www.msidergisi.com / www.savunmahaber.com

ISSN: 2149 - 2514 • Complimentary Copy

MSI

ISSUE: 83

JUNE 2020 / 06

TURKISH DEFENCE REVIEW

Military Science & Intelligence

■ AEROSPACE ■ DEFENCE TECHNOLOGIES ■ STRATEGY

2020

EUROSATORY

SPECIAL DIGITAL ISSUE

AMAC MAGAZINE

YOUR GLOBAL BUSINESS CONNECTION

contact

P : +90 312 225 41 73
F : +90 312 225 41 74
E : info@milscint.com
W : www.milscint.com

address

Yaşamkent Mah.
3147 Sok. No: 10
Çankaya
Ankara

Cover: © KasabaWorks

ISSN: 2149 - 2514

ISSUE: 83
Jun 2020 / 06

CONTENTS

05 **SSB MESSAGE**
Ismail DEMİR Ph. D., Presidency of the Republic of Turkey President of Defence Industries
Turkish Defence Sector to Demonstrate Once Again its Progress at Eurosatory 2022

06 **TAFF MESSAGE**
Sadık PİYADE, Deputy General Manager of TAFF
TAFF Continues its Activities