
MEMORANDUM OF UNDERSTANDING
ON
COPPER MITIGATION IN WATERSHEDS AND WATERWAYS
BETWEEN
U.S. ENVIRONMENTAL PROTECTION AGENCY
AND
MOTOR & EQUIPMENT MANUFACTURERS ASSOCIATION, AUTOMOTIVE
AFTERMARKET SUPPLIERS ASSOCIATION, BRAKE MANUFACTURERS COUNCIL and
HEAVY DUTY MANUFACTURERS ASSOCIATION
AND
AUTO CARE ASSOCIATION
AND
ALLIANCE OF AUTOMOBILE MANUFACTURERS
AND
ASSOCIATION OF GLOBAL AUTOMAKERS, INC.
AND
TRUCK AND ENGINE MANUFACTURERS ASSOCIATION
AND
ENVIRONMENTAL COUNCIL OF THE STATES

I. Purpose and Intent

A. The purpose of this memorandum of understanding (MOU) between the U.S. Environmental Protection Agency (EPA), Environmental Council of the States (ECOS) and the vehicle industry signatories, Motor and Equipment Manufacturers Association (MEMA), Automotive Aftermarket Suppliers Association (AASA), Brake Manufacturers Council (BMC), Heavy Duty Manufacturers Association (HDMA), Auto Care Association, Alliance of Automobile Manufacturers (Alliance), Association of Global Automakers, Inc. (Global Automakers) and Truck and Engine Manufacturers Association (EMA) is to reduce heavy metals and other pollutants in stormwater runoff from roads and highways by promoting and facilitating the phase out – consistent with the terms of this MOU – of copper, asbestiform fibers, cadmium and its compounds, chromium (VI)-salts, lead and its compounds, and mercury and its compounds (copper and other constituents) in motor vehicle brake friction materials, also called brake pads. Debris from brake pads are one source of these pollutants in stormwater discharges, and reducing or eliminating the use of these compounds at the source has the potential to reduce environmental exposure of these materials in watersheds and waterways. This effort will be called the Copper-free Brake Initiative.

B. The parties intend to implement this Copper-free Brake Initiative to phase out copper and other constituents used in brake pads nationwide (see Appendix 1 for party descriptions). The voluntary practices and approaches described in the Copper-free Brake Initiative are modeled on laws and regulations currently in place in the states of Washington and California, which have taken the lead in establishing requirements to phase out the use of copper and other constituents used in brake pads. The signatories also agree to educate service providers and other stakeholders about the changes being made to these products, as designated in Section VI. “Responsibilities and Intentions of the Parties” of the Copper-free Brake Initiative.

II. Background

A. Copper in Stormwater Runoff

Copper is a primary pollutant of concern found in highway stormwater runoff. Copper in its naturally occurring state has been observed at levels between 0.03 to 0.23 µg/L in surface seawater and 0.20 to 30 µg/L in freshwater.¹ In some areas copper far exceeds the EPA’s water-quality criteria for aquatic life, with concentrations of 100 µg/L to 200,000 µg/L in areas where mining occurs.² Elevated levels of copper are toxic in aquatic environments and may adversely affect fish, invertebrates, plants and amphibians. Acute toxic effects may include mortality of organisms, and chronic toxicity can result in reductions in survival, reproduction and growth.³ Copper is also directly toxic to the salmon olfactory system, even at very low exposure concentrations, and degrades salmon’s ability to avoid predators.⁴ One source of copper includes wearing of vehicle brake pads onto roadway surfaces where it comes into contact with stormwater and is discharged into nearby waterways.

¹ Bowen, H.J.M. (1985). The natural environment and biogeochemical cycles. In: The Handbook of Environmental Chemistry, Vol. 1, Part D. D. Hutzinger, ed., Springer-Verlag, New York, 1-26.

² Davis, A. and Ashenberg et al. (1989). The aqueous geochemistry of the Berkley Pit, Butte, Montana, U.S.A. Appl. Geochem.

³ U.S. EPA, Water Quality Criteria Copper Aquatic Life Criteria. (n.d.). *Home*. Retrieved June 13, 2014, from <http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/copper/background.cfm>

⁴ McIntyre, J.K., Baldwin, D.H., Beauchamp, D.A., and Scholz, N.L. (2012). Low-level copper exposures increase the visibility and vulnerability of juvenile Coho salmon to cutthroat trout predators. *Ecological Applications*, 22:1460-1471.

B. Brake Friction Materials (Brake Pads) and Copper

A brake system is made of multiple components and parts. Brake friction materials – or brake pads – are mounted in a caliper on steel backing plates that faces the brake rotor or on shoes that face a brake drum. These are a critical component in slowing and stopping vehicles. Friction materials are composites of application-specific formulas and designs with various properties that offer specific performance characteristics.

Copper is used in brake pads for functional reasons like fading and friction properties, thermal conductivity and amount of wear. Finding and developing substitutes that have similar properties to copper has begun, but it is quite complex. Because of high safety relevance, suitable substitutes to copper still have to be identified and then confirmed through intensive testing such that the substitute(s) can be used in a variety of applications and exhibit desired performance.

C. Laws in the States of California and Washington

In recent years, the states of California and Washington have each passed laws⁵ to require abatement of copper and other constituents found in motor vehicle brake pads. During this time, brake system manufacturers, friction material manufacturers, vehicle manufacturers, parts retailers and service providers have all engaged and worked collaboratively with states, nongovernmental organizations and other interested stakeholders to address concerns related to these pollutants.

