SISTEM TEKNIK ISSUE
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INDUSTRIAL FURNACES

TECHNOLOGY NEWS



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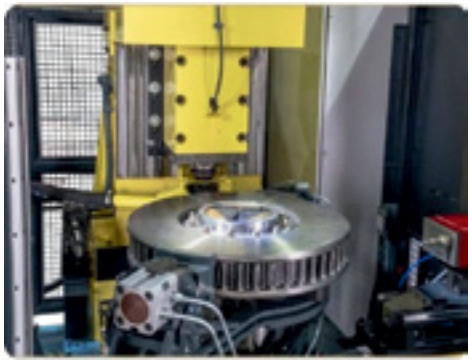



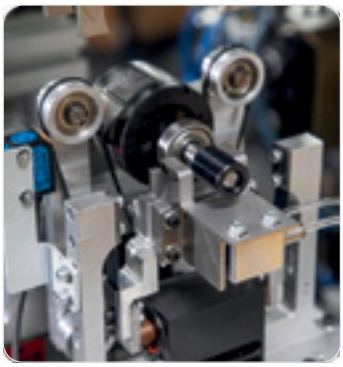



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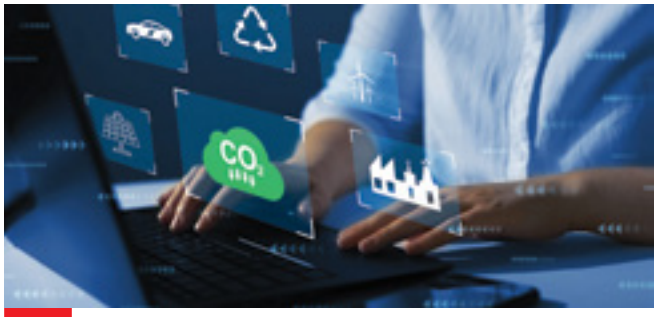

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ENTERİNG A NEW ERA



Mehmet Özdeşlik
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Group Chairman of the Board
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Dear Valued Readers,

In this issue, I would like to share with you some important developments that hold a special meaning for me in our nearly half-century journey.

When we founded Sistem Teknik in 1979, of course I did not know that we were taking the first step of a long journey that would extend to today. Since then, we have worked hard, produced, learned, and always strived to do better. Over the years, seeing Sistem Teknik grow into a company that exports technology to many countries around the world has always been a great source of pride for me as a founder.

However, at the point we have reached today, our story is no longer limited to Sistem Teknik alone. Over time, our companies operating in different sectors, each with its own expertise and goals, have emerged. While Sistem Teknik Industrial Furnaces Inc., Sistem Teknik Automotive, Sarvion Inc., and Vesta Inc. continue to grow in their respective fields, we believed that the time had come to bring these companies together under a stronger structure.

With this vision, we established the IDT Group and brought our companies together under the same roof.

I do not see the IDT Group merely as a new organizational structure that unites our companies. I see it as the beginning of a new era, where the knowledge, experience, and expertise we have built over the years come together, where our companies gain strength from one another, and where we prepare for the future together. I believe that by preserving each company's identity and expertise, we will build a much stronger structure as a whole.

Along with this new structure, one of the things that makes me happiest as both a founder and a father is that my daughters Beste and Beril have taken on active roles in managing our companies and are continuing this journey as the new generation.

Another development that makes this new era even more meaningful for me is that I have transferred my role as CEO of Sistem Teknik Industrial Furnaces Inc., which I have held since 1979, to my daughter Beste Özdeşlik.

Establishing a company, growing it over the years, and bringing it to a certain level requires great effort. However, I believe that one of the most important milestones for a founder is being able to entrust this responsibility to the next generation at the right time. I sincerely believe that the second generation will take Sistem Teknik much further.

In addition to these important developments, I would also like to mention our efforts in sustainability, energy efficiency, digitalization, and equal opportunity—areas we believe will shape our future.

The European Green Deal, announced by the European Union on December 11, 2019, initiated a significant transformation process that concerns not only companies in Europe but all industrial organizations working with Europe. We see this transformation not merely as an obligation, but as an important opportunity to prepare our companies for the future.

In this context, within the companies under the IDT Group, we replaced our company vehicles with our national pride, TOGG electric vehicles. In this way, we significantly reduced our carbon emissions and began achieving annual fuel savings exceeding 6 million TL.

However, for us, the most important aspect of sustainability is the energy consumption of the furnaces we produce. Because we believe that the real impact can be achieved not only by reducing energy consumption in our own factories, but also by enabling the furnaces used by our customers to perform the same tasks with lower energy consumption.

For this reason, we allocate a significant portion of our R&D efforts to energy efficiency. As a result of our work on enabling our furnaces to perform the same processes with lower energy consumption, we have achieved important gains. In the coming period, reducing energy consumption and carbon footprint will continue to be one of the main priorities of our product development efforts.

We believe that another important element of efficiency is scale and specialization. For this reason, we encourage specialization not only within our own companies but also among the subcontractors we work with in specific areas. At the same time, we support our subcontractors in developing expertise in particular fields. In this way, by creating a more competent supply and production ecosystem around us, we become stronger and more competitive together.

Another issue we place great importance on while preparing for the future is equal opportunity. I believe that developed societies and strong companies are those that can integrate women's talent and labor into every aspect of production. With this understanding, we took part in the "Equalize Opportunity, Diversify Talent" project carried out by TAYSAD. Today, I am also pleased that the proportion of female employees in our companies has reached 35%. We have already begun to see the positive results of this within our organizations.

Many things have changed since our journey began in 1979. Technology has changed, the world has changed, and our customers' expectations have changed. However, one thing has remained the same: our desire to produce, to develop, and to do better.

Today, with a new generation of management, a stronger group structure, our understanding of sustainability, our R&D-driven technologies, and our continuously growing ecosystem, we continue on our path.

With the strength we draw from the past, we look to the future; and we believe that, together with the increasing responsibility of the second generation, our stronger group structure, our employees, and our business partners, we will take IDT Group companies to much greater heights.

On this occasion, I wish you all good health, success, and prosperity.

Sincerely,



SISTEM TEKNIK SHOWCASED ITS DEFENSE INDUSTRY SOLUTIONS AT SAHA EXPO 2026

Sistem Teknik Industrial Furnaces took its place at SAHA EXPO 2026, one of the key meeting platforms of the defense industry.

Throughout the exhibition, Sistem Teknik's stand attracted strong interest from defense industry professionals and sector representatives. In particular, the 155 mm ammunition body heat treatment lines we developed for the Turkish defense industry were among the projects that drew significant attention from visitors.

This line, developed for ammunition production processes that require high capacity, process precision, and repeatability, is one of the key examples of the domestic engineering and advanced heat treatment solutions that Sistem Teknik offers to the defense industry.

During the presentations held within the scope of SAHA EXPO 2026, Sistem Teknik's technological capabilities and innovative work for the defense industry were also shared.

Our Assistant Automation Manager, Mr. Eren Şahin, delivered a presentation titled "Electrical Infrastructure and SCADA System of the Ammunition Body Heat Treatment Line," while our Technology Development and Innovation Manager, Mr. Alper Keleşoğlu, met with industry professionals through his presentation titled "Hardening with Hydrogen: The Future of Vacuum Processes."

SAHA EXPO 2026 proved to be a productive event for Sistem Teknik in terms of strengthening existing collaborations and establishing valuable connections for new projects in the defense industry.













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SISTEM TEKNIK MET WITH INDUSTRY PROFESSIONALS IN THE UNITED KINGDOM AT **FIRE SAFETY UK 2026!**

Sistem Teknik Industrial Furnaces Inc., which continues to develop its international activities and sectoral collaborations in the field of fire resistance test furnaces, participated in the Fire Safety UK 2026 exhibition held in Birmingham this year, following the Fire Safety Asia 2025 event held in Singapore last year.

The event, which held particular importance for Sistem Teknik, became one of the first large-scale industry organizations in which the company participated with a stand in the United Kingdom. Throughout the event, Sistem Teknik shared with visitors its engineering capabilities in the field of fire resistance test furnaces, along with its product and system solutions and international project experience.

As part of the organization, Sistem Teknik's Chairman of the Board, Beste Özdeşlik, also delivered a presentation, sharing the company's knowledge, experience, and solutions in the field of fire resistance test technologies with international participants.

Fire Safety UK 2026 also became an important meeting point for Sistem Teknik to strengthen its existing connections in the United Kingdom market and to lay the foundations for new collaborations.

During the event, through meetings held with regional testing laboratories, industry professionals, and various organizations, opportunities were created to establish new connections and evaluate potential collaborations.

Following the Fire Safety Asia 2025 event held in Singapore last year, participation in Fire Safety UK 2026 in Birmingham marked one of the important steps in Sistem Teknik's goal of expanding its international activities in the field of fire resistance test technologies across different regions. Sistem Teknik continues to leverage its engineering expertise and specialization in fire resistance test technologies to expand into international markets, while further strengthening its global presence through new connections, strong collaborations, and projects across different geographies.

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HEAT TREATMENT FURNACES IN THE DEFENSE INDUSTRY

Okan Kuloğlu - Assistant Sales Manager

Success in the defense industry is not determined solely by correct design, the right material, or the appropriate manufacturing method. One of the most critical factors that determine final performance is heat treatment processes, which directly affect product reliability. Across a wide range of products—from armored land vehicles to aerospace components, from advanced defense systems to sensitive mechanical sub-parts—achieving the desired mechanical and metallurgical properties of materials is only possible through a controlled heat treatment infrastructure.

Today, this need has become even more visible with the rapid growth of the defense industry. According to SIPRI data, global military expenditures reached approximately $2.7 trillion in 2024, with an annual increase of 9.4%, marking the tenth consecutive year of growth.

This growth requires not only an increase in production capacity for main contractors but also the enhancement of capacity and quality requirements for subcontractors, process suppliers, and critical production infrastructures. When evaluated on a product basis, production at this scale demands not only increased capacity but also the ability to ensure the same quality is repeatable and verifiable in high volumes. Heat treatment is therefore no longer just a single stage in the defense supply chain; it is one of the key factors determining quality, reliability, and performance. The “special process” approach in the aerospace and defense ecosystem requires not only the correct implementation of processes but also their validation, documentation, and auditability. In this context, Nadcap serves as an important reference point for the inspection and accreditation of critical processes within the aerospace and defense supply chain.

