

NOVEMBER 29

Brake dust becomes a regulated emission in Europe.

The regulation is written.

The test labs are accredited.

The aftermarket still isn't sorted.

SUPPLIER Q&A

Sarah Olson, PureForge — on what Euro 7 leaves undefined

COLLOQUIUM PREVIEW

Greg Vyletel on friction, AI, and Palm Desert

THE QUARTER IN REVIEW

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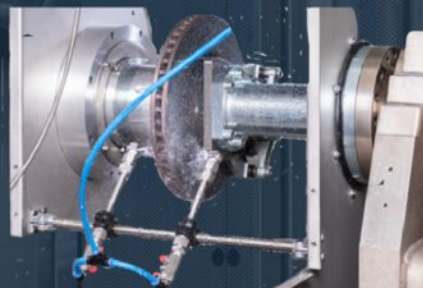
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Ninety Days to Euro 7

On November 29, brake dust becomes a regulated emission in Europe. That sentence has been true on paper since the regulation was adopted, but this is the quarter it stopped being a planning assumption and became a production deadline. That's the thread running through this issue.

You can see the shift in what companies chose to announce. In Q2 we covered reformulation — Otto Zimmermann, Tribol, Fraunhofer, PFC Brakes engineering against the 7 mg/km PM10 limit. This quarter the announcements moved downstream to verification. Link Engineering's Limburg laboratory received VCA authorization in July to run witnessed brake-emissions testing for type approval, on top of its DAkkS accreditation. That's a sentence about certification bodies and audit trails, not friction chemistry, and it's the more important sentence. A limit only matters once someone is accredited to enforce it.

Our Supplier Q&A this issue is with Sarah Olson of PureForge, who chairs the SAE Brake Linings Standards Committee and presented the company's TÜV-Nord results at EuroBrake in June. She's direct about what the regulation does and doesn't cover, and her point about the aftermarket — that nobody has actually defined what compliance means for a replacement part sold three years from now — is the question I keep hearing in different forms from different people.

Two other stories from the quarter belong in this letter. First, AUMOVIO sold two European brake plants in one quarter — Rheinböllen in July and Mechelen in September — a few weeks after signing a supply agreement with BMW worth more than a billion euros and settling the litigation between them. Last issue we asked whether Rheinböllen was a one-off. It wasn't. Second, First Brands is finished: Centric went to Motorcar Parts of America, Raybestos went to Friction One, and in August a federal judge converted what was left to Chapter 7. Two of the most recognizable aftermarket brake names in North America now have new owners.

From the recruiting chair, the Euro 7 story has already changed what my clients are asking for. Twelve months ago the searches were formulation — chemists and friction-development engineers. A good formulator is still the hardest hire in this industry and still the most valuable, but that is no longer where the volume is. This quarter the demand moved toward testing and product development: emissions measurement, validation, and people who can carry a part from the dyno through to a catalog listing. What's notable is who's asking. It isn't the independent test labs. It's Tier 1 suppliers and aftermarket brands building the capability in-house, which tells you they expect to be doing this work for a long time.

Ninety days is not a long time. What's left to learn between now and November is who is actually ready — and a good place to find out is Palm Desert. The SAE Brake Colloquium runs September 20-23, and this year the standards committees, the CARB task force, and most of the people quoted in this issue will be in the same building. I sit on the advisory board, so take the recommendation with that in mind, but I'd be going regardless. Find me there.

Brian Hagman

Founder, The BRAKE Report

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What Happened, What It Means

June through early September 2026, in five themes.

Euro 7: Verification Arrives

Link Engineering authorized for witnessed Euro 7 type-approval testing

On July 22, Link Engineering announced that its Limburg, Germany laboratory had been authorized by the UK's Vehicle Certification Agency to conduct witnessed brake-emissions testing for vehicle type-approval programs, building on its ISO/IEC 17025 and DAkkS accreditations.

Why it matters — This is the first data point on the question we set up last issue: what does compliance verification look like in practice? The answer is that it runs through a short list of accredited labs with UN GTR 24-capable dynamometers, and a certification body's witness in the room. Capacity at those labs is now a scheduling constraint for every OEM program with a European launch after November. Watch for more labs announcing similar authorizations before year-end; watch harder for the ones that don't.

PureForge presents TÜV-Nord results at EuroBrake

PureForge reported 3.3 mg/km on a VW Golf brake system with Atomic-Forged rotors and standard OE pads under the WLTP UN GTR 24 procedure, against a 7 mg/km limit. Sarah Olson presented at EuroBrake in Mainz on June 2 and joined the Coffee Brake podcast in August.

Why it matters — The interesting number isn't 3.3, it's the baseline. If a conventional cast-iron rotor with standard pads is running near or above the limit on a compact car, the default configuration on a large share of today's parc doesn't pass. Every supplier with a coated, treated, or composite rotor now has the same argument to make, and the market is going to sort them on cost per compliant axle.

Dust-free concepts move from lab to track

Schaeffler ran an enclosed wet lamella brake on the rear axle of its DTM Innovation Taxi at the Nürburgring on August 14–16, a pre-development project the company describes as emission-free with respect to brake dust and intended for integrated electric axles. Separately, Brembo brought a fully copper-free pad range and an expanded Greenance line to Automechanika Frankfurt, and EBC announced SC Super Ceramic, which it calls its lowest-dusting compound, for SEMA.

Why it matters — The wet lamella brake is the outlier worth noting. It doesn't reduce brake dust; it contains it, which sidesteps the friction-couple trade-off entirely. It only works where packaging allows an enclosed unit, which today means e-axle rear brakes on EVs with high regen. That's a narrow window, but it's the same window where regulators are looking next.

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Ownership and Footprint: The Pattern Confirmed

AUMOVIO divests two European brake plants

AUMOVIO completed the sale of its Rheinböllen caliper and electric parking brake plant to RHB-Industries on July 3, transferring roughly 320 employees. On September 2 it closed the sale of its Mechelen, Belgium electronic brake systems plant to the Dumarey Group, transferring about 300 employees while retaining customer relationships and running production under a contract manufacturing arrangement. In between, on July 30, AUMOVIO and BMW signed a long-term brake and electronics supply agreement worth more than €1 billion, extending MK C2 deliveries into the mid-2030s and settling the legal proceedings between them.

Why it matters — Last issue we asked whether Rheinböllen signaled a wider caliper-plant divestiture pattern. Two plants in nine weeks answers it. Read the three announcements together: AUMOVIO is keeping the customer contracts and the system-level engineering and shedding the fixed cost of European component manufacturing. The Mechelen structure — sell the plant, keep the customer, buy back the output — is the cleanest expression of that strategy. Expect other Tier 1s to study it.

First Brands is dissolved; its brake brands find new owners

Motorcar Parts of America acquired the Centric Parts brands — StopTech, Posi Quiet, and C-TEK — through a court-supervised Section 363 sale on June 30. Friction One acquired the Raybestos brand, including formulations, specifications, application data, and catalog, with first product expected in Q4 2026, and two weeks later bought BPI's engineering and test laboratory in McHenry, Illinois, including seven dynamometers bound for its Juárez and Xiantao plants. On August 26 a federal judge converted First Brands to Chapter 7 liquidation after rejecting a reorganization plan built on litigation recoveries.

Why it matters — Two things. First, Raybestos and Centric now belong to companies with manufacturing, not to a holding company with a marketing budget, which is a better outcome for the brands than the alternative. Second, Friction One's lab purchase is the tell: you don't buy seven dynos for a brand you intend to relabel. They're planning to develop, and the Raybestos catalog is the application data they'll develop against.

Quick hits

Rane (Madras) is acquiring Hindustan Composites' friction business, including the COMPO brand and two Maharashtra plants, for \$39.1 million (July 1). Scan Pac acquired Great Lakes Friction Products, combining two Wisconsin friction manufacturers (June 1). Brembo and Ningbo SAFE formed BRSF Active Safety Solutions to build single- and dual-channel motorcycle ABS for India (June 17). Chinese brake-by-wire supplier NASN Intelligent Tech listed in Hong Kong at an opening market capitalization of HK\$10.06 billion (August 7), and BWI Group opened a brake-by-wire R&D center near São Paulo, its fourth region (August 7). Knorr-Bremse agreed to sell its Merak train HVAC unit to OpenGate Capital (July 29). Honda pushed the Astemo consolidation into its third fiscal quarter pending regulatory approvals (July 6).

"You don't buy seven dynamometers for a brand you intend to relabel."

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Brake-by-Wire: Europe Gets a Chinese Supplier

BWI launches iDBC 1-Box in Europe

BWI Group's integrated Dynamic Brake Control 1-Box electro-hydraulic system launched in European series production in July, offering tunable regen-to-friction blending and faster pressure build. Per our OE Power Rankings, it's the first Chinese supplier building brake-by-wire for a European production program.

Why it matters — For a decade the one-box market in Europe was Bosch, Continental (now AUMOVIO), ZF, and Brembo's ambitions. A Chinese Tier 1 with European volume changes the price conversation for every OEM sourcing its next platform, and it changes the competitive set for the incumbents at exactly the moment AUMOVIO is restructuring its European footprint.

Architecture keeps consolidating at the corner

Audi's Nuvolari debuted the Ceramic Pro system — brake-by-wire with F1-derived long-fiber carbon discs and ten-piston front calipers (June 5). Lamborghini's Urus SE Performante introduced an Integrated Power Brake with a predictive sensor array (July 1). Allegro MicroSystems announced the A81415, an ASIL-D safety PMIC with an on-chip wheel-speed sensor interface designed to reduce component count in electromechanical corner modules and support 48V (July 9). Czingier introduced BrakeNode, an additively manufactured part consolidating caliper, suspension upright, and hydraulic passages (August 21). Brembo unveiled BOLDIKA, a six-piston aluminum caliper rated above 8,500 Nm, launching on the Silverado EV (August 13).