Since the passage of these laws, the state of Washington issued final regulations on October 19, 2012.⁶ Since June 14, 2014, California has been developing regulations to implement the California law along with conducting a series of workshops.⁷

At the core of the California and Washington laws are the percent-by-weight requirements for brake friction material formulations sold in each state. The table outlines the different states' laws and the dates by which copper and other constituents must comply with the requirements. By the year 2015, brake friction materials need to be certified and marked in accordance with the requirements of the law. In addition, by the year 2015, brake-friction materials cannot be sold in either state if they contain asbestiform fibers, chromium (VI)-salts, lead and its compounds, and mercury and its compounds in concentrations exceeding 0.1 percent by weight (0.10 wt %) and cadmium and its compounds in concentrations exceeding 0.01 percent by weight (0.01 wt %). By the year 2021 in both states brake friction material formulations cannot contain copper that exceeds 5.0 percent by weight (5.00 wt %).⁸ By 2025 in California copper cannot exceed 0.5 percent by weight (0.50 wt %) in the brake friction material formulations; Washington is expected to adopt a date for 0.5 percent by weight (0.50 wt %) copper content in brake friction materials following a feasibility assessment of an identified alternative(s) that is reviewed by expert panel.⁹

⁵ California Health and Safety Code, Division 20, Chapter 6.5, Article 13.5 (California SB 346); State of Washington Chapter 70.285 RCW (Washington SB 6557). (CA-DTSC: The California and Washington state laws also include the elements compounds). The state of Washington has issued final regulations. At the time of this MOU, California has not issued regulations.

⁶ Better Brakes Rule, Washington Chapter 173.901 WAC

⁷ <http://dtsc.ca.gov/pollutionprevention/brakepads.cfm>

⁸ See "Section VIII. Limitations" in this MOU.

⁹ The state of Washington does not require a firm deadline year for 0.5 percent by weight for copper.

Material*	Legal Maximum as of:		
	State of Washington	Jan. 1, 2015	Jan. 1, 2021
Cu	no limit	5.00 wt%	0.50 wt%**
Asbestos, Cr(VI), Pb, Hg	0.10 wt%	0.10 wt%	0.10 wt%
Cd	0.01 wt%	0.01 wt%	0.01 wt%
Ni, Sb, Zn	Currently none – may be regulated in the future		
State of California	Jan. 1, 2014	Jan. 1, 2021	Jan. 1, 2025
Cu	No limit	5.00 wt%	0.50 wt%
Asbestos, Cr(VI), Pb, Hg	0.10 wt%	0.10 wt%	0.10 wt%
Cd	0.01 wt%	0.01 wt%	0.01 wt%
<p>* NOTE: Some exemptions and extensions are permitted for certain applications</p> <p>**Date may be later pending Washington’s determination of availability of 0.50 wt% materials. The December 1, 2023, deadline for 0.50 wt% copper will be the earliest possible date.</p>			

D. Industry Action

Currently, the California and Washington laws are effectively driving an industry de facto standard, leading brake friction material manufacturers to change all of their U.S. product lines to be compliant with those laws. The changes will ultimately benefit the entire nation’s watersheds and waterways, not just those in California and Washington.

The brake friction materials manufacturers, suppliers, vehicle manufacturers, retailers and other industry stakeholders are already working together toward the reduction and removal of copper and other constituents from brake friction materials.

With respect to edge code marking, one response was for industry to update existing and develop new standards through the SAE International (“SAE”), which is a global association of more than 138,000 engineers and related technical experts in the automotive, commercial-vehicle and aerospace industries that develop voluntary consensus standards.

To specifically address the needs resulting from these new state laws, SAE revised an existing standard for the marking of brake friction materials (SAE J866)¹⁰ and created a new standard to test for other constituents in friction materials (SAE J2975).¹¹

¹⁰ “Friction Coefficient Identification and Environmental Marking System for Brake Lining” (www.sae.org)

¹¹ “Measurement of Copper and Other Elements in Brake Friction Materials” (www.sae.org)

With respect to package labeling, to meet the needs of Washington's marking requirements, in 2012 BMC developed and trademarked a packaging icon for industrywide use – the LeafMark™, which is owned by MEMA/AASA/BMC and available to brake manufacturers through a certification program. Furthermore, friction material manufacturers collaborated with states, aftermarket suppliers, vehicle dealers, retailers and service providers and launched an educational website www.copperfreebrakes.org in December 2013. See Appendix 2 for more information about marking.

E. Government-Industry Memorandum of Understanding

To get in front of the issues surrounding copper abatement in brake friction materials and to avert a potential patchwork of compliance and enforcement mechanisms under additional state laws, the signatories agree to a voluntary memorandum of understanding. This document can ensure that there is a streamlined, national approach on this environmental issue that will create a transparent framework for all parties to implement the initiative described in this agreement to phase out copper and other constituents found in brake pads. Entering into this Copper-free Brake Initiative now could avoid unnecessary, costly and redundant burdens for states and industry as well reduce confusion along the supply chain and down to the end user.

This Copper-free Brake Initiative is expected to promote important synergies. Industry can phase out the materials in their products and on motor vehicles and comply with related requirements in a consistent and certain approach. Since brake materials manufacturers, suppliers, wholesalers and retailers operate across state lines they can work with the EPA and state governments to educate installation technicians, consumers and other nongovernmental organizations about implementing the Copper-free Brake Initiative set forth in this MOU to achieve positive environmental effects.

III. Authorities

- A. Clean Water Act, sections 104(a) and (b), 33 U.S.C. § 104(a) and (b).
- B. National Environmental Policy Act section 102(2) (G), 42 U.S.C. § 4332(2)(G).

