

# Cured Urethane Cleanup

NMP Outperforms Methylene Chloride & Formulated Products

## General

If you are looking for a replacement for methylene chloride or expensive formulated products to clean cured urethane residues from your tools or processing equipment, look no further than NMP. There is, simply, no better and safer solvent for this difficult job.

This graph shows that NMP is 30% more effective than methylene chloride or commercial formulated products for removing cured urethane foam from metal. The data shown is the average foam removed using three rigid and one slab urethane foam cured on carbon steel for 24 hours. Soiled parts and tools are simply immersed in an NMP bath until the cured foam swells and falls off the metal. No heating or agitation is necessary. Residual NMP can be rinsed off with water.

NMP can be recycled by vacuum distillation, incinerated, or sent to reclamation. Lyondell Chemical maintains a list of qualified NMP reclaimers.

## Market Offerings

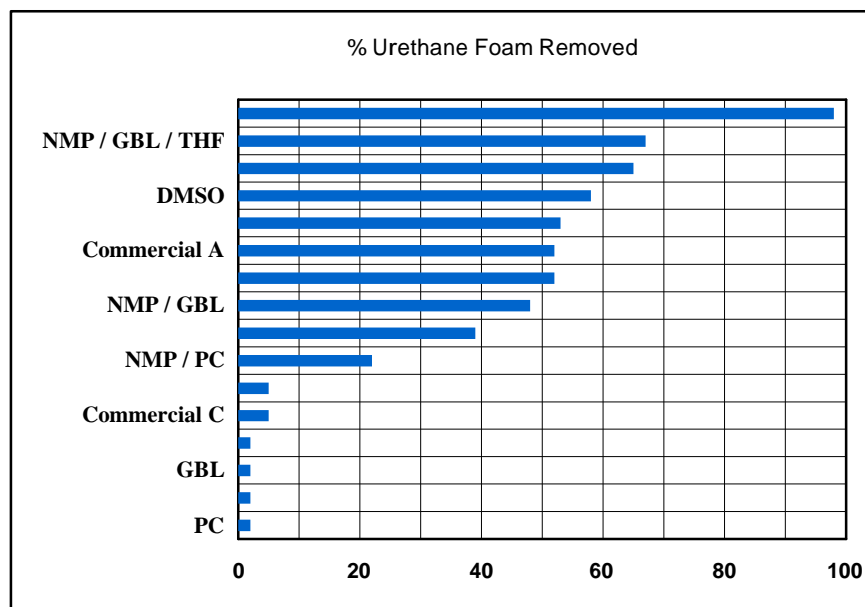
The appropriate replacement solvent depends on the cure time of the foam, the type of foam, and the customer's specific price sensitivity.

### • Cured foam (> 5 min)

If the customer is interested in a solvent that can be recycled and looks at total cleanup costs, we recommend straight NMP. However, if the customer focuses on initial up front costs of the solvent, a blend of NMP with other solvents (PMA, PC) will be cheaper but not recyclable. The charts below and to the right compares the performance of these different solvent blends.

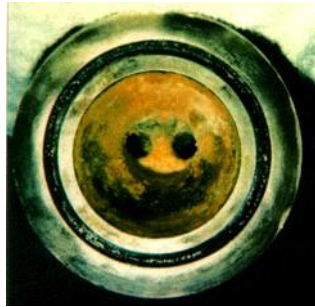
### • Uncured foam (< 5 min)

Foam type has the greatest influence over solvent performance. The charts below show the performance of our solvents.

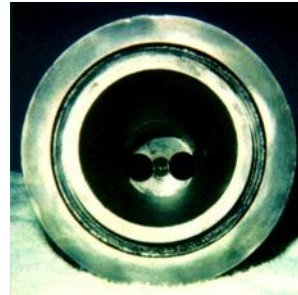


Flexible Urethane Foam		
Foam immersed in solvent and tested under high shear conditions		
Recommend PMA		
Solvent	Clean-up Time (seconds)	
	PMDI	TDI
Methylene Chloride	72	84
Glycol Ether PM	84	68
Glycol Ether PMA	40	31
NMP	180	34

Low Density Packaging Foam		
Foam immersed in solvent and tested under high shear conditions		
Recommend PM		
Solvent	Clean-up Time (seconds)	
	1-min cure	3-min cure
Methylene Chloride	40	Softens
Glycol Ether PM	36	Softens
Glycol Ether PMA	44	Softens



Cured foam in mixing head



After immersion in NMP

High-Density Spray Foam		
Foam immersed in solvent and tested under high shear conditions		
Recommend PM or PMA		
Solvent	Clean-up Time (seconds)	
	1-min cure	4-min cure
Methylene Chloride	10	10
Glycol Ether PM	10	60
Glycol Ether DPM	10	120
Glycol Ether PMA	10	70
50/50 PM/DPM	10	120
50/50 PM/Propylene		
50/50 PM/NMP	10	100
Carbonate	30	Ineffective

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Users should review the applicable Safety Data Sheet before handling the product.

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2593-V2-0511  
Supersedes 2593-V2-0104