# Metalworking Fluid Committee

Annual Meeting 2024

September 30, 2024

ILMA
Independent Lubricant Manufacturers Association

Chair: Robin Dilts, Quaker Houghton PA, Inc.

Vice-Chair: Christy Henley, Sea-Land Chemical Company

Secretary: Nora Kieffer, Advancion Corporation

ILMA Board Liaison: Dean Froney, Master Fluid Solutions

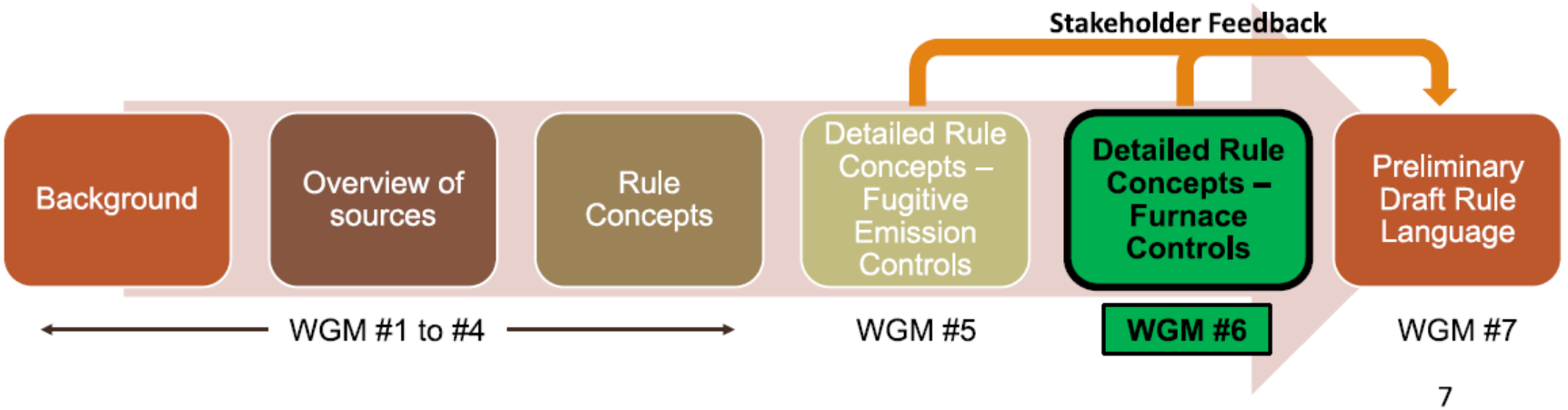
# California Rule Making Activity

- SCAQMD Proposed Rule 1435
- SCAQMD Proposed Rule 1445
- Proposed Amended Rule 1401
- Proposed Amended Rule 1171

# SCAQMD Proposed Rule 1435

- Control of Toxic Air Contaminant Emissions from Metal Heating Operations

# SCAQMD Proposed Rule 1435 TIMELINE – SO FAR



# Included in the Rule

**Metal Heating Definition:**

- Any operation in which a metal or metal alloy is heated to below the melting point, including, but not limited to, forging, heat treating, and the preheating of the metal or metal alloy prior to further processing

- Operating a furnace at or above 1250$^{o}$F
- Processing Chromium Alloys @ 0.5% wt. or greater
- Furnace contains Rule 1401 metals

# Rule 1401 Metals

- Arsenic
- Cadmium
- Chromium & Chromium Compounds (include chromates)
- Cobalt and Cobalt Compounds
- Copper and Copper Compounds (i.e. brass)
- Lead and Lead Compounds
- Mercury and Mercury Compounds (inorganic)
- Manganese and Manganese Compounds
- Nickel and Nickel compounds (i.e. stainless alloys)
- Silver and Silver Compounds
- Selenium and Selenium Compounds
- Vanadium and Vanadium Pentoxide
- Zinc and Zinc compounds

# Proposed Metal Heating Facility Classes

| Class | Criteria* |
|---|---|
| 4 | • ≥17 air furnaces that process Cr alloys (≥0.5% Cr by weight) |
| 3 | • ≥8 air furnaces that is not a Class 4 facility<br>• ≥17 applicable furnaces with at least one air furnace |
| 2 | • ≤7 air furnaces that process Cr alloys<br>• All applicable facilities that are not in Classes 1, 3, or 4 |
| 1 | • ≤7 air furnaces that don't process Cr alloys<br>• Exclusively non air furnaces |