IV. Definitions

- A. For purposes of this Copper-free Brake Initiative, the following definitions apply:
1. “Brake friction material” or “friction material” means that part of a motor vehicle brake pad designed to retard or stop the movement of a motor vehicle through friction against a rotor made of a more durable material.
 2. “Brake friction material manufactured as part of an original equipment service contract” means brake friction material that:
 - a. Is provided as service parts originally designed for and using the same brake friction material formulation sold with a new motor vehicle and there have been no changes to the original design of the service part's brake friction formulation; or,
 - b. Is manufactured as part of a contract between a vehicle manufacturer and a brake friction material manufacturer that requires the brake friction material manufacturer to provide brakes with the identical brake friction material formulation to those that originally came with a new motor vehicle and the brake friction material manufacturer only sells these parts directly to the vehicle manufacturer.
 3. “Collector Vehicle” means a motor vehicle, but not a reproduction thereof, manufactured at least 30 years prior to the current year and maintained in or restored to a condition that is substantially in conformity with manufacturer specifications and appearance. (NOTE: States’, industry and car club definitions will vary)
 4. “Copper and other constituents” means copper, asbestiform fibers, cadmium and its compounds, chromium (VI)-salts, lead and its compounds, and mercury and its compounds.
 5. “Motor Vehicle” means a vehicle driven or drawn by mechanical power and manufactured primarily for use on public streets, roads and highways, but does not include a vehicle operated only on a rail line (49 U.S.C. §30102). For more details, please refer to The Code of Federal Regulations, Title 49 Transportation, Subtitle B, Chapter V, Part 523 “Vehicle Classification,” and The Federal Motor Carrier Safety Regulations, Title 49, Subtitle B, Chapter III, Subchapter B, Part 390, Subpart A, Subsections 390.5 “Definitions.”
 6. “Phase Out” means the systematic reduction in the amount of specified constituents to agreed-upon levels.
 7. “Rotor” means the rotating portion of a motor vehicle brake system including, but not limited to, brake disks and brake drums. (Definition may vary state to state.)

V. Copper-free Brake Initiative

- A.** The Copper-free Brake Initiative is intended to be a cooperative effort among auto manufacturers, brake manufacturers, aftermarket industries, the EPA and states to phase out copper and other constituents found in brake pads nationwide. As detailed below, the parties agree to accept responsibilities for aspects of the design and implementation of this initiative. The key to success of this initiative will be the sharing of information and monitoring progress. This initiative has six elements:
1. Education and outreach to bring about the nationwide phase-out of copper and other constituents found in brake pads
 2. Testing friction materials and its constituents for safe alternatives
 3. Marking and labeling of friction material packaging and product¹²
 4. Providing accessible contact information for and access to the reporting registrar(s)/agent(s)
 5. Publishing and distributing educational materials
 6. Working toward achieving the goals set forth in this Copper-free Brake Initiative consistent with timeframes in Section VII

VI. Responsibilities and Intentions of the Parties

- A.** Motor & Equipment Manufacturers Association (MEMA), Automotive Aftermarket Suppliers Association (AASA), Brake Manufacturers Council (BMC) and Heavy Duty Manufacturers Association (HDMA) intend to:
1. Work to encourage national implementation of the initiative described herein by providing their brake manufacturer members with education about:
 - a. Phasing out the use of copper and other constituents found in brake pads consistent with the timing in Section VII;
 - b. Testing friction materials for antimony, asbestiform fibers, cadmium, chromium (VI), copper, lead, mercury, nickel and zinc. (using SAE J2975 or other standardized test protocols);
 - c. Marking the brake friction materials edge code per industry standards (SAE J866) to communicate compliant product; and
 - d. Marking the brake-friction-material packaging with the LeafMark™ Certification Mark and educating their supply chain about the LeafMark™ Certification Mark.
 2. Work with third-party reporting registrar(s)/agent(s), their supply chain (e.g. brake manufacturers, vehicle manufacturers, distributors, retailers) and other industry stakeholders to educate service providers. This includes, but is not limited to:
 - a. Educating about the brake friction materials edge code and LeafMark™ Certification product marking and labeling requirements;

¹² The EPA notes that the marking and labeling is not in any way affiliated with the EPA.

- b.** Providing accessible contact information for and access to the reporting registrar(s)/agent(s). (Registrar(s) in California is known as the “testing certification agency”);
 - c.** Publishing online and written materials; and
 - d.** Distributing educational materials or hosting educational sessions at industry trade shows.
- 3.** Develop and distribute educational public-outreach materials about the initiative to other stakeholders throughout the brake pad distribution system, as applicable, as well as other interested parties, such as government entities and the public. These educational materials should provide information about the phase-out of copper and other constituents found in brake pads and on how to identify brake pads that follow the compliance marking requirements as established in California and Washington. See Appendix 2 for more information.
- 4.** Encourage their brake manufacturer member companies to complete a screening level hazard assessment of substances used in brake friction materials to find safe, technically feasible alternatives to copper that pose less potential hazard to public health and the environment.

B. Auto Care Association intends to:

- 1.** Work to encourage national implementation of the initiative described herein by providing its brake manufacturer, distributor and retail members with education about:
 - a.** Phasing out the use of copper and other constituents found in brake pads consistent with the timing in Section VII;
 - b.** Testing friction materials for antimony, asbestiform fibers, cadmium, chromium (VI), copper, lead, mercury, nickel and zinc. (using SAE J2975 or other standardized test protocols);
 - c.** Marking the friction materials edge code per industry standards (SAE J866) to communicate compliant product; and
 - d.** Marking the brake friction material packaging with the LeafMark™ Certification Mark and educating their supply chain about the LeafMark™ Certification Mark.

2. Work with third-party reporting registrar(s)/agent(s), their supply chain, brake manufacturers, vehicle manufacturers, distributors, retailers, and other industry stakeholders to educate service providers. This includes but is not limited to:
 - a. Educating about the brake-friction materials edge code and LeafMark™ Certification product marking and labeling requirements;
 - b. Providing accessible contact information for and access to the reporting registrar(s)/agent(s). (Registrar(s) in California is known as the “testing certification agency”);
 - c. Publishing online and written materials; and
 - d. Distributing educational materials or hosting educational sessions at industry trade shows.
3. Develop and distribute educational public outreach materials about the initiative to other stakeholders throughout the brake pad distribution system, as applicable, as well as other interested parties, such as government entities and the public. These educational materials should provide information about the phase-out of copper and other constituents found in brake pads and on how to identify brake pads that follow the compliance marking requirements as established in California and Washington. See Appendix 2 for more information.
4. Encourage its brake manufacturer member companies to complete a screening level hazard assessment of substances used in brake friction materials to find safe, technically feasible alternatives to copper that pose less potential hazard to public health and the environment.

