Summary

HandiFoam HVLP drum foam dispensed via Nitrosys Plus HVLP equipment presents insulation contractors with new advantages and capabilities. **Lower equipment costs, ease of use (plastic high output guns), and on-ratio foam every time through Nitrosys, allow contractors to manage their business more efficiently.**

The extensive low pressure testing for EH&S, PPE, and dispensing claims, extended equipment mobility for hard-to-reach altitudes or job sites, and simplicity of use create an emerging and valuable new option in the spray foam universe.

ICP Group's Commitment to Product Stewardship, Sustainability & Customer Support

Contractors build their businesses on great performance, word of mouth and solid support from their equipment and foam suppliers. **ICP and SFS have combined to form a unique partnership based on state-of-the-art low pressure/high volume foam dispensing, and high quality/reliable foam that is thoroughly emission-tested in conjunction with Nitrosys Plus for maximum performance and safety.** ICP holds a record of standing behind its customers in all aspects of business, from superior dispensing equipment and foams to the peace of mind contractors have that HandiFoam HVLP is thoroughly and continually field tested for safety.



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