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ANDAR
Electromechanical Systems

Serkan KALE, Reşat Hakan AVCI, and Gökhan KOYUNCU,
Founding Partners of ANDAR: "We combined all of our
infrastructure in our new facility, bolstering our
design and production processes."



Period of Mastery Begins for ANDAR: Strengthening Design and Mass Production Capabilities with the New Facility

ANDAR, a company that is focused on the design and production of electromechanical actuators, is continuously enhancing its capabilities, with the company launching a new facility in Ankara OSTİM at the beginning of 2024. ANDAR has advanced its production capabilities to a higher level by setting up its mass production infrastructure in a new, unique and modern facilities, which has few equivalents worldwide. The facility transforms raw materials into ready-to-use electromechanical actuators for integrators, as well as sub-components that may be used for the production of these actuators. Serkan Kale, Reşat Hakan Avcı, and Gökhan Koyuncu, the founding partners of ANDAR, state this current period as the “period of mastery” for the company, with the company planning to stand out as a manufacturer as well as a designer. ANDAR hosted MSI TDR at their new facility and shared details on the investment, as well as the company’s goals, for MSI TDR readers.

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Serkan Kale, Reşat Hakan Avcı, and Gökhan Koyuncu, Founding Partners of ANDAR

MSI TDR: Let us start by congratulating you on your new facility. We were very impressed with what we have observed. If we had conducted this interview without touring the facility, some things you would tell us might not have been fully understood. When we combine this tour with ANDAR’s history, it becomes obvious that this place has a concept beyond an ordinary production facility. In this direction, could you first explain the concept of this new factory and why you needed such a concept?

Gökhan KOYUNCU: ANDAR entered business life as a start-up and focused on working with electromechanical actuators since its establishment. We have always faced the most challenging problems related to these actuator systems since the beginning, and these challenges required either innovative solutions that were non-existent or rare worldwide, or the indigenous development of technologies that couldn’t be procured due to export restrictions in the Turkish defence and aerospace industry. We successfully overcame these problems and created an extensive solution range providing off-the-shelf products. For example, we have a product family

that can independently provide all electromechanical subsystem solutions for smart and guided munitions, and members of this family successfully operate on different types of munitions. Our products have proven their reliability with thousands of hours of mission time on different UAV platforms, including the ANKA. For manned platforms, our solutions are featured in GÖKBAY, HÜRJET, HÜRKUŞ, ATAK, and KAAAN projects in Türkiye, and on Calidus’s new generation advanced trainer and light attack aircraft in the United Arab Emirates.

This expanding product range and increasing demand led us to significantly increase our mass production capability. However, as you observed in the facility tour, the establishment here is not just mass production capabilities but also an advanced production philosophy. This facility was built with a vision beyond mass production.

Reşat Hakan AVCI: If I were to make a general assessment, a new factory is typically an investment that organisations make to increase production capacity or combine various infrastructure. While these factors apply to ANDAR specifically, they remain secondary for us.

Visitors to our new facility encounter an infrastructure different from the production facilities of companies conducting similar activities. In the factory, they can observe a facility that can produce all subcomponents of electromechanical actuators with excellent precision, with production volumes well above tens of thousands annually. If we could procure these subcomponents from other companies, with the desired quality, production quantities, and lead times, a production infrastructure for far fewer capabilities might have been sufficient in our new facility. However, we struggled to find domestic or foreign partners meeting critical requirements like high precision, and therefore had to establish a serious vertical integration setup.

The primary source of motivation behind what you see in here were the problems we experienced in the procurement processes of subcomponents for our designed products. This facility is a place that brings our previously separate production capabilities together and increases our production capacity and, more importantly, our efficiency.

Serkan KALE: The various special infrastructure we have built in our production facility result from our investments in what we describe as enabling technologies. Some of these investments might not appear economically feasible at first glance in terms of infrastructure utilisation intensity or product costs. For instance, there are certainly other companies worldwide that have infrastructure similar to ours and use them more efficiently than us. However, without these kinds of infrastructure, you lose access to certain critical technologies needed in your products. They say "there's no need to reinvent the wheel," but sometimes you really need to invent it. Because the knowledge or the technology you need



ANDAR-branded products are also used in HÜRJET, one of the premier projects of the Turkish defence and aerospace sector.