AMS2750, on the other hand, defines the technical requirements related to the pyrometry infrastructure used in heat treatment processes; including temperature measurement, sensors, instrumentation, TUS (Temperature Uniformity Survey), SAT (System Accuracy Test), and calibration practices.

This discipline of verification and record-keeping is one of the fundamental tools for ensuring the technical performance of the final product.

In the defense industry, the expected outcome from heat treatment is not limited to “hardness” alone.

From a technical perspective, the





> Heat treatment, therefore, is no longer just a production stage in the defense supply chain; it is one of the key factors determining quality, reliability, and performance.

primary objective of heat treatment is to achieve the appropriate microstructure and mechanical properties, ensure dimensional stability, and maintain surface integrity. In critical components, even a slight deviation in temperature, weaknesses in atmosphere or vacuum control, or an improper cooling profile can have a direct impact on part life, safety, and operational performance. For this reason, heat treatment is a critical manufacturing discipline that precisely controls and governs the final performance of the material.

From the end user's perspective, expectations go beyond meeting technical requirements. In the defense supply chain, customers expect consistent performance in every cycle, design and manufacturing in compliance with standards, traceability at both cycle and product levels, as well as operational ergonomics and ease of operation. In addition to cycle reports, recipe management, lot and serial number information, record keeping, and deviation tracking, ease of loading and unloading, maintenance accessibility, and safe working conditions are also important elements of system design. Thus, the customer is purchasing not merely equipment, but a production infrastructure in which technical performance can be achieved sustainably and in an auditable manner.

Typical Process Requirements in Defense Applications

Process selection is determined based on the material family of the component and the targeted mechanical and metallurgical properties in the final product. For this reason, different recipes and process applications may be required for each product.

The main processes frequently encountered in defense projects can be listed as follows: hardening, tempering, stress relieving, carburizing, nitriding, brazing, composite curing, and pressure curing.

As the complexity of part geometry and tolerance sensitivity increase, the process window narrows and the need for control rises.

Therefore, process and equipment selection must be carried out by evaluating not only the material class and target mechanical properties, but also product geometry, distortion risk, loading and fixturing approach, production volume, atmosphere/vacuum requirements, and traceability infrastructure together.

- ***Application-Based Furnace Type Approach***

Since part sizes, geometries, tolerance sensitivities, and production volumes vary significantly in the defense industry, a single-type furnace approach is often insufficient. The correct furnace selection should not be based solely on basic parameters such as maximum temperature or internal volume; instead, it must be determined by evaluating the product's material, geometry, loading method, process requirements, and production model together.

For large and heavy parts, chamber-type or car-bottom furnaces can provide suitable solutions in terms of ease of loading/unloading and processing high-mass components. For long or vertically oriented parts, bell-type or pit-type furnaces may be preferred, especially in applications where product positioning and deformation control are critical.

In applications requiring high-volume and continuous production, belt/roller conveyor systems, walking-beam furnaces, or other continuous systems can offer advantages such as standardized process flow and high capacity.

In addition, vacuum requirements, the need for a controlled atmosphere, cooling method, loading and fixturing approach, and traceability infrastructure are also key criteria in determining the furnace type.

Therefore, the correct investment decision should be made by evaluating together the material class and target mechanical properties, product geometry and distortion risk, production volume/flow, atmosphere or vacuum requirements, and the recording/traceability infrastructure.

This approach requires the equip-

ment manufacturer to be positioned not merely as a standard machine supplier, but as an engineering solution partner that determines the appropriate furnace architecture according to the product and process.

- ***Vacuum Heat Treatment: Clean Process And High Control***

For advanced engineering materials—especially titanium, nickel-based alloys, high-alloy steels, and parts with tight tolerances—preventing surface oxidation and decarburization is of great importance. Heat treatment carried out in a vacuum environment provides cleaner surfaces, stable temperature control, and more reliable metallurgical results.

From a technical standpoint, success is not defined solely by reaching the target temperature, but by managing the loading arrangement, fixturing, temperature uniformity, vacuum level, and cooling characteristics together.

Especially in parts with tight tolerances, distortion control is directly related not only to the process recipe but also to equipment and loading engineering. One of the advanced solutions that stands out in vacuum processes is low-pressure carburizing (LPC) technology. LPC processes, carried out using controlled hydrocarbon gas, can provide a cleaner process environment, better control of case hardening depth, and more uniform results in complex geometries. In defense components where wear resistance, fatigue life, and dimensional stability are critical, these features offer significant advantages.

- ***Composite curing and pressurized consolidation***

In defense manufacturing, composite structures are increasingly used alongside metal components. Advantages such as light weight, high strength-to-weight ratio, corrosion resistance, and design flexibility are increasing the use of composites across many defense platforms.

Composite curing furnaces are special furnaces used to ensure the controlled curing of parts produced with reinforcement materials such as glass fiber and carbon fiber, typically with resin-based or similar matrix systems.

Pressurized consolidation systems aim to achieve more stable and repeatable quality, especially in critical structural applications, by controlling temperature and pressure parameters during the curing process.

In these systems, controlled process cycles, temperature accuracy and uniformity, lower defect risk, surface quality, dimensional stability, repeatability, and traceability are among the key benefits.

Particularly in large-sized or thick-section composite parts, controlling temperature differences, preventing void formation, delamination, and mechanical property deviations is of great importance. In pressurized processes, controlling pressure together with temperature supports structural stability and quality continuity.



- ***Custom Heat Treatment Lines***

In the defense industry, product dimensions, geometries, production quantities, and process requirements can vary significantly.

As production volume and continuity requirements increase, the goal is not only to perform the correct heat treatment but also to produce the same quality at high speed, in a standardized and traceable manner.

For this reason, for products with different sizes and geometries, continuous or application-specific heat treatment lines can be designed according to process requirements and target capacity.

In these systems, the process is not limited to the furnace section; product transfer, loading and fixturing, heating, soaking, and cooling stages are evaluated together with automation, recipe management, and data recording infrastructure.

In high-capacity or repetitive production, proper line design ensures increased production speed as well as process repeatability, quality standardization, and product-level traceability.

Thus, the need evolves from a standard furnace solution into an integrated engineering solution shaped according to product family, process flow, and capacity.

- ***Compliance with standards and validation chain***

In defense projects, heat treatment infrastructure is evaluated not only based on the nominal capacity of the equipment, but also on the ability to manage processes in a verifiable manner.

The fundamental elements that ensure the user obtains the desired final product include the accuracy of measurement systems, furnace performance validation, and recording discipline.

Within this scope, alongside reference frameworks such as Nadcap accreditation and SAE AMS2750,

the chain of TUS, SAT, and calibration forms the backbone of process assurance infrastructure. With TUS, temperature uniformity within the furnace working volume is verified, while SAT ensures the accuracy of the measurement system.

Sensor and measurement device calibrations, process reports, alarm history, and deviation management complete this validation chain.

Thus, quality becomes not only an achieved result but a proven and auditable process outcome that is documented, repeatable, and controllable.

- ***Digitalization and energy efficiency***

In next-generation heat treatment systems, furnaces are no longer only operated but are managed through data.

Recipe standardization, user authorization, alarm and fault history, process reports and trend tracking enable early detection of process deviations, reduce operator-related errors, and ensure continuity of quality.

At the same time, digital infrastructure supports audits and acceptance processes in the defense industry by enabling backward traceability at the product, recipe, and process levels.

Energy efficiency is also becoming increasingly critical in terms of both operational costs and sustainability.

Cycle optimization, reduction of unnecessary waiting times, minimization of heat losses, and proper furnace insulation design contribute to reducing total energy consumption.

Therefore, in new investments, evaluation should not be based solely on the equipment purchase cost but also on the total cost of ownership and lifecycle performance of the system.

- ***Demilitarization: End-of-Life Management and Safe Disposal***

The defense lifecycle is not limited to production; end-of-life management and safe disposal processes are also an essential part of the defense ecosystem.

Products that have reached the end of their service life, become obsolete, or are returned from the field must be disposed of safely and in compliance with regulations. This requires safety, traceability, and environmental control.

Demilitarization facilities are specialized solutions that ensure safe destruction processes are managed in a controlled and auditable manner.

In such facilities, process safety, automation, control and monitoring infrastructure, recording discipline, and environmental impact management must be handled together.

In facilities where potentially explosive atmospheres exist, proper equipment selection and safety design in accordance with the ATEX approach become critical requirements.

Therefore, in demilitarization system design, not only process capacity but also explosion safety, operational security, and regulatory compliance must be evaluated holistically.

Sistem Teknik's approach: Integrated solution

Within this framework, the defense industry requires not just a single furnace but fully integrated solutions designed specifically for applications, compliant with standards, verifiable, traceable, and sustainably operable.

As Sistem Teknik, our goal is not only to supply equipment but to position ourselves as a solution partner covering the entire process—from design to commissioning, from validation to recording and traceability infrastructure, and from modernization to sustainable operation through service processes.

Within this scope, Sistem Teknik offers:

- Application-specific industrial furnace solutions in various configurations
- Vacuum heat treatment systems and LPC solutions
- Composite curing and pressurized consolidation systems
- Batch (load-based) and continuous custom process lines according to capacity
- A wide range of furnace types suitable for different product sizes and process requirements
- TUS/SAT and process-specific validation/testing capabilities
- Modernization and service solutions
- Demilitarization facilities
- ATEX-compliant design approaches for potentially explosive atmospheres

Thus, a comprehensive solution framework is provided for the defense industry.

The main objective of this approach is to deliver a process assurance infrastructure where not only equipment, but also technical performance, quality assurance, traceability, and production continuity are managed together in a verifiable manner.

As a result, heat treatment is one of the critical and non-compensable stages in defense manufacturing.

The correct microstructure, proper surface condition, appropriate process, correct system selection, and accurate data recording infrastructure form the foundation of competitiveness and reliability.

