



Metal
Manufacturers & Finishers
Green Certification

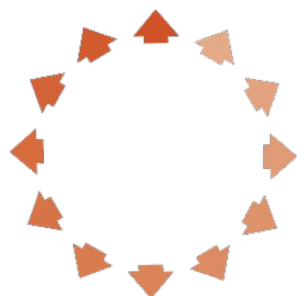


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NATIONAL POLLUTION
PREVENTION ROUNDTABLE



Schedule – Wednesdays 9am-10:30am (PT)

Introduction to Metal Finishing Environmental Certification

Week 1: Introduction - "Finding the Hidden Profits in Environmental Stewardship"

Week 2: Success Stories - "Real World Examples from the Metal Manufacturing Industry "

Successful Metal Manufacturing Environmental Practices

Week 3: Best Management Practices for Metal Finishing

Week 4: Best Management Practices for Cutting Fluids and other issues - "More Metal Manufacturing Best Management Practices"

Lean and Environmental Training for Metal Finishing

Week 5: Solvent Issues - "Safer Alternatives in Solvent Applications for Metal Processing"

Week 6: Lean Manufacturing Techniques – Using Lean Manufacturing to uncover opportunities.

Week 7: Lean Practices and Success Stories

Metal Working Fluids Project

Goal: Enable US machine shops to find safer, not hazardous waste MWFs.

Result: “Metal working fluids by score” a MWF alternatives list.

A tool to find safer, not haz waste MWFs”.

Download Alternatives List (see Chatbox):

<https://files.constantcontact.com/599bf013501/571aaf66-6af6-49c5-81a6-fc9abd5fa40b.pdf>

Metal working fluids cool, lubricate & flush chips



Metalworking Fluids by Score

Last updated March 5, 2021.

