

A Turkish SME specializing in heat treatment is preparing an Eureka Clusters SMART call project together with a Turkish brake disc foundry, a friction material producer, and a vehicle manufacturer. The consortium is currently looking for European partners

Summary

Profile type

Research & Development Request Türkiye

Company's country

POD reference

RDTR20261002004

Profile status

PUBLISHED

Type of partnership

Research and development cooperation agreement

Targeted countries

- Austria
- Belgium
- Poland
- United Kingdom
- Canada
- Luxembourg
- Lithuania
- Ireland
- South Africa
- Spain
- Finland
- Sweden
- Singapore
- Israel
- Hungary
- France
- Germany
- Portugal
- South Korea
- Latvia
- Slovakia

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Term of validity

2 Oct 2026**2 Oct 2027**

Last update

2 Oct 2026

General Information

Short summary

A Turkish heat treatment SME is preparing an international R&D project with a brake disc foundry, friction material producer and vehicle manufacturer. The project targets a matched grey cast iron brake disc/brake pad system with lower particle emissions for Euro 7. Partners are sought for compliant emission testing, digital twin/DPP development, environmental impact assessment and tribology research under Eureka Clusters SMART (outline deadline: 26 January 2027).

Full description

The requesting company is a small or medium-sized enterprise (SME) located in Ankara, Türkiye. It provides contract heat treatment and surface engineering services to industrial customers from several plants and operates an officially approved in-house research and development (R&D) centre. Its fields of work are metallurgy, thermochemical surface treatment and process control for automotive and machinery components. The company treats parts supplied by its customers and does not manufacture finished products.

Background. Brake discs and pads are a major source of non-exhaust particulate emissions from road traffic. Regulation (EU) 2024/1257 (Euro 7) sets the first limits for brake particle emissions of passenger cars, expressed as particulate matter below 10 micrometres (PM₁₀): 7 mg/km for combustion and hybrid vehicles and 3 mg/km for battery electric vehicles. The limits apply to new vehicle types from 29 November 2026. Compliance is checked on a brake dynamometer with the WLTP brake cycle described in UN Global Technical Regulation No. 24 and the newer UN Regulation No. 179.

Planned project. The company will coordinate a Turkish group made up of a grey cast iron brake disc foundry, a friction material producer and a vehicle manufacturer. The group plans to develop a matched brake disc and brake pad system with lower wear and lower particle emission. The disc is made of alloyed grey cast iron and receives a combined heat treatment of stress relieving and a nitrocarburising-based surface modification. The pad is a friction material formulated for the treated disc surface. The vehicle manufacturer defines the requirements and validates braking performance at vehicle level.

Current status. Laboratory and dynamometer tests have so far used only heat-treated discs made of non-alloyed cast iron with standard pads. Compared with untreated discs, wear of discs and pads was reduced by about 45 to 50%, and PM₁₀ emission in a WLTP brake test by about one third. Projected to vehicle level, the result is still slightly above the Euro 7 limit. The combined system of alloyed disc, heat treatment and matched pad does not exist yet. Developing and validating it, and explaining how the treated surface and the pad interact (friction layer formation, wear mechanisms, particle generation), are the aims of the project. Vehicle-level brake particle measurement is outside the scope, and vehicle values are projected from disc-level results using the front to rear brake bias.

Why international partners are needed. The Turkish group has no particle emission test facility that follows the regulation and is accepted by European customers. It also lacks experience with digital twins and digital product passports for brake components, and it needs life cycle assessment capacity at the required depth. Further partners are needed to deepen the scientific analysis of the tribological mechanisms and to support market entry in Europe.

Planned cooperation. The company is preparing a joint application to the Eureka Clusters SMART call (project outline deadline 26 January 2027), where each country funds its own participants. A research cooperation agreement is proposed, in which each foreign partner is a full R&D partner with its own work package, budget and rights to results. A technical cooperation agreement would cover test methods, data exchange and training of the Turkish partners. Full partnership is preferred to subcontracting because test data, models and methods will be produced jointly and must be accepted by customers in several countries. A consortium agreement will regulate intellectual property and later licensing or supply arrangements.

Advantages and innovations

Innovation. Common approaches to reducing brake dust are low-emission pads tuned for untreated cast iron discs, hard coatings on the disc surface (for example thermal spray or laser cladding), and particle capture devices at the caliper. The planned project treats disc and pad as one system: the disc surface is modified by a diffusion-based heat treatment that is part of the disc itself, and the pad is formulated for that surface.