With increasing global defense demand, high-volume production requirements, stricter quality standards, advanced material and process technologies, and sustainability expectations, industrial furnaces and process lines developed for the defense industry should be considered not merely as production investments,

The Impact of Electrification on Efficiency and Carbon Footprint in Industrial Heat Treatment Furnaces: GREEN TRANSFORMATION AT SKF

Selin Şahin - Sarvion End. Malz. ve Müh. Tic. A.Ş., Project Manager

An Engineering Approach Beyond Electrification

As investments aimed at reducing carbon emissions in industry accelerate within the scope of the European Green Deal, the conversion of natural gas-fired systems to electric solutions in heat treatment processes has also become an important area of transformation. However, this transformation should not be evaluated merely as replacing the combustion system with electric heaters. The design of the electric heater, power selection, and control strategy directly determine energy consumption, equipment lifetime, and carbon footprint. In this context, the 120 kg/hour capacity drum-type tempering furnace at the SKF facility operating in Cassino, Italy, has been converted from a natural gas-fired system to a fully electric heating system in line with green energy transformation goals. Throughout the project, while maintaining the existing production capacity, reducing carbon emissions and improving energy consumption were targeted.

Analysis of the Existing System

Before the revision, the furnace had a total of eight natural gas burners, four on the right side and four on the left.

The burners were operating with U-type radiant tubes, with a burner located at one end of the tubes while the other end functioned as a flue. Since technical label data of the burners was not available, their exact capacity could not be determined; however, based on process data and consumption analyses, it was identified that the system operated at approximately 70–75 kW. The main expectation of the customer was to eliminate the use of natural gas entirely while maintaining the current process performance and to achieve a transition to a sustainable production infrastructure with lower carbon emissions.

Design of the Electric Heating System

Within the scope of the revision, the existing U-type radiant tubes were preserved, and cage-type electric resistances were specially designed to be placed at both ends. In this way, two resistances were used in each radiant tube, and a total of 16 electric heaters were put into operation. The most important engineering approach of the system was not only the use of electric heaters, but also ensuring that the resistance wire temperature was kept under continuous control. Thanks to the thermocouples placed inside each cage-type resistance, the wire temperature is continuously monitored by the PLC, and when the specified limit temperatures are reached, the SCR-controlled power system temporarily cuts off the heating to maintain a safe operating temperature for the resistance.

As a result of this control approach,

- the risks of arcing and melting due to excessive temperature in the resistance wires have been reduced,
- the lifetime of the resistances has been extended,
- maintenance and spare part costs have been reduced,
- and unplanned downtime has been minimized.

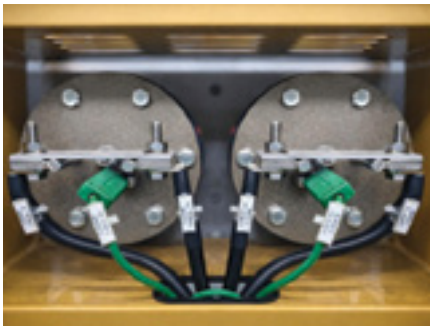
For supplying the electric heating system, two power transformers were used, and power control was achieved with SCR technology. Within the scope of the project, a new SCR panel and PLC control panel were designed, and together with HMI screens, the automation software was completely renewed, and the electric heating system was fully integrated into the existing process.



BEFORE



AFTER



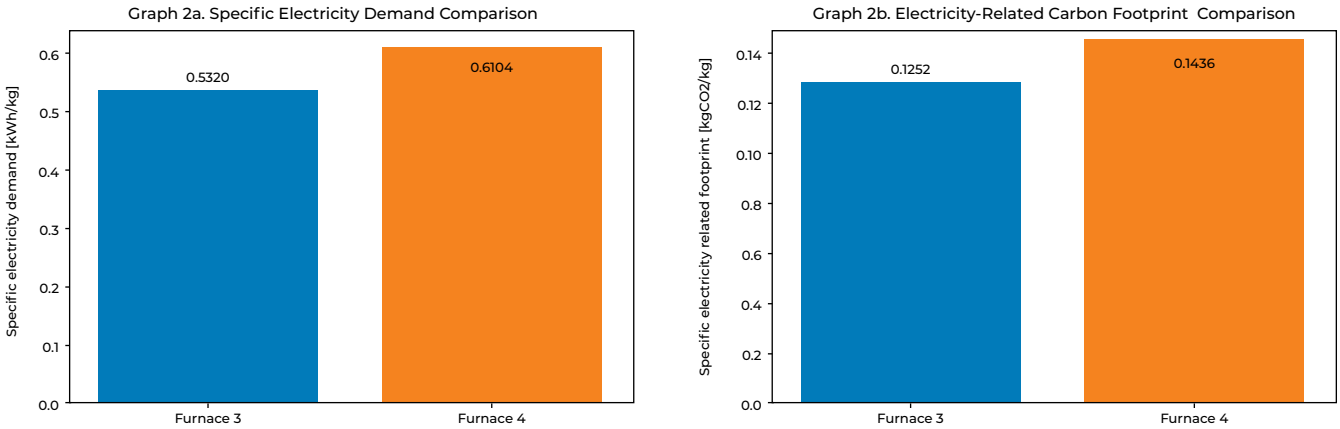


Figure 1. Specific electricity demand and electricity-related footprint comparison.

Carbon Footprint and Energy Performance

In the performance evaluation carried out after the revision, a comparative energy analysis was conducted with another electric tempering furnace operating at a similar capacity.

While spiral-type electric resistances were used in the compared system, specially designed cage-type resistances were preferred in the revised system. As a result of the measurements, the specific electrical consumption in the revised furnace was determined as **0.53 kWh/kg,** while it was **0.61 kWh/kg** in the compared electric furnace. These values show that the revised system achieved approximately **13% lower specific energy consumption**. At the same time, while the product carbon footprint from electricity was calculated as **0.125 $kgCO_2$/kg**, this value was found to be **0.144 $kgCO_2$/kg** in the compared system. Thus, approximately **0.019 $kgCO_2$** lower carbon emissions per product were achieved. In the graphs shown in Figure 1 and Figure 2, Furnace 3 represents the revised system, while Furnace 4 represents the compared electric furnace with similar capacity.

Although the process boundaries of the two systems are not completely identical (one system includes only tempering, while the other includes washing and tempering processes), it is observed that the revised system maintains its energy performance advantage even after the sensitivity analyses carried out in the report.

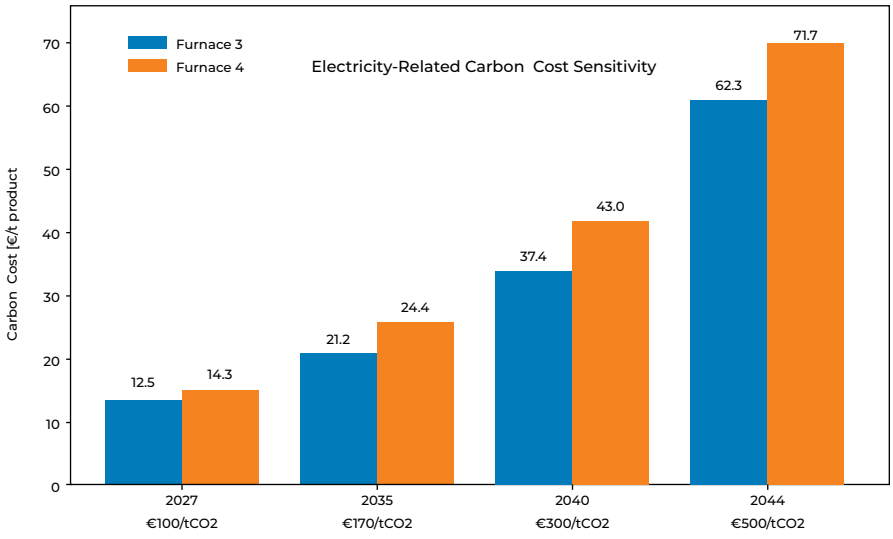


Figure 2. Electricity based carbon cost sensitivity with future predictions of carbon cost in Europe.

Conclusion

The SKF Cassino project demonstrates that the transition to electric heating is not merely limited to replacing burners with electric resistances. Designing the electric heater in accordance with process conditions, performing correct power calculations, and applying advanced temperature control algorithms play a critical role in energy efficiency, equipment lifetime, and reduction of carbon emissions. The results obtained reveal that electric furnace revisions carried out with the right engineering approach can make significant contributions both to sustainability goals and to the reduction of long-term energy and maintenance costs of enterprises.

The energy performance achieved within the project has shown lower specific energy consumption and a lower electricity-based carbon footprint compared to similar electric systems. In addition, the sensitivity evaluation regarding carbon costs indicates that if carbon prices increase in the future, high energy-efficient systems will provide not only environmental but also economic advantages. For this reason, the success criteria in electric furnace transformations should not be limited only to fuel switching; it should include heater design suitable for process requirements, the correct control system, and an optimized engineering approach.

“OUR MAIN OBJECTIVE IS TO PROVIDE A PRODUCTION INFRASTRUCTURE THAT CAN COMPETE ON A GLOBAL SCALE, WHILE INCREASING OUR SHARE OF DOMESTIC AND NATIONAL PRODUCTION IN THE DEFENSE INDUSTRY.”

Interview by: Berkay Emiroğlu – Sinerji Yüksek Teknoloji / Production Engineer

Our collaboration with Sistem Teknik has progressed in a highly dynamic and solution-oriented manner, from the project design phase to on-site installation and post-commissioning technical support. Their constructive approach in addressing technical deficiencies encountered under field conditions, as well as their efforts in optimizing hydraulic and mechanical components and providing maintenance training, has facilitated the line in reaching full capacity.



Can you briefly tell us about your company and your role?
I work in the field of Production and Operations Management / Production Engineering within Sinerji High Technology. In our facilities, I coordinate the uninterrupted execution of hot forging and heat treatment processes for ammunition and heavy industry components with high quality and optimum efficiency.

Regarding the defense industry sector you serve, which products and services of Sistem Teknik do you benefit from?
In the production of ammunition bodies for the defense industry, which require high strength and precision, we benefit from Sistem Teknik’s industrial furnace solutions and engineering support services. In particular, we have integrated continuous walking-beam heat treatment lines, austenitizing and tempering furnaces, and quenching tank systems into our production processes.



sinerji



What kind of processes do you carry out in the furnaces you use in your production lines?