Increasing Requirements

***Applies to furnaces with maximum operating temperature of ≥1250°F**

# Summary of Working Group Meeting #5 and #6

WG #5

- May 2, 2024 - Duration - Three hours
- Quench Tanks Restrictions Discussed
- 80 Attendees

WG #6

- September 5, 2024 – Duration Two hours
- Discussed Furnace Restrictions
- 90 Attendees

# Quench Tanks

- Quench tank water shown to be a source of hexavalent chromium when heated chromium alloys are placed into the quench tank
- Elevated levels of hexavalent chromium were detected at a heat-treating facility's water quench tank and at the outlet of the tank's direct circulating cooling tower
- Small amount of hexavalent chromium detected in heat treating facility's oil quench tank fluid
- A quench tank that contains elevated levels of hexavalent chromium may exceed health risk thresholds in Rule 1401 – New Source Review of Toxic Air Contaminants and thus require a Permit to Operate
- Staff recommends quenching fluid be tested to measure hexavalent chromium concentrations

Quench Tanks

# Initial Recommendations

## Water Quench Tanks

On and after date of rule adoption, a facility that processes Chromium Alloys shall measure the hexavalent chromium concentration of the quench water, using American Public Health Method 312B*:

- For a Tier 3 or Tier 2 facility, once every calendar month
- For a Tier 1 facility, once every 3 calendar months

If measurements show that Hexavalent Chromium is present in quench water:

- No later than 7 days of receiving results, treat or replace quench water to ensure that concentrations are below 0.15 mg/L
- No later than 90 days of receiving results, submit a complete application for a permit to operate

* In *Standard Methods for the Examination of Water and Wastewater*, published by the American Public Health Association

Quench Tanks

# Initial Recommendations

## Non-Water Quench Tanks

- Within 3 months of rule adoption, a facility shall measure the hexavalent chromium concentration of the quench fluid in a non-water quench tank, and submit the results to South Coast AQMD

- Results from non-water quench tanks tests would be collected for information purposes
- The need for further action will be determined based on testing results

Prohibitions

# Initial Recommendations

- On and after January 1, 2026, do not operate any furnace with refractory that is manufactured to contain chromium
  - Verified through testing, Safety Data Sheet (SDS) or other official manufacturer-supplied documentation
- On and after one year of date of rule adoption, a facility with a water quench tank that processes Chromium Alloys shall not operate an evaporative cooling tower unless the cooling tower is a Closed Loop Cooling Tower

# Four Options for Compliance - Large Facilities

**Option A**

Capture and Control:

PTEs vented to HEPA

**Option B**

Capture and Control:

Furnace exhausts vented to HEPA

**Option C**

Demonstrate low emissions and low health risk

**Option D**

Fenceline air monitoring

**Rule goes into Effect in 2025 – No Date Set**

# Topics for Further Discussion:

- Ferrous Sulfate and Cr VI reduction treatment - May not be effective with polymer quenchants present.
- Increased testing requests by customers for Cr-VI (not for compliance)
- Standard Methods 312b may be inaccurate with polymer quenchants present.
- Chromium Alloys still present in the furnace – as racking
- Who were the attendees of WG Meeting #5 and #6 - Freedom of Information Request
- CR-VI is not stable and decline to Cr-III over 48 hours.

# Why Be Concerned

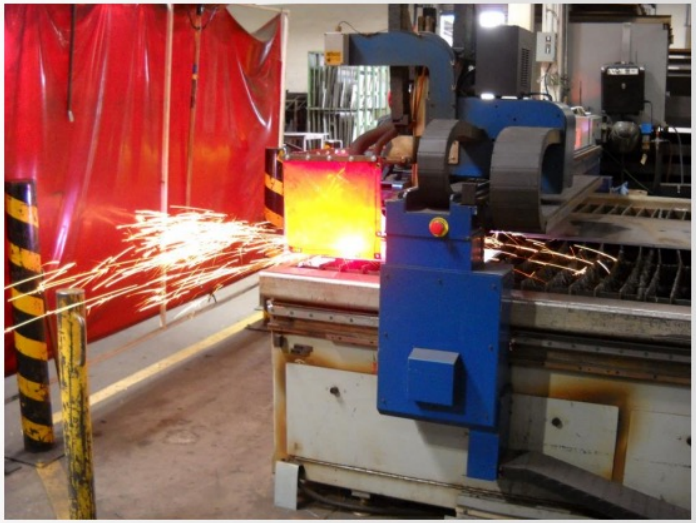
- Increased awareness of Cr-V1 in high heat operations
- Customer questions regarding Cr- VI
- Increased awareness by other agencies –globally

