

ELIMINATION OF
TRICHLOROETHYLENE/HAZARDOUS WASTE
REDUCTION
POLLUTION PREVENTION/BEST PRACTICES



**ELIMINATION OF TRICHLOROETHYLENE/HAZARDOUS WASTE REDUCTION
POLLUTION PREVENTION/BEST PRACTICES**



Ben McKnight

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**Executive Director for the Partners for Pollution
Prevention**

Facilities: Franklin Indiana, Lexington SC

**Facility Type: Precious Metal Plating for High Reliability
Components**

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Certifications:

ISO 9001, ISO 14001:2015, AS9100:2016, ISO13485 and NADCAP

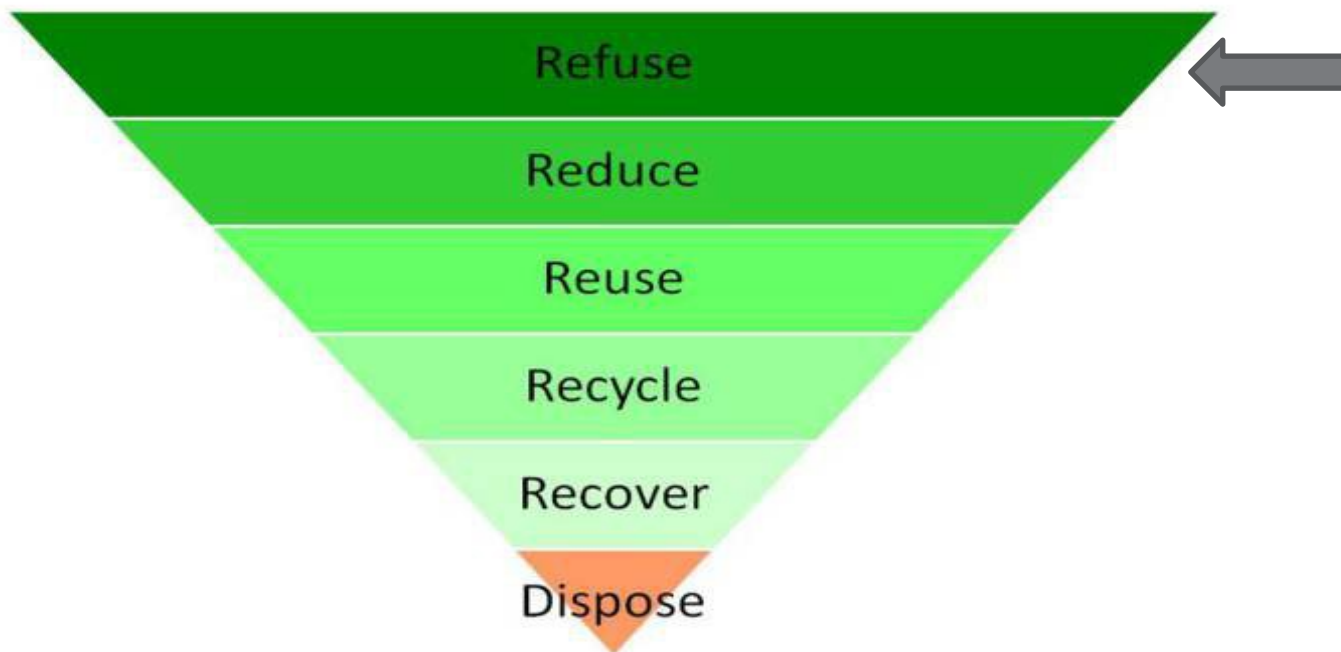
Members Of:



ELIMINATION OF TRICHLOROETHYLENE/HAZARDOUS WASTE REDUCTION POLLUTION PREVENTION/BEST PRACTICES


THE BEST WAY TO PREVENT POLLUTION IS NOT TO USE THE PRODUCT.