In the furnaces within our production line, the main processes carried out are as follows:

- Austenitizing: Preparing the internal structure of forged ammunition bodies for hardening by homogenizing it at high temperatures after forging.
- Oil/Water Quenching: Controlled rapid cooling to achieve the desired mechanical strength and hardness values.
- Tempering: Eliminating brittleness and imparting the required ductility, impact resistance, and final mechanical properties to the parts.

What are the main advantages of using Sistem Teknik furnaces?

- High Temperature and Atmosphere Uniformity: Achieving consistent and repeatable quality on a part-by-part basis.
- Precise Process Control: Minimizing parameter deviations through advanced automation and recipe management infrastructure.

Could you talk about the contributions of the new furnace, manufactured and installed by Sistem Teknik, to your processes?

Our new walking beam heat treatment line, whose installation and commissioning were completed by Sistem Teknik, has elevated our production capacity and quality to a higher level.

Could you provide an evaluation of your collaboration with Sistem Teknik and the overall progress of the services you have received?

Our collaboration with Sistem Teknik has progressed in a highly dynamic and solution-oriented manner, from the project design phase to on-site installation and post-commissioning technical support. Their constructive approach in addressing technical deficiencies encountered in field conditions, as well as their work on the optimization of hydraulic and mechanical components and maintenance training, has facilitated the line in reaching full capacity.

If we ask you to share your goals and plans as Sinerji with our readers, what would you say?

As Sinerji, our main goal is to provide a production infrastructure that can compete on a global scale while increasing our share of local and national production in the defense industry:

- Integrating all processes in our production lines with data-driven automation systems.
- Doubling our ammunition production volumes through modernization investments in hot forging and heat treatment lines.
- Creating an environmentally friendly and sustainable industrial model at high standards by optimizing unit energy consumption.

SISTEM TEKNIK HAS ONCE AGAIN TAKEN ITS PLACE ON THE INTERNATIONAL STAGE OF THE FIRE RESISTANCE INDUSTRY!



With its expertise in fire resistance test furnaces and its international projects, Sistem Teknik Sanayi Fırınları A.Ş., which has been operating in the sector for many years, participated once again this year as a sponsor in the annual meeting organized by EGOLF (European Group of Organisations for Fire Testing, Inspection and Certification).

At the event held between April 21–23, 2026, in Borås, Sweden, Sistem Teknik came together with industry professionals from different countries around the world, closely followed the latest developments in the field of fire resistance, strengthened existing collaborations, and found opportunities to establish new connections.

Sistem Teknik, which has been regularly participating in the EGOLF organization for many years, also took part this year as a sponsor. At its stand in the event area, the company presented its engineering capabilities, products, and system solutions in the field of fire resistance test furnaces to international participants.

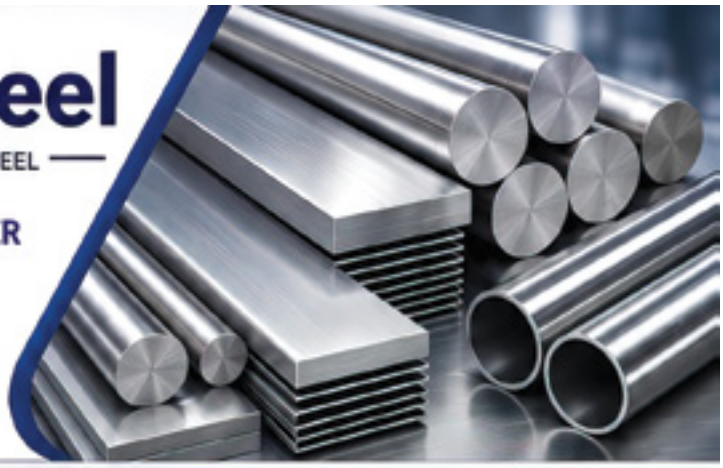
Throughout the three-day event, sessions on fire resistance tests, testing and certification processes, international standards, and the latest developments in the sector were followed. At the same time, meetings held with test laboratories, certification bodies, and industry representatives from different countries provided a valuable environment for sectoral knowledge sharing and new business collaboration opportunities.

The EGOLF organization, in which Sistem Teknik has been regularly involved for many years, continues to serve as an important platform for strengthening the company's international presence in fire resistance testing technologies and maintaining direct communication with leading organizations in the sector.

With its engineering expertise and international experience in fire resistance testing technologies, Sistem Teknik continues to take an active role in shaping the industry, adding value to the sector, and strengthening international collaborations.

Minerva Steel

EVERYTHING ABOUT STAINLESS STEEL



YOUR TRUSTED STAINLESS STEEL PARTNER

Minerva Steel is a Türkiye-based stainless steel supplier providing high-quality stainless steel products and value-added processing solutions for industrial and engineering applications.

With strong expertise in specialized stainless steel grades, we supply **sheets, plates, round bars, pipes, profiles and custom-cut components** to customers in Türkiye and around the world.

SPECIALIZED IN 310 / 310S & 321 STAINLESS STEEL

Minerva Steel is particularly strong in the supply of **AISI 310 / 310S and AISI 321 stainless steel.**
We provide reliable solutions for demanding applications requiring high-temperature resistance, corrosion resistance and long service life.

ROUND BARS
Ø50 – Ø150 mm

SHEETS & PLATES
0.5 – 30 mm

Our products are widely used in heat treatment, industrial furnaces, chemical processing, food industry, machinery, energy and general engineering applications.

20 kW FIBER LASER CUTTING

Our advanced 20 kW fiber laser cutting **technology** enables us to cut stainless steel plates up to 50 mm thickness with high precision and superior edge quality.

From standard material supply to custom-designed components, Minerva Steel provides material, technical expertise and precision cutting services under one roof.

This capability allows us to streamline our customers' supply chain, reduce lead times and deliver tailor-made solutions.



UP TO **50 mm** CUTTING CAPACITY

EXPORTING TO 11 COUNTRIES GLOBAL PARTNERSHIPS

Minerva Steel exports stainless steel products **to 11 countries** today and builds long-term partnerships in international markets.

By understanding the technical and commercial needs of our customers in different regions, we combine quality materials with reliable logistics and professional service.



11 COUNTRIES
STAINLESS STEEL ENGINEERING SOLUTIONS

CUSTOMER FOCUS & QUALITY SERVICE

At Minerva Steel, we believe tha: our success is built on strong customer relationships and a sustainable service approach.

We treat every customer's need not just as an order, but as the beginning of a long-term partnership.

From the right material in the right quality and dimensions to on-time delivery and after-sales support, we manage all our processes in line with our customers' expectations.

Customer focus, quality service and reliable supply are the core values of Minerva Steel.

We analyze technical requirements accurately, offer suitable stainless steel solutions and maintain transparent communication at every stage.

Our goal is not just to sell products, but to be a reliable and sustainable solution partner that adds value to our customers' business processes.



Our exports to 11 countries are a testament to our commitment to quality, reliability and service excellence in global markets.

Minerva Steel — Quality Materials, Strong Service, Long-Term Partnerships.

STRONG STOCK & RELIABLE SUPPLY | HIGH QUALITY STAINLESS STEEL | 20 kW FIBER LASER CUTTING TECHNOLOGY | EXPORTING TO 11 COUNTRIES | CUSTOMER FOCUSED QUALITY SERVICE

Minerva Steel
EVERYTHING ABOUT STAINLESS STEEL
Everything About Stainless Steel.

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ACHIEVING SUCCESS TOGETHER: EFFECTIVE LEADERSHIP AND HIGH-PERFORMANCE TEAMS



In corporate life, lasting success does not have a single hero; success is the result of a well-directed, harmonious team. As we strive to achieve our goals, our greatest strength in turning our vision into action is our human capital and our culture of working together.

With this vision, through the "Grid and Belbin Method: Effective Leadership and Teamwork Workshop Series," which we launched in 2025 and continued in 2026 with Corporate Academy Trainer Expert Psychologist Ülkü Önder, we examined two globally recognized management approaches that will further strengthen our corporate culture and elevate our internal synergy: the Managerial Grid Model and Belbin Team Roles.

So, what do these two powerful models tell us, and how do they transform our daily ways of working?

Our Leadership Compass: The Managerial Grid Model

What is the most important factor a leader should focus on when leading a team to its goals: the task itself, or the people doing the task?

The Managerial Grid (Leadership Grid) Model, developed by Robert Blake and Jane Mouton, defines effective leadership based on these two dimensions: concern for production/results and concern for people. In our workshops, we addressed—through practical case studies—that leadership is not a one-dimensional concept; while aiming for operational excellence and efficiency, employee motivation, trust, and development must also be maintained at the highest level.

The most ideal point indicated by the model, the "Team Management" (9,9) style, reflects the core philosophy adopted by our company:

When our strong commitment to our work and the deep respect we have for one another come together, achieving high performance becomes inevitable—even in the most complex projects and during crisis situations.

The DNA of the Team: Belbin Team Roles

While leadership creates the right climate, the element that will thrive within that climate is the team itself. At this point, Belbin Team Roles come into play, based on the philosophy: "There are no perfect individuals, but there are perfect teams."

According to this approach, developed by Dr. Meredith Belbin as a result of years of research, a successful team is not formed merely by bringing together intelligent or talented individuals. Success is achieved by the balanced combination of different behavioral profiles (roles) that are action-oriented, people-oriented, and thought-oriented.

Throughout the workshop, we had the opportunity to discover our natural tendencies and our roles within the team:

Some of us, in the role of "Innovators," plant the seeds of new ideas,

Some of us, in the role of "Implementers," transform these ideas into systematic processes,

Some of us, in the role of "Completers," identify risks in the details and ensure quality.

According to the approach developed by Dr. Meredith Belbin through years of research, a successful team is not formed simply by bringing together intelligent or talented individuals.

Belbin defined people's natural behavioral tendencies within a team under nine different roles. These roles are not fixed personality traits; rather, they represent a dynamic map of how we interact with our environment in the workplace and in which areas we can create the highest added value.

Success is achieved through the balanced combination of these different behavioral profiles (roles), which are action-oriented, people-oriented, and thought-oriented.