Why it matters — Halo-car brake-by-wire is old news; what's new is the silicon. Allegro's part is the kind of enabling component that shows up two years before the volume programs it enables. When semiconductor suppliers start optimizing for EMB corner modules, the EMB corner module is on somebody's sourcing timeline.

Commercial vehicle and rail, briefly

Knorr-Bremse confirmed its rGSBC redundant braking system for Level 4 trucks enters series production in 2027 (July 14) and will show a hydraulics-free electromechanical rail brake at InnoTrans (August 19). Bendix is integrating Aeva's 4D LiDAR into Class 8 collision-mitigation systems (June 16).

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Regulation Beyond Euro 7

NHTSA opened rulemaking on June 25 to amend FMVSS 135, dropping the manual brake-pedal requirement for ADS-only vehicles while preserving stopping-distance performance through alternative test procedures; the comment period was extended to August 26. The EU's General Safety Regulation second phase took full effect July 7, making pedestrian- and cyclist-detecting AEB mandatory on new cars and vans. The UN R156 grace period for retrofitting Software Update Management Systems on trailers expired in July, meaning trailers built without SUMS can now be refused a plate. BMW made braking-capable active-safety functions standard across Neue Klasse (August 27). CVSA's 2026 Roadcheck logged 5,451 brake-related out-of-service violations, 39.1% of the vehicle total (August 28).

Why it matters — FMVSS 135 is the one to watch. Removing the pedal mandate is a small text change with a large implication: the U.S. federal standard is being rewritten to accommodate vehicles whose brake system has no human input path at all. Every supplier with an EMB roadmap should be reading the docket.

Results Season

Company	Period	Headline number	Note
Brembo	Q2 2026	Revenue €983.0M, +6.4%	Net profit +30%; FY guidance raised to ~5% growth at constant FX
Knorr-Bremse	Q2 2026	Operating EBIT margin 14.2%	BOOST target cleared early; guidance raised; 2030 Growth Beyond targets
ZF	H1 2026	Adjusted EBIT margin 5.0%	Sales €19.3B; adjusted free cash flow more than doubled
AUMOVIO	H1 2026	Adjusted sales –8.9%	BMW settlement compressed Q2 EBIT; full-year guidance narrowed
Akebono	Q1 (to Jun 30)	Net sales ¥37.2B, –6.7%	Operating profit +3.6%; returned to profitability
ASK Automotive	Q1 FY27	Revenue ₹1,361 crore, +52.1%	Record quarter
SBS Friction	FY 2025	Gross profit DKK 129.8M, +27%	Output +34.2%; net result DKK 11.6M



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Recall & Litigation

Date	Company	Scope	Issue
Aug 24	GM (NHTSA EA26006)	~1,164,820 vehicles	eBoost probe escalated to Engineering Analysis; 745 incidents, 22 crashes or fires, 6 injuries
Aug 25	Ford (NHTSA DP26007)	~82,040 MY2024 Maverick Hybrid	Defect petition: intermittent ABS and regenerative braking loss
Jul 30	Mercedes-Benz USA	310,667	Corroded door microswitch prevents EPB auto-engage; rollaway risk
Jul 15 / Aug 21	KTM North America	6,257, then ~21,040	Rear caliper cracking; NHTSA Do Not Drive advisory on the first action
Jul 8	Stellantis	11,980 MY2026 Grand Wagoneer	Brake control module defect disabling ESC and electronic brake assist
Jul 24	Blue Bird	5,125 Vision buses	Exhaust hanger cotter pin can chafe through the hydraulic brake line
Jul 9	BMW	428	Integrated brake remedy from two earlier recalls not performed to procedure
Aug 27	Altec	55	Bendix automatic braking left uncalibrated after front radar box relocation
Aug 3	Autocar	137 terminal tractors	ABS electronic control unit may not be properly secured
Jun 1	Shyft Group	836 Spartan RV chassis	Brake pressure switch leaves stop lamps illuminated
Jul 1	Tesla	Probe closed	NHTSA ends four-year phantom-braking investigation
Jul 30	Suzuki	Litigation	Ninth Circuit affirms dismissal of master cylinder class action
Jun 5	Brembo / AP Racing	Litigation	Essex Parts tortious-interference suit dismissed

Why it matters — Read the quarter’s docket as a whole and the friction couple is almost absent from it. The largest action, GM’s eBoost analysis, concerns an electro-hydraulic booster. The Ford petition concerns regenerative blending. Even the investigation NHTSA closed, after four years of Tesla phantom braking, was about perception and software. Brake recalls in 2026 are actuator, blending-logic, and software problems, and the phrase “brake defect” is going to need a footnote.

The International Brake Recall Monitor covered May, June, and July during the quarter, including Hyundai’s cross-border phantom-braking campaign closing with a 104,781-vehicle Korean correction, a 405,963-unit Daihatsu brake booster recall from Japan’s register, and Renault’s silent ABS-ESP failure on 24,112 Austral vehicles in Australia.

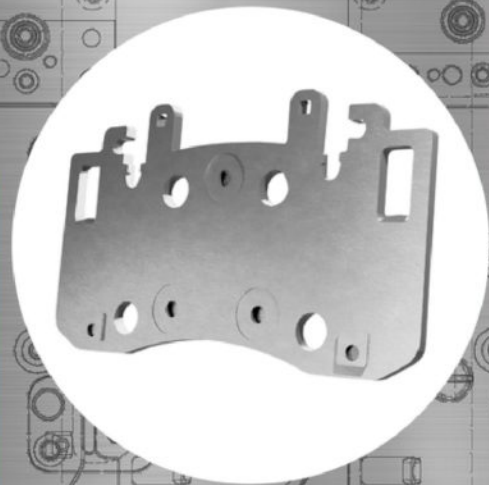
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Catalog, Coverage, and Channel

A heavy quarter for catalog expansion, with two structural stories underneath the part-number counts. Commercial vehicle friction drew new entrants: HELLA launched truck, bus, and trailer pads for the first time, and Bosch expanded its CV disc pad range with a wear claim aimed at fleets. And EV-specific replacement lines moved from novelty to category, with Comline's EVLine opening at 69 references and Apec, Delphi, and First Line all adding EV fitments to general ranges. The through-line is the same one Greg Vyletel raises later in this issue: the aftermarket is still learning what EV brake service actually looks like, and it is building catalog ahead of the data.

Company	Announcement	Detail
Momentum USA	Monthly releases	24 part numbers in June; July release across five lines; 77 in August adding 44M+ VIO
Apec	Red and Black expansions	49 parts (Jun 19), 34 parts (Jul 20), 51 parts including 44 calipers (Aug 13)
First Line	July new-to-range	151 references, including discs and pads covering Tesla, Polestar, and Volvo EVs
Delphi	Range expansion	53 new parts, 38 braking references; 117 newly stocked
HELLA	CV brake pads — first entry	58 references, ECE R90 certified, launched worldwide
Bosch	CV disc brake pads	Claims up to 25% reduction in disc wear; range to double by end of 2026
Comline	EVLine	EV-specific pad range, R90-approved, 69 opening references
Akebono	EURO and Severe Duty	Six part numbers; coverage for more than 8.6 million vehicles
Bremskerl CV	Air disc rotors	13 references, four with Geomet-coated finishes
ConMet	TruCast drums	Nine part numbers in 15-inch and 16.5-inch sizes
DRiV	Abex air disc system	Calipers complete the existing rotor and pad lineup
Cummins	QuikDisc	First ADB rotor for a single rear-drive axle at 33,500 lb, for fire apparatus
Automann	Webb Wheel partnership	Air and hydraulic disc calipers, pads, and rotors
Timbren	Brake Enhancement System	Coated rotor rated to 932°F with copper-free low-metallic pad, for tow vehicles
Wilwood	XRS; Aero6-DM; OE Flexlines	XRS from \$664.10; Tacoma kit from \$2,035.08; lines from \$66.14
PFC Brakes	68 compound and BMW kits	Street-and-track compound, new pad shapes, F- and G-series race kits

Company	Announcement	Detail
EBC Brakes	ED+; GPFAX D2; SC Super Ceramic	Extra-duty towing pad; flagship race motorcycle pad; low-dust compound at SEMA
DBA	LC300 rear kit; BMW M range	Completes the LC300 package; M2, M3, M4 across six platforms
ZF Aftermarket	TRW DOT 4 ESP Recycled	60% post-consumer recycled content
Halo by Orthene	Halo GT	DOT 4 racing fluid, 336°C dry boiling point
Otto Zimmermann	Packaging redesign	Part number and EAN on lid and side; both designs in circulation
DFC	POLICE pads	AMECA Police Declaration of Conformity listing
FMSI	Rotor catalog; partnerships	Catalog targeted mid-2028, VIO data from Jan 1, 2027; AMECA and IDF agreements



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Distribution and channel

NRS Brakes was approved as a vendor partner to The Group, joining roughly 150 brands across the buying group's network. Galfer confirmed Galfer USA as its only authorized North American representative, distancing itself from former importer Giocar's new GBrakes brand. Akebono took Supplier of the Year at Worldpac STX 2026, the top of nine awards at an expo drawing more than 2,500 aftermarket professionals. The 2026 Joint Channel Forecast projects 5.2% U.S. aftermarket growth this year and a market above \$500 billion by 2029.

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“The Aftermarket Piece Hasn’t Been Figured Out Yet”

Sarah Olson, VP Engineering & Strategic Partnerships at PureForge and Chair of the SAE Brake Linings Standards Committee, on what Euro 7 actually regulates, who is exposed first, and why the conversation at EuroBrake shifted from coatings to quality control.

Edited from a Coffee Brake podcast conversation, August 2026.

