
KYZEN
Where Science and Care Converge.

OSCG 2023

# Conserving Solvent and Capturing Cost Savings

# “Endangered” Vapor Degreasing Fluids

- ✓ HFC’s – Subject to phasedown due to GWP/AIM Act
- ✓ Certain HFE’s will no longer be manufactured after 2025
- ✓ EPA announced framework for evaluating foreign-made PFAS before they enter the U.S. (June 2023)
- ✓ TCE, nPB, PCE – under EPA TSCA review – toxicity
- ✓ Qualifying replacements could take several years

# Solvent Conservation

- Necessary for “endangered” fluids to extend usage while seeking replacements
- Ensures Cost savings for current and replacement fluids
- EH&S Compliance

# Fluid Conservation Best Practices

- Optimize Vapor Degreaser Operation
- Minimize dragout
- Reuse/Reclaim spent solvent

# Optimizing Vapor Degreaser Operation

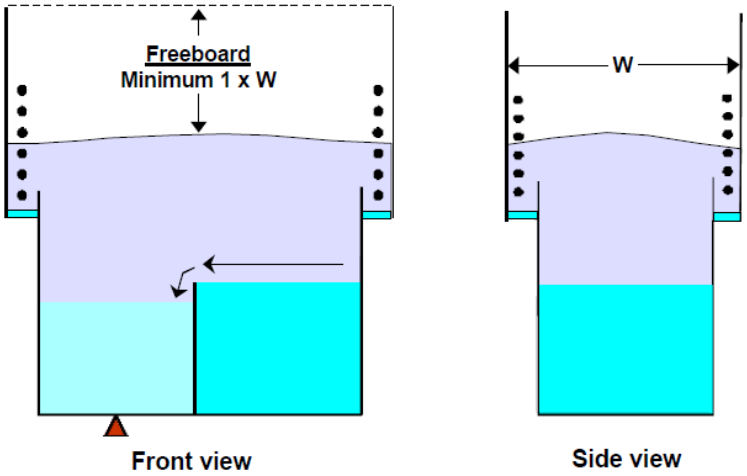
## EQUIPMENT CONSIDERATIONS:

- Higher freeboard that exceeds NESHAP Guidelines up to 150%
- Second set of low temp (0 to -20 F) condenser coils (freeboard chiller coils)
- Improved tank sealing covers (both manual and power operated)
- 3-4 angstrom molecular sieves rather than water separators for specific solvents
- Superheated vapor zones
- Automated work transporters to reduce operator interface and provide process control