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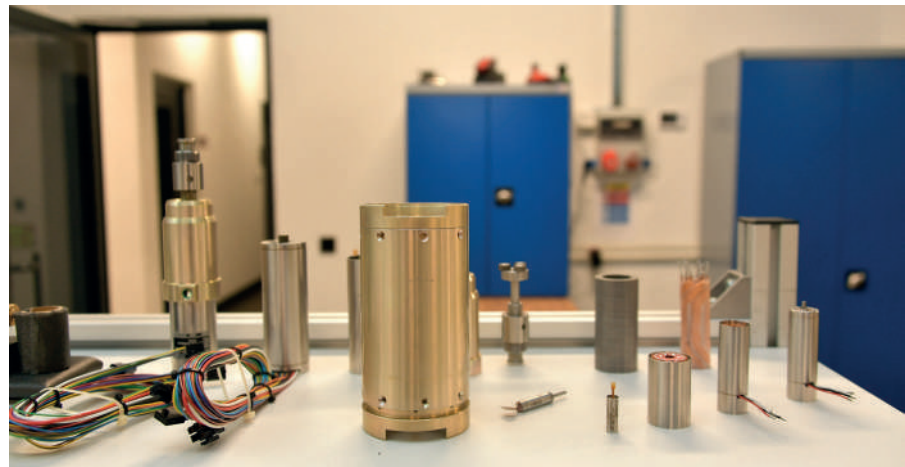
ANDAR's solutions serve in HÜRKUŞ as well.

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ANDAR also provides solutions for rotary-wing platforms like T129 ATAK helicopters.

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ANDAR's new facilities can produce complete actuators for air platforms or smart munitions, as well as sub-components for these actuators.



Serkan Kale, Reşat Hakan Avcı, and Gökhan Koyuncu, Founding Partners of ANDAR, informed Ümit Bayraktar, Executive Editor of MSI TDR, regarding the details of the production processes in their new facilities.

might not always be accessible, and you might need to research and develop it in depth. This cannot be done with outsourced equipments or services.

In some of our past work, our main motivation was production to acquire technology. Because it was impossible to outsource certain critical subcomponents required for the products we design within our desired quality, cost, and time constraints. In this case, we needed to manufacture these components in-house. For example, when we needed very small and precise gears, we invested regardless of the low production quantity that was needed. We solved this problem by investing in precision machinery used by watchmakers, which are rare worldwide. When making these investments, we were aware that we wouldn't be able to use most of the capacity initially. However, without these

investments, we wouldn't have had the chance to develop products with our desired quality and optimisation. We always adopted a results-oriented approach. The fact that some machines you see in this facility today have no other examples in Türkiye, and that machines to produce some parts aren't even available in the market yet, where this led us to design and produce these machines ourselves. The infrastructure you see in this facility today is a result of such decisions and investments.

ANDAR: Creating Solutions for Challenging Requirements

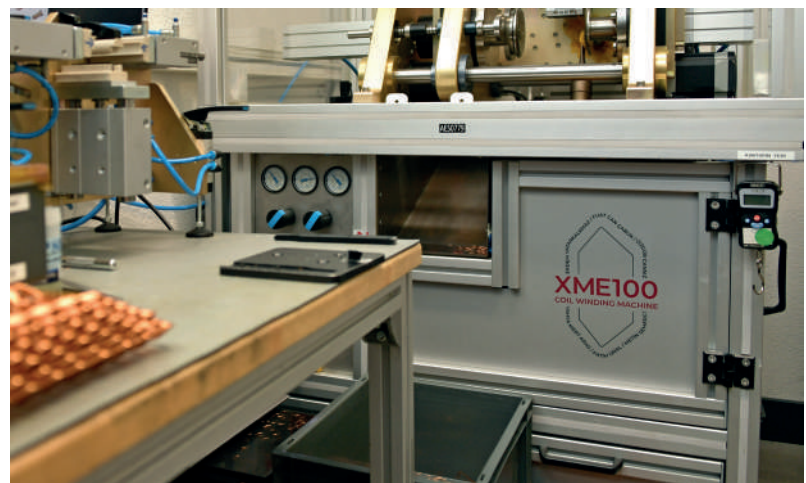
MSI TDR: From a technical perspective, why did ANDAR need such special infrastructure?