Waste Pyramid



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ISO 14001, INSHARP and ESP

- **Make your company look at everything with a different perspective.**
 - **Customer Products**
 - **Chemicals that are used in your processes**
 - **How SAFE is this for your company and workers**
 - **What can you avoid as a possible pollutant and safety issues.**
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**ELIMINATION OF TRICHLOROETHYLENE/HAZARDOUS WASTE REDUCTION
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Degreasing ferrous and non-ferrous parts for plating



ELIMINATION OF TRICHLOROETHYLENE/HAZARDOUS WASTE REDUCTION POLLUTION PREVENTION/BEST PRACTICES

- The use of trichloroethylene in a vacuum vapor environment has always allowed Electro-Spec to use chlorinated solvent without any risks to the environment or human health.
- Electro-Spec is dedicated to find a new technology that is environmentally friendly and with this new solvent we were able to eliminate the use of trichloroethylene.
- The use of trichloroethylene in any equipment can still run the risk of an environmental issues if not handled properly. The City of Franklin is now discovering how the impact of not handling trichloroethylene properly can impact not only the environment but the health of people living in the city.
- Next slide is a picture of our degreaser.

ELIMINATION OF TRICHLOROETHYLENE/HAZARDOUS WASTE REDUCTION POLLUTION PREVENTION/BEST PRACTICES VAPOR DEGREASING



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HAZARDOUS MATERIALS ELIMINATION

We all know the TCE can be a carcinogenic when the proper PPE and Environmental conditions are not followed.



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Dec 15, 2020, EPA had an online webinar (first attachment) on the published Final Risk Assessment on TCE. It's a good summary of the risk assessment and status:

Page 4 outlined the TSCA risk evaluation process. The Risk Assessment was complete November 2020. The Risk Management is next and should be done 2-4 years from Risk Assessment.


Pages 8 and 9 summarized the Risk Assessment conclusion - Vapor Degreasing (open top and closed top) imposes unreasonable risk to health.

Next step is to determine the options for Risk Management. Pages 16 to 20 lists available options. Some industry experts advocates for outright ban.

However, it looks like New York State took immediate action to ban TCE in Vapor Degreasing, effective December 1, 2021. See the second attachment.

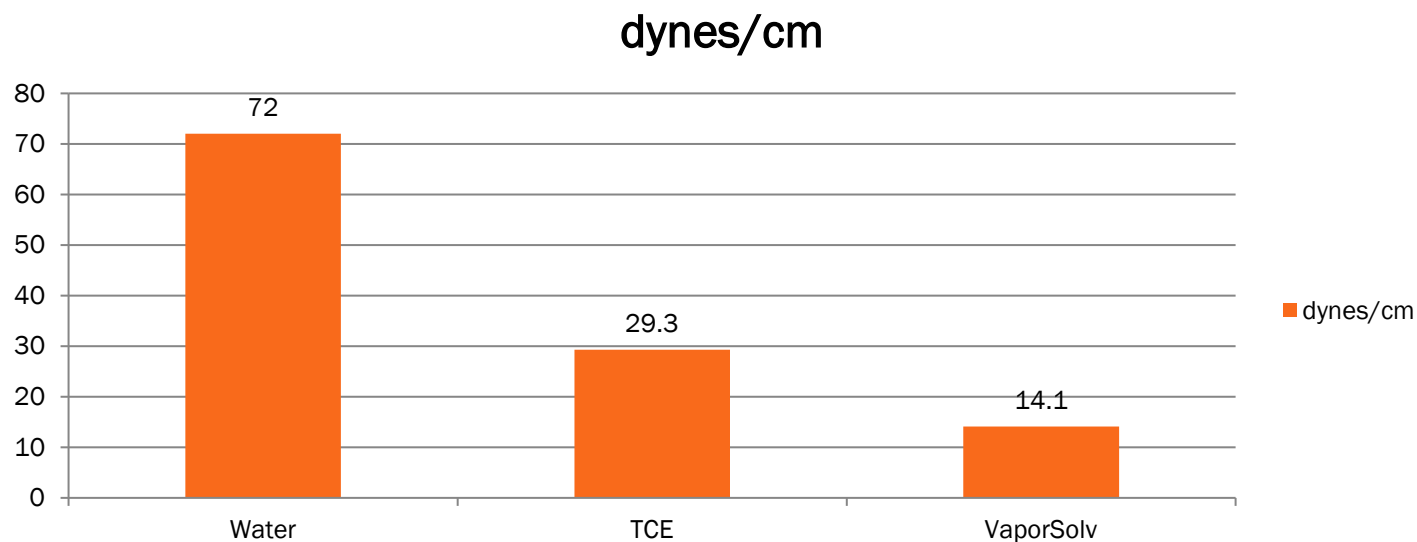
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To Eliminate the use of Trichloroethylene we had to find a new solvent. The EPA has several hundred alternative cleaning methods but none of their methods have a surface tension value of solvents. Electro-Spec needs a solvent with a low surface tension to clean the small parts we plate.