You started as a friction formulator, engineering the material that wears off. Now your job is making sure less of it does. What changed — you or the industry?

Both. I moved into friction in 2004, right as certain companies were coming out of the asbestos Chapter 11s, so the industry already had a long history with materials and what comes off them. For a long time the focus was copper, which is itself an emission. Emissions have been a theme in brakes for twenty years; the word just wasn’t attached to it. What’s different now is that Europe has regulated the quantity — PM10 mass coming off the brake — rather than the chemical composition. And it will probably be adopted in other regions.

Twenty years ago, did anyone treat brake dust as an emission, or was it a cosmetic problem?

Cosmetic. Dirty wheels came up, but not as a health and safety issue. My first friction job was in a factory and then the test lab, and the lab was the cleanest part of the building. You were conditioned to it, and so were the customers. Even in the U.S. today it isn’t really a health and safety focus. The awareness of potential health effects is much higher in Europe than here.

Euro 7 takes effect in November. If you tested the brakes on the road right now, how many would pass?

It’s a mixed bag. A portion of the smaller vehicles would. The heavier and higher-performance end — E- and F-segment, performance SUVs, delivery and transit vans — typically would not have passed with what was on them at the Euro 6 level. And there are trade-offs in every approach. To get emissions down you’re often putting more costly components on the vehicle, and sometimes you sacrifice another attribute like noise. Some manufacturers have gone to vehicle-level changes: the test has a speed component, and the slower you go the less energy goes into each stop and the less dust you make.

Who’s more exposed — OEMs or the aftermarket?

Near term, the OEMs, because that’s how the regulation rolls out. This year it’s brand-new platforms; in 2027 it’s everything newly manufactured. Euro 7 is a whole-vehicle regulation and brake emissions are a requirement in it for the first time. The OEM has to have a compliant vehicle to sell.

The aftermarket is a longer fuse — a first brake job is typically four or five years out, sometimes longer, and any vehicle on the road today is grandfathered under whatever standard it was homologated to. But the aftermarket is still not sorted out. That’s one of the big open discussions: how you qualify which families of vehicles and brakes have to be

tested for an independent aftermarket material to be compliant. Even down to annual inspection — how do you validate that the brakes on a car meet the requirement, whether OEM or aftermarket? There are minor revisions going to Geneva for a vote in October, and I expect that to continue every year. There's a lot of work going into the aftermarket piece, but it isn't finalized.

"The aftermarket is still not sorted out."

Asia is moving on its own rules. Does the industry converge on one procedure, or do we end up testing to several?

China 7 references the WLTP dyno schedule as a recommended standard, not a hard limit, with an additional optional schedule. CARB has its own California cycle but is aware of WLTP. As an industry, everyone would prefer one schedule, one methodology, one set of equipment for dynamometers and capture. Getting there means every country and legal body agreeing, and each one wants the test to represent its own conditions.

The underlying debate is between a test that models real-world emissions in a given region and a test that serves as quality control — A is better than B, B is better than C, consistently. Europe is set: it's WLTP, and it's the front-runner. The question as other regions come on board, including the U.S., is whether that suffices for what they want to accomplish.

Where do EVs fit? Does regen make the test easier or more complicated?

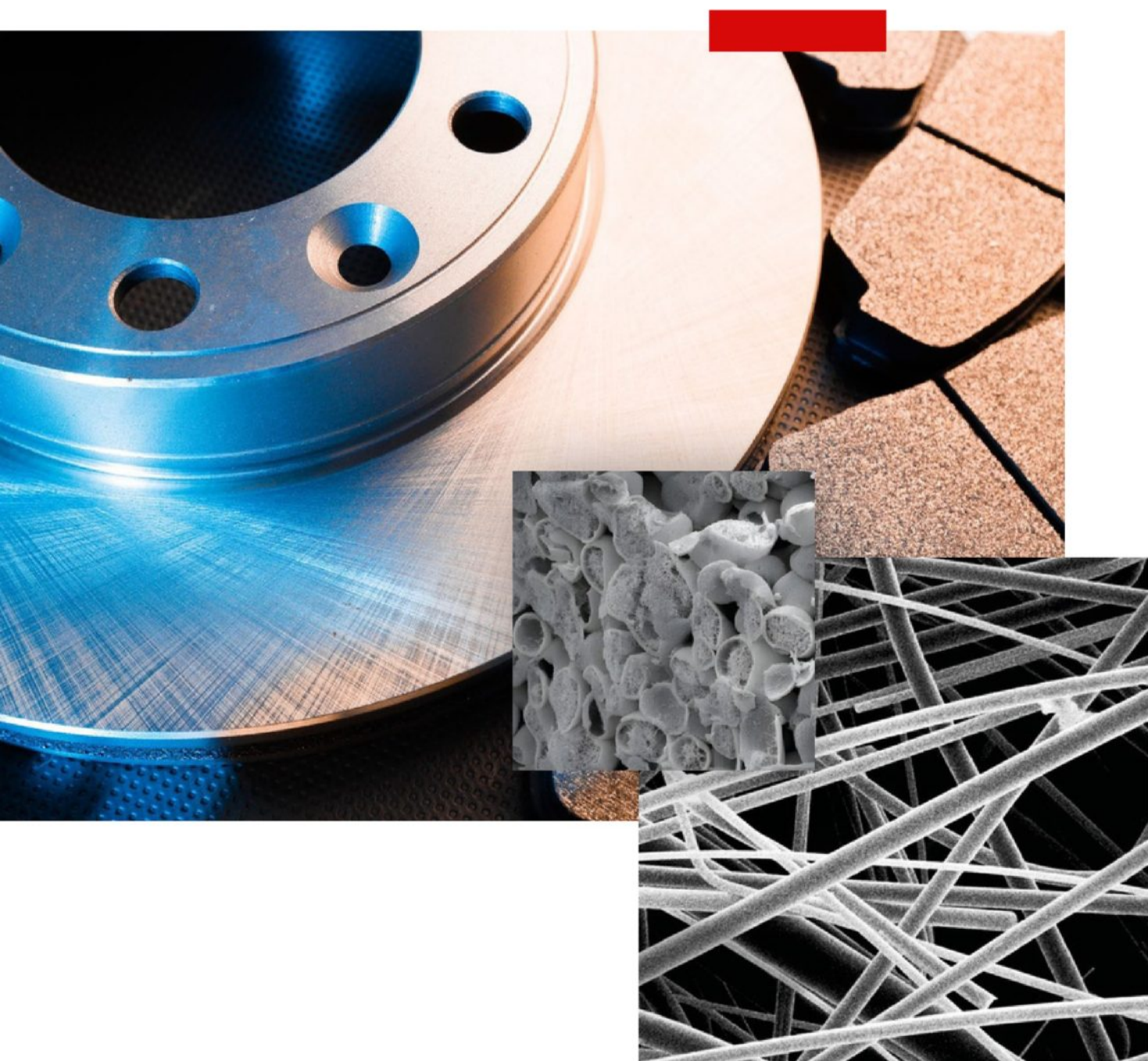
Easier, in general, with two caveats. The limit for a standard ICE vehicle is 7 mg/km, but for EVs it's 3. And there's a brake factor. An ICE vehicle takes its measured number at face value — a multiplier of one. A full EV is assumed to do 17 percent of its braking on the friction brakes and 83 percent through regen, so you multiply by 0.17. The reported number is much lower on the way to that 3. EVs also tend to run less aggressive materials. They're part of the solution, not the whole solution.

If an EV sits for days and the brakes barely get used, does corrosion complicate the picture?

A dyno test says what could be emitted under a defined procedure. Real life includes everything else. Corrosion is a big issue in braking for many reasons, and on EVs it's one of them — when the pad scrubs corrosion off the rotor, that's dust, and it's not captured in the dyno procedure. Does the test represent the real world? Never one hundred percent.



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You presented PureForge's TÜV-Nord results at EuroBrake in June. What did you run, and what was the reaction?

We ran a VW Golf. The result was 3.3 mg/km against the 7 mg/km limit, using the OE pads — standard low-steel, no special development — and our rotor treatment. The test measures one corner, and a factor gives you the full-vehicle estimate; for the actual regulation you run each corner, front and rear.

The reaction was good. It's a new regulation, and the technologies going out as first-run solutions in November are also new, so there's a lot of uncertainty. Another option gets attention. What surprised me most was that there was less conversation this year about treatment technologies than last year and much more about testing, quality control, and inline production quality. The new technologies are new, so people are asking how you confirm them in production. There were companies there whose whole subject was inline QC.

Was Euro 7 the reason attendance topped a thousand?

It's a big influence. The other change was the attendee mix. NIO was on the OEM panel; Chery and BYD were there. The European car park is changing, and ten years ago the imports came from the U.S. Now they come from Asia. Euro 7 will keep pushing that shift, and brakes aren't the only thing changing with it.

Did you hear anything you flat disagreed with?

Nothing erroneous. Everyone puts their own technology in the best light. Laser cladding is the main one people talk about, and depending on who was speaking, what got highlighted was very different — how fail-safe it is, what the challenges are. I'm not a laser-cladding person, so I won't say who's right.

For readers who don't know PureForge — who are you?

A rotor treatment company, covered by 47 patents, so really a technology and IP business. The treatment is a PVD process at under 300°C, about four microns deep. There's no additional thermal stress because it's low temperature, no mechanical stress because nothing touches the part in the chamber, and no shape or size constraint. It's a batch process today; inline PVD systems exist for other treatments and could scale.

The treatment molecularly changes the surface structure and chemistry, and that forms a very stable transfer layer, especially with low-steel and semi-metallic pads. Because the rotor doesn't wear, it doesn't make dust. We have rotors back with 100,000 miles on them where you can still see the original grind marks. Pads last three to five times longer than on a standard grey-iron rotor. In the U.S. our market has been police, first responders, and fleets, on a three-year, 100,000-mile warranty, and we're at roughly eight million road miles. We're looking at Class 8 next; the air disc brake systems for the commercial-vehicle phase of Euro 7 are still under development, along with the test procedures.