In our company, the workshop process that started with leadership teams continued in two sessions with Specialist / Engineer / Blue-Collar team leaders who carry out operations. We learned that our differences are not a source of conflict, but the greatest strength of our team. When we complement each other's weaknesses with our strengths, we create value far greater than the sum of our individual capacities.

This workshop series once again showed us that when we demonstrate a trust-based leadership approach that values both goals and people simultaneously through the Managerial Grid, and when we understand each other's differences and work collaboratively through the Belbin model, there is no obstacle we cannot overcome as an organization.

By carrying these valuable insights gained from the training into our daily operations, meetings, and project processes, we will continue to achieve new successes together.

BELBIN TEAM ROLES

ACTION-ORIENTED
Transforms ideas into results

Shaper
Takes on challenges and increases momentum. Drives the team toward the goal.

Implementer
Turns plans into organized and practical actions.

Completer-Finisher
Controls details; identifies errors and deficiencies before the work is completed.

PEOPLE-ORIENTED
Builds relationships and collaboration

Coordinator
Clarifies goals and matches talents with the right tasks.

Teamworker
Supports harmony, softens conflicts, and strengthens collaboration.

Resource Investigator
Establishes external connections, discovers opportunities and new resources.

THOUGHT-ORIENTED
Provides analysis and expertise

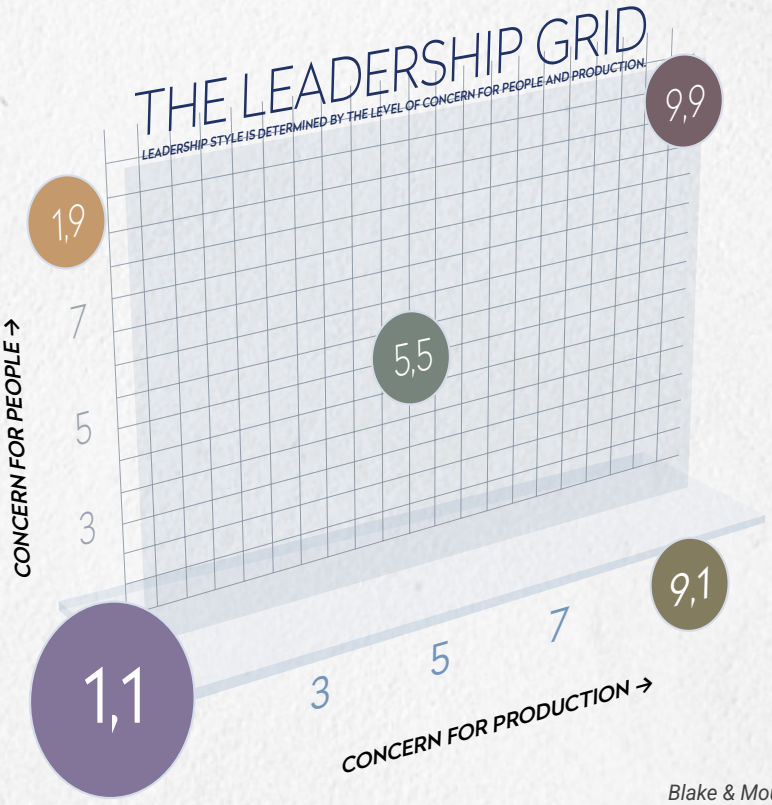
Plant (Creative)
Develops original ideas and finds new ways to solve complex problems.

Monitor Evaluator
Analyzes options objectively and ensures sound decision-making.

Specialist
Provides deep knowledge and technical expertise in a specific field.

One person can take on more than one role • balance varies depending on the team's needs.





FIVE BASIC LEADERSHIP STYLES

- **9,9** Team Management — *High commitment + high performance*
- **1,9** Country Club Management — *Strong relationships, low focus on results*
- **9,1** Authority-Compliance — *Strong focus on results, low focus on people*
- **5,5** Middle-of-the-Road Management — *Balanced on both axes, moderate approach*
- **1,1** Impoverished Management — *Low involvement in both dimensions*

9,9: the ideal approach of the model.

Blake & Mouton Managerial Grid: 1 = low importance, 9 = high importance.

SISTEM TEKNIK SANAYI FIRINLARI A.Ş. — ELECTRICAL AUTOMATION

STAR: SISTEM TEKNIK ADVANCED REPORTING SYSTEM

Proses: Standard quench (vacuum hardening) furnace • **System:** STAR process reporting WinCC V8.1 · SQL Server · HTML5 • **Field:** Heat treatment automation, process quality documentation, sustainability

Eren Şahin - Automation Assistant Manager

ABSTRACT

In standard quench furnaces, data generated throughout a cycle—such as recipe definitions, second-level measurement records, alarms and events, and resource consumption—are often stored separately, and quality records are compiled manually. This study presents a reporting system that consolidates all such data into a single document, generated by the operator with a single button, and capable of functioning fully even on a computer without an internet connection. The distinguishing feature of the system is that it does not merely display raw data: recipe parameters are transformed into a step-by-parameter matrix, unused measurement channels are automatically eliminated, alarms are chronologically embedded into the data timeline, and the carbon footprint is calculated based on electricity and nitrogen consumption. The method is demonstrated through the report of a carburizing cycle lasting twenty-five hours.

1. Introduction

Standard quenching is a hardening process in which the load is heated under vacuum and rapidly cooled with gas. Throughout the cycle, temperature, vacuum, pressure, and resource consumption are monitored simultaneously; the process can last for hours, and in some cases even days. Once the process is completed, a record must be left behind that documents how the product—ready for delivery to the customer—has been treated.

In practice, this record is often fragmented. The recipe definition is on the SCADA screen, measurement data is stored in a database, alarms are listed separately, and energy consumption appears in the facility's utility bills. The quality record is created by manually combining these pieces—making the process both time-consuming and dependent on the person compiling it.

The STAR system presented in this study automates the task of combining these elements and produces **a single document**. In the following sections, the system's capabilities are first introduced, followed by an example cycle, and finally the limitations of the method are discussed.

2. Capabilities of the Report

2.1. Process Information and Resource Consumption

The first section of the report presents the cycle identity in a card-style layout: recipe name, operator, start and end times, calculated cycle duration, and load information.

The same section also includes **electricity (kWh) and nitrogen (Nm³) consumption**, along with the calculated Scope 2, Scope 3, and product carbon footprint derived from these values. The summary information sought by the person reviewing the quality document is gathered on a single screen.

2.2. Recipe Chart

Recipe steps are not stored as rows in the database, but as columns in the format Step1_SetTemperature, Step1_



Figure 1. Process information section. The top row contains recipe, time, and operator information; the bottom row includes cards for electricity consumption, nitrogen consumption, Scope 2 CF, Scope 3 CF, and product carbon footprint. Values represent cumulative readings at the end of the cycle.



Figure 2. Recipe chart. Each column represents a step, and each row represents a parameter; step types (vacuum, convection heating, static partial pressure) are indicated in the header. Hundreds of database columns have been reduced to a single readable chart.

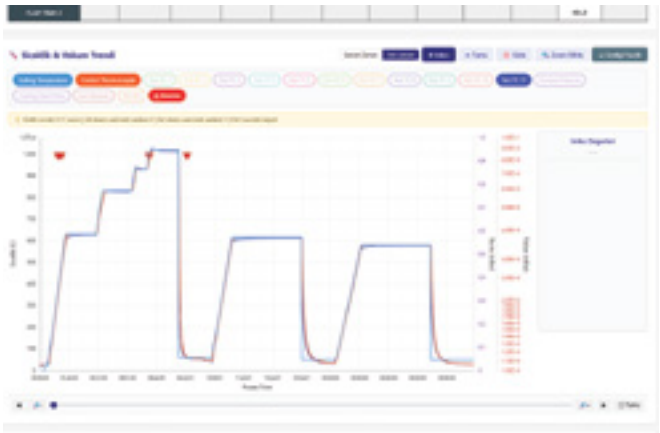


Figure 3. Temperature and vacuum trend.
The entire twenty-five-hour cycle is displayed on a single graph; the set temperature and control thermocouple are overlaid. Channels are selected from the upper legend bar, and navigation along the time axis is performed using the slider below.

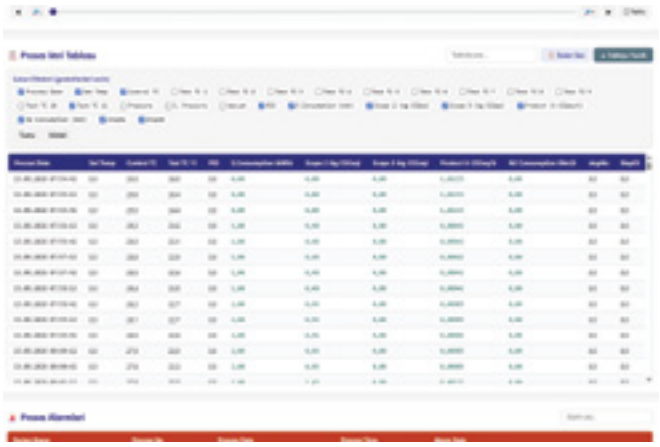


Figure 4. Process Data Table.
At the top, a column selector is provided; selected channels are displayed in the table. Consumption and emission columns (E.Consumption, Scope 2, Scope 3, Product, N_2 Consumption) appear in each measurement row.

Ramp, Step2_SetTemperature, etc. A twenty-step recipe in this structure corresponds to hundreds of columns and cannot be read directly.

The first operation of the reporting engine is to convert this flat column list back into a **step × parameter matrix**. Parameters are then arranged in a meaningful order: set temperature, ramp, time, cooling, and others.

2.3. Interactive temperature and vacuum trend

In the trend graph, the set temperature, control thermocouple, and load thermocouples are plotted on top of each other; pressure and vacuum are displayed on separate axes. The user can toggle channels on and off via the legend, zoom into any part of the graph, and read all values at a single moment using the cursor. **Alarms are marked directly on the curve**; thus, the exact moment when a deviation occurs can be immediately seen from the graph.