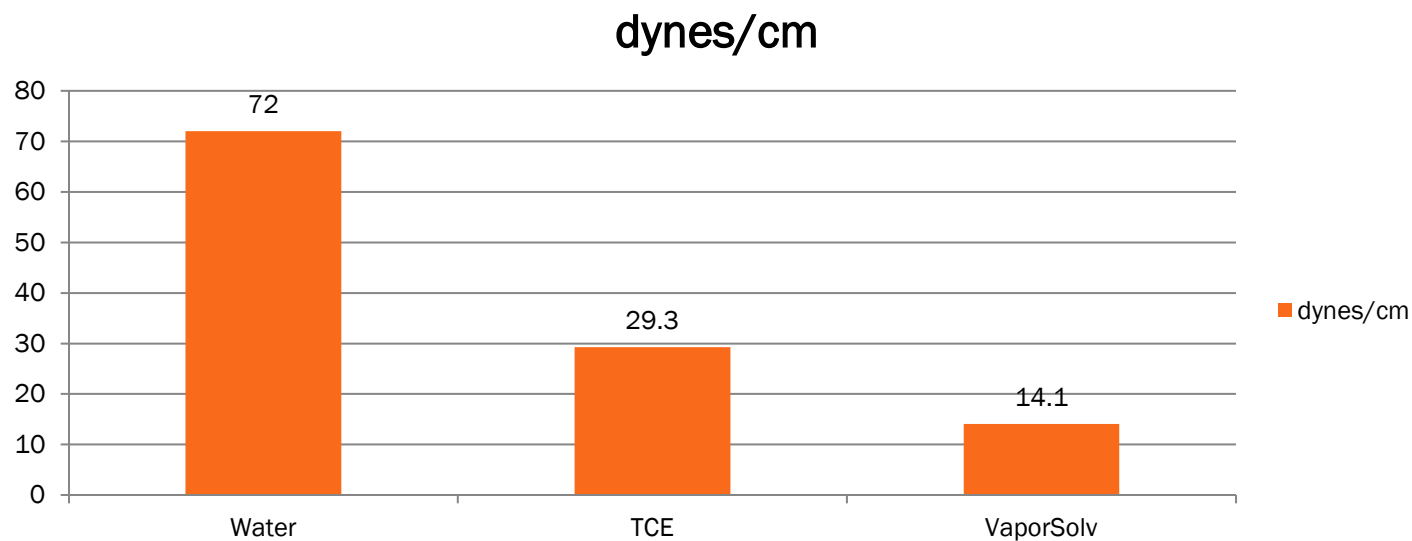
ELIMINATION OF TRICHLOROETHYLENE/HAZARDOUS WASTE REDUCTION POLLUTION PREVENTION/BEST PRACTICES

Surface tension of water is 72 dynes/cm, the surface tension of TCE 29.3 dynes/cm and the surface tension of VaporSolv is 14.1 dynes/cm