Editor's note: Euro 7 becomes mandatory for new heavy-duty vehicle types (M2, M3, N2, N3) on May 29, 2028, and for all new heavy-duty vehicles on May 29, 2029. Brake particulate limits for those categories are not yet set — the regulation leaves them to the European Commission, which must submit its analysis by the end of 2027.

Do fleets have to run your pads?

We recommend PureForge pads only, and the warranty is only valid with them, because those are what we've tested and validated. The treatment performs best with semi-metallic

and low-steel formulations. We haven't done as much with NAO because that's not the market we've pursued, but we're testing with pad formulations globally.

Most of the Euro 7 solutions people talk about are coatings. Why is a treatment better?

Fail-safe behavior. If something extreme happens — a hung caliper, a rock, enough heat to wear through the treatment — you're on a standard rotor. The car stops. With laser cladding, if corrosion gets under it, or if thermal-mechanical stresses from the process aren't relieved, you can get warping, delamination, and cracking. A chunk flaking off is a real problem, and nobody in automotive likes a new failure mode; we all have to rank them on our FMEAs. Cladding also changes the material properties enough that noise can be harder to solve. Ours tends to be quieter, if anything, because a stable transfer layer means less vibration excitation.

In the U.S. there's no dust regulation. What closes the deal with fleets?

Total cost of ownership and uptime. If brake service moves from every 8,000 to 10,000 miles on a police vehicle to something you don't look at until you're changing tires, that's a different repair sequence — parts, labor, and vehicles on the road. For police there's also a safety factor in a pursuit situation: the brakes aren't fading. Dust isn't a selling factor in the U.S. yet. It's coming.

Is CARB going to move, or wait to see how Euro 7 plays out?

CARB held a webinar recently on emissions overall, with brake emissions as one piece, and stated verbally — not in writing — that it was looking at implementing brake-emissions regulation similar to Euro 7 by 2031. The public comment period ran through the end of July. The Brake Manufacturers Council submitted a letter with its concerns.

And the SAE task force you've reopened?

The Brake Environmental Task Force, reopened across the SAE brake standards committees. The mission is technical, not political: advise CARB on test procedures and how a regulation could roll out. CARB's California cycle is considered somewhat more severe than the WLTP cycle Euro 7 uses. Our objective is to outline the differences and the pluses and minuses of each, and talk about consolidation or compromise. If California insists on a completely different dyno procedure, all the Euro 7 testing has to be repeated and none of it is valid here. That's the stake.

Where will people find you at the SAE Brake Colloquium?

I'm giving the SAE standards update in the Monday session, along with the other committee chairs, including this new task force. PureForge has a booth. Or find me on LinkedIn.

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Who Moved This Quarter

Name	Move	Effective
Piotr Sroka	President & CEO, Knorr-Bremse North America, while continuing as President & CEO of Bendix	Aug 2026
Chris Janech	President, PFC Brakes — Motorsports, OE, and Severe-Duty divisions	Jul 2026
Martin Walder	Global Sales Director, EBC Brakes, based in Northampton	Aug 17, 2026
Michelle Allen	EVP Independent Aftermarket Sales, TERREPOWER, succeeding Chris Garner	Jun 2026
Toby Whewell	Managing Director, Frasle Mobility UK, succeeding Mark Clegg	Aug 1, 2026
Chris Bowman	Head of Sales, Frasle Mobility UK	Aug 2026
Mark Joseph	VP Sales & Marketing, North America, KPR Performance Brakes	Sep 2026
Lars Sendal From	Senior Sales Director, Europe, Winhere Auto-Part Manufacturing	Jun 2026
Jason Lang	Chairman of the Board, FMSI (ADVICS North America); Skip Carroll to Past Chairman	Jun 2026

Also this quarter

PowerStop named six senior leaders across sales, marketing, and engineering, including a chief marketing officer and vice presidents of wholesale and engineering, as it pursues distribution and product growth. Greg Vyletel of Power Stop takes the chair of the SAE Brake Colloquium; he is interviewed later in this issue.

Two of the quarter's appointments are worth reading together. Sroka now runs Knorr-Bremse North America while keeping Bendix, consolidating regional oversight under an operator already running the group's largest North American brake business. Whewell's appointment at Frasle Mobility UK follows a planned retirement with an internal promotion beneath it — succession handled in advance rather than backfilled after a departure. Both are the kind of move that signals stability rather than change of direction.

What we're seeing in hiring

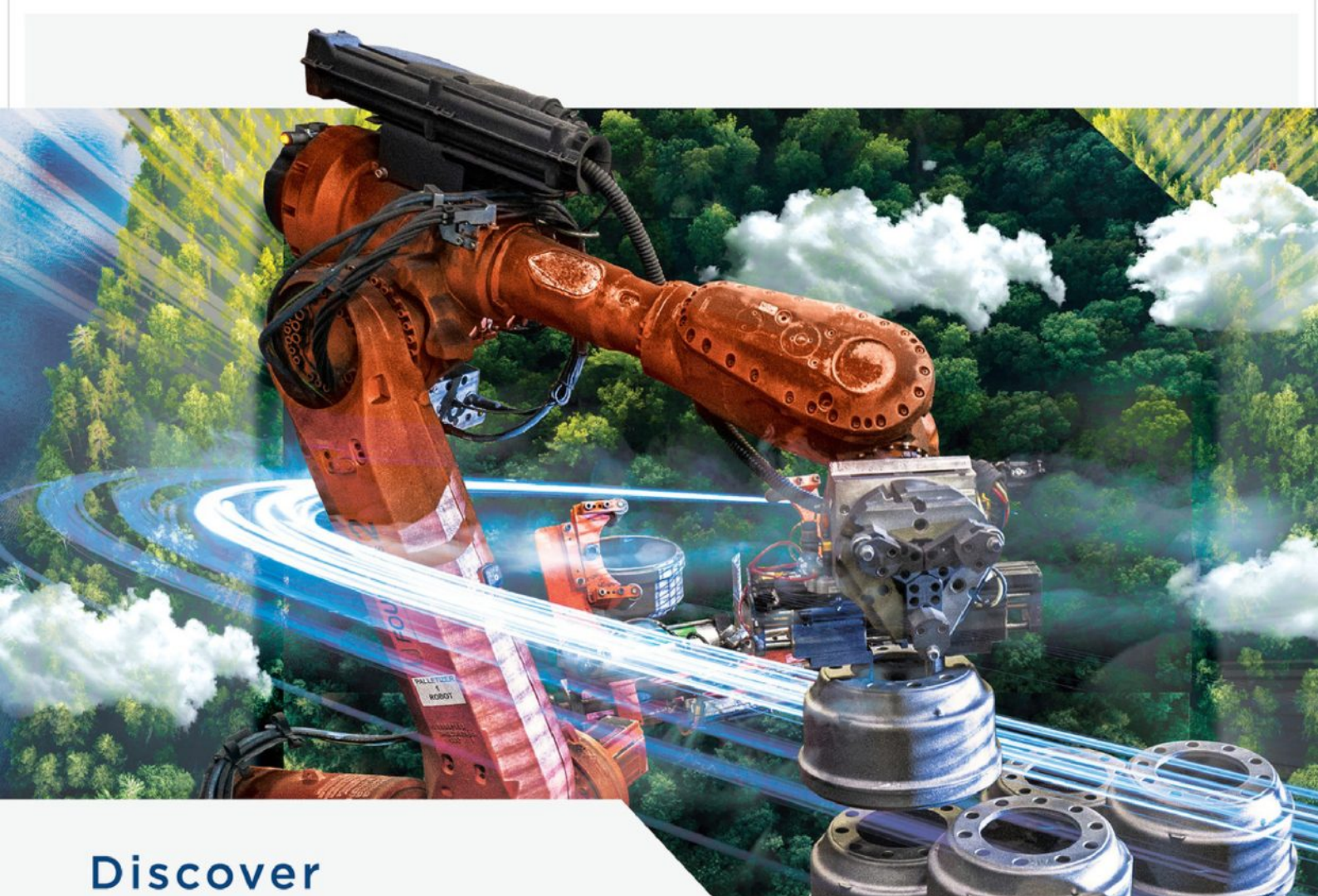
The mix has shifted this quarter. Testing and product development roles have been heating up — emissions measurement, validation engineering, and product development leads who can take a part from the dynamometer through to a catalog listing. Formulation has not become easy: a good friction formulator remains the hardest hire in this industry and the most valuable person in most development organizations. But the volume of those searches has come down from where it was a year ago, and testing has taken its place.

That tracks what Sarah Olson describes from EuroBrake earlier in this issue: less discussion of which treatment technology, more discussion of testing, quality control, and

inline production verification. Once a regulation moves from what do we make to how do we prove it, the hiring follows within a quarter or two.

Two things about that demand are worth noting. The first is where it comes from: Tier 1 suppliers and aftermarket brands, not the independent test laboratories. Companies are building verification capability inside their own walls rather than buying it as a service, which is a bet that this work is permanent rather than a compliance push that ends in 2027.

The second is that these roles are filling slowly, and the reason is not money. Compensation is up modestly — enough to signal that the roles matter, not enough to change anyone's life. What stalls a search is geography. Brake testing capacity sits in a short list of places, and the people qualified to run it already live near one of them, with a mortgage, a spouse's job, and a school district. A modest premium does not move a family across an ocean. Until compensation moves further, or until companies get more comfortable with split-location teams, expect these searches to run longer than the formulation searches they are replacing.