C. Alliance of Automobile Manufacturers (Alliance) and Association of Global Automakers, Inc. (Global Automakers) and Truck and Engine Manufacturers Association (EMA) intend to:

1. Educate their respective member companies about meeting the brake friction material provisions of this Copper-free Brake Initiative in new motor vehicles.
2. Work with brake friction manufacturers and their association(s) to make them aware of this Copper-free Brake Initiative.

D. U.S. Environmental Protection Agency (EPA) intends to:

1. Promote the Copper-free Brake Initiative and phase-out of the following constituents in motor vehicle brake friction materials on a national basis: copper, asbestiform fibers, cadmium and its compounds, chromium (VI)-salts, lead and its compounds, and mercury and its compounds;
2. Establish a segment of its website to house important information on this Copper-free Brake Initiative, including, but not limited to, references, links and contact information to appropriate reporting registrars/agents; and
3. Promote this as the federal Copper-free Brake Initiative.¹³

¹³ The industry established a website to which the EPA can link: www.copperfreebrakes.org.

E. Environmental Council of States (ECOS) intends to:

1. Encourage its member states to review this Copper-free Brake Initiative and to understand the positive impact the phase-out of copper and other constituents will have on their local watersheds and waterways;
2. Collaborate with states, the parties to this initiative and other interested stakeholders to develop materials and tools that could assist states environmental agencies/authorities about the reduction of copper in their local watersheds and waterways; and
3. Work with its member state governments to share information on the progress of this initiative.

F. Joint Responsibilities - All parties intend to conduct the following activities, as appropriate, related to the status of the Copper-free Brake Initiative:

1. Meet on a periodic basis;
2. Provide information and monitor progress using existing, related data sets and tools; and
3. Make summary reports, as appropriate, that include progress made by all parties and are available online for public access.

VII. Timing of National Initiative

The industry signatories agree to promote the phase-out of copper and other constituents from brake friction materials in accordance with the following voluntary milestones¹⁴.

A. Non-Copper Constituents in Brake Friction Material

1. The use of the following brake-friction materials that exceed the concentration limits noted will be phased out as of January 1, 2015 (*note that California and Washington ban their sale*):
 - a. asbestiform fibers in concentrations exceeding 0.1% by wt;
 - b. cadmium and its compounds in concentrations exceeding 0.01% by wt;
 - c. chromium (VI)-salts in concentrations exceeding 0.1% by wt;
 - d. lead and its compounds in concentrations exceeding 0.1% by wt; or,
 - e. mercury and its compounds in concentrations exceeding 0.1% by wt.

¹⁴ These milestones are not voluntary in California and Washington.

B. Copper Constituents in Brake Friction Material¹⁵

1. The use of copper in brake friction materials at concentrations exceeding 5.0% copper and its compounds by weight will be phased out by January 1, 2021.
2. The use of copper in brake friction materials at concentrations exceeding 0.5% copper and its compounds by weight will be phased out by January 1, 2025.
3. The parties to this memorandum of understanding will consider modifying this Copper-free Brake Initiative if extensions are needed due to difficulties associated with the technical feasibility of meeting this deadline.¹⁶

C. Brake Friction Materials: Edge Code Marking and Package Labeling

1. The industry signatories, as applicable, will work to ensure that all brake friction materials will be marked with the appropriate edge code and packaging will be marked with the LeafMarkTM Certification mark no later than 24 months after the signing of this Copper-free Brake Initiative.

VIII. Limitations

- A. This Copper-free Brake Initiative is a voluntary agreement that expresses the good-faith intentions of the parties and is not intended to be legally binding or create any contractual obligations on any party. This Copper-free Brake Initiative does not supersede any federal or state law nor is it legally enforceable. Moreover, this Copper-free Brake Initiative does not replace or supersede any state requirements, and acting consistent with the provisions of the Copper-free Brake Initiative does not necessarily ensure compliance with state law.
- B. This Copper-free Brake Initiative in no way restricts the signatories from participating in similar activities or arrangements with other entities or federal agencies.
- C. This Copper-free Brake Initiative does not create any right or benefit, substantive or procedural, enforceable by law or equity against the signatories of the Copper-free Brake Initiative, their officers or employees or any other person. This Copper-free Brake Initiative does not direct or apply to any person outside the signatories to the document.

¹⁵ Applies generally, unless exempted or an extension is applied for under state law.

¹⁶ In California, a manufacturer may seek a one-, two- or three-year extension of the January 1, 2025, requirement.