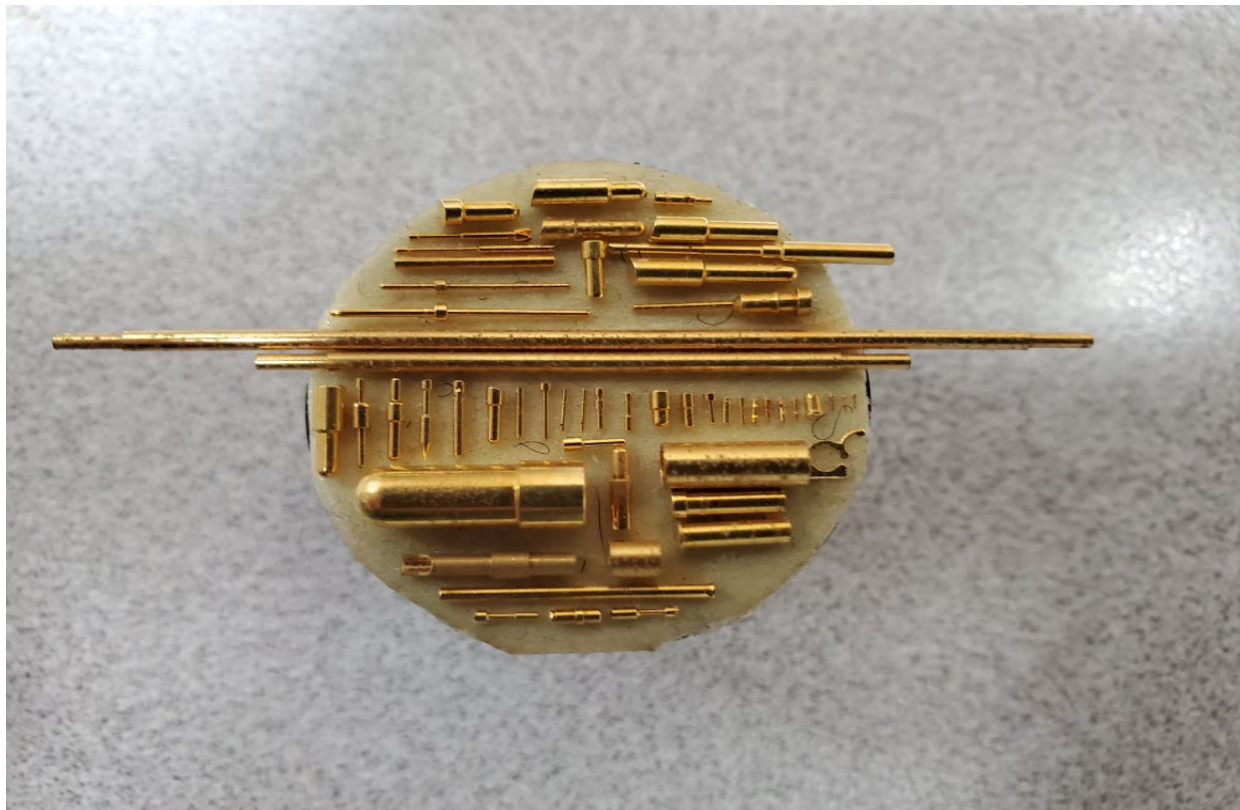


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**ELIMINATION OF TRICHLOROETHYLENE/HAZARDOUS WASTE REDUCTION
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SAMPLE OF PART SIZE PLATED AT ELECTRO-SPEC INC.**