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FROM HAGMAN SEARCH

The 2026 Brake Industry Compensation & Talent Report

What companies pay. What candidates expect. Where the gaps are.

When a VP of HR needs to benchmark an NVH engineer, there is no brake-specific resource to consult. General automotive surveys lump brake engineers in with powertrain, chassis, and body. Compensation in this industry gets set on gut instinct and whatever someone last heard at a conference. The Compensation & Talent Report is built to replace that — not a statistically controlled salary survey, but a read drawn from Hagman Search's own search activity since 2012: the offers that closed, the ones that didn't, and the roles that sat open because the budget didn't match the market.

Where the market is tightest

Role	Base range (USD)	Scarcity
Systems Engineer, brake-by-wire	\$130,000 – \$175,000	Critical
Software / Controls Engineer	\$120,000 – \$170,000	Critical
Senior Formulator, 10+ years	\$155,000 – \$205,000	High
Friction Materials Specialist	\$120,000 – \$160,000	High

Three findings from the 2026 edition

Software pay is pulling the whole structure upward.

Software and controls roles command 15-30% above traditional brake engineering scales, forcing companies to raise entire salary bands to avoid internal equity problems.

The hardest hire is not the most senior one.

It is the mid-career professional with eight to fifteen years of brake domain knowledge plus software or controls competency. Those hybrid profiles barely exist.

Two-year-old benchmarks no longer clear the market.

Roles posted against 2022-23 bands take materially longer to fill. Budget 10-15% higher for mid-to-senior engineering hires.



"For roles rated Critical, expect a search to run four to eight months."

**Read the full report at
hagmansearch.com**

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The Steel Must Outlast the Friction

Brake pad marketing centers on friction formulations. NRS Brakes spent five weeks this quarter arguing that the component determining whether a pad reaches the end of its service life is the one nobody markets: the steel backing plate.

By NRS Brakes: a NUCAP company

Condensed from a five-part contributed series published on thebrakereport.com, June 26 – July 31, 2026. The technical positions expressed are the author's. NRS Brakes is a sponsor of The BRAKE Report; the series was contributed as editorial and was not paid placement. The BRAKE Report welcomes responses from other manufacturers.

Ask most brake professionals what makes a pad perform and the conversation turns to friction formulas: stopping power, fade resistance, wear characteristics. Those factors matter. But they all depend on something more fundamental.

The backing plate is usually described as a carrier for the friction material. It is better understood as the structural foundation of the entire assembly. It locates the pad in the caliper bracket, carries braking torque, supports the friction material, retains the shim, transfers piston force, controls movement, and holds dimensional stability under heat and load. When a vehicle slows, torque passes from the friction material into the steel and out through the bracket. The steel is the load path.

That leads to a single principle, which is the argument of this series: the steel must outlast the friction for the entire life of the brake pad.

The friction material is designed to disappear. The steel is not. If the plate corrodes, swells, loses flatness, changes dimension, or stops supporting the friction before the friction is worn out, the pad can no longer perform as engineered. A premium formulation cannot compensate for a compromised foundation.

What the steel determines

- Fitment accuracy and load transfer
- Shim retention and pad movement control
- Corrosion durability and thermal stability
- Noise characteristics
- Friction support integrity

The industry's focus on friction formulas has overshadowed this. Yet when technicians encounter rust jacking, delamination, binding, drag, or heavy corrosion, the root cause frequently originates in the steel.

What paint hides

Open a brake pad box in a warehouse and most pads look alike. Many are painted black. Many look clean. Many appear corrosion resistant. A painted plate tells you almost nothing about the steel beneath it. Paint is often one of the last manufacturing steps, which leaves installers and distributors with no way to evaluate what the plate looked like before the coating went on. The question isn't whether paint improves appearance. It's whether the steel underneath survives as long as the friction.

Brake pads work in one of the harshest environments on a vehicle: road salt, moisture, debris, thermal cycling, impact, abrasion. As corrosion develops it can contribute to rust jacking, friction lift, loss of clearance, pad binding, uneven wear, noise, shim separation, and delamination. Paint is primarily a visual finish, and once it is damaged during installation, by bracket contact, by debris, or through normal service, the exposed steel is vulnerable. The question for installers and distributors becomes what protection remains when the paint no longer provides any.

Why friction depends on the plate

Ceramic, semi-metallic, low-metallic, hybrid — the friction material gets the attention because it touches the rotor. But it cannot function independently. During braking it absorbs heat, shear loads, vibration, thermal cycling, and repeated clamp pressure, and the backing plate has to manage those forces while holding its dimensions.

When the steel corrodes or loses structural integrity, the consequences show up in the friction: reduced support, higher cracking risk, delamination potential, uneven pressure distribution, taper wear, noise, thermal distortion. No formulation, however sophisticated, compensates for a compromised plate. The relationship is a building and its foundation — the visible structure may be impressive, but its long-term performance depends on what supports it.

For brake engineers, the challenge isn't only creating friction that performs on a dynamometer. It's ensuring the steel underneath stays sound until the friction reaches the end of its intended wear life.

Corrosion is a dimensional problem, not a cosmetic one

Corrosion on a backing plate is routinely treated as an appearance issue. It isn't. Corrosion products occupy more volume than the steel they replace, so a corroding plate changes dimension: it swells, loses clearance in the bracket, and begins to drag. Rust forming between the plate and the friction material lifts the friction from its foundation — rust jacking — which alters pressure distribution and wear pattern well before the pad reaches replacement thickness. What starts as surface discoloration ends as a fit-and-function failure.

The standard that matters

A brake pad should reach replacement thickness because the friction wore out — not because the steel failed first. That is the whole of the argument. Every pad is a two-part system, and the industry has spent decades optimizing the half that is designed to disappear while treating the half that has to survive as a commodity stamping.

The friction stops the vehicle. The steel allows the friction to do its job. And the steel must survive longer than the friction it supports.

"The friction is designed to disappear. The steel is not."

About NRS Brakes

NRS Brakes manufactures brake pads built around its NRS (NUCAP Retention System) technology, which uses hooked, galvanized steel backing plates to retain friction material through mechanical attachment rather than adhesive. Its pads also feature a noise-dampening piston insert. The approach underlies the FMSI "Z" designation for OEM-specified mechanical fusion. NRS Brakes is based in Toronto, Ontario.

A detailed, close-up photograph of a car's wheel and brake assembly. The image shows a multi-spoke alloy wheel, a black tire, and a blue-painted brake caliper with a silver brake disc. The lighting is dramatic, highlighting the metallic textures and the blue paint.

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Ten weeks before Euro 7 takes effect, North America's brake engineers meet in the desert.

This year's program lands at the moment this issue is about. On Tuesday afternoon, BC300 — Euro 7 Standards: Strategy and Impacts on Vehicle Design, Validation, Homologation, and Supply Chain Management — puts the compliance question in one room for 100 minutes. Wednesday is built around Brake Emissions Measurement and Characterization in two sessions. On Monday at 4:25 p.m., the SAE Brake Standards Update Panel delivers the first public report from the reopened Brake Environmental Task Force advising CARB; Sarah Olson, interviewed in this issue, chairs the Brake Linings committee.

Also on the program: a keynote from Josh Holder, Corvette Chief Engineer at General Motors; a Global Strategy Panel; two sessions on the impact of AI on braking; electro-mechanical brake systems and mechatronics; friction materials and friction couples; NVH; wheel bearings; and — new this year — a Purchasing Panel aimed at bringing the people who sign the orders into the room with the people who engineer the parts.

Sixty exhibitors span friction, raw materials, rotors and coatings, test equipment, and instrumentation. The exhibit hall is open Monday 9:30 a.m. to 6:00 p.m. and Tuesday 9:00 a.m. to 4:00 p.m., with networking receptions both evenings and a golf outing Sunday morning.

If you read this publication, this is your room.

Register: sae.org/events/brake

Save the date: the 45th Colloquium is October 3-6, 2027, in Orlando.

*Brian Hagman sits on the Colloquium advisory board and The BRAKE Report is a Conference Supporter.
We'll be on site all week — if you're attending, find us.*

“You’ve Got the Entire Supply Chain at One Event”

Greg Vyletel, VP of Engineering and Quality at Power Stop and chair of the SAE Brake Colloquium, on friction as a craft, why Euro 7 turns pad development into friction-couple development, what AI can and can’t do in brake design, and who is missing from the room in Palm Desert.

Edited from a Coffee Brake podcast conversation, July 2026.

You’ve spent your whole career in friction, you lead engineering and quality for a major aftermarket company, and now you help run the biggest brake gathering in North America. Why juggle both?

This has been a great industry to me, and it’s a way to give back. In honesty, we have a great board and a wonderful technical team of volunteers that makes the lifting easy. People would be shocked at how many are behind the scenes making this thing work. It may be a title, but the volunteers are the ones who deserve the credit.

What pulled you into friction?

Ford funded most of my PhD work, and I spent a lot of time at their research labs in Dearborn. After I graduated from the University of Michigan, Ford had an open position in advanced vehicle technologies working on friction materials. I didn’t know anything about it, but it was a cool materials-related industry, and I convinced them my scientific process could help. It’s been a fun ride since.

At the Colloquium, in a room full of engineers, which hat are you wearing?

When I’m on stage for opening remarks or leading a panel, I’m representing SAE on behalf of the industry. Walking the exhibit hall, it’s both. I try to visit every vendor and thank them, because the vendors make the event — but I also keep an eye out for technologies that will help Power Stop.

A brake pad has to do contradictory things at once: stop hard, stay quiet, spare the rotor, survive heat. How do you begin to balance that?

It goes back to first principles in engineering and materials science. I like breaking a complex challenge into simpler problems. You ask what’s most important — NVH, durability, performance — and my favorite phrase is that there’s elegance in simplicity. If you try to maximize every corner at once, you won’t do well. You take a well-rounded material and ask where it needs to improve, and how to improve it without degrading the rest. Materials science is the perfect background because it’s built on structure-property relationships.