2.4. Process data table and channel filtering

All measurement rows of the cycle are presented in tabular form. Load thermocouples are defined according to furnace capacity; however, not all of them are used in every load. An unconnected channel writes a constant value to the database and unnecessarily crowds the table. The column selector allows the user to determine which channels will be displayed.

2.5. Chronological integration of alarms and events

When alarms are presented as a separate list, it is not possible to determine at which process step the deviation occurred. The system places alarm records and operator interventions **as rows within the data table at their corresponding timestamps**, and also marks them on the trend graph. Thus, the event becomes visible together with the data flow.

2.6. Exporting, printing, and the single-file principle

The report is generated as **a single HTML file** including the company logo, graph libraries, and all data. This is not a preference but a requirement arising from the production environment: SCADA computers do not have, and are not intended to have, internet access. Libraries are installed locally once during setup and embedded into each report; no external connection is made during operation.

The resulting document can be sent via email, transferred via a portable drive, and maintains the same appearance even years later. The report also produces a multi-page spreadsheet-style output (including data, recipe, operations, and alarms) and is formatted for A4 landscape printing: controls are hidden during printing, sections are not split across pages, and table headers are repeated on each page.

4.997 kWh ELECTRICITY CONSUMPTION	244,92 Nm³ NITROGEN CONSUMPTION	2.489 kg CO_2eq TOTAL EMISSIONS	2,12128 t CO_2eq / t PRODUCT CARBON FOOTPRINT

Item	Consumption	Emission Factor	Emission	Share of total
Electricity (Scope 2)	4.997,00 kWh	0,478 kg CO_2eq/kWh	2.388,57 kg CO_2eq	%96,0
Nitrogen (Scope 3)	244,92 Nm³	0,410 kg CO_2eq/Nm³	100,42 kg CO_2eq	%4,0
Total	—	—	**2.488,99 kg CO_2eq**	**%100**

Table 1. Emission breakdown of the sample cycle. Emission factors are derived from the ratio of consumption and emission values included in the report.

3. Example Cycle

The values below are taken from the report of a hardening cycle lasting twenty-five hours and one minute (recipe: 1020 HARDENING). The carbon footprint is calculated from the cycle's **electricity (kWh) and nitrogen (Nm³) consumption**; electricity is reported under Scope 2, while nitrogen is reported under Scope 3 as supply chain emissions.

Finding: 96% of emissions originate from electricity. This ratio directly indicates where improvement efforts should be focused. A 10% saving in nitrogen consumption would reduce the total carbon footprint of the cycle by only 0.4%, whereas the same rate of electricity savings would reduce it by 9.6%. Without item-based measurement, this prioritization would not be visible, and improvement efforts could be directed to the wrong area.

4. Evaluation

- **Single document.** Recipe, measurements, events, and consumption are collected in the same record; no separate file compilation is required for quality documentation.
- **Instantly ready.** The report can be generated as soon as the cycle is completed; the need for manual data collection is eliminated.
- **Measurement-based environmental data.** The carbon footprint is not allocated based on plant averages; it is calculated from the actual consumption of that specific cycle.
- **No additional hardware required.** Electricity and nitrogen measurements are already connected to SCADA; the only addition is a software layer that reads and processes these values.
- **Compatibility with isolated networks.** Thanks to the single-file principle, the report runs fully functional on a computer without an internet connection.
- **Comparability.** Normalized values per product enable comparison between loads of different sizes and different recipes.

5. Limitations

The scope of the method must be clearly defined; otherwise, the produced figure may be perceived as representing a broader meaning than it actually does.

- **Scope limitation.** The calculation includes only the direct consumption of the furnace cycle. Load preparation, transportation, furnace waiting times, and general facility inputs (lighting, heating, compressed air) are not included.
- **Normalization basis.** The value per product is obtained by dividing by the load mass. Whether this mass represents the gross load or the net product must be consistently defined across the facility; otherwise, two reports cannot be compared.
- **Idle time.** The energy consumed by the furnace outside the cycle is not included in this calculation; therefore, the difference between the total plant consumption and the sum of the cycles is expected.

6. Conclusion and Future Work

This study demonstrates that, in an energy-intensive production step such as standard quenching, both quality documentation and environmental data can be generated through a software layer added to the existing SCADA infrastructure, without requiring significant hardware investment. The key factor is not establishing a new measurement system; rather, it is transforming already measured variables into a meaningful document using process engineering logic — recipe matrix, channel filtering, event structuring, emission factors. As future work, it is aimed to enable time-based accumulation of cycle data for recipe-based carbon comparison, to monitor furnace performance through statistical process control, and to automatically generate product carbon declarations at the order level.

Responsibility of the Emission Factor The accuracy of the calculation is only as reliable as the accuracy of the emission factor used. Grid carbon intensity varies from year to year, and the nitrogen factor differs depending on the supplier. Unless the source, year, and scope of the factor are properly documented, the report cannot be defended during an audit.

HT & HIP CONFERENCE IN CHINA

Sarvion's CEO Beste Özdeşlik presented at 5th HT & HIP Conference held in Wuxi, China on April 8-10, 2026 with the title "Evaluation of Compliance and Performance of Heat Treatment Furnaces". The conference was successful with 680 attendees, the main focus however was on HIP technologies. SARVION was the only Turkish company within the presenters.





MAİB BOARD MEMBERSHIP:
REPRESENTING THE INDUSTRIAL FURNACE SECTOR IN EXPORTS!

At the Ordinary General Assembly held in Ankara on April 16, 2026, our General Manager, Beste Özdeşlik, was elected as a full member of the Board of Directors of the Machinery Exporters' Association (MAİB).

We congratulate our General Manager, who represents our sector under the Türkiye's Machinery brand.



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PETROFER, as your global technology partner in specialty industrial lubricants, process chemicals, and greases, offers high-quality products based on more than 800 advanced formulations.

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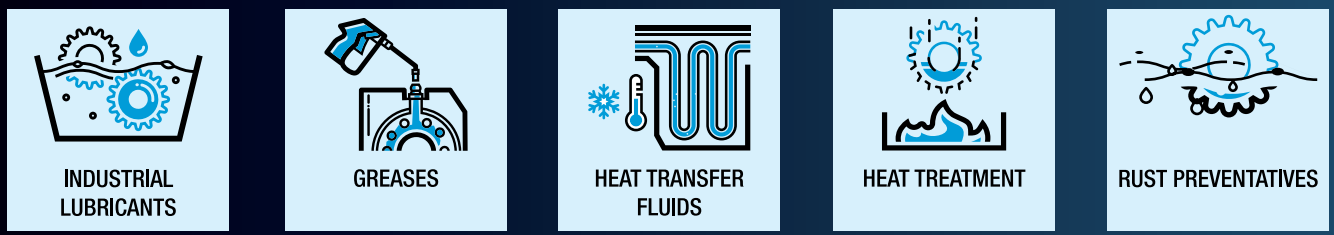

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#fırsatı eşitle yeteneği çeşitle

EQUALIZE OPPORTUNITY, DIVERSIFY TALENT.

Through the "Equalize the Opportunity, Diversify the Talent" (FEYÇ) project, implemented in collaboration with the European Bank for Reconstruction and Development (EBRD) and the TAYSAD Automotive Suppliers Association of Türkiye, our company participated as a Project Stakeholder in the fourth term of the program. Through this initiative, we aimed to increase the proportion of women employees and introduce diversity and inclusion practices within our organization.

GENDER EQUALITY: WHAT IS IT ?

Gender equality means ensuring that people of all genders have equal rights, opportunities, resources, and responsibilities. It means developing and implementing models and methods to establish gender equality. Equality does not mean that women and men will be the same; however, the rights, responsibilities, and opportunities of women and men will not depend on whether they are born male or female. Every community in which people live together is affected by gender inequality. The reduction of violence and the increase in economic prosperity are directly proportional to achieving gender equality. Gender equality is not a "women's issue"; it is an issue that concerns and should concern men as much as women. Equality between women and men is regarded both as a human rights issue and as a prerequisite and indicator for sustainable development.

Not everyone experiences inequality in the same way. Today, women and children constitute the groups most affected by gender inequality, both around the world and in our country. Men are also negatively affected by gender inequality. A multidimensional approach is needed to achieve gender equality. Work should be carried out based on the principle of equality in every area, from employment experience to communication and from education to rethinking the ecosystem, and these efforts should remain open to continuous improvement.





WHAT HAVE WE DONE FOR FEYÇ AT OUR COMPANY?

- Understanding Gender Roles and Norms: We held an awareness-raising training session with Ebru Nihan Celkan on March 12, 2026
- Assessing Gender-Based Inequalities: We established a voluntary FEYÇ Working Group within the company. The Working Group consists of:

  Nazlı Keskin – Human Resources and Administrative Affairs Manager
  Cansu Özsubaşı – Secretary
  Özlem Kara – Planning and Organizations Manager
  Fatih Gümüşsoy – After-Sales Services Assistant Manager
- Examining the Gender-Based Division of Labor: We completed the Gender Equality Checklist.
- Identifying Gaps and Opportunities: We developed a Gender Equality Action Plan.

  As the first step of the action plan, we added a commitment to promoting gender equality to our recruitment procedure—an area that had not previously been a specific focus before FEYÇ—and completed 50% of our recruitment processes in 2026 with female candidates.

  The positions filled through these recruitment processes included roles such as Production Officer, Tool Room Responsible, and Administrative Affairs Specialist—positions in which women had never previously been employed throughout the company's history.

  With Hasan Deniz from AÇEV as the trainer, we provided all company employees with training on “The Role and Importance of Fathers in Child Development and Care.”

  Through the FEYÇ Working Group meetings, we also had the opportunity to connect with companies that had participated in previous FEYÇ terms and learn about the positive and beneficial transformations they had achieved within their organizations through the FEYÇ initiative.



WHAT DO WE WANT TO ACHIEVE AND ENSURE THROUGH THE PROJECT?

- ✔ We want to ensure that both women and men are represented.
- ✔ We want to avoid the use of exclusionary language.
- ✔ We want to ensure equal communication with individuals.
- ✔ We want to continue collecting and analyzing gender-disaggregated data.