ELIMINATION OF TRICHLOROETHYLENE/HAZARDOUS WASTE REDUCTION POLLUTION PREVENTION/BEST PRACTICES NEW SOLVENT



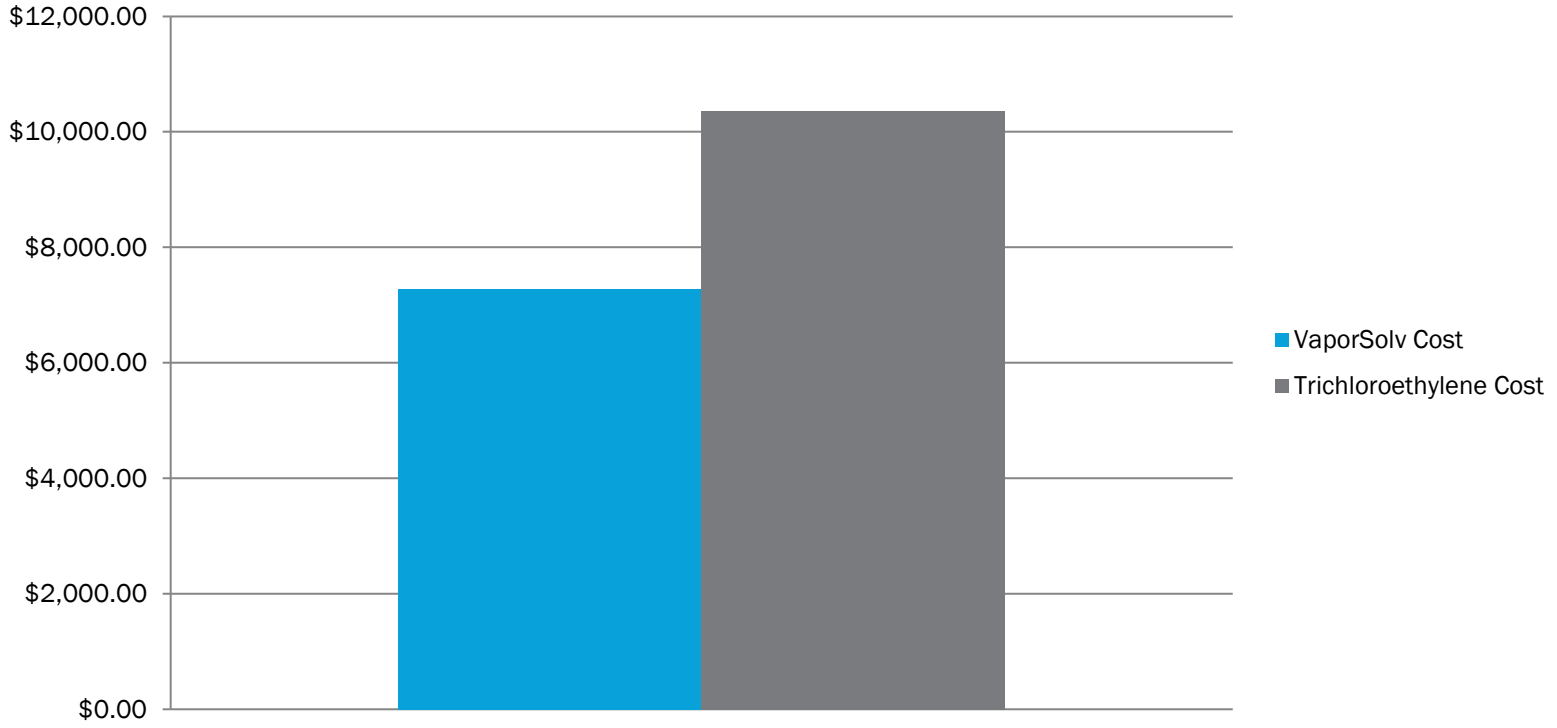
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SolVantage® Vapor Solv Vapor Degreasing Solvent

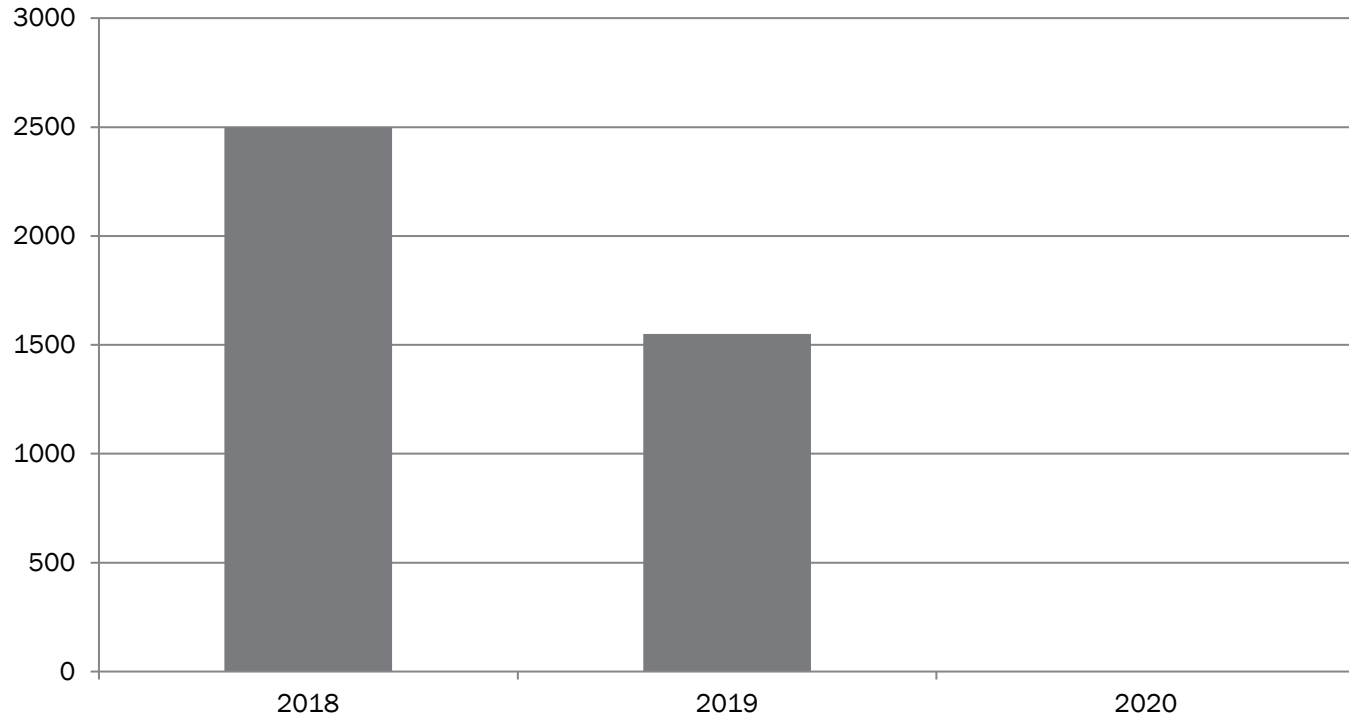
- Excellent Solvency
- Non-Flammable, No Flash Point
- US EPA SNAP Approved
- Not a Hazardous Air Pollutant (HAP)
- Boeing BAC 5408 (PSD 6-77) Approved