Table 3: Water-based metalworking fluids found in Washington state.¹

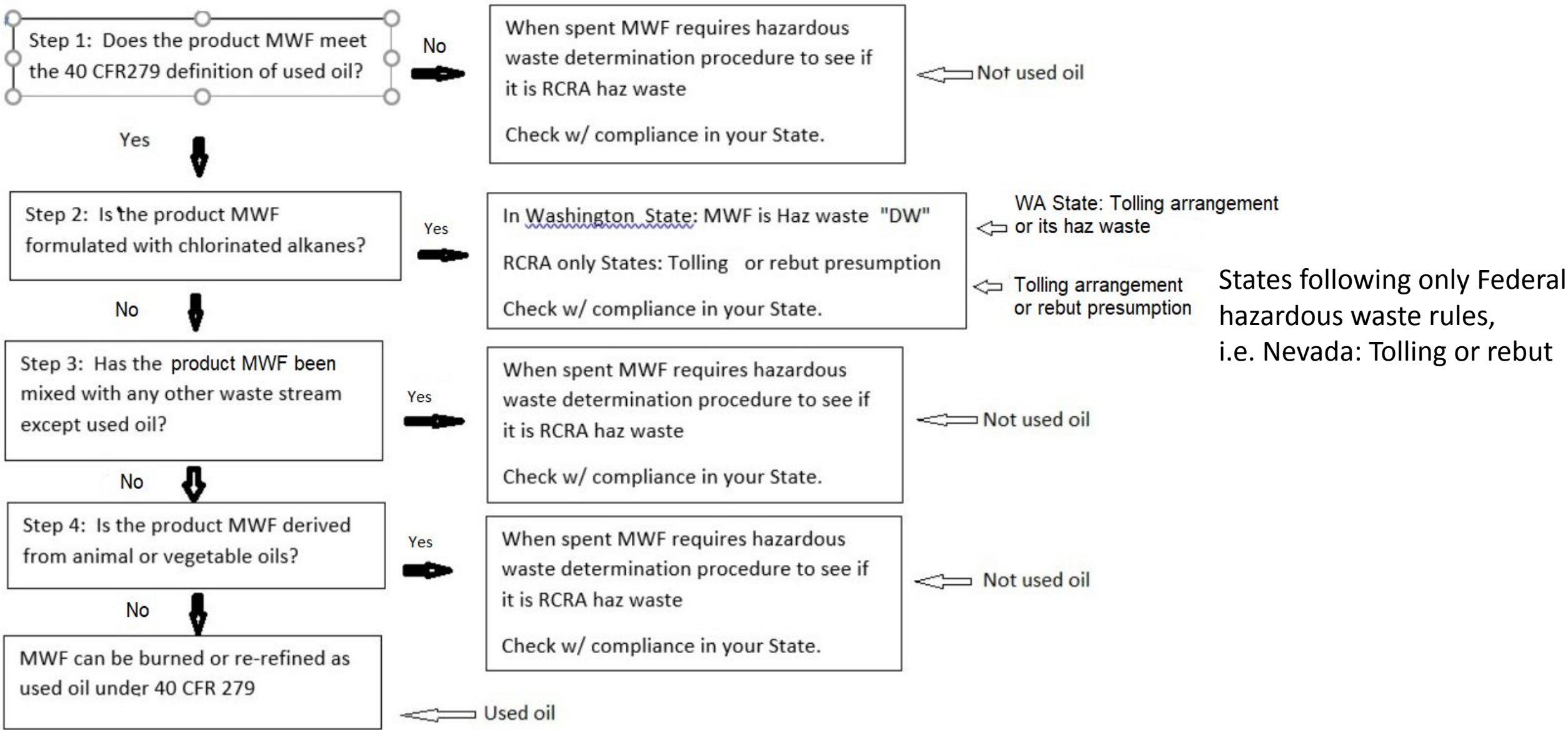
Metalworking Fluid Name	Unused Product Disposal Status	Water Dilution	% Toxic Substances	% Unknown Substances	% Preferred Substances
Blaser Synergy 735	Not used oil	y 20:1	0	0.6	99.4
Goodson SGC-10 (SDS: FG-550)	Used oil	y 20:1	0	1.3	98.7
Blaser Blasocut 4000 STRONG	Tolling or rebut	y 20:1	0	1.5	98.5
Blaser Vasco 7000	Not used oil	y 20:1	0	2.0	98.0
Qualichem Xtreme Cut 250C	Used oil	y 20:1	0	2.3	97.7
Blaser Blasocut 935 SW	Not used oil	y 20:1	0	3.2	96.8

¹ Sorted by percent toxic substances reported by manufacturer as being in product as used.

How was the MWF Alternatives List made?

- Cold calls: 100 WA State machine shops, “What MWFs do you use?”
 - Using only local machine shops assures alternative assessment viability
- Worked w/ manufacturer tech support to determine disposal status:
 - determine disposal status – “Used oil, not used oil, Toll or Rebut”
- Worked with Scivera and 2 of 23 manufacturers to assess MWF safety
 - Determine weight % of toxic, unknown, preferred chemicals in MWF products
 - Blaser Swiss Lube and Qualichem actively participated/ signed NDA

Virgin metal working fluid (MWF) disposal status



Part of a MWF Safety Data Sheet section 3: Chemical ingredients

DISPERSED

ALKANES C14-16, CHLORO	1372804-76-6	10 - 20	%
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CONCENTRATED MWF

Water based MWF: mix 19 parts water with 1 part MWF concentrate creating a 20:1 ready to use mixture

if original concentrated MWF was **10% alkanes C14-16 chloro**, the **spent MWF contains** $10\%/20 = 0.5\%$ or **5,000 PPM HOC**

if original concentrated MWF was **20% alkanes C14-16 chloro**, the **spent MWF contains**, $20\%/20 = 1\%$ or **10,000 PPM HOC**



If spent MWF HOC > 1,000 PPM HOC machine shops need to:

Manage spent MWF under tolling agreement or rebut presumption

§ 279.44 Rebuttable presumption for used oil.