Serkan KALE: The shortest answer to your question would be "high-precision tolerances and requirements". In the defence and aerospace sector, tolerances in product dimensions are determined in hundredths or thousandths of a millimetre. In Türkiye, tolerances in hundredths are generally considered sufficient for designed and manufactured parts. However, our solutions require precision in thousandths. Without achieving this precision, it's impossible for the final product to reach its desired performance.

Gökhan KOYUNCU: This clearly demonstrates a fact: when there's a need for a special electromechanical actuator with challenging requirements such as fitting within a specific volume, not exceeding a certain weight, and performing desired movements in usage cases, the solution is usually to reach out to ANDAR. This has been the case for a long time in Türkiye. Recently, similar demands have started coming from international markets as well.

MSI TDR: How was the progress after it was decided to invest in a new facility? How long was the period between your decision and the facility becoming operational?

Serkan KALE: Many of our competitors assemble the final product by procuring some subcomponents from other companies. However, as founding partners, we adopted the principle of "complete product mastery" from the very beginning. This meant a comprehensive investment process requiring special machines and infrastructure. We had to establish this system step by step. We used almost all of our revenue for this purpose. We use extremely special machines that have only a few manufacturers worldwide. All stages, including ordering, production, delivery, and installation of these machines, required a very long time frame and technical preparation.



As Türkiye did not have the required infrastructure to produce the designs ANDAR makes, the company had to develop its own production machinery. Some of the invented machines were named after their developers.

After this comprehensive preparation process, we took the first steps for our new facility in 2021. Our work gained momentum in 2023, and finally, our facility became operational at the beginning of 2024.

MSI TDR: Will the establishment of the new production facility require a review of your AS9100 processes?

Reşat Hakan AVCI: Our new facility was designed to be fully compatible with our existing AS9100 quality management system. However, like any new facility or process, we will conduct a detailed AS9100 audit for our new facility. Through this audit, we will confirm the compliance of processes in our new facility with AS9100 standards and make necessary corrections in case of any non-compliance. We aim to complete the audit processes successfully by making all necessary arrangements according to our planned schedule.

Ultimate Goal for ANDAR Is Establishing a “Dark Factory”

MSI TDR: Could you provide information about the facility’s current status? Have you implemented the production setup as planned, or are there still incomplete activities?

Serkan KALE: Our facility has two divisions, and we conduct production processes in two categories: system-level products requiring high precision according to aerospace standards, such as servo actuators, and the production of subcomponents like electric motors, gearboxes, and sensors that can be sold independently and are also basic components of these systems.

As for our capabilities, we have a comprehensive production line for manufacturing subcomponents. All our processes, from raw material processing to quality control and final assembly, including windings used in electric motors, machining, heat treatment lines,



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quality department, and subsequent electromechanical assembly and assembly line, were designed according to the best quality standards in the world. We ensure each part is inspected during production and possible errors are detected immediately by integrating measurement and control processes into the production line. We have such a process in the serial production of subcomponents.