- D.** The phase-out initiative under this Copper-free Brake Initiative is not intended to apply to brake friction materials for which an exemption is provided under legislation and regulations in the states of California and Washington, including brake friction materials used in:
1. Motorcycles;
 2. Motor vehicles employing internal-closed-oil-immersed motor-vehicle brakes or similar brake systems that are fully contained and emit no debris or fluid under normal operating conditions;
 3. Military combat and military tactical-support vehicles;
 4. Race cars, dual-sport vehicles or track day vehicles, whose primary use is for off-road purposes (Exempt in only the state of Washington; California does not exempt.) (Vehicles that are primarily driven off highway include race cars, farm equipment, logging equipment and other such vehicles.);
 5. Collector vehicles (only in the state of Washington, California does not exempt)
 6. Motor vehicle brakes designed primarily to hold motor vehicles stationary and not for use while motor vehicles are in motion.
- E.** Brake friction materials manufactured under the following conditions are excluded from the initiative under this Copper-free Brake Initiative:
1. Brake friction material manufactured prior to the January 1, 2021, requirement for no greater than 5.0% copper and its compounds by weight may be sold for use or offered for sale in motor vehicles until January 1, 2031.
 2. Brake friction material manufactured prior to January 1, 2025, containing greater than 0.5% copper and its compounds by weight may be sold for use or offered for sale in motor vehicles until January 1, 2035.
 3. Brake friction material that contains greater than 5.0% copper and its compounds by weight and is designed for use on vehicles manufactured prior to January 1, 2021, as part of an original equipment service contract may be sold for use or offered for sale in motor vehicles.
 4. Brake friction material that contains greater than 0.5% copper and its compounds by weight and is designed for use on vehicles manufactured prior to January 1, 2025, as part of an original service contract may be sold for use or offered for sale in motor vehicles.
- F.** As required by the Antideficiency Act, 31 U.S.C. §§ 1341 and 1342, all undertakings by the EPA in this Copper-free Brake Initiative are subject to the availability of appropriated funds. Nothing in this Copper-free Brake Initiative obligates the EPA to expend appropriations or to enter into any contract, assistance agreement or interagency agreement, or to incur any other financial obligations that would be inconsistent with agency budget priorities. Nothing in this Copper-free Brake Initiative exempts any party from EPA policies governing competition for assistance agreements. To the extent there may be any transaction involving reimbursement or contribution of funds between the parties to the Copper-free Brake Initiative, such transactions will be handled in accordance with applicable laws, regulations and procedures under separate written agreements.

- G.** The parties agree that any copyrightable subject matter, including but not limited to journal articles, training, educational or information material or software, created jointly by the parties from the activities conducted under the Copper-free Brake Initiative may be copyrighted as follows: MEMA, AASA and BMC may assert copyright in any copyrightable work developed solely by the MEMA/AASA/BMC or jointly by the parties under this Copper-free Brake Initiative. If MEMA/AASA/BMC asserts copyright, it hereby grants the signatories of this Copper-free Brake Initiative and contractors working on their behalf a nonexclusive, irrevocable, paid-up, worldwide license to use, reproduce, distribute, prepare derivative works, perform publicly and display publicly such copyrightable work for federal purposes. Any other intellectual property developed collaboratively by the parties will be governed by the Federal Patent Statute at Title 35 of the United States Code or by 15 U.S.C. § 3701, et. seq. (Refer to Appendix 2 “Mandatory AASA LeafMarks™ Usage Guidelines for Registered Products”).
- H.** The LeafMark™ certification mark is owned by MEMA/AASA/BMC and is not in any way affiliated with the EPA. The LeafMark™ certification mark is available by license to manufacturers with products that meet the requirements of the certification program. All use of the LeafMark™ certification mark must comply with applicable laws, as well as the Usage Guidelines attached at Appendix 2.
- I.** Should any party need to lose proprietary information to the EPA, the EPA agrees not to disclose, copy, reproduce or otherwise make available in any form whatsoever to any other person, firm, corporation, partnership, association or other entity information designated as proprietary confidential business information without the written consent of the disclosing party, except to the extent such information may be subject to disclosure under the Freedom of Information Act (5 U.S.C. § 552), and the EPA’s regulations at 40 C.F.R. part 2, or as otherwise authorized by law. Proprietary information is defined as information that an affected business claims to be confidential and is not otherwise available to the public. The parties agree to clearly identify confidential business information disclosed to the EPA in writing and to avoid disclosing orally to the EPA confidential business information.
- J.** Under federal ethics rules, the EPA may not endorse products or services provided by private entities. Nothing in this Copper-free Brake Initiative constitutes an endorsement by the EPA of the products, services, and/or fundraising activities of any party. The parties agree not to make statements to the public at workshops, meetings or other public venues, or in promotional or educational literature, on websites or through any other media that imply that the EPA endorses any party’s product or service. Any statements or promotional materials that describe this Copper-free Brake Initiative must be approved in advance by the EPA.

IX. Signatories Information References

- A.** The following individuals are designated as points of contact for this Copper-free Brake Initiative:
1. U.S. Environmental Protection Agency (EPA)
Rachel Herbert, herbert.rachel@epa.gov, (202) 564-2649
 2. Motor & Equipment Manufacturers Association (MEMA)
Leigh Merino, lmerino@mema.org, (202) 312-9249
 3. Automotive Aftermarket Suppliers Association (AASA)
Bill Hanvey, bhanvey@mema.org, (919) 406-8856

4. Brake Manufacturers Council (BMC)
Bill Hanvey, bhanvey@mema.org, (919) 406-8856
5. Heavy Duty Manufacturers Association (HDMA)
Tim Kraus, tkraus@mema.org, (919) 406-8835
6. Auto Care Association
Aaron Lowe, aaron.lowe@autocare.org, (301) 654-6664 ext. 1021
7. Alliance Of Automobile Manufacturers (Alliance)
Stacy Tatman, statman@autoalliance.org, (202) 326-5551
8. Association Of Global Automakers (Global Automakers)
Julia Rege, jrege@globalautomakers.org, (202) 650-5559
9. Truck and Engine Manufacturers Association (EMA)
Tim Blubaugh, tblubaugh@emamail.org, (312) 929-1972
10. Environmental Council of the States (ECOS)
Alexandra Dunn, adunn@ecos.org, (202) 266-4929


X. Effective Date

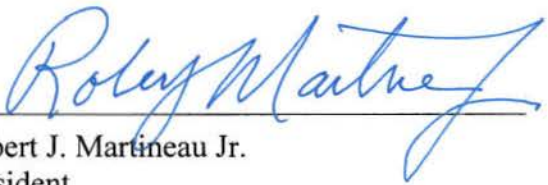
- A.** This Copper-free Brake Initiative will become effective upon signature by the Administrator of the U.S. Environmental Protection Agency; the president and chief executive officer of Motor & Equipment Manufacturers Association; the president and chief operating officer of Automotive Aftermarket Suppliers Association; the managing director of the Brake Manufacturers Council; the president and chief operating officer of Heavy Duty Manufacturers Association (HDMA); the president and chief executive officer of the Auto Care Association; the president and chief executive officers of Alliance of Automobile Manufacturers; the president and chief executive officer of Association of Global Automakers; the head of ECOS; the president and chief executive officer of Truck and Engine Manufacturers Association (EMA) and shall remain in effect until termination by any party.