(a) To ensure that used oil is not a hazardous waste under the rebuttable presumption of § 279.10(b)(1)(ii),), the used oil transporter must determine whether the total halogen content of used oil being transported or stored at a transfer facility is above or below 1,000 ppm.

(b) The transporter must make this determination by: Look at the last page of the alternatives list

40CFR279.24(c) Tolling arrangements. Used oil generators may arrange for used oil to be transported by a transporter without an EPA identification number if the used oil is reclaimed under a contractual agreement pursuant to which reclaimed oil is returned by the processor/re-refiner to the generator for use as a lubricant, cutting oil, or coolant.

The contract (known as a “tolling arrangement”) must indicate: Look at the last page of the alternatives list

Why look at metal working fluid safety?

- 25-30 years inadvertent touch/ breathe exposure
- Ecology's Toxic Evolution mission
- Empower machinists to use safest MWF possible
- Practical terms: Put safest MWFs at top of list, least safe at bottom
- Encourage manufacturers to make safer products

Scivera CHA Determining product MWF safety

How safe (chemical over-all grade) is the HC: C= Cancer, M = Mutation, R = Reproductive toxicity, etc.

ROW	CASRN	COMMON NAME	IMPORTED	%	LIST	HC	V	C	M	R	D	ea	atd	ato	ati	st	n	ds	rs	di	ei	ap	si	P	B	AAT	CAT	etp	r	f
1	50-00-0	formaldehyde	No	0.0	▲	●	✓	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
34	7732-18-5	water		0.0	▲	●	✓	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

The MWF project sorts HC into 3 categories:

Toxic

Preferred

Unknown

The only Scivera result we care about for this project is the HC – the overall chemical grade.

Calculating MWF weight % toxic using Scivera

Product Name: Metal Working Fluid XYZ

MWF XYZ Safety Data Sheet Section 3.

Scivera database HC results

CASRN as used in shop average weight percentage

123-45-6789 20%

● Red (analogous GS BM-1)

9876-543-21 16%

● half-yellow half green (GS BM-3)

6666-66-666 15%

● yellow (GS BM-2)

22-33-44 6%

● Red (GS BM-1)

11-111-111 3%

● Grey (GS BM-UNK)

Water 2%

● Green (GS BM-4)

MWF XYZ: Figuring weight % of toxic substances

Weight percent of MWF XYZ:

- - toxic substances: add together all Scivera Red HC weight percentages
- ● - preferred substances: add together Scivera yellow and green-yellow HC weight percentages and EPA SCIL percentages
- - unknown substances (100% - toxic substances% - preferred %)

Metal working fluid XYZ Appendix A results

For metal working fluid XYZ this looks like:

- weight % of toxic substances in XYZ = $20 + 6 = 26\%$
- weight % of preferred substances in XYZ = $16 + 15 + 2 = 33\%$
- weight % of unknown substances in XYZ = $(100 - 26 - 33 =) 41\%$.



If MWF XYZ was reported in Metal Working Fluid by Score, Appendix A, it would look like:

<u>name:</u>	% Toxic substances	% Unknown substances	% Preferred substances	%
MWF XYZ	26	41	33	

How to use Metal Working Fluid by Score

- **Warning** – Businesses are ultimately responsible for the proper haz waste determination and disposal of their waste because only they control the best management practices actually in use at the shop.
- Businesses must know their spent MWF disposal status
- The alternatives list is the unused product disposal status
- Knowing unused product disposal status helps find “used oil” MWFs
- **Do not use chlorinated tapping fluids – mix only with other used oil**
- Bad or sloppy management practices can make any MWF haz waste.

How should you use the alternatives list to find a MWF you can manage as used oil?