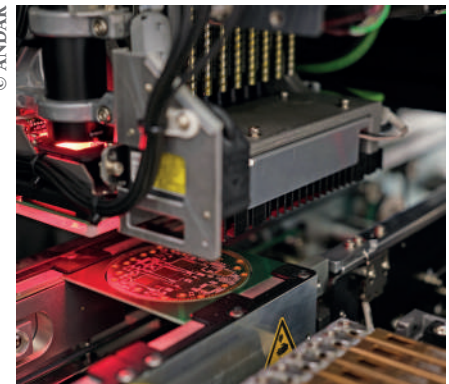
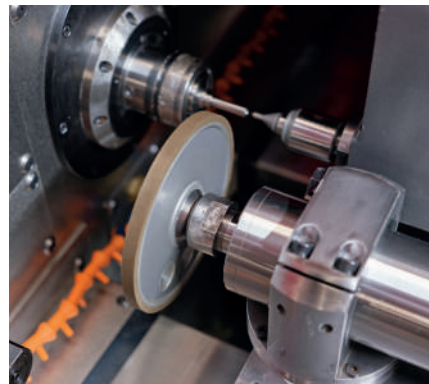
System-level products require different processes in line with the special

requirements of the aerospace sector. Therefore, we designed subcomponent and system-level productions separately.

When considering aerospace-related production only on Türkiye’s scale, a smaller facility might seem sufficient for our production activities. However, we anticipate that the need at subcomponent or component level will increase exponentially with the business volume in the future. In our current setup, our facility can produce between 12,000 and 15,000 subcomponent-level products



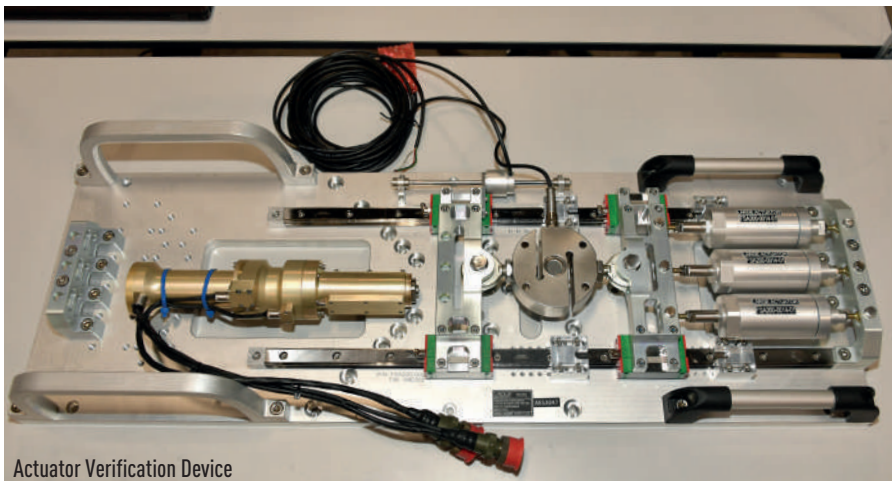
ANDAR’s new facilities produce world-class products with extremely tight tolerances.



ANDAR also proved its circuit board production capabilities, with a production volume of 10,000 controllers per month.



Reşat Hakan Avcı: “We believe this facility will give us not just production capacity but also an industrial enterprise identity. Until now, we were mainly considered a company that designs and develops products. When main integrator companies we provide solutions to encountered a problem with electromechanical motion systems, they contacted us, saying, “Only ANDAR can solve this problem.” We had multiple opportunities to prove ourselves in engineering capabilities. But now, with this facility and our new mass production capability, we’re transforming into a company that can mass-produce products in quantities of thousands and tens of thousands, for products we have designed, qualified, and created, products which serve in various platforms. This shows how right our path has been until now.”



Actuator Verification Device

every per year. We aim to increase this capacity further. Since main components at the system level vary by product, providing exact figures might not be appropriate. However, we can say that we currently have production capacity to simultaneously support 6 different platform-level projects. We are also very strong in circuit board assembly. We can produce approximately 120,000 controllers yearly.

We will set up the second floor of our facility as a dark factory after expanding into the industrial/civil sector. When production numbers reach hundreds of thousands, we aim for a setup focusing more on automation, with less human labour involvement, where quality requirements can be maximised. We aim to complete studies related to this planning next year and execute it in the following period.

Excluding the dark factory concept, we can say our facility is about 70 percent complete. There are process items to be completed regarding various storage systems and categorisation activities. When we reach the expected business volumes in the coming period, planning new infrastructure for areas designated for expansion will be considered as well.