XI. Withdrawal as Party; Modification and Termination of the Copper-free Brake Initiative

- A.** Any party may withdraw from the agreement by giving written notice to the other non-withdrawing parties of the intent to withdraw from the Copper-free Brake Initiative. The party's withdrawal shall be effective thirty (30) days from the date of notice to the remaining parties.
- B.** The provisions of the Copper-free Brake Initiative will be reviewed annually and amended or supplemented as may be mutually agreed upon in writing with respect to the list of intended activities set forth in Section III above and/or determine the most practical manner by which the goals, purposes and activities of this Copper-free Brake Initiative will be accomplished. Unless parties wish to terminate this Copper-free Brake Initiative shall terminate at the end of twenty (20) years from the date of signature unless revised or extended at that time by written agreement of the parties.

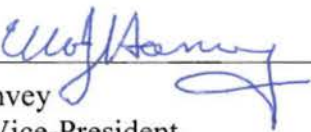
XII. Signatories


Gina McCarthy
Administrator
U.S. Environmental Protection Agency
Date: 1/21/2015

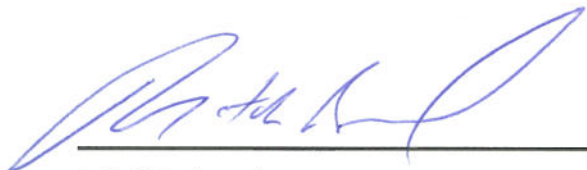

Robert J. Martineau Jr.
President
Environmental Council of the States
Date: January 21, 2015


Ann Wilson
Senior Vice President,
Motor & Equipment Manufacturers Association
Date: 1/21/15


Bill Long
President and Chief Operating Officer,
Automotive Aftermarket Suppliers Association
Date: 1-21-2015


Bill Hanvey
Senior Vice-President,
Automotive Aftermarket Suppliers Association
Managing Director, Brake Manufacturers Council
Date: 1/21/15


Kathleen Schmatz
President and Chief Executive Officer,
Auto Care Association Inc.
Date: 1-21-15



Mitch Bainwol
President and CEO,
Alliance of Automobile Manufacturers (Alliance)

Date: 1/20/15



John Bozzella
President and CEO,
Association of Global Automakers, Inc. (Global
Automakers)

Date: 1/21/15



Tim Kraus
President and COO,
Heavy Duty Manufacturers Association (HDMA)

Date: January 16, 2015



Timothy A. Blubaugh
Executive Vice President,
Truck and Engine Manufacturers Association (EMA)

Date: Timothy Blubaugh

MEMORANDUM OF UNDERSTANDING ON COPPER MITIGATION IN WATERSHEDS AND WATERWAYS

Descriptions of Signatories

U.S. Environmental Protection Agency (EPA)

The U.S. Environmental Protection Agency's (EPA) mission is to protect human health and the environment. The EPA was established to consolidate a variety of federal research, monitoring, standard-setting and enforcement activities to ensure environmental protection. Since its inception, the EPA has been working for a cleaner, healthier environment for the American people.

For more information visit: www.epa.gov

Environmental Council of the States (ECOS)

The Environmental Council of the States (ECOS) is the national nonprofit, nonpartisan association of state and territorial environmental agency leaders. The purpose of ECOS is to improve the capability of state environmental agencies and their leaders to protect and improve human health and the environment of the United States of America. Our belief is that state government agencies are keys to delivering environmental protection afforded by both federal and state law. ECOS plays a critical role in facilitating a quality relationship between federal and state agencies in the fulfillment of that mission. That role is defined as:

- Articulate, advocate, preserve and champion the role of the states in environmental management;
- Provide for the exchange of ideas, views and experiences among states and with others;
- Foster cooperation and coordination in environmental management; and
- Articulate state positions to Congress, federal agencies and the public on environmental issues.

For more information visit: <http://www.ecos.org/>

Motor and Equipment Manufacturers Association (MEMA)

Established in 1904, MEMA exclusively represents over 1,000 companies that manufacture motor vehicle components and systems for the original equipment and aftermarket segments of the passenger and commercial vehicle industries. Motor vehicle parts manufacturers are the backbone of the vehicle manufacturing industry and the nation's largest manufacturing sector, directly employing over 734,000 U.S. workers. MEMA serves as an advocate on business, legislative and regulatory issues impacting the supplier industry through a network of four divisions: Original Equipment Suppliers Association (OESA), Automotive Aftermarket Suppliers Association (AASA), Heavy Duty Manufacturers Association (HDMA) and Motor & Equipment Remanufacturers Association (MERA).

- AASA - U.S. aftermarket suppliers manufacture parts and components to support all vehicle markets. The aftermarket segment includes the manufacturing, distribution, retailing and installation of all vehicle parts, chemicals, tools, equipment and accessories necessary to keep the vehicles on our roads operating safely and efficiently.
- OESA - Original equipment suppliers design, engineer, procure and manufacture the parts, systems and components required for the assembly of new passenger cars and light trucks. OESA represents more than 70 percent of North American automotive supplier sales.
- HDMA - The premier trade association representing NAFTA-based heavy-duty original equipment and aftermarket commercial vehicle suppliers servicing various sectors, such as on-highway, agricultural, construction, military and mining.
- MERA – Representing remanufacturers that service all vehicle sectors and promote the environmental, economic and product performance benefits of remanufactured goods. Remanufacturing is a standardized industrial process with technical specifications by which previously sold, worn or non-functional products are returned to same-as-new, or better, condition and performance to yield fully warranted products.