Results so far (heat-treated non-alloyed disc and standard pad, compared with untreated disc):

- Disc and pad wear reduced by about 45 to 50% in full-scale dynamometer tests.
- PM10 reduced by about 34% and PM2.5 by about 60% in a WLTP brake test.
- Surface hardness about three times higher, with a more stable friction coefficient at high temperature.
- Project target: meet the Euro 7 PM10 limit at vehicle level while keeping the wear reductions with the alloyed disc.
- No separate coating layer, so no coating-substrate interface or risk of detachment. The treatment is intended for existing disc designs and casting lines.
- A digital twin and product passport data set will link process parameters, test results and life cycle data to support type approval documents and customer audits.

Know-how. The coordinating company has experience in nitriding, nitrocarburising and process control. The consortium covers the chain from disc casting to vehicle validation.

Technical specification or expertise sought

Stage of development

Under development

IPR Status

No IPR applied

IPR Notes

Sustainable Development goals

• Goal 9: Industry, Innovation and Infrastructure

Partner Sought

Expected role of the partner

The company is looking for several complementary partners for a joint R&D project in the Eureka Clusters SMART call (project outline deadline 26 January 2027). At least one industrial company from outside Türkiye is needed. Only organisations that can receive public funding for this call from their own national funding body can join as partners. Self-funded participation is not sought. Research organisations that cannot be funded directly in their country (for example in Spain or France) can join only as subcontractors of a funded company from the same country. A pre-

check or letter of support from the national funding body will be requested before the outline is submitted.

1. Brake emission testing laboratory or test service company (industry, or research and technology organisation)
 Needed: a brake dynamometer with enclosure and measurement of PM10, PM2.5 and particle number according to UN GTR No. 24 or UN Regulation No. 179. Tasks: define the test plan, run WLTP brake cycle tests on the developed disc and pad combinations, compare results with the Turkish dynamometer tests to establish correlation, advise on the type approval route and train Turkish staff in measurement practice.

2. Digital twin and digital product passport partner (SME or research organisation)

Tasks: build a digital twin of the disc and pad system that predicts temperature, wear and particle emission from process and test data, define a data model for a digital product passport of brake components, and connect test data with life cycle data.

3. Environmental impact assessment partner (university, research organisation or consultancy)

Tasks: carry out a life cycle assessment of the new disc and pad system against a reference system, covering production, use phase particle emissions and end of life, and assess the environmental benefit of the reduced emissions.

4. Tribology and surface science research organisation or university

Tasks: characterise disc surfaces and friction layers (electron microscopy, X-ray methods, hardness and corrosion tests), identify wear and particle formation mechanisms, and support scientific publication of the results.

5. Brake system manufacturer, disc or pad distributor, or aftermarket company (industry)

Tasks: define market requirements, test prototypes under customer conditions and discuss later licensing or supply of the treated discs and matched pads.

Type of cooperation: a research cooperation agreement with the partner as a full project participant, and a technical cooperation agreement for test methods and know-how transfer. Commercial agreements with technical assistance or licensing may follow after the project. A partner may cover one or several of the roles above. SMEs and organisations with previous Eureka, Eurostars or Horizon Europe experience are preferred. Expressions of interest are welcome until mid-December 2026, so that the consortium is complete before the outline is submitted. Please include a short organisation profile, relevant facilities, similar projects and the contact at your national funding body.

Type of partnership

Research and development cooperation agreement

Type and size of the partner

- **SME 11-49**
- **University**
- **SME 50 - 249**
- **SME <=10**
- **R&D Institution**
- **Big company**

Call Details

Framework program

Eureka

Call title and identifier

Eureka Clusters SMART Call 10 – 2026

Submission and evaluation scheme

Anticipated project budget

Coordinator required

No

Deadline for EoI

24 Jan 2027

Deadline of the call

26 Jan 2027

Project duration in weeks

Web link to the call

https://www.eurekanetwork.org/programmes-and-calls/eureka-clusters/smart-call-10-2026/?utm_source=chatgpt.com

Project title and acronym

Dissemination

Technology keywords

- **02009011 - Air pollution control for cars and transport**
- **02002015 - Surface treatment (painting, galvano, polishing, CVD, ..)**
- **02007010 - Metals and Alloys**
- **10002008 - Measurement and Detection of Pollution**
- **02002006 - Hardening, heat treatment**

Market keywords

- **08003001 - Machine tools, other metal working equipment (excl. numeric control)**
- **08004004 - Other pollution and recycling related**

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- France
- Germany
- Portugal
- South Korea
- Latvia
- Slovakia

Sector groups involved