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Solvent management

Solvents – Don't let your money evaporate before your eyes

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Eco-efficiency for the Marine Industry Fact Sheet

Do you want to

- reduce what you spend on purchasing solvents?
- reduce your solvent waste disposal costs?
- reduce the risk of fire in your workplace?
- improve your site's working conditions?

Up to 40% of solvents are lost through inappropriate use, evaporation, spills and leaks! ^[1]



Check to see if you are managing your solvent use efficiently

- Do you have an effective inventory management system that tracks the date received and the date expired?
- Do you try to avoid spills by using taps on solvent containers?
- Do you reduce waste by rationing solvent to employees, reducing the number of cleaning units or buckets, or by pre-cleaning parts with brushes, wipes or air?
- To reduce the need to replenish solvent, do you train staff to remove parts slowly from solvent buckets?
- Do you reduce loss due to evaporation by always keeping solvents covered (e.g. with foot-operated lids)?
- Do you store solvent contaminated rags and absorbent material in sealed containers?
- Do you use slightly dirty (but relatively clean) solvent in other parts of your operation, such as pre-soaking, pre-rinsing or thinning?
- Have you considered recycling dirty solvent on site using a vapour distillation unit or an external recycling company?
- Do you get the most out of solvents by allowing them to become dirty before recycling?
- Have you considered alternatives such as high boiling point solvents or aqueous cleaners?
- Have you checked with your supplier to investigate the possibility of re-using empty solvent containers?
- Do you ensure that sealed solvent containers are stored in cool, dry areas that are regularly inspected?

How much does your business spend on solvent and its disposal?

Volume of solvent used annually?

L/yr

What do you pay for your solvent?

\$/L

Annual cost of solvent (volume X cost)

\$/yr

Annual cost of solvent waste disposal
(check your disposal invoice)

\$/yr

Solvent alternatives

In the USA, regulations to reduce the use of solvents have forced manufacturers to change processes or find substitutes. After changing to less hazardous solvents, many businesses have found that working conditions have improved. Financial savings may also occur because alternatives are often cheaper or recyclable (see case studies below). Before switching to any solvent alternatives, conduct trials to verify effectiveness, and check for any potential worker exposure hazards on the associated material safety data sheet (MSDS).

Case study: Wellcraft Marine switches to diacetone alcohol and propylene carbonate and recycles on site ^[2]

Wellcraft Marine in Florida, USA, was consuming large amounts of acetone, much of which was being lost through evaporation. The business tested a number of substitutes and decided on diacetone alcohol (DAA), which it estimated would last 16 times longer. In addition, it purchased recycling equipment. The equipment paid for itself in two months! The company has now started using propylene carbonate, which has better solvency than DAA, keeps resins in solution and, with a flash point of 132 °C, is not regulated as a hazardous waste.

'We figure everybody should be doing this. It's just so cost-effective, I can't believe there is anyone out there still using acetone. Even a small business should take out a loan if they have to, to buy recycling equipment.'

Bill McDonald, Wellcraft.

Case study: Boat builder switches to n-methyl pyrrolidone and aliphatic ester and recycles off site ^[3]

A company that manufactures 6m to 14m fibreglass sail boats on Rhode Island, USA, was using approximately 208 L of acetone a week to clean its tools and spray guns. As much as 50% of the acetone was lost due to evaporation, creating an ignition hazard in the work area.



The company switched to 'ShipShape' (n-methyl pyrrolidone), which has a flashpoint of 94°C, as opposed to acetone which has a flashpoint of 20°C, for general cleaning. 'Thermaclean' (aliphatic ester), an aqueous cleaner, was used for gun flushing. Both solvents are recycled via a commercial recycling service.

The initiative required no additional equipment or operational changes, but has eliminated 9,600L of acetone and associated waste disposal costs. The company saves over AU\$6,000 annually in purchasing costs and the ignition hazard has been removed.

Some possible alternatives are:

- solvents with higher boiling points that do not evaporate as readily, such as n-methyl pyrrolidone, dibasic ester and diacetone alcohol. While the initial cost of some of these alternatives is greater, their low vapour pressure reduces evaporative losses
- aqueous cleaners such as aliphatic ester and glycol methyl ether. To be effective, aqueous cleaners often require staff to be trained in new cleaning procedures. If you use aqueous cleaners, always consider the implications for wastewater releases.

For more information about solvent alternatives, visit the SAGE website <http://clean.rti.org/altern.cfm>.

References

1. EEC (2005) *Business Resources – Business Fact Sheets – Fact Sheet: Eco-Efficiency and Responsible Solvent Use*, Eco-Efficiency Centre, Dartmouth, Canada. Retrieved 13-12-2005 from: www.mgmt.dal.ca/sres/eco-burnside/businessfactsheets/solvents_fs.pdf
2. FDEP (2005) *Success Stories – FL Pollution Prevention Program – Wellcraft Marine*, Department of Environmental Protection, Florida, USA. Retrieved 05-01-06 from: www.dep.state.fl.us/waste/categories/p2/pages/wellcraft.htm
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For further information

Ecobiz can assist you to reduce costs and improve eco-efficiency in your business Call 1300 369 388 for further information.

Eco-efficiency Project Officer
Marine Industries and Fibre Composites Group
Department of Tourism, Regional Development and Industry
Telephone: 07 3227 5756
marine@dtrdi.qld.gov.au
www.marine.industry.qld.gov.au