Which demands fight each other most?

It depends whether you’re designing for the OE or the aftermarket. For the OE it’s always zero noise. Early in my career we were running a vehicle test and had one noise event out of about 250,000 stops, and the engineering manager asked what we were going to do about it. From an actuarial perspective there’s no way to treat one event, but they have J.D. Power numbers and warranty to worry about. For the aftermarket it’s balancing

affordability with performance and NVH, and most of the time the focus is NVH, because noise is what brings people back. With Euro 7 and pending emission laws, I think you'll see the focus shift toward tribological wear and durability.

What would surprise people about what's in a pad?

The number of materials. When I started, asbestos was fading out and semi-metallics were the big thing, and the first NAOs were just being introduced at Ford. Reverse-engineer a semi-met and you see eight to twelve ingredients. An NAO or ceramic has fifteen to twenty. And within each ingredient — take alumina — there's degree of calcination, percent alpha, percent gamma, particle size. A good formulator has to know a lot about individual raw materials, and they're so different: phenolic resins for the polymer people, mineral and ceramic fibers for the ceramists.

Where does cost come in?

There are raw materials I'll never touch — that's the grade we use and always will. Others you can source from a different location. Since COVID, and with current trade policy, logistics often drive more of the cost than the material itself. There's always purchase price variance pressure to find lower-cost raw materials, and that's where it gets complicated: two materials look identical on the spec sheet, you swap one, and the formulation behaves completely differently. A lot of chemical specs don't fully capture a material's impact, either because people don't have that knowledge or because a spec that tight becomes too burdensome for suppliers to meet.

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The EV curveball. Regen means EVs barely touch the friction brakes. What does that do to the pad you're designing?

It's still a learning experience. Traditional system design specs didn't adequately predict the failures that evolved with EVs — corrosion removal, lukewarm or cool friction, contamination. People have looked at nitrocarburized discs to avoid corrosion, or scheduled brake applies to clean the rotor. Some owners have been surprised to park after a drive on a salty, slushy road and find a large mass of frozen debris around the wheel corner the next morning, because there's no latent heat from an engine to melt it. And then Euro 7 and potentially CARB change things again, because on top of friction you now see a tremendous amount of rotor research — advanced coatings, plasma coatings, how to minimize wear. Everybody's trying to figure out the best mousetrap.

Euro 7 is the first rule to put brake particulate on the table. Is it really changing how you formulate, or is that overblown?

It is going to change. Traditionally, friction manufacturers picked a platform's rotor and asked how to meet the requirement with the formulation. With rotor coatings coming out, you're going to see partnerships and development where the friction couple is developed as a whole. Plasma coatings are essentially a formulation themselves — hard materials like titanium diboride, tungsten carbide, silicon carbide for anti-wear — simpler than a friction material because there are fewer ingredients, but with a coefficient of thermal expansion mismatch against grey iron that needs a buffer layer to prevent cracking.

The other thing people don't realize: depending on the formulation, 20 to 60 percent of the raw materials going in are PM10 or smaller, because friction modifiers have to be fine or they'll chew up the rotor. So the next three to five years on rotors and coatings are going to be an interesting ride.

Is the aftermarket ahead of the OEMs on this, or behind?

It's a complex problem for the aftermarket because with EVs we don't have decades of experience the way we do with ICE. The OEMs get vehicle feedback. We see a brake replacement at four or five years on an ICE vehicle; on an EV it's seven to ten. So we don't fully understand that market yet. Companies like Power Stop are working on solutions, and the Colloquium helps, because we hear the issues people are seeing with EVs and hybrids that you haven't encountered. But both sides are still in learning mode.

For someone who's never gone, what happens at the Colloquium that can't happen on a Teams call?

You've got the entire supply chain at one event. On the OE side that's OEMs, Tier 1 brake suppliers, Tier 2 friction suppliers, and raw material companies. From an aftermarket perspective, you can have back-to-back meetings with your entire raw material supply chain. The face-to-face interaction isn't the same on Teams. You also get a little reconnaissance — you see who's talking to whom.

And it's a place to communicate the aftermarket's challenges back to the Tier 1s. Look at how many distinct backing plates the aftermarket now has to carry. Why do you need that many? Every one of them is tooling, inventory, and catalog complexity that somebody pays for. You can't have that conversation on a call.

Forty-four years in, what's kept "by engineers, for engineers" from getting watered down?

An ever-evolving landscape. When I attended my first Colloquium we were in the semi-met-to-NAO era, and the program was geared toward raw materials and friction. Then ABS and control technology came in and it became a true braking show, with control strategies on the agenda. There's always something new — regulation, technology, market demand — and we look for it to build into the program. Looking forward, AI and emissions have been the larger focus for the past couple of years, and that will continue.

Best hallway conversation or aha moment?

Not a single moment — more of a time-capsule comparison. Look at how the copper regulation evolved: Washington, California, SAE, the Brake Manufacturers Council, and MEMA, with industry, academia, and government working side by side. Emissions has been markedly different. The industry, at least in the U.S., hasn't been that engaged — maybe because emissions took root in Europe and the U.S. is trailing the play. But it's a complex challenge that needs all those parties. People thought copper would be easy, and it was, right up until the final portion when everyone asked how to implement it. On these regulations you almost need to start at the back end — how would this be implemented — and work back to the science. Europe is starting to see some of that.

What are you most excited about in the 2026 program?

Hearing how AI is going into the design process. AI is a bit overused — some people run a design of experiments and call it AI because it's a numerical model. What I'd like to see is true AI: give it a few parameters and get an elegant solution. Ask a chatbot for a friction formulation and it tells you that's complex and proprietary and gives you something that wouldn't be a friction material. The other thing is the number of papers on particle and non-exhaust emissions.

What share of brake companies are actually embracing AI?

The industry is going in, but you need to define what you mean. If you said, I've got a 20-inch wheel, the vehicle weighs this much, it needs to stop in this distance, minimize weight, maximize performance, give me a design — I don't think we're there. People are using it for things like optimal seal-groove geometry. Some are getting into friction material design, and I scratch my head, because we've tried that in the past with some pretty smart people, and the dyno variation plus raw material variation outweighs the granularity of the model. Eventually we'll get there.

Is there a group that's not at the Colloquium that needs to be?

I'd like more OEMs. We don't see aftermarket retailers or WDs — they may see it as too technical and go to AAPEX instead, because they're buying friction, not engineering it. We'd love more students, but there's not much braking research at U.S. universities; the emissions work may help generate interest. And purchasing people. Vendors tell us the decision-makers aren't there, so we've built a purchasing panel this year to plant a seed. It's like a grocery store — all your vendors in one place, one trip to talk to fifteen or twenty of them.

Ten years out, what does the brake corner look like?

It depends on how EV and hybrid powertrains continue to penetrate. But I think you'll see markedly different disc technology to combat current and pending emissions rules. If EVs

keep growing, I could see some OEMs eliminating rear brakes at the corner in favor of a single driveline brake. And the most certain area is dry systems — eliminating hydraulics and moving to brake-by-wire. The enablers are there now: higher voltages through the powertrain that a 12-volt system ten or twenty years ago couldn't have supported.

Your pitch to a young engineer on why the brake industry is the most interesting it's ever been?

We're at a transition point. Traditional braking is going down with hybrids and EVs, so you need to be cross-functional — a mechatronics person — and data science is coming in with AI. But you also need to know the braking system; you can't pull a computer science graduate out of Silicon Valley and ask them to make a brake better. The universities are going to need more cross-disciplinary degrees. And as two guys with grey hair, we need new ideas to challenge the status quo. Do you need cast iron at the corners? What if you didn't have brakes at the corners at all? That's a great place for younger engineers.

"You can't pull a computer science graduate out of Silicon Valley and ask them to make a brake better."

Who should come, and how do they sign up?

Come one, come all. There's something for everyone, from senior leadership to early-career engineers. Register at sae.org/events/brake. It's not the easiest place to get to, but once you're there you'll appreciate it.

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Three Stories We're Tracking

Regulatory / Policy

Euro 7 takes effect, and the aftermarket question stays open

November 29 is the date. New vehicle types in Europe must meet the 7 mg/km PM10 brake particulate limit — 3 mg/km for full EVs, with the 0.17 brake factor applied — and in 2027 the requirement extends to all new manufacturing. Two things to watch between now and then. First, the October session in Geneva, where minor revisions to the regulation go to a vote; watch for any language touching aftermarket qualification, which as Sarah Olson notes in this issue remains unresolved, including how a periodic inspection would verify that the brakes on a car meet the requirement. Second, accredited test capacity. Link Engineering's Limburg lab received VCA authorization for witnessed type-approval testing in July. Each additional lab announcement is a data point on whether certification capacity can absorb the demand arriving in Q4.

Company / M&A

Raybestos returns, and AUMOVIO's model gets copied or doesn't

Friction One expects the first Raybestos-branded products under its ownership to reach distribution in Q4 2026, roughly six months after acquiring the brand out of First Brands' bankruptcy and three months after buying BPI's seven-dynamometer laboratory in McHenry, Illinois. What lands in Q4 — which lines, at what coverage, positioned against what — will indicate whether Friction One intends to rebuild Raybestos as an engineered brand or monetize the catalog. Separately, AUMOVIO has now sold two European brake plants in nine weeks while retaining the customer relationships, and in the Mechelen case buying back the output under contract manufacturing. If that structure appears at another European Tier 1 in Q4, it stops being a company strategy and becomes an industry template.