Offices in Teknopark Ankara and METU Technopark Will Continue to Operate

MSI TDR: Could you provide more detailed information about the new facility’s role in ANDAR’s operations?

Gökhan KOYUNCU: We currently have a team of 113 people, and approximately 70 percent of this team works in our new facility. We completely moved our production processes from Teknopark Ankara to our new facility. However, our activities continue in our Teknopark Ankara and METU Technopark offices for administrative and R&D work. With our new facility, total indoor area of our facilities has reached 4,638 m² in total.

Reşat Hakan AVCI: We brought all our production capabilities together, including quality assurance and testing, in our new facility. This created stronger synergy between our teams and significantly accelerated our processes. In our new facility, we currently operate in a 2,000-square-metre indoor area. We equally divide this area for the production of subcomponent and system-level products. Our facility



Gökhan Koyuncu: “We’re on a path where we’ll develop our production technologies, focusing on production optimisations, automation, and ultimately leading to a dark factory. We’re actually moving towards problems we haven’t yet solved in serial production. We’re trying to move towards a fully automated system. When we achieve this, we’ll make ANDAR one of the strong players in the global market in the not-too-distant future.”

has 6 specially designed machines for machining, along with precision measurement devices and equipment for conducting environmental tests required by the aerospace sector. As demand for our products increases, we have the potential to double our production capacity in a short time by implementing a shift system. We need to increase human resources to achieve this goal. Our current infrastructure and facility are sufficient to support this increase.

MSI TDR: Based on the information you provided; can we say that you will only conduct mass production in this facility?

Serkan KALE: In our short-term plans, we haven’t positioned this facility entirely as a centre for developing new technologies. Because we have all the necessary knowledge and production infrastructure to design and produce both an electromechanical actuator itself and all its subcomponents. Considering

today’s technology level, we can say we’ve completed all our development activities. This facility was designed to enable mass production focusing more on our existing technologies and their derivatives.

Reşat Hakan AVCI: R&D and product development can sometimes be confused when used in different contexts. Many products that are said to be “developed with R&D” are product development activities for us. However, as ANDAR, we clearly distinguish between these two concepts. For us, R&D means new projects that will help us gain knowledge we didn’t previously have. We’ve reached a level where we can design and produce all components of an electromechanical actuator, including the controller, software, and electric motor. We also completely mastered the highly precise machining and heat treatment processes required for producing mechanical parts of such a system. Therefore, our activities in this facility will be more

product development rather than R&D. In our current facility, we will conduct mass production by adapting our existing technologies to different products.

As Serkan emphasised, this facility will be a production base where we will implement our years of R&D investments in practice. On the other hand, we won’t pause our R&D activities. Our main R&D processes will continue in our offices at Teknopark Ankara and METU Technopark. With our mature company identity that has developed its own technologies, we will continue to invest in technologies that will keep us ahead in competition.

MSI TDR: Why did you choose OSTİM for the production facility?

Reşat Hakan AVCI: Each location has its own advantages and disadvantages. When making decisions about our production facility’s location, we considered our team’s opinions, and most of our employees indicated they preferred working at a location within the city. Therefore, OSTİM was among our priority options. The factory building that we found here met all our needs with both its indoor space and other infrastructure features. Ultimately, we chose OSTİM by making a decision that both meets our technical requirements and employee desires.

New Production Facility Makes ANDAR a Manufacturer

MSI TDR: What role does your new production facility play in ANDAR’s corporate development? Which goals will this facility help you achieve?

Gökhan KOYUNCU: ANDAR has experienced intensive growth the past 10 years. During this process, we gained comprehensive knowledge and production capability in both main components and subsystems of electromechanical actuators. These efforts were conducted entirely with our own resources, and they created a great potential in our company. Now it is time to realise this potential by developing new products and transitioning to mass production. Thanks to our knowledge and experience, we can meet all our customers’ demands for electromechanical actuators in terms of performance, cost, and delivery time, and even exceed them. With our new facility, we optimised our production processes by combining our design capabilities with mass production. We now have the capacity to produce our designed products in high quantities and with high quality. Our goal is to reach a wider customer base worldwide and significantly increase production volumes.