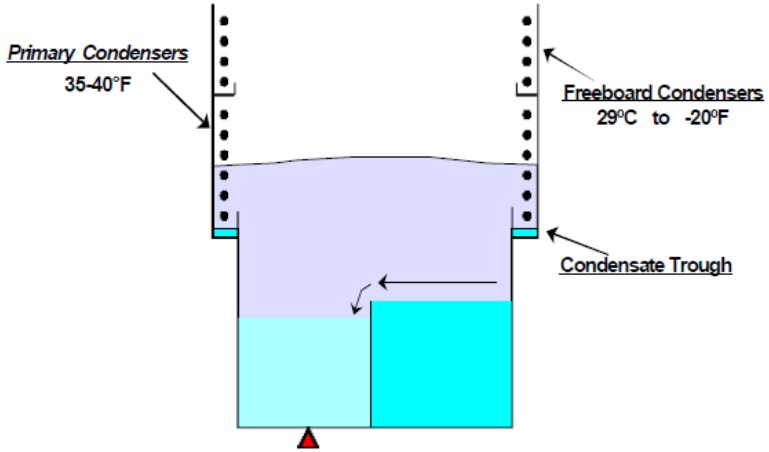
# Freeboard and Refrigeration

Freeboard: 125%-150%

Equipment Design & Maintenance
Diffusion Losses - Freeboard Height



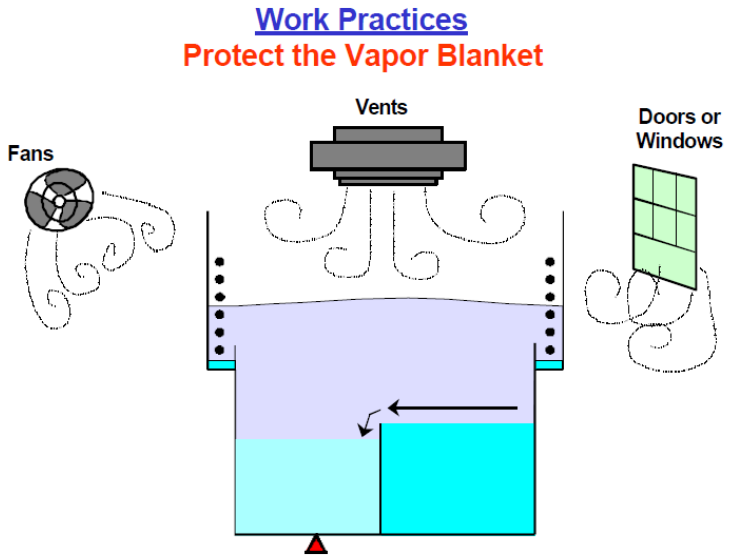

Equipment Design & Maintenance
Diffusion Losses - Freeboard Condensers



# Optimizing Vapor Degreaser Operation

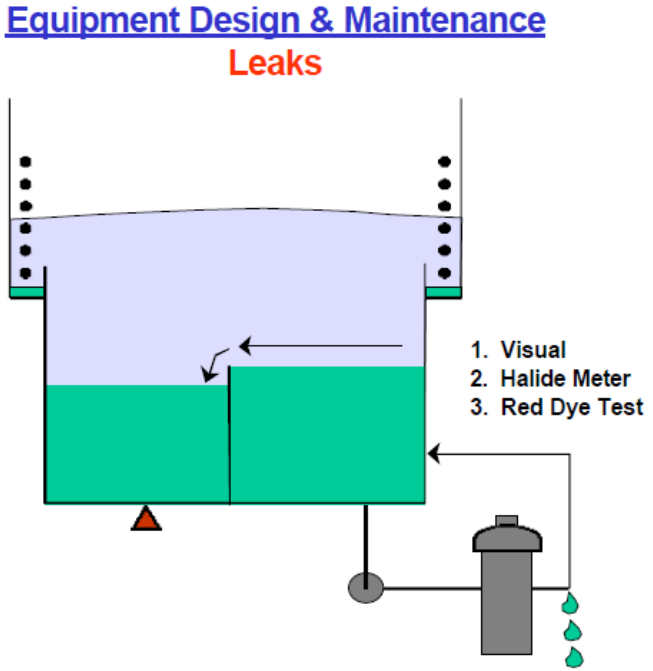
## CLEANING SYSTEM LOCATION:

- Draft-free environment – drafts significantly increase solvent losses



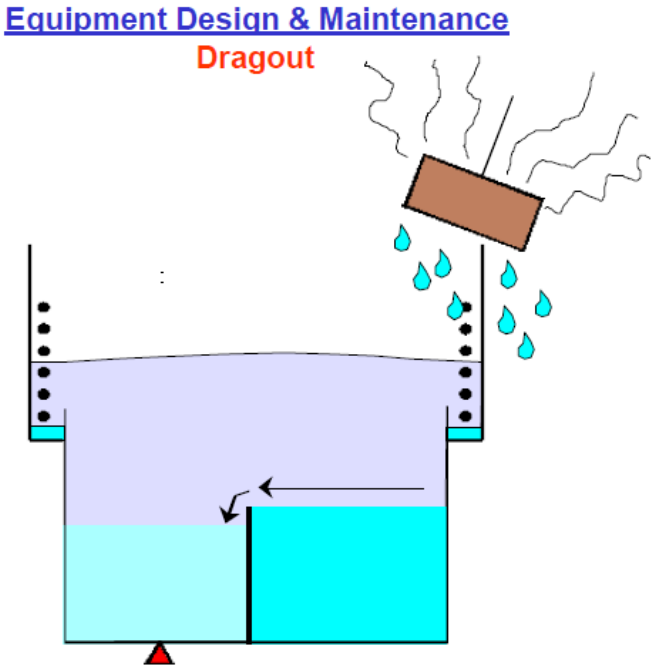
# Optimizing Vapor Degreaser Operation

- Check pump seals, valves, pipe joints, gasket covers, sight glasses, and filter housings regularly for **leaks**.