- Pick a “Used oil” MWF as high up list as possible
- and:
 - don’t contaminate MWF with chlorinated tapping fluids.
 - when MWF is spent, mix it only with used oil.
 - label container “used oil only”, keep it closed, clean up spills
- Higher up = less toxics for workers to breathe & touch
- Pick one with lowest % unknowns – unknowns may be toxic
- If you pick a MWF that’s disposal status is “Tolling or Rebut”
- If you pick a “Not used oil”

Using a “Not used oil” MWF

- The unused MWF contains a vegetable or animal oil (canola, tall, etc.)
- MWF must have RCRA haz waste determination (be tested, Pb, Cr, etc)
- You can not tell if its Haz waste or not until its spent and you test it
- You might want to try one despite the testing hassle because ...

How will the list be communicated to public?



Toxics Evolution Metalworking Fluids Project Report

- <https://apps.ecology.wa.gov/publications/documents/2104025.pdf>

NDA solution: Scivera signs NDA w/Blaser

1 Identification

Product identifier

Trade name: Synergy 735



Reviewed on 06/15/2020

3 Composition/information on ingredients

Chemical characterization: **Mixtures**

Description: Mixture of the substances listed below with nonhazardous additions.

Declarable components:

CAS no.

	Carboxylic acids, neutralized with alkanolamines*	>5-<15%
	Alkanolamine*	>1-6.9%
102-71-6	Triethanolamine	<2%

NDA Chemical hazard assessment results: now we know 88%, not 2%

Blasersynergy735

Details

ROW	CASRN	COMMON NAME	IMPORTED?	%	LIST	HC	V	C	M	R	D	ea	atd	ato	ati	st	n	ds	rs	di	ei	ap	si	P	B	AAT	CAT	etp	r	f		
1	redacted	redacted	Yes	38.0																												
2	redacted	redacted	Yes	30.0																												
3	redacted	redacted	Yes	13.0																												
4	redacted	redacted	Yes	7.0																												

What we know after signing the NDA:

- No NDA - just a Blaser Synergy 735 SDS:

<u>Metal Working Fluid Name</u>	% Toxic substances		% Unknown Substances	% Preferred Substances
Blaser Synergy 735	0	4.9	95.1	

- After Scivera-Blaser NDA:

<u>Metal Working Fluid Name</u>	% Toxic substances		% Unknown Substances	% Preferred Substances
Blaser Synergy 735	0	0.6	99.4	

Synergy 735 is diluted w/ water: 19 parts water to 1 part MWF = 95% water which means 95% of MWF as used is preferred

Blaser Swiss Lube & Qualichem

- Two out of twenty-three manufacturers participated
- Why? Protect market share – improve “product rating, higher on list”
- Ecology, Blaser & Qualichem – “Learned a lot”.
- Manufacturer participation improved list’s quality and quantity
- Follow on: leverage market share with National machine shop article?

What problems did the project encounter?

1. Identifying MWFs that are viable alternatives (AA)
2. Proprietary data needing NDA, getting corporate approval
3. Communicating CHA data to machinists in understandable format
4. Comparing products w/ many different chemicals & CHAs
5. Getting CHA data for 115 chemicals (reasonable time/cost)

Conclusions

- The MWF alternative list is a tool to find safer MWF that can be managed as used oil avoiding Tolling/Rebutting
- **Pick a MWF as high up the list as you can that has an unused product disposal status of “Used oil”, do not use HOC tapping fluids, when spent mix only with other used oil. Read the directions!**
- Unknown chemicals may be toxic, pick smart, minimize their presence
- Scivera is a valuable tool for getting CHA information on chemicals
 - Scivera can get CHA on proprietary chemicals needing a NDA
- Machinist work around MWF 25-30 years, choose safest MWF practical
- Questions/ comments?

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Next course: September 15, 2021

Safer Alternatives in Solvent Applications for Metal Processing.

Solvents including vapor degreasing, paint stripping, aerosol cleaning lubricants, and metalworking fluids are used by thousands of companies for cleaning metal processing. This training will explore potential alternatives to harmful solvents and tradeoffs for each of the methods. Also covered is a list of alternatives for metal working fluids used to cool and lubricate cutting heads, drills and saws.

Presenter: Katy Wolf, Consultant