A non-flammable, high performance, precision cleaning solvent designed for vapor degreasing. An azeotropic, fluorinated solvent degreaser, drop-in replacement for n-propyl bromide (nPB), TCE and other vapor degreasing solvents. Safe on virtually all metals. SolVantage Vapor Solv is non-corrosive and will not stain metals. Can also be used as a carrier fluid for deposition of materials such as silicone or other oils, as well as in flush or spray device facilities.

ELIMINATION OF TRICHLOROETHYLENE/HAZARDOUS WASTE REDUCTION POLLUTION PREVENTION/BEST PRACTICES 2019 – 2021 SOLVENT COST THE COST OF THE NEW SOLVENT IS STILL CHEAPER THAN USING TCE



ELIMINATION OF TRICHLOROETHYLENE/HAZARDOUS WASTE REDUCTION POLLUTION PREVENTION/BEST PRACTICES ELIMINATION OF HAZARDOUS WASTE BEING SHIPPED FOR RECYCLING



Not so Fast



APRIL 2021

The use of Vapor Solv stopped working !!!

We started processing a part for an automotive manufacture that the parts contained a lot of fine metals and the customer used chlorinated paraffin as a lubricant to manufacture the parts and the degreasing solution was shot.

We were forced to switch our degreaser back to TCE



MOVING FORWARD

The search was on to find a replacement solvent for our vacuum vapor degreaser but everything we found would not work in our existing machine.



NEW SOLVENT NEW MACHINE

Through one of our Partner members we were invited to a Cleaning workshop on the NW side of Indianapolis.

They distributed and serviced the exact type of machine we needed and offered a solvent that was not hazardous to humans or the environment.

They had a machine charged with solvent that would allow us to process over 100,000 parts over an eight week time frame through the machine with a 97.0% FPY.



NEW MACHINE AND SOLVENT



NEW SOLVENT NEW MACHINE

If Electro-Spec Inc wanted to continue to use a solvent in a vacuum vapor degreaser it would have to be in a different or new machine.

This would require a capital investment of \$250k to \$300K investment that can be challenging for a small to medium business.

IDEM CTAP was contacted (Jennifer Collins) to see if there were any grants available to help off-set the cost of a new degreaser.

She was able to give me links to three different grants that might help off-set the total price of the machine.

We did apply to an Indiana Readiness grant that paid for 50% of the new machine or \$150,000 allowing us to purchase a new machine using a more environmentally freindly solvent and again eliminate the use of TCE.