For more information visit: www.mema.org/Main-Menu/About-Us

Brake Manufacturers Council (BMC)

The BMC is a product council of the Automotive Aftermarket Suppliers Association (AASA) and represents manufacturers of new and replacement (i.e. OE and aftermarket) brake components and brake friction materials for passenger cars and light trucks. BMC also represents companies that conduct quality control and testing of brakes and components.

For more information visit: <http://www.aftermarketsuppliers.org/Councils/Brake-Manufacturers-Council-BMC/About-BMC>

Appendix 1

MEMORANDUM OF UNDERSTANDING ON COPPER MITIGATION IN WATERSHEDS AND WATERWAYS

Auto Care Association

The Auto Care Association is a Bethesda, Md.-based association whose more than 2,000 member companies represent approximately 150,000 independent businesses that manufacture, distribute and sell motor vehicle parts, accessories, tools, equipment, materials, supplies and perform vehicle service and repair.

For more information visit: www.autocare.org

Alliance of Automobile Manufacturers (Auto Alliance)

The Alliance of Automobile Manufacturers (Auto Alliance) is the voice for a united auto industry. We are committed to developing and implementing constructive solutions to public policy challenges that promote sustainable mobility and benefit society in the areas of environment, energy and motor vehicle safety.

The Alliance of Automobile Manufacturers, the leading advocacy group for the auto industry, represents 77% of all car and light truck sales in the United States, including the BMW Group, Chrysler Group LLC, Ford Motor Company, General Motors Company, Jaguar Land Rover, Mazda, Mercedes-Benz USA, Mitsubishi Motors, Porsche Cars North America, Toyota, Volkswagen Group of America and Volvo Car Corporation.

For more information visit: www.autoalliance.org/about-the-alliance/overview

Association of Global Automakers, Inc. (Global Automakers)

The Association of Global Automakers, Inc. represents international motor vehicle manufacturers, original equipment suppliers, and other automotive-related trade associations. Our members' market share of both U.S. sales and production is 40 percent and growing. We work with industry leaders, legislators, regulators, and other stakeholders in the United States to create public policy that improves motor vehicle safety, encourages technological innovation and protects our planet. Our goal is to foster an open and competitive automotive marketplace that encourages investment, job growth, and development of vehicles that can enhance Americans' quality of life. Global Automakers' members include Aston Martin, Ferrari, Honda, Hyundai, Isuzu, Kia, Maserati, McLaren, Nissan, Subaru, Suzuki, and Toyota. Please visit www.globalautomakers.org for further information.

For more information visit: www.globalautomakers.org

Truck and Engine Manufacturers Association (EMA)

The Truck and Engine Manufacturers Association (EMA) represents worldwide manufacturers of internal combustion engines and on-highway medium- and heavy-duty trucks. EMA works with government and industry to help the nation achieve its goals of cleaner air and safer highways and to ensure that environmental and safety standards and regulations are technologically feasible cost-effective, and provide safety and environmental benefits.

For more information visit: www.truckandenginemanufacturers.org

Appendix 2
Brake Friction Materials (Brake Pads)
Brake Pad Marking and Package Labeling

Includes information on:

Marking of Brake Friction Materials a.k.a. “Edge Code”

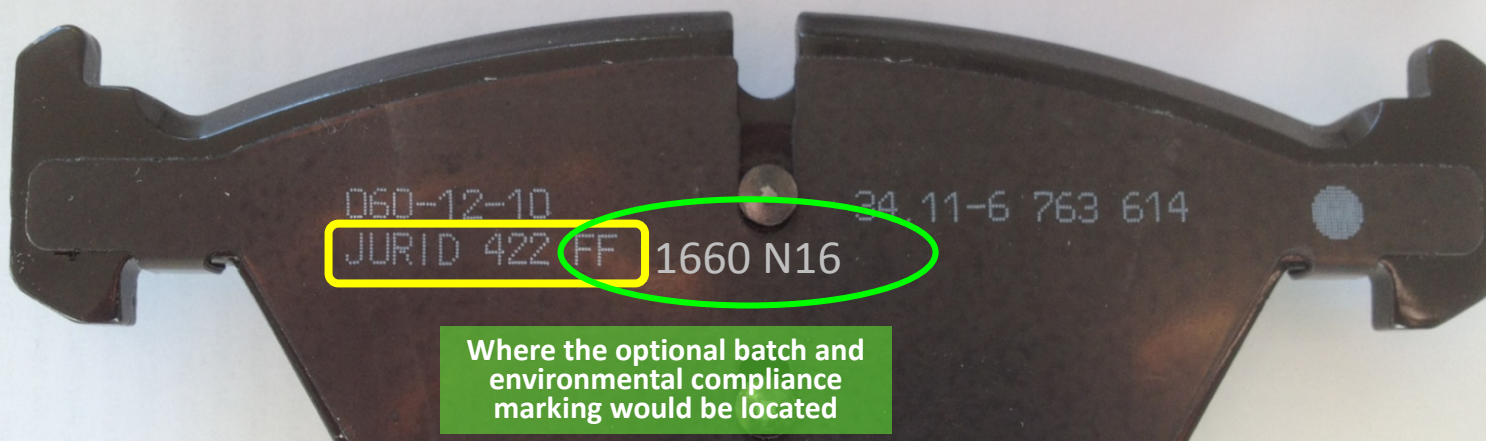
and

Mandatory AASA LeafMark™ Usage Guidelines for Registered Products

MARKING BRAKE FRICTION MATERIALS – a.k.a. “Edge Code”

SAE J866 “Friction Coefficient Identification and Environmental Marking System for Brake Linings”
 The standard reflects compliance requirements for mark proof of certification on brake friction materials (brake pads). This marking is more commonly known in the industry as the “edge code.”