# SCAQMD Proposed Rule 1445

- CONTROL OF TOXIC EMISSIONS FROM LASER AND PLASMA ARC METAL CUTTING

# EMISSION SOURCE

- Laser and plasma arc cutting process creates fumes and smoke from vaporizing the molten material
  - Fumes generated contain carcinogens such as nickel, lead, manganese and other toxic metal particulates
- Heating the metal to the temperatures involved in these cutting processes can form oxidized compounds
  - Elemental chrome in stainless steel could be oxidized into hexavalent chromium



# TOXIC AIR CONTAMINANTS

- Hexavalent chromium is a toxic air contaminant that is a potent carcinogen
  - Long-term inhalation of hexavalent chromium can increase the risk of developing lung and nasal cancers
- Other toxic metals, such as nickel, also have adverse health affects
  - Acute effects from nickel inhalation include gastrointestinal distress, pulmonary fibrosis, and lung and kidney damage

OEHHA
California Office of Environmental Health Hazard Assessment

| Action | Date |
| --- | --- |
| **Written Comments Due** | **September 12, 2024** |
| Stationary Source Committee | September 20, 2024 |
| Set Hearing | October 4, 2024 |
| Public Hearing | November 1, 2024 |

# Proposed Amended Rule 1171

## Solvent Cleaning Operations

### Proposed Prohibited Use

Parachlorobenzotrifluoride (PCBTF) CAS 98-55-6

Tert-Butyl-Acetate (TBAC) CAS 540-88-5

# ASTM – WG 68411- Recent Activity

**Proposed New Standard Guide for minimizing Heavy Metal Accumulation in Metalworking Fluids**

| | |
|---|---|
| **Subcommittee:** | ASTM E34.50 – Committee Chair – Dr. Fred Passman |
| **Technical Contact:** | Richard Butler |
| **Standard:** | Proposed New Standard Guide for Minimizing Heavy Metal Accumulation in Metalworking Fluids |
| **Work Item:** | WK68411 |
| **Ballot Action:** | Proposed new Guide. Ballot Due Date – September 23, 2024 |

**Basic Premise:**

1. Metalworking Fluids (MWF), specifically metal removal and metal forming fluids, are used to cool, lubricate, remove metal debris from the work zone, and provide short-term corrosion protection.

2. During the metal removal process, small metal particles are comingled with this circulating fluid.

3. These small metal particles can remain in the fluid as particulates or dissolved contaminants.

4. Some of the metals machined have toxic characteristics, these are referenced in the Proposed Standard Guide;
   a. Arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, nickel, tungsten, and vanadium.

**Basic Premise: Continued**

5. As these metals build in concentration in the MWFs, it is alleged that these MWFs cause increased health risks to workers where MWFs are used.

6. This Proposed Standard Guide recommends, in some cases, weekly monitoring of these metals.

7. This Proposed Standard Guide recommends maintaining these metals below 75% of saturation.

8. This Proposed Standard Guide recommends that the most effective means to eliminate saturation is to drain and recharge the MWF system.

**Weakness:**

1. Mr. Butler and Dr. Passman appear to be working alone on this ASTM activity with no support from other experts in the MWF community.

2. The CDC, OSHA, NIOSH, and EPA are not currently researching "heavy metal" accumulation in MWF. It is also not on their proposed research dockets.

3. There are no peer-reviewed articles that correlate heavy metal accumulation in MWFs to adverse or increased health effects on workers in the area where MWFs are used.
   a. If these peer-reviewed articles exist, then Mr. Butler should have listed them in his Proposed Standard Guide references – which he did not.

**Weakness, Continued:**

4. This Proposed Standard Guide is purely speculation on the part of Mr. Butler and Dr. Passman with no scientific basis that heavy metal accumulation in MWF causes increased health effects to workers in the area where MWF are used.

5. Mr. Butler brought his concerns to ILMA approximately 5 years ago and was not supported by ILMA's MWF and SHERA committees.

**Appropriate Next Steps:**

1. This Proposed Standard Guide is premature in addressing this alleged issue.

2. The proper way to address this alleged issue is to conduct an industry supported peer-reviewed study conducted on heavy metal accumulation in MWFs and prove (or disprove) health risks to workers in the area where MWFs are used. (10-15 years)

3. This study can then be offered as evidence to CDC, OSHA, NIOSH, and EPA for further study.

4. Then an ASTM standard guide can follow.