

Manufacturing Company Evaluates Alternatives for Solvent Parts Cleaning within its Operation



Challenge

The New York State Department of Environmental Conservation (NYSDEC) has introduced a regulatory update that addresses volatile organic compound (VOC) emissions produced by [industrial solvent cleaning processes](#). Implementation of the regulatory update is scheduled for the fourth quarter of 2020. Commonly used cleaning solvents such as isopropanol (IPA) and mineral spirits contain VOC's and are subject to the updated regulation.

A New York manufacturer utilizes industrial cleaning solvents to remove debris, processing liquids, and water from metal part surfaces. Many of the components manufactured by the company come into regular contact with reactive fluids which severely limits the types of solvents that can be used. High-purity IPA and mineral spirits are preferred cleaning solvents due to their excellent cleaning performance and compatibility with customer and other specifications. Under the updated rule IPA and mineral spirits are considered non-compliant cleaning solvents, impacting several cleaning operations at the company.

With the impending change in cleaning operations VOC emissions regulations, the company was concerned that their use of solvents for cleaning and dewatering parts may be impacted.

Solutions

To prepare for the potential restrictions on the use of certain cleaning solvents, the company partnered with the New York State Pollution Prevention Institute (NYSP2I) to investigate potential alternative solvent cleaners that would both be in compliance and provide an effective level of cleaning. Potential alternatives were evaluated based on their environmental health and safety hazard profiles, VOC profiles, and cleaning compatibility. NYSP2I also researched potential usage reduction opportunities for the non-compliant solvent cleaners. To accomplish these tasks, a technical evaluation of the currently used and alternative

Challenge

- A NYS manufacturer wanted to assess alternatives to parts cleaning with two noncompliant solvents - IPA and mineral spirits.

Solution

- NYSP2I investigated alternative solvent cleaners and potential reduction opportunities for the usage of non-compliant solvent cleaners.

Results

- NYSP2I identified 4 potential alternatives to IPA and 11 potential alternatives to mineral spirits.
- The company will need to further evaluate which cleaning applications the alternatives may be most effectively used on.
- NYSP2I identified cleaning best practices which may reduce the use of IPA in spot (hand) cleaning, immersion (dip) cleaning, and part flush operations.

solvents was performed by NYSP2I, the Toxics Use Reduction Institute (TURI) at the University of Massachusetts Lowell, and an independent environmental engineering consultant.

Results

The work performed by NYSP2I led to key findings that can support the company with its VOC emissions compliance initiatives.

- 4 substitute cleaning solvents were identified as potential alternatives to IPA. There is no single alternative that could replace IPA in every instance. There are also no practical replacements for IPA in the manufacturing and rework of high-precision products.
- 11 substitute cleaning solvents were identified as potential alternatives to mineral spirits. There is no single alternative that could replace mineral spirits in every instance, but aqueous-based detergents offer the best potential to reduce the cost, flammability profile and VOC content of industrial solvent cleaning operations.
- The company will need to further evaluate which cleaning applications the alternatives may be most effectively used on.
- Best practices within the company's spot (hand) cleaning, immersion (dip) cleaning, and part flush operations were identified to reduce the usage of IPA.

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