SISTEM TEKNIK ACCELERATES ITS GREEN TRANSFORMATION



Sistem Teknik has taken a significant step towards its sustainability goals by transforming its vehicle fleet. All company vehicles assigned to executives have been replaced with Togg, Türkiye's domestically manufactured electric car. This initiative aims to reduce carbon emissions, promote energy efficiency and support the wider adoption of homegrown technology.

GROUP COMPANIES UNITE UNDER IDT GROUP

Bringing the group companies (Sistem Teknik Industrial Furnaces, Sarvion, Sistem Teknik Heat Engineering and Vesta TP) together under IDT Group has established a strong corporate foundation for the family business's sustainable future. Each company will retain its own expertise and corporate identity while working towards a shared vision. With its combined capabilities and renewed strategic direction, IDT Group is preparing for the future through a stronger and more integrated structure.



We professionally supply full-range graphite products for high-temperature vacuum furnaces: precision machined high-purity graphite parts, C/C carbon-carbon composite components, rigid graphite thermal insulation felt and soft graphite thermal insulation felt.

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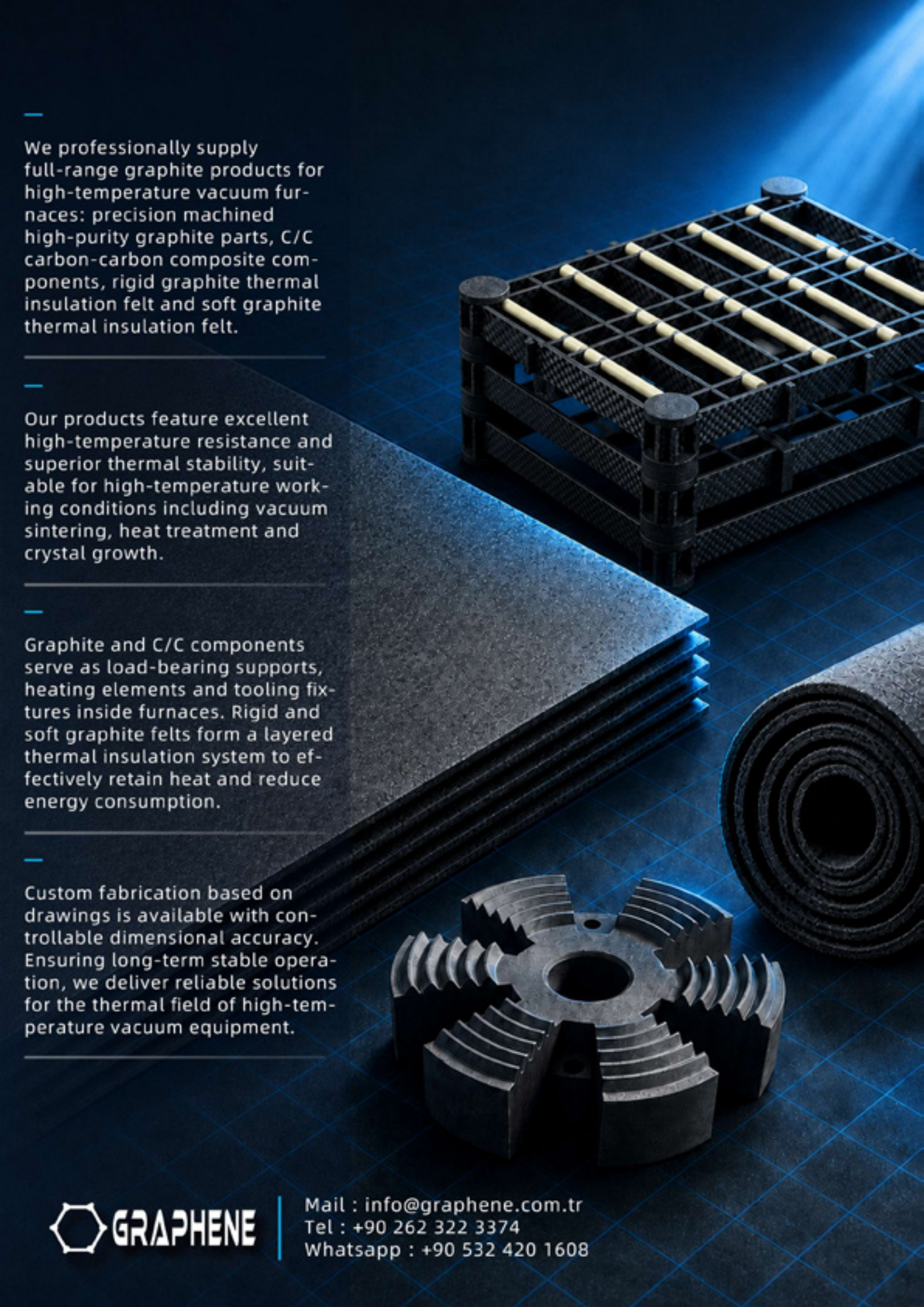

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FURNACE UP 3 BROUGHT TOGETHER THE DEFENSE AND AEROSPACE INDUSTRIES

The FURNACE UP 3 Seminar, organized by SARVION, brought together professionals from the heat treatment and industrial furnace sectors.

The FURNACE UP 3 Seminar, where heat treatment technologies, industrial furnace solutions, and current sector developments were discussed, was held with strong participation from industry representatives. The event provided a platform for knowledge sharing, technical evaluations, and networking, bringing together experts from various fields of the industry. The opening speech of the seminar was delivered by Assoc. Prof. Dr. Mehmet Buğdaycı from Yalova University. Within the program, many important topics were covered, ranging from NADCAP requirements in aerospace heat treatment applications to hydrogen technologies and industrial furnace solutions for the defense industry. One of the notable presentations in the program was delivered by Bernd Groos, Senior Product Manager at Schunk GmbH, titled “Materials Used in Heat Treatment in the Aerospace Sector.” The materials used in aerospace applications and the requirements of heat treatment processes were shared with participants. Yasemin Özkan, Senior Group Leader at TEI, delivered a presentation titled “Pyrometry in the Aerospace Sector from a NADCAP Perspective,” addressing the importance of process control and pyrometry in aerospace within the NADCAP framework.

Yasemin Özkan, Senior Group Leader at TEI, delivered a presentation titled “Pyrometry in the Aerospace Sector from a NADCAP Perspective,” addressing the importance of process control and pyrometry in aerospace within the NADCAP framework.

At the event, Dr. Seren Çelenlioğlu, Business Development Manager at SARVION, delivered a presentation titled “Hydrogen in Industry – Opportunities, Challenges, and CBAM Compliance Strategies.” The future of hydrogen use in industry, potential challenges, and strategies within the scope of the Carbon Border Adjustment Mechanism (CBAM) were evaluated. In the presentation titled “Heat Treatment Solutions in the Defense Industry,” delivered by Okan Kuloğlu, Deputy Sales and Marketing Manager at Sistem Teknik A.Ş., industrial furnace technologies and heat treatment solutions were discussed in line with the needs of the defense industry. FURNACE UP 3 was successfully completed as a productive organization where professionals from different sectors came together to share their experiences, evaluate current technologies, and create opportunities for new collaborations

As SARVION, we would like to thank all our valued guests, speakers, and supporting organizations who participated in FURNACE UP 3, and we aim to continue fostering knowledge sharing and collaborations that will contribute to the development of our sector in the future.



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- 16 Bar High-Pressure Rapid Cooling
- Eco-Friendly & Safe Technology



Future Technology, Maximum Performance

WITH THE ASSURANCE OF VESTA TP



EFSİAD CELEBRATES ITS 10TH ANNIVERSARY WITH A PRESTIGIOUS GALA

EFSİAD celebrated its 10th anniversary with a prestigious gala held at Swissôtel The Bosphorus. Sistem Teknik served as the main sponsor of the evening, while Sarvion supported the event as a silver sponsor. EFSİAD President Beste Özdeşlik announced the association's vision for the next 10 years at the gala, which was carefully organized to emphasize the importance of industry solidarity and to share the association's ten-year experience. The evening, hosted by Ezgi Özyurt, was attended by members of the press and leading representatives of the machinery and industrial sectors.







EFFICIENT BUSINESS COLLABORATIONS IN POLAND WITH THE EFSİAD SECTORAL TRADE DELEGATION

Between June 9–11, 2026, we participated in the business development event held in Warsaw, the capital of Poland, within the scope of the Sectoral Trade Delegation Program organized by EFSIAD (Industrial Furnace Manufacturers and Businesspeople Association). During the program, bilateral business meetings were held between companies operating in the industrial furnace sector and Polish industrial organizations. The event provided an important platform for sector representatives to develop new business partnerships, increase export potential, and closely follow current developments in international markets.

As part of the program, a meeting was also held in Krakow with the Polish Foundry Association. During the meeting, opportunities for sectoral cooperation between the two countries were evaluated, and ideas were exchanged on the latest developments in industrial furnace and casting technologies.

The meeting proved productive in terms of potential joint projects and future commercial collaborations.

As Sistem Teknik, we had the opportunity to share our more than 45 years of engineering and manufacturing experience with international stakeholders, while also introducing our solutions in industrial furnace technologies to potential business partners.

We believe that this organization, held under the coordination of EFSIAD, will make significant contributions to increasing the visibility of the Turkish industrial furnace sector in international markets and to establishing new commercial partnerships.

As Sistem Teknik, we will continue to represent our sector on international platforms and to develop strong collaborations in new markets in line with our export-oriented growth objectives.



A TURKISH WOMAN AT THE NADCAP PLATFORM

A TALK ON QUALITY, AUDITING, TRAINING, AND ACCREDITATION IN THE AEROSPACE AND AVIATION INDUSTRY

Interview by: Yasemin Özkan – TEI - Tusaş Motor Sanayi A.Ş /
Senior Group Leader, NDT & Special Processes Quality Directorate



I can summarize Nadcap as an international quality accreditation system that ensures critical manufacturing and special processes in the aviation and aerospace sectors are carried out in accordance with globally recognized common standards. This structure contributes to the standardization of audits and the establishment of reliability in the global supply chain by creating a shared understanding of quality among different manufacturers and suppliers.

What were the main factors that led you to this profession? Did you ever foresee that you would dedicate a large part of your career to aviation and aerospace components?