# Minimizing Dragout and Solvent Losses

- Store solvent in cool, dry location with container closed tightly
- Use care when loading solvent into degreaser to minimize evaporation
- Ensure workload is not too heavy or it will disrupt the vapor blanket
- Orient parts in basket to maximize drainage of solvent from the parts. Review work basket design for maximum drainage.
- Open cover slowly (or ideally, have automated cover and transport system)
- Allow sufficient freeboard dwell time before removing workload from degreaser



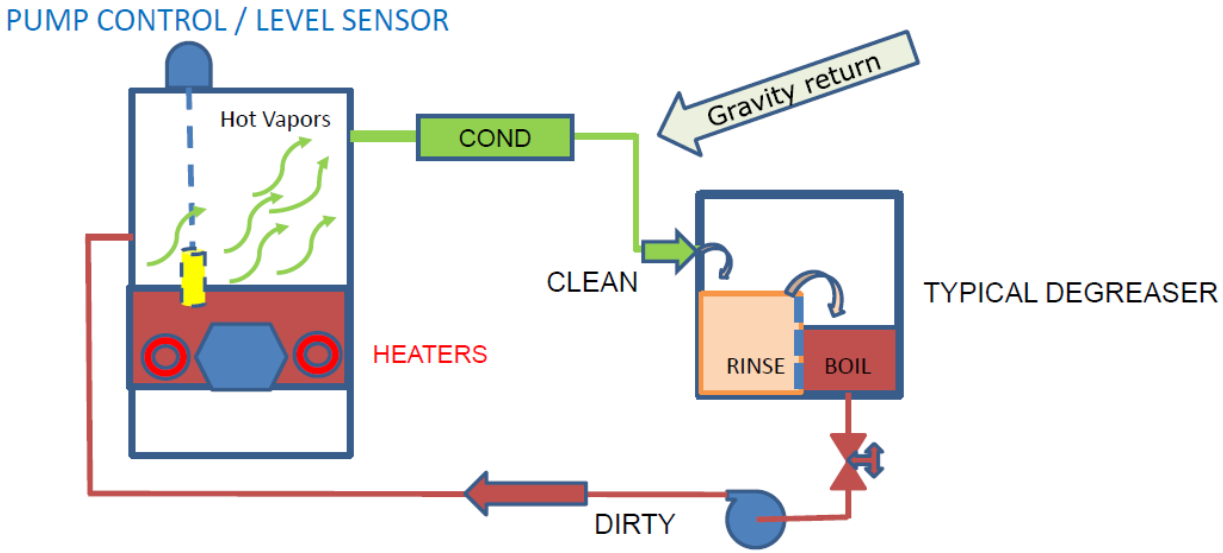
RIGHT....POSITION PARTS FOR PROPER DRAIN

WRONG...."CUP UP" CREATES DRAG-OUT !

# Vapor Degreaser Solvent Management Options

- Dispose of Boil Sump contents when maximum soil loading reached
- Traditional “boil down” of contaminated boil sump and disposal of soil and small amount of solvent
  - Both above options require labor and downtime
- Traditional distillation system attached to degreaser
- Low-volume continuous solvent recycle