ANDAR's solutions serve in UAVs like ANKA, for thousands of hours, reliably and proudly.

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We achieved an average growth rate of 30 percent over the past 5 years. Thanks to our new facility, we believe we can maintain this growth trend for the next 5 years.

Reşat Hakan AVCI: We believe this facility will provide us not just production capacity but also an industrial enterprise identity. Until now, we were mainly considered a company that designs and develops products. When main integrator companies we provide solutions encountered a problem with electromechanical motion systems, they contacted us, saying, "Only ANDAR can solve this problem." We had multiple opportunities to prove ourselves in engineering capabilities. But now, with this facility and our new mass production capability, we're transforming into a company that can mass-produce products in quantities of thousands and tens of thousands, for products we have designed, qualified, and created, products which serve in various platforms. This shows how right our path has been until now.

Serkan KALE: Recently, we were asking ourselves this question: Can we produce the products we design in high quantities? We knew that a consistent and efficient production process was necessary to achieve this goal. For this, we needed such a facility and infrastructure. We achieved this.

In the next phase, our goal is to establish dark factories and bring our off-the-shelf products that we mass-produce to world markets. We consider the current facility as a pilot project in this sense. When we transition to the dark factory model, we will benefit from these experiences.

New Product Families Underway

MSI TDR: Could you briefly touch on the notable developments of 2024 and tell us about your plans for 2025?

Gökhan KOYUNCU: 2024 was a year where ANDAR continued its growth. Our turnover increased by 40 percent in foreign reserve currencies compared to last year, and we experienced a significant increase in orders.

As for notable developments of 2024, we can highlight our successes in international markets. In this context, I can list our cooperation with French company Ascendance FT and our projects in the United Arab Emirates. We also captured new opportunities in the Kingdom of Saudi Arabian market.

Serkan KALE: In 2025, we will focus on standard products that are off-the-shelf, suitable for general use rather than specific customer needs. Considering the targets we have regarding international markets, we will continue developing new products with existing technologies without developing new technology. These are R&D projects we can do with our resources. We aim to introduce electric motors, gearboxes, sensors of certain diameters, and their derivatives as off-the-shelf products. We've already achieved some of these. Now we'll develop their derivatives. We will be designing these products for a variety of power needs under 1,000 watts. We'll work to realise a sales structure that's initially B2B, then extending to B2C, with ready-to-sell products.

We'll focus on developing products for sectors with high growth potential, like UAVs. We aim to provide competitive solutions that meet our customer needs and make a difference in the market in this highly exciting field. We want to go beyond responding to customer demands, and we want to guide the market by developing our own products. A significant portion of these will be for the civilian sector rather than defence and aerospace

sector. We'll consider this according to our commercial outlook.

MSI TDR: Is there anything else you'd like to add?

Serkan KALE: ANDAR's dreams are very big. We set out dreaming of much more than what we're doing today. But the process was not easy; products did not emerge easily. We faced many challenges until today and matured by overcoming them. We've reached a position where we have complete mastery over our products in every sense. Now, we're creating a new space for ourselves in the world. If we encounter a problem we need to solve, we are much stronger now.

Reşat Hakan AVCI: We've completed our product development processes and will now focus on product families and mass production. But we're still new to mass production. We're entering a period where we'll reduce intensive R&D activities and focus on production processes. Today we're talking about high quantities like 10,000, 20,000. We have goals like producing 30,000 electric motors in 2026.

Gökhan KOYUNCU: We're on a path where we'll develop our production technologies, focusing on production optimisations, automation, and ultimately leading to a dark factory. We're actually moving towards problems we haven't yet solved in serial production. We're trying to move towards a fully automated manufacturing line. When we achieve this, we'll make ANDAR one of the strong players in the global market in the not-too-distant future.

We would like to thank Serkan Kale, Reşat Hakan Avci, and Gökhan Koyuncu, Founding Partners of ANDAR, for taking the time to answer our questions, and for providing us with such valuable information. ♦