Engineering was a childhood dream of mine... In fact, I even wrote in my middle school diary that I wanted to become an Electrical and Electronics Engineer. ☺ However, I certainly did not foresee at that time that a significant part of my career would be spent in the aviation sector.

When I started working at TEI, I realized over time that I was not only gaining a profession, but also becoming part of a sector that requires a very high level of responsibility and professionalism, where our work directly impacts flight safety.

Looking back today, I feel great pride in having been part of the aviation industry for about 22 years and in having specialized in this field. Contributing to a part of the work that is not visible but is critical to flight safety makes this profession much more meaningful for me.

How would you summarize the concept of "Nadcap" in a single sentence to someone who has never encountered it before?

I would summarize Nadcap as an international quality accreditation system that ensures critical manufacturing and special processes in the aviation and aerospace sectors are carried out in accordance with globally recognized common standards.

This structure contributes to the

standardization of audits and ensures reliability in the global supply chain by establishing a shared understanding of quality among different manufacturers and suppliers.

Could you briefly talk about the Nadcap and PRI structure?
PRI is an international organization driven by the industry that ensures critical processes are evaluated through an independent and standardized approach. One of the most important features of Nadcap is that it not only conducts audits but also supports continuous improvement through training, technical working groups, and the participation of industry stakeholders. For me, one of the most valuable aspects of this structure is that real-world experience can provide feedback to the development of standards and practices.

Professional Background and the Journey to Becoming a Trainer

Could you tell us about your industry and professional background? Have you specialized in a specific discipline such as quality engineering, non-destructive testing (NDT), or heat treatment?
I am an Electrical and Electronics Engineer with a master's degree. For approximately 22 years, I have been responsible for Calibration Laboratories at TEI. Calibration is one of the technical areas that directly affects the reliability of all critical production and quality processes in the aviation sector, and therefore it is subject to intensive auditing. Throughout this process, the experience I gained from audits conducted by many national and international authorities has been an important part of my professional development.

What are the steps and processes required for an expert to achieve Nadcap trainer status?
To become a trainer at Performance Review Institute, especially in the field of Pyrometry, technical knowledge alone is not sufficient. It is essential to thoroughly understand Nadcap methodologies, technical requirements, and checklists; as well as how these are applied in practice and evaluated during audits. For me, the most important aspect of this process was being able to combine the field experience and audit expertise I gained over the years with the theoretical requirements of the standards. Because knowing a standard is one thing, but understanding how it is applied in real-world conditions and recognizing its critical points is another.

I believe that having this experience has provided me with a significant advantage in the training process.

Heat treatment, in particular, is one of the most technically challenging processes and has been Nadcap-accredited since 2005. Over the years, my work and experience in this field have led me to specialize not only in practical applications but also in understanding and correctly implementing standards and audit criteria.

At this stage of my career, being able to share the experience I have gained in the field over many years, both within TEI and on international platforms, is highly valuable for me professionally.

Since calibration is involved in all processes, it is one of the most frequently audited technical units. For this reason, we are audited each year by a considerable number of different authorities. Heat treatment, likewise, has been Nadcap-approved since 2005 and is considered one of the most challenging Nadcap certifications.

In which task groups are you authorized to provide training?
Within Performance Review Institute (PRI), I actively serve as a voting member in the Heat Treatment and Measurement & Testing task groups under the Supplier category. These roles require not only applying existing requirements but also understanding the needs of the industry and the realities in the field. The field of Pyrometry, in particular, is a strong area of expertise for me, because the reliability of temperature measurement directly affects the entire heat treatment process chain. Currently, I provide training only in the Pyrometry field.

When sectoral standards and audit checklists are updated, how do you follow these changes and stay up to date?
Through PRI's technical working groups, we not only follow changes but also have the opportunity to provide input on certain revisions from an industry perspective. In addition, it is essential to continuously monitor current standards, customer requirements, and their practical applications. Because reading standards once is not enough; it is also necessary to continuously verify how these changes are reflected in real operations.

Training Process and Methodology

How do you carry out the preparation process before a planned training?
First, I clarify the scope of the training, the participant profile, and the objectives. In PRI's trainings for different processes, the content is planned months in advance. In Pyrometry training, instead of presenting topics only theoretically, I relate them to real field applications. During the training, we use short tests and interactive engagement to instantly measure how well participants understand the topic and to evaluate the effectiveness of the training.

What are the critical points you especially focus on during training?
For me, the most critical point is explaining not only what a requirement is, but also why it exists and how it should be applied in real field conditions. Especially in the measurement chain, it is important to demonstrate how a small detail can turn into a major quality risk. For me, the success of a training is not whether participants memorize the standard, but whether they can make the right decisions when faced with a real situation.

What actions do you take when you detect a mismatch between practices observed in the field and the rules defined in approved procedures?
First, I evaluate the situation objectively and review the relevant standard and procedure together. My goal is not only to eliminate a nonconformity, but also to understand its root cause and develop a sustainable solution. Because true quality is achieved not just by correcting an error after it occurs, but by establishing a system that prevents the same error from happening again.

Risk Management and the Importance of Accreditation

Why is Nadcap accreditation so critically important for the safety and structural integrity of an aircraft or defense industry equipment?
There is a saying: "Aviation is a set of rules written in blood." This is because a small and seemingly insignificant nonconformity can lead to very serious consequences when combined with other factors.

The Nadcap approach is not only about meeting a standard; it is about ensuring that critical processes are correctly defined, kept under control, and carried out by competent personnel.

This is exactly where the most important aspect of our work begins: ensuring that a measurement is accurate and reliable is far more valuable than detecting an error at the end of production.

Can you share an experience where a potential nonconformity prevented a larger operational risk or error in later stages?
I may not be able to give a very specific example, but in calibration and pyrometry processes, detecting even a small deviation early can prevent incorrect temperature profiles or faulty measurement results in production.

For this reason, my approach is not to evaluate a finding solely from an audit perspective, but also to consider the risks it may create in the continuation of the process. A preventive mindset is one of the most essential components of the quality culture in aviation.



Audit, Standards, and Contribution to the Industry

How would you define your contribution to the development of audits and standards?
For me, expertise consists of a cycle: knowing the standards, applying them in the field, evaluating them from an audit perspective, and then transferring the experience gained back to the industry.

Being involved as a Supplier Member in the technical working groups of Performance Review Institute (PRI) provides the opportunity to directly communicate the real-world implications of these requirements to the technical committee members who develop the standards. It also allows us to contribute—when necessary—to shaping checklists and evaluations in a way that aligns with practical implementation.

Pyrometry Special Section

How would you define the concept of pyrometry for those unfamiliar with it? Why does something that seems as simple as "accurate temperature measurement" carry such critical importance in aerospace manufacturing?
Pyrometry is not just about measuring temperature. It is a quality system that ensures a furnace is truly operating at the intended temperature and that the component is exposed to the required thermal conditions. In aerospace, mechanical properties are directly dependent on temperature. Even a deviation of a few degrees can affect the hardness, strength, fatigue life, and microstructure of a material. For this reason, accurate pyrometry is one of the fundamental pillars of safe flight.

What are the main activities carried out within the scope of a pyrometry audit?
The main activities include thermocouple management, calibration of

sensors and measuring instruments, system accuracy tests (SAT), furnace temperature uniformity surveys (TUS), and evaluation of related records. The critical point here is that these activities should not be considered independently, but rather evaluated as a whole.

What are the most common challenges encountered in pyrometry processes?
One of the most common challenges is ensuring that tests are correctly implemented and that the sensors and instruments used fully meet the specified conditions. Pyrometry is a sequence of operations; each parameter has its own technical requirements. It is not enough for each piece of equipment to function correctly on its own—the entire system must produce accurate results when working together. We can think of it like an orchestra: each instrument must play correctly and harmonize with the others to produce the right outcome.
What would be your most critical advice for a company preparing for a pyrometry audit (under standards such as AMS 2750)?
My first advice would be to read and fully understand all relevant standards in detail and to recognize how the defined requirements are applied in practice. Reading a standard without understanding its application is just as risky as trying to apply it without knowing it. In addition, customer specifications should be followed just as carefully, since some customers may require additional or different requirements beyond AMS2750. This is where the value of Performance Review Institute (PRI) trainings becomes clear. In PRI trainings, the interpretation of standards, technical requirements of heat treatment components, application steps, nonconformities, and reporting techniques are all covered together in detail.

RECOMMENDATIONS

If you were to give a single most important recommendation to a facility preparing for its first Nadcap audit, what would it be?
I would recommend that they do not see the Nadcap audit as a process that is only prepared for the audit date. Nadcap should actually be a part of the daily working culture. If you first understand customer requirements and defined rules correctly, then follow the principle of "Do what you write" and "Write what you do," you will not face major issues during the audit.

In Nadcap audit processes, what are the areas where facilities struggle the most in terms of sustainability and commonly make mistakes?
Customer requirements and standards can change according to industrial needs, and this change has accelerated significantly in recent years. It is necessary to closely follow updates. Reading and understanding standards once is not sufficient; operations must also be continuously monitored, and changes must be reflected in daily practices on time.

Is there a detail about practicing this profession that you think would surprise people outside the field?
Many people think that the contribution to flight safety in aviation comes only from aircraft design or manufacturing. However, accurate temperature measurement, reliable calibration, and properly executed pyrometry processes are invisible yet critical parts of the chain that ensures flight safety.

Our work is often not visible—but when it is not done correctly, the consequences can be very visible. A calibration error alone may not directly cause an accident, but it can be a factor that delays the detection of an existing problem or leads to incorrect decisions.

Looking back, what is the most fulfilling and pride-inducing aspect of this profession for you?
Heat treatment and pyrometry are truly challenging and highly specialized fields. Being authorized by an internationally respected organization like Performance Review Institute (PRI) to provide Pyrometry training in such a critical area is a great source of pride for me, both on behalf of TEI and personally. Being one of the limited number of trainers worldwide authorized by PRI in the field of Pyrometry—and the only Turkish trainer who can provide this training—is especially valuable to me.

As a female engineer in a male-dominated industry, this journey has not been only about technical specialization. Becoming an instructor who brings together years of field experience, international standards, and audit perspective is one of the most rewarding milestones of my career. I also feel great pride and happiness in representing TEI and Türkiye on international platforms in the best possible way.

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