EXAMPLE of EXISTING BRAKE PAD with FICTIONAL EDGECODE



<i>Fictional Edge Code Marked as Compliant</i>	
JURID 422 FF 1660 N16	
JURID	Friction Material Company Code
422	Brake Lining Material
FF	Hot and Cold Coefficients of Friction, per SAE J866 and VESC 3.0
1660	<u>Optional</u> Batch Code or Specific Date Code In this example, “1660” means material produced on the 60 th day of 2016. <i>Used by the manufacturer for quality tracking purposes. The batch code is optional and up to the discretion of the manufacturer as long as it does not conflict with the environmental markings.</i>
N16	Environmental Compliance Marking In this example, product conforms to containing 0.5% or less Cu as well as the absence of heavy metals [Hg, Pb, Cr(VI), Cd and asbestiform] requirements and was produced in the year 2016.

MEMORANDUM OF UNDERSTANDING ON COPPER MITIGATION IN WATERSHEDS AND WATERWAYS



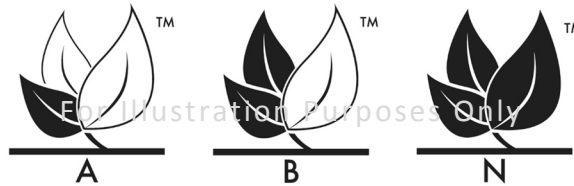
Mandatory AASA LeafMark™ Usage Guidelines for Registered Products

Updated November 2014

All capitalized terms shall have the meanings set forth in the applicable Licensing Agreement between a REGISTRAR and the Automotive Aftermarket Suppliers Association (AASA), the Registered Manufacturer Agreement, and the documents related to REGISTRAR's registration process.

A. AASA Leafmark™

The Motor and Equipment Manufacturers Association owns the following certification trademarks:



B. Permissible Uses of the AASA Leafmark™

Registered Manufacturers may use the AASA Leafmark™ **only for Registered Products** on the products themselves, on packaging and labels, and in advertising, promotional, and sales materials, provided that such use complies with all applicable federal and state laws and regulations, and does not mislead consumers as to the source of the products or the Registered Manufacturer's relationship with AASA, MEMA and/or REGISTRAR.

C. Prohibited Uses of the AASA Leafmark™

1. DO NOT use the AASA Leafmark™ on business cards, letterhead, or invoices.
2. DO NOT use the AASA Leafmark™ in advertising that is false or misleading.
3. DO NOT use the AASA Leafmark™ on or in connection with any defamatory, scandalous, or other objectionable materials.
4. DO NOT use the AASA Leafmark™ to disparage AASA, MEMA, NSF, or any related companies or their products or services.

D. Usage Guidelines

1. Appearance of the Leafmark™

- a. The shape of the marks must look exactly as they are shown above. Embossing is permitted, but shadow effects, gradation, decorative patterns, or any decorative elements are not.
- b. The marks should be presented consistently. The following general guidelines apply:
 - DO NOT distort a logo for artistic purposes.
 - DO NOT enclose a logo in a design that alters the look of the logo.
 - DO NOT place photographs, lines, markings or artwork across or over a logo.
 - DO NOT place copy over or too closely around the logo to clutter it.
 - DO use the corresponding trademark symbol **™** according to the rules set forth below.

2. Size of the Leafmark™

The marks may appear in any size, but must be noticeable and in the exact proportions as shown above.

3. Color of the Leafmark™

The marks may be represented in any single color, including a hologram effect. They must be clearly visible against their background.

4. Location of the Leafmark™

The marks must prominently appear on the product packaging or labels, or as otherwise required by applicable laws and regulations.

5. Clear Zone of the Leafmark™

The marks must be displayed separately from, and cannot be co-joined, superimposed or combined with, any other trademarks.

MEMORANDUM OF UNDERSTANDING ON COPPER MITIGATION IN WATERSHEDS AND WATERWAYS



Mandatory AASA LeafMark™ Usage Guidelines for Registered Products

Updated November 2014

6. **Trademark Notices**

The “TM” symbol TM must be displayed on the right side of the mark (oriented to the top of the mark shown above). It must appear in a sufficiently visible size, but should be smaller than the mark itself. Unless notified by REGISTRAR, Registered Manufacturers **MAY NOT** replace the “TM” symbol on the right side of the mark with the registration symbol “®”.

7. **Attribution**

For promotional materials, including websites, marketing literatures and advertisements, always include attribution within the credit notice section of materials with the following format: “The LeafMarkTM is a trademark of The Motor and Equipment Manufacturers Association.”

8. **Educational and Promotional Use of the LeafmarkTM**

MEMA recognizes that the LeafMarkTM will be used for promotional and educational purposes by other stakeholders, such as state and local government agencies, trade associations and non-governmental organizations. In order to maintain the integrity and intended use of the marks, MEMA requires written permission requesting to use the marks in any fashion other than the process as outlined in Section B of the AASA LeafmarkTM usage guidelines for registered products. MEMA also has the right to approve such usage of the LeafmarkTM before the collateral is used or distributed.

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Copper Free Brakes Initiative:

www.copperfreebrakes.org

LeafMarkTM Questions or Written Requests

Automotive Aftermarket Suppliers Association

ATTN: Brake Manufacturers Council

P.O. Box 13966 // 10 Laboratory Drive // Research Triangle Park, NC 27709

Main Line: 919-549-4800 Fax: 919-549-4824

Websites: <http://www.aftermarketsuppliers.org/> or <http://www.mema.org>

E-mail: info@aftermarketsuppliers.org