Technology

The corner goes dry

Brake-by-wire crossed from halo applications into volume architecture this quarter: BWI's iDBC 1-Box entered European series production, NASN listed in Hong Kong on brake-by-wire economics, and Allegro introduced a safety PMIC specifically for electromechanical corner modules with integrated wheel-speed sensing. Watch three things in Q4. Whether NHTSA's FMVSS 135 rulemaking — which would drop the manual brake pedal requirement for ADS-only vehicles — advances after its August 26 comment deadline. Whether Knorr-Bremse holds its 2027 date for rGSBC redundant braking in Level 4 trucks. And what comes out of the electro-mechanical braking and mechatronics sessions at the SAE Brake Colloquium, September 20-23 in Palm Desert.

Watch item	Category	Key date
Euro 7 enforcement for new vehicle types	Regulatory	November 29, 2026
Geneva vote on Euro 7 revisions	Regulatory	October 2026
Additional VCA, KBA, or RDW test lab authorizations	Regulatory	Ongoing
First Raybestos products under Friction One	Company	Q4 2026
Further European Tier 1 plant divestitures	Company	Ongoing
FMVSS 135 rulemaking progress	Regulatory	After Aug 26 comment close
SAE Brake Colloquium & Exhibition	Industry	September 20–23, 2026
Knorr-Bremse rGSBC series production	Technology	2027 target



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amstedauto.com

AUMOVIO Engineering Solutions

AUMOVIO Engineering Solutions is an agile and flexible engineering partner delivering end-to-end development, product supply, integration, and consulting for the automotive industry and a wide range of mobility sectors including railway, aviation, and eVTOL. With locations and experts worldwide, we combine deep automotive engineering know-how with proven high-volume industrialization methods to create prototypes, small series, niche applications, and scalable production solutions.

Our core competencies span Interior Electronic Functions, Brake Systems, Advanced Mobility solutions, Data & Sustainability, supported by specialist engineering and validated component technologies. We work with a prestigious lineup of customers from sportscar and motorcycle OEMs to niche and special-vehicle manufacturers, delivering tailored and efficient engineering. As the mobility ecosystem accelerates toward electrification, software-defined architectures, connected systems, and sustainable production, AUMOVIO Engineering Solutions supports OEMs and Tier 1 suppliers in navigating this transformation.

engineering-solutions.aumovio.com

Bruker Nano Surfaces & Metrology

Bruker's TriboLab HD enables cost-effective, rapid screening of new friction materials. This versatile, high-torque system bridges the gap between the drawing board and dynamometer testing by making repeatable brake friction, wear, and particle emissions studies possible in a laboratory setting.

Critical decisions can be made earlier in the brake material development process, with TriboLab HD's in-lab ability to simulate SAE J2522 protocols and other standards that are then used to screen and rank new formulations. The tool offers the most force torque in a research testing system, the widest range of test capabilities, the most control over test parameters and conditions, and support for brake particle analysis. TriboLab HD helps engineers and manufacturers meet the development needs for standard and emerging brake materials.

bruker.com

Draxton

Draxton is a world-class company specializing in the manufacturing and commercialization of highly-complex machined cast and machined iron and aluminum components for passenger and commercial vehicles, as well as industrial applications.

Serving over 75 customers and strategically located in 6 countries across 3 continents. The total annual capacity of the sector, including joint ventures, is more than 640 thousand tons of iron casting, more than 11 thousand tons of aluminum casting, and machining of more than 30 million parts.

Draxton's team is formed by more than 5,000 talented workers at 15 productive units plus engineering centers. With a wide portfolio of technologies, processes and materials we produce highly complex components for brakes, powertrain and transmission systems.

draxton.com

EBC Brakes

With a worldwide work force of over 400 people, EBC Brakes is an independently owned and managed leader in the brake market, proud of its customers, its products, its success and its people.

EBC Brakes produce the largest range of brake pads and brake rotors in the world, with over 60,000 part numbers for every type of moving vehicle. EBC Brakes are made in one of its two specialist factories in the UK and USA.

Our product range includes brake pads for cars, trucks and SUV, brake rotors for every rolling vehicle on the planet and even brake pads for wind farms, brake pads for military applications such as the Humvee, various armoured cars and even tanks, railway brake products and all kinds of industrial vehicle brakes.

Types of brake pads manufactured include aramid brake pads, sintered brakes, ceramic brake pads and carbon long life brake pads. The EBC Brakes rotor range includes cast iron brake rotors for automobiles, stainless steel brake rotors for motorcycles, bicycle brake pads and bicycle brake rotors and ATV brake pads and rotors.

ebcbrakes.com

Frasle Mobility

Fras-le is a leading supplier of heavy duty drum brake lining in North America, with a strong presence in the OEM and IAM markets, our core business being brake pads and linings for medium duty and heavy duty vehicles. As of recently, we are moving towards building a unified global company under Frasle Mobility, resulting in a complete portfolio of products and services solutions. This allows us the opportunity to collaborate our house of brands to further serve different parts of the IAM and OEM markets.

Fras-le has two locations in the US, a commercial and engineering office located in Auburn Hills, MI and a production plant in Prattville, AL. We are currently expanding our portfolio, launching medium duty hydraulic rotors and heavy duty air disc brake rotors. Fras-le produces high quality and engineered products, with a focus on copper free materials as well as other products such as brake pads for off highway and mining applications, aircraft, industrial applications and others.

fraslemobility.com

Frenkit

Frenkit, a leading European brake hardware supplier, is building on its 25+ years of experience in the industry and expanding coverage for the North American aftermarket. Featuring proprietary

rubber components manufactured at its facilities in Spain and India, Frenkit now offers US customers nearly 6,000 different brake hardware kits, covering 98% of US aftermarket sales.

Frenkit has customers in over 70 countries, including OEMs, top aftermarket distributors and caliper remanufacturers. Their program includes hardware kits for both disc and drum brakes, caliper pistons, brake caliper repair kits, electronic parking brake kits and much more. In total, Frenkit's growing brake hardware portfolio is comprised of more than 15,000 different components covering 55,000 parts cross-referenced to OE. Frenkit's extensive catalog is fully ACES and PIES compliant and FMSI-indexed.

Frenkit companies also include Seinsa Corporation and Joycar S.L., both based in Spain. Seinsa has been a leading manufacturer of products in braking, suspension, steering and transmission systems for the last 50 years. Joycar is well-known for its design solutions and mold making expertise, with a focus on small series production, 3D printing and prototyping.

frenkitbrakehardware.com

Friction Materials Standards Institute

Founded in 1948, the Friction Materials Standards Institute (FMSI) began as a trade association for North American automotive aftermarket friction manufacturers. Over the decades, it has developed a universal part numbering system for brake pads, shoes, discs, and clutch facings known as the FMSI part number.

Membership is open to any manufacturer of friction products covered by the FMSI and FMS numbering systems. Distributors, retailers, and other industry participants may qualify for subscription.

From the factory floor to the service bay, a single, consistent FMSI number serves as the industry's common language, eliminating confusion and reducing costs across the entire supply chain. While the core focus remains on-highway vehicles in North America, the FMSI system now enjoys widespread global adoption and covers a broad range of vehicle types.

In July 2025, FMSI introduced a subscription service providing fee-based access to its electronic catalog and daily updates on new brake applications, making it available to anyone on the planet.

fmsi.org

Hagman Search

Hagman Search is a retained boutique search firm dedicated exclusively to the automotive and commercial vehicle brake industries.

We don't just fill open requisitions; we build the leadership and technical teams that define the future of braking technology. As a retained partner, we work on an exclusive basis, allowing us to commit 100% of our resources to solving your most critical hiring challenges in this highly specialized market.

By combining deep technical fluency with a rigorous, personalized search methodology, Hagman Search has become the trusted advisor for companies that cannot afford to compromise on talent. We deliver the innovators and leaders who drive growth in a competitive global landscape.

hagmansearch.com

Horiba

Shaping a sustainable future through the development of unique and innovative measurement and analysis technology has been at the core of HORIBA for more than 70 years, offering customized solutions across various industries. Our brake testing portfolio delivers precision and reliability,

featuring advanced brake dynamometers for performance and NVH testing across vehicle types, from compact cars to heavy-duty and railway systems.

Additional solutions include brake dust measurement systems and environmental simulation options like saltwater and fog testing. A range of contract testing as well as engineering and consultancy options round off our brake testing portfolio.

horiba.com

Mevotech

Founded in 1982, Mevotech is a North American leader in the engineering and design of driveline, steering, braking, and suspension aftermarket auto parts. For more than four decades, Mevotech has worked to improve the technician experience through advanced engineering, superior materials, and rigorous quality control standards, developing components that deliver durability, performance, and efficient installation for professional repair facilities.

Engineering is at the core of Mevotech's approach. With an in-house engineering team dedicated to continuous product development, the company has introduced 13 patented chassis technologies and more than a thousand first-to-market product innovations that address real-world aftermarket challenges. This same engineering philosophy extends to Mevotech's braking solutions, where advanced materials, performance-driven friction formulations, and design improvements help technicians deliver reliable stopping power across a wide range of driving conditions.

txinnovation.com/brakes

NRS Brakes

The innovative technology behind NRS Brakes has earned a reputation for producing the world's longest-lasting and quietest brake pads.

Leading the global market in brake pad technology is our PACE award-winning NUCAP Retention System (NRS) Technology, guaranteeing friction material won't delaminate.

Our pads feature fully galvanized backing plates for extended pad life and an innovative noise-canceling piston insert, ensuring a quiet ride by eliminating noise.

The FMSI now designates brake pad applications with OEM-specified mechanical fusion as "Z". NRS Brakes provides a full listing of all FMSI Z Number applications.

nrsbrakes.com

NUADI Group

NUADI GROUP is formed by two strong brands dedicated to design, develop and manufacture brake components for all types of vehicles. On one hand, NUADI, who has been supplying brake pad backing plates and shims to the OE and Aftermarket sectors for more than 60 years. And on the other hand, SADECA, who has recently joined the group and has over 40 years of experience in designing and manufacturing electrical wear sensors and hardware applications for brake systems.

As a consequence of the great experience of our outstanding team, a relentless work in innovation, product development and continuous improvement allowed NUADI Group to become the international leader in engineering, designing and manufacturing of brake systems components supplied globally to the most recognized OEMs and brake systems manufacturers around the world, thanks to our global presence in Asia, Europe and America.

nuadigroup.com

Orthene Chemicals

Orthene is the world's leading expert in brake fluid, and the world's largest specialist private label brake fluid manufacturer. We know brake fluid like nobody else.

Orthene offers its private label customers a comprehensive service, ensuring the highest possible quality. We formulate, blend, bottle, label, pack and ship to major brake parts manufacturers, large oil and lubricant brands and leading petroleum companies worldwide. We treat their brand as if it was our own.

Orthene can supply all types of brake fluid; from a standard DOT3 to the highest specification DOT5.1 LV, from military-grade options to the highest performance racing brake fluids, for both the OEM and IAM markets. Orthene is certified to meet the most stringent international automotive quality standards such as IATF 16949 and ISO 9001.

Orthene continues to lead innovation in the world of brake fluid, as it has done for almost 50 years. We produce the world's highest performance racing brake fluid, Halo P1, and recently launched the pioneering REC60, a DOT 4 brake fluid with 60% recycled content.

orthene.com

PFC Brakes

PFC Brakes is a global leader in the design, development, and manufacturing of high-performance braking systems. Our products deliver ultimate stopping power, durability, and reliability. PFC Brakes serves various industries, including motorsports, automotive, and commercial vehicles. Renowned for our innovative approach, we utilize advanced materials and proprietary technologies to produce brake pads, rotors, and calipers that consistently outperform competitors.

At PFC Brakes, we are dedicated to pushing the boundaries of engineering, ensuring that our products provide exceptional performance. We even strive to reduce our environmental footprint by employing eco-friendly practices and materials in the production process. PFC Brakes continues to set new benchmarks for precision and performance — NO COMPROMISES.

pfcbrakes.com

PureForge

PureForge has innovated a Nano-Surface Forging technology that addresses many of the standard automotive industry issues related to current brake systems. Reducing brake maintenance could lead to reduced labor overhead.

PureForge Brakes are disrupting and changing what we know about braking and can provide significant TCO benefits to fleet owners through our patented technology.

PureForge technology has several advantages over standard OEM or aftermarket brake replacement parts. These advantages include longevity, reduced brake dust, corrosion resistance, and light-weighting.

pureforge.com

ROCKWOOL

Lapinus products are being produced by the ROCKWOOL group, the world's biggest producer of mineral fibre-based products. For over 30 years our sustainable certified bio-soluble fibres, with a high and stable quality, are being used globally in OEM, OES and AM friction materials. We support the market using our extensive knowledge generated using our pilot plant and testing centre.

Data using our Krauss machine and full-scale passenger car noise dynamometer allow us to understand the interaction between our fibres and other materials in the friction composite. We

recently added emission measurement equipment to our dynamometer enabling us to measure brake wear emissions during dyno testing. Next to our fibres we also offer PROMAXON-D, a versatile high quality synthetic calcium silicate which has a good synergy with our fibres in friction material formulations.

lapinus.com

SAE Brake

At the 44th Brake Colloquium & Exhibition, we are your gateway to the forefront of braking technology and innovation. With a rich history spanning over four decades, the brightest minds in the braking industry gather, creating a platform where ideas are cultivated, and partnerships thrive.

The Brake Colloquium & Exhibition is the premier gathering for all those passionate about braking technology. Whether you are an industry veteran, an engineer, a researcher or an emerging professional, this event is designed to educate, inspire, and connect. This is where experts, engineers and enthusiasts convene to discuss the latest developments in the ever-evolving world of braking systems.

sae.org/attend/brake

Sangsin Brake

Sangsin Brake is the No.1 manufacturer in the domestic brake friction materials market, as it occupies the greatest market share in Korea.

Sangsin is equipped with original technologies that are globally appreciated — NVH (noise, vibration, harshness) tuning technology for improved brake sensitivity, environmentally friendly friction material technology addressing the strict regulations in North America and Europe, the most optimized mix and convergence technologies, and raw materials convergence technology for improving safety and abrasion resistance.

In preparation of the upcoming electric vehicle era, Sangsin is currently developing a noncontact type of brake auxiliary device as well.

sangsinusa.com

Tribotecc

Tribotecc GmbH is a global market and technology leader of high performance metal sulfide solutions for the friction industry. The tribological properties of metal sulfide systems with regard to chemical structure, polarity, lubricating ability and thermal behavior are essential for the functioning and performance enhancement of friction products and help to extend the lifetime of components in motion.

Sulfides of various metals have proven to be the most versatile and effective additives for stabilizing the coefficient of friction at high level, preventing brake fading, reducing pad and disc wear and increasing comfort through less noise and vibration. Tribotecc is continuously working with its partners in the brake industry to develop next generation materials to address new requirements such as emission reduction, price stability or substitution of certain metals such as antimony or copper.

tribotecc.com

Waupaca Foundry

Discover the power of true capacity.

What is true capacity? At Waupaca Foundry, it's more than volume. It's our capacity to keep promises so you can expect tomorrow's deliveries on time, as well as tomorrow's industry-leading advancements. It's leveraging design, material solutions, and additive manufacturing to cut cost, as well as flexing production to meet your needs. It's the capacity to ensure quality, manage value-added services, and offer carbon-neutral Waupaca Green Castings to meet your Scope 3 GHG emissions reduction targets. And it's the capacity to contribute value and solve problems at every stage of launch and production.

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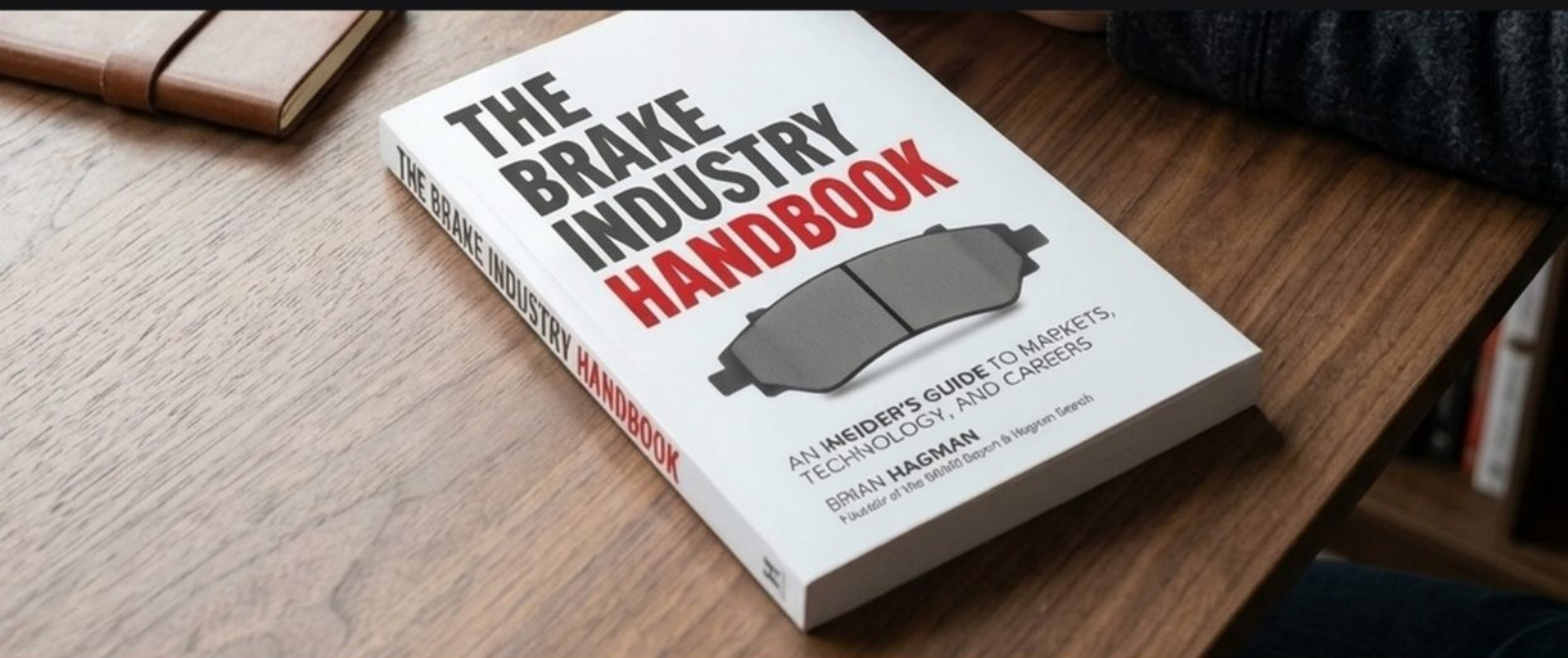
waupacafoundry.com

WINHERE

Located in the greater Chicago area, Winhere Brake Parts, Inc. (WBPI) distributes brake rotors, drums and other brake components to customers throughout North America. WBPI prides itself on supplying its partners with products that are consistent and of a high quality.

Winhere Auto-Part Manufacturing Co. Ltd., the parent company of WBPI, has grown rapidly to become the largest professional brake manufacturer of discs and drums in China and Thailand, shipping and producing more than 55 million units of brake discs and 10 million brake pads annually to its customers all over the world.

winherebrake.com



The Brake Industry Handbook

An Insider's Guide to Markets, Technology, and Careers

By Brian Hagman · Foreword by Roy H. Link, Chairman, Link Engineering

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