

Alternatives to Isopropyl Alcohol

Across the world, there are still many companies using Isopropyl alcohol (IPA) for cleaning applications. In addition to the safety concerns, IPA is not always the cheapest solution for cleaning. As companies look for a safer solution, alternative solvents and water based products are replacing IPA.

Disadvantages of IPA

1. IPA has a low flashpoint of 53°F which presents a high risk of fire and/or explosion. It also requires special measures for storage and shipping due to its flammability.
 - a. Vapor may travel considerable distance to source of ignition and flash back.
 - b. May form an ignitable vapor/air mixture in closed tanks or containers.
 - c. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME.

KYZEN products, used in water-free, semi-aqueous and aqueous processes, have a higher or no flash point and are much safer to use than IPA.

2. IPA's high volatility has a great impact on emissions, which present a conflict with environmental regulations and laws. Its high volatility is also the reason why IPA is not truly cheaper than alternative solvents as IPA consumption is much higher and process cost can be actually higher than apparently more expensive alternative products.

KYZEN products are non-ozone depleting and have much lower emissions than IPA

3. Potential Chronic Health Effects:
 - a. Slightly hazardous in case of skin contact (sensitizer).
 - b. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Development toxin [POSSIBLE]. The substance may be toxic to kidneys, liver, skin, central nervous system (CNS).
 - c. Repeated or prolonged exposure to the substance can produce target organs damage.

KYZEN products, when used as recommended, present low or no risk to the health and safety of the users. Contact KYZEN for all MSDS.

PCB Cleaning

IPA is a very poor cleaning agent for reflow and wave fluxes. IPA is not able to solubilize effectively most fluxes (no-clean, lead-free, etc.) used in electronics manufacturing today.

Consequently, it is a very poor choice for PCB defluxing in manual or automated cleaning applications. If used for manual cleaning, it requires a lot of labor to achieve an apparently clean surface which, in reality is not likely to be free of residue due to lack of solubility.

	IPA	Cybersolv 141-R	Ionox I3302	Aquanox A4625B (@15%)	Aquanox A4651US (20%)	Cybersolv C8882
Performance – Reflowed Flux	Poor	Excellent	Excellent	Excellent	Excellent	Excellent
Flash Point	12°C/53°F	None	82°C/180°F	None	None	61°C/142°F
VOC, EPA Method 24	100%	1175.13 g/L	1034.9 g/L	141.3 g/L	110.2 g/L	875.6 g/L
HMIS	2-3-0	1-0-0	2-1-0	1-0-0	1-0-0	1-2-0
Transportation & Storage	CLASS 3: Flammable liquid.	*Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous

*Aerosol: Non-flammable gas.

System Maintenance Cleaning

IPA is not a good choice either for maintenance cleaning of reflow and wave solder ovens. Burnt flux residues do not solubilize in IPA. Also, due to the hot environment, the rate of evaporation of IPA is very high and the result is very high consumption and cost for your cleaning process. The hot environment and high rate of evaporation makes for a very unsafe environment for the workers.

For cleaning of solder pallets and oven parts, IPA continues to be a very poor choice for cleaning.

	IPA	Cybersolv C8502	Cybersolv C8508	KYZEN E5321 (@10%)	Ionox L5314 (@25%)
Performance – Burnt Flux	Poor	Excellent	Excellent	Good	Average
Flash Point	12°C/53°F	None	None	None	None
VOC, EPA Method 24	100%	503.2 g/L	339 g/L	47.7 g/L	7 g/L
HMIS	2-3-0	1-0-0	2-1-0	2-0-0	2-0-0
Transportation & Storage	CLASS 3: Flammable liquid.	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous

SMT Stencil Cleaning

Underside wipes in printers - IPA as a flammable product is not a safe choice to use in equipment with electrical contacts. Most printer manufacturers recommend that customers do not use IPA in their printers because of safety concerns due to the flammability and vapor emissions. Also, IPA is not a good cleaner in cleaning adhesives. IPA tends to dry (partially cure) the adhesive, making it more difficult to clean later on.

Manual cleaning - In addition to the poor cleaning ability of IPA, users are exposed to the vapors emitted by IPA.

Automated cleaning equipment - Explosion-proof equipment is required to use IPA due to the flammable and explosive nature of the product. The only advantage of IPA is its fast drying characteristics.

	IPA	Cybersolv C8622	Ionoxy I3400 (Cybersolv C3400)	Cybersolv C8882	Aquanox A8820 (@25%)
Performance – Paste	Average	Excellent	Excellent	Excellent	Excellent
Performance – Adhesive	Poor	Average	Poor	Excellent	Excellent
Flash Point	12°C/53°F	142°F	142°F	61°C/142°F	None
VOC, EPA Met. 24	100%	296.1 g/L	753.8 g/L	875.6 g/L	221.1 g/L
HMIS	2-3-0	1-0-0	1-1-0	1-2-0	1-1-0
Transportation & Storage	CLASS 3: Flammable liquid.	Non-Hazardous	Non-Hazardous	Non-Hazardous	Non-Hazardous

Additional Resources / References

- <http://nj.gov/health/eoh/rtkweb/documents/fs/1076.pdf>
- <http://www.sciencelab.com/msds.php?msdsId=9924412>
- http://en.wikipedia.org/wiki/Isopropyl_alcohol

Reported By:

Charlie Pitarys (USA Retired)

Technical Expert Sales Support

Phone: (615) 983-4523 Skype: charlie_pitarys

STATEMENT OF TESTING INTEGRITY

KYZEN certifies that the information, methods and data within this report are true and accurate. Customers are encouraged to visit KYZEN to witness any and all tests performed. Please contact your KYZEN representative for more information.

CONFIDENTIAL

This report may contain confidential and/or proprietary information owned by one or both parties. Do not reproduce, publish or distribute without permission.

DISCLAIMER

The data contained herein is based on information available to KYZEN Corporation at the time of completion. This report, including analytical results and/or process recommendations, should only be used as a guide to optimize specific cleaning applications. This report is not a guarantee of performance. It is the customer's responsibility to determine the suitability and completeness of such information for their own particular application, verifying that any process recommendations are compatible with their product and/or cleaning application. Analytical tests are performed using standardized methods; however, sample quality can affect the accuracy and reproducibility of results. This information is not intended to be all-inclusive as to the manner and conditions of use, handling and storage of KYZEN product(s). Other factors may involve additional safety or performance considerations- refer to the KYZEN product Safety Data Sheet (SDS) for complete safety information. This data is not to be taken as a warranty or representation for which KYZEN assumes legal or financial responsibility.

Copyright © 2014 KYZEN Corporation | All rights reserved | DO NOT DISTRIBUTE