# Typical Degreaser with Solvent Recycle System

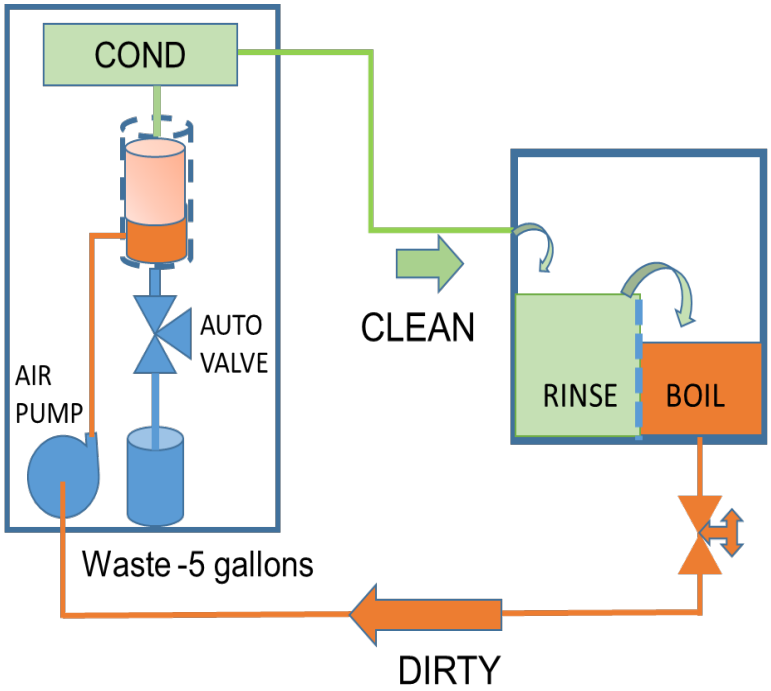


# Low Volume Continuous Solvent Recycle

- Small-footprint distillation system connected to degreaser boil sump
- Programmed to periodically pump portion of boil sump to small (1 quart) distillation chamber
- Distilled (clean) solvent returned to degreaser's boil sump
- Since solvent is continuously cleaned, contamination levels remain low.
- Cost savings = labor, virgin solvent, waste disposal

# Example Schematic

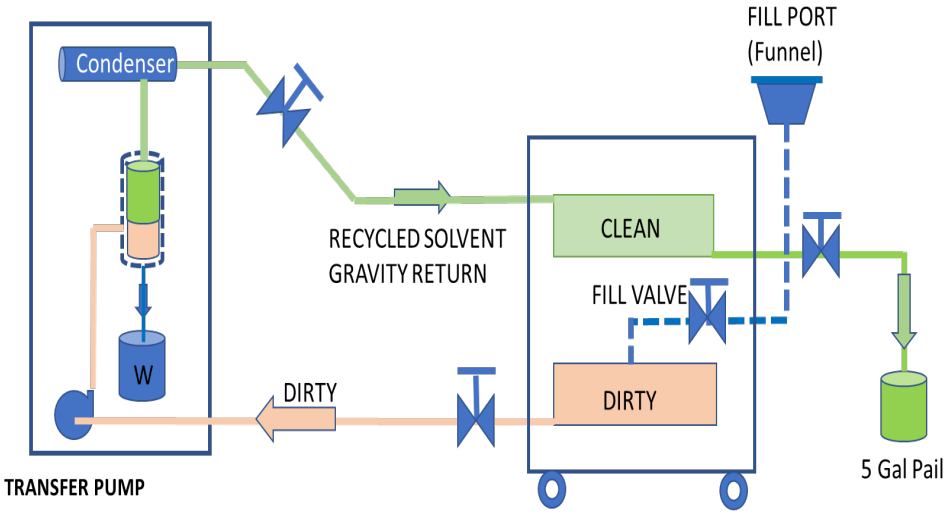
**DISTILLATION VESSEL**




TYPICAL DEGREASER

- ✓CONTINUOUSLY CLEANS DEGREASER SOLVENT
- ✓REMOVES AND CAPTURES SOILS
- ✓ELIMINATES PRODUCTION INTERRUPTION FOR SERVICE
- ✓CONCENTRATES WASTE
- ✓ REDUCES MAINTENANCE
- ✓SAVES SOLVENT

# Manual Cleaning – Solvent Conservation




**MOBILE SOLVENT TRANSFER CART**

When using solvent to manually clean or flush:

- Collect flush solvent in a 5-gallon (or other) container
- Use Solvent Transfer Cart to transfer to continuous recycling system

# RECLAIMING SOLVENT MAKES SENSE

- Recycling also reduces the overall solvent usage/cost on a yearly basis.
- The amount of good, reusable solvent that would normally be entrained in the contaminated solvent bath may range from 50% to 75% by volume.
- Companies can lower this entrained amount to expected levels of 5% or less by recycling the solvent.

**RECYCLING REDUCES:**

**DISPOSAL COST**

**HAZARDOUS WASTE TRANSPORT**

**REPORTING / TAXES / PERMITS**

# In Conclusion…

- Solvent Conservation is vitally important
- Best practices for vapor degreaser operation and cleaning processes are critical
- Work with experienced suppliers of equipment and cleaning fluids for the best outcome!

# Questions and Contact Information

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