Trichloroethylene
TSCA Risk Management Rule

Microporous LLC

RIN: 2070-AK83

12 September 2024

Microporous

Microporous manufactures mission-critical lead acid battery separators integral to the operation of a rechargeable battery.

- Major markets: Automotive, Motive, and Stationary with annual growth of ~3.5%.

- <u>Only two US manufacturers</u>, both using TCE as a critical processing aid.
  - US producers represent 22% of global capacity.
  - Worldwide demand is greater than 85% of installed capacity.
  - The third US producer ceased operations in July 2024.
  - All manufacturing lines built since 1980 utilize TCE - No alternative processing aid has been identfied as a safe and suitable alternative.

What is a Battery Separator?

- Batteries simply do not work without a separator between the positive and negative electrodes.
- The major roles of the separator in a battery are to:
  - Serve as an electronic insulator.
  - Prevent shorting between the electrodes.
  - Maintain stability within the battery's chemical environment
  - Allow ionic conduction.
- In lithium batteries, separators provide the safety "shut down" mechanism to prevent thermal runaway if a battery gets too hot.

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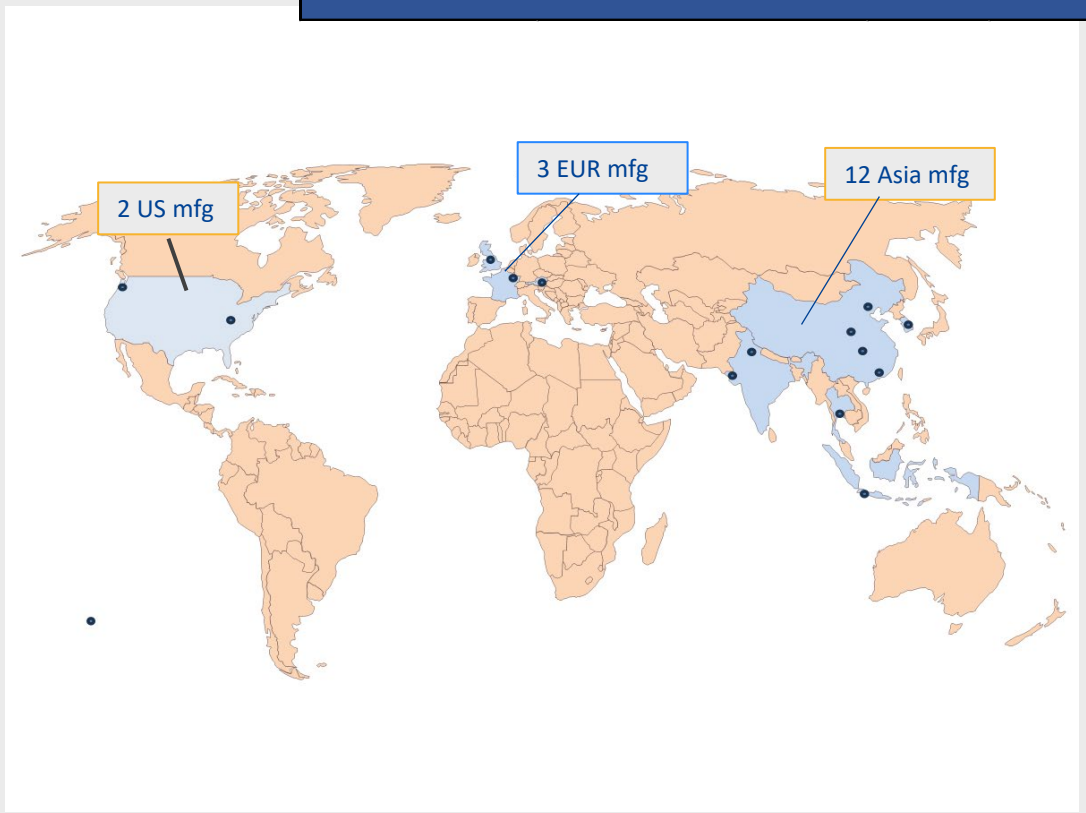
Operates One of Two North American Battery Separator Manufacturing Plants.

- An economic analysis report released in 2024 by research firm EBP estimated the US battery industry powers roughly **$8.1 trillion** worth of domestic industrial economic output annually. **
- There are **1.2 billion** internal combustion engine (ICE) vehicles worldwide with **140 million** in the US.
- **48 million** US jobs are related to the battery industry with over **120,000** jobs in the lead acid battery manufacturing space. **
- The U.S. government and Department of Defense purchase roughly **$7.5 billion** of domestically produced batteries. **
- The average American household relies on 3 lead batteries for everyday use. **

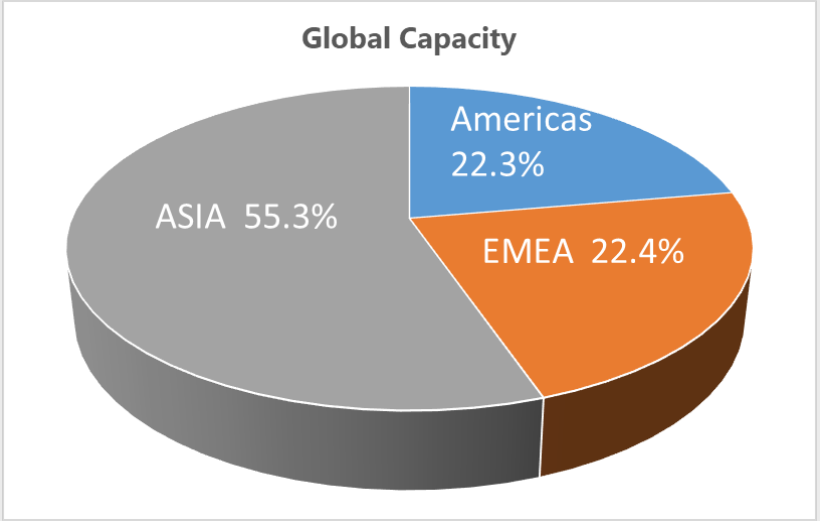
** Battery Council International data

Where are Battery Separators Manufactured?

2025 PE SEPARATOR CAPACITY BY REGION



Region		Americas	EMEA	Asia
Mfg Locations	no.	2	3	12
Global Capacity	MM sqm eq	254	255	630
% Global Capacity	%	22.3%	22.4%	55.3%



Major Concerns with the Proposed Rule

- TCE is essential to battery separator manufacturing.
  - By providing the 10-year exemption, EPA recognizes that no viable alternative has been identified after years of research, nor is one on the horizon.
  - The manufacturing process is designed around the use of TCE - it is a critical and essential component.

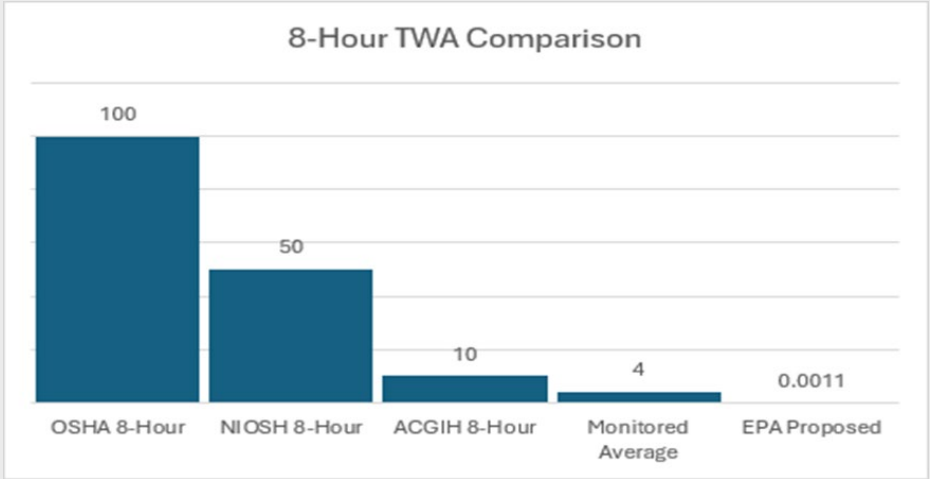
- Microporous has researched, engineered, developed, and invested in sophisticated engineering controls and measures to provide a closed system to minimize employee exposure to TCE.

- Microporous has invested heavily in “best in class” recycling and recovery systems delivering a 99% recycle rate.

Major Concerns with the Proposed Rule

ECEL

- The ECEL and WCPP need to be reasonable, otherwise the exemption operates as a practical ban.
  - EPA may impose conditions on an exemption under section 6(g) while still allowing an exempt party to achieve the purpose of the exemption.
  - EPA based its decision on an animal study that has not been replicated, lacks broader scientific support, and that EPA's own scientific advisors have recommended against using as a basis for regulatory decisions.
  - There are no feasible engineering or administrative controls that could be implemented to meet the proposed ECELs.



Agency	8-Hour TWA
OSHA	100 ppm
NIOSH	50 ppm
ACGIH	10 ppm
EPA	0.0011 ppm
Monitored Average	4 ppm

- The proposed ECEL limit is five orders of magnitude lower than the existing ECEL.
- Monitored Average is the current production environment utilizing best in class engineering controls.

Major Concerns with the Proposed Rule

Reasonable Exemption

- Microporous needs a 25-year exemption; the proposed 10-year exemption is unreasonable.
  - Currently No Known Alternative.
  - EPA must adopt a "reasonable" duration for exemption under Section 6(g).
  - To be reasonable, an exemption must remain in place as long as necessary to fulfill the exemption's purposes.
  - Once an alternative is identified, significant time is then needed to construct the necessary manufacturing infrastructure and allow the alternative to undergo the rigorous performance testing required for commercial use for national defense, energy storage, and other transportation applications (refer to table).

Alternative Processing Aid Timeline Example

Action	Time Frame
Evaluation of Reasonable Alternative	4 - 6 years
Qualification Trials (internal)	2 - 3 years
Laboratory Battery Qualification	2 - 4 years
Trials at Battery Manufacturers	2 - 3 years
Design of Manufacturing Line Sourcing/Installation/ Commissioning	3 - 5 years
Scale-up | Process Validation	2 - 3 years
Battery Manufacturer Qualification and Validation	3 - 4 years
End Use Customer Validation and PPAP	2 - 3 years
Total	20 - 31 years

Major Concerns with the Proposed Rule

WCPP

- The ban on TCE in wastewater discharge is not reasonable and is contrary to the well-established regulatory framework for wastewater discharges under the Clean Water Act.
  - The proposed ban on TCE in wastewater is unworkable and unlawful.
  - Discharge to a POTW is done pursuant to a wastewater discharge permit.
  - The alternative to a wastewater discharge ban to a POTW is to haul wastewater off-site for disposal at enormous environmental cost and additional environmental risk.