



# mobius system™

CHEMICAL RECYCLING

TMAH is one of the  
primary chemicals used in  
semiconductor manufacturing...

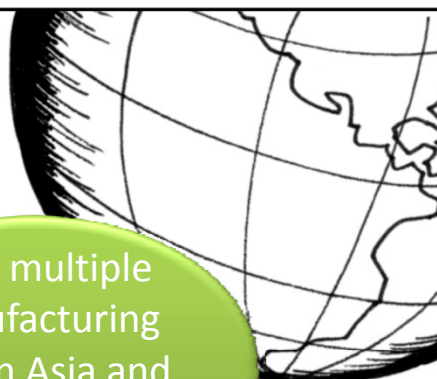
# SACHEM



...and SACHEM is one of the  
oldest and largest  
manufacturers of ultra-pure  
TMAH in the world...

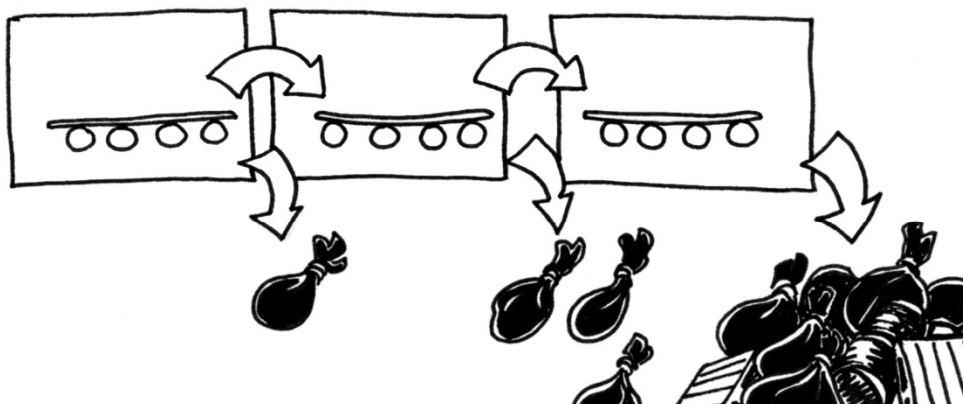


With multiple  
manufacturing  
sites in Asia and  
US and one in  
Europe.





TMAH is applied to the semiconductor surface and then rinsed away through several cycles...the result is dilute developer mixed with fab-specific contaminants and a lot of photoresist.



TMAH is a primary chemical used in semiconductor manufacturing and it must be shipped and stored in bulk. It must also be disposed of properly...

Wouldn't it be great to re-think how we do this?



Could we reliably recycle high-quality TMAH on-site or nearby?

At first, the suggestion of “recycle” for a pure chemical like TMAH sounded like a **BAD IDEA**—I didn’t want to hear about it



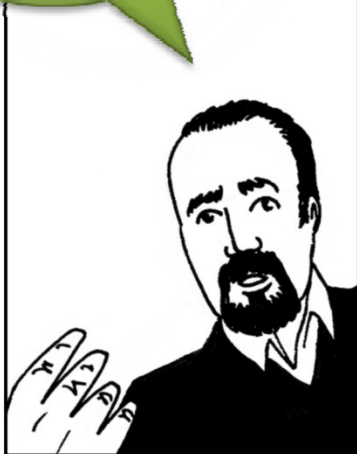
Then I thought about the advantages of keeping our TMAH dedicated to our facility...it is safer because it flows at low concentrations in pipes that we have qualified...



It’s a closed loop...you start with very pure material and selectively remove those contaminants that our process creates. The material stays pure!



You know, what else?



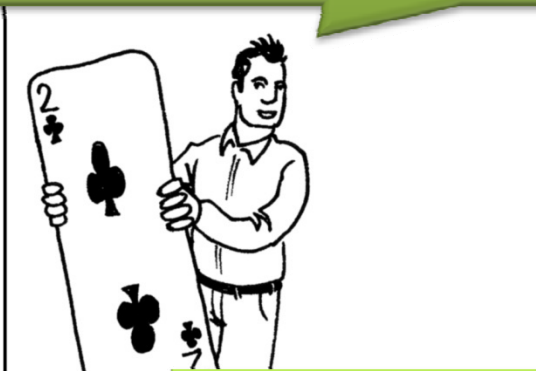
...the production supply line goes from weeks to minutes. At once, I can reduce the cash dedicated to inventory and supplier risk.



The historical relationship for TMAH sales to fabs is fairly simple. The fabs negotiate for volume and price...



...and then the suppliers provide bulk quantities of product as needed.



Sure...sometimes extra inventory is needed but this works fine ...



...until a supplier changes a pipe or pump OR has an unplanned shutdown. Fabs usually don't hear about these things...



That's supplier risk and it can create headaches and even shut down a fab. Manufacturing on-site or next door can mitigate that risk.



AND --



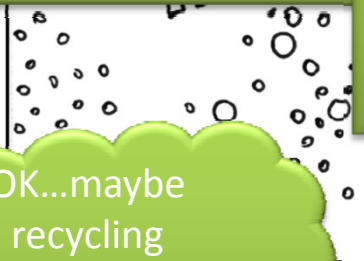
...I reduce the liquid waste (BOD & COD loading). This:



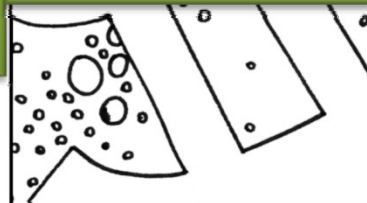
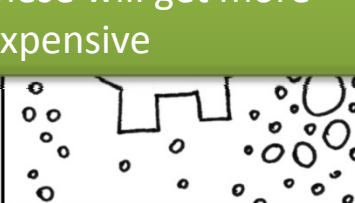
1) Lowers the capital invested in waste treatment

2) Reduces the number of chemicals used for water treatment which also takes away risk that these will get more expensive

3) Allows me to recycle water rather than continuously re-purchasing



OK...maybe recycling TMAH isn't a bad idea...



Are there any other advantages?



Rising AND fluctuating oil prices hurt my cost and supply forecasting. I want supply lines that have stable, easily forecasted costs



I would like to have stable input costs, while my competition has to deal with fluctuating energy prices



The costs for newly manufactured TMAH is primarily based on energy costs. Recycled TMAH can smooth out cost planning...



So, uh, why would one of the largest manufacturers of high-purity newly manufactured TMAH want to promote recycled TMAH? Is that a good idea?



The market continues to grow, so we can do both...



...and there's environmental costs that somehow should be valued as well.





What do you think so far?



The idea as merit, but I've got a multi-billion dollar fab... How do I know for sure this will work?



This technology has been recycling TMAH for 5 fabs in Japan for over two years. It is being installed at the massive Sharp G-10 facility in Sakai, Japan as well

Then why doesn't everyone do this?



It sounds like the way of the future to me...



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Checkout our website to download our whitepaper or email :

[mobius@sacheminc.com](mailto:mobius@sacheminc.com)...



[www.sacheminc.com](http://www.sacheminc.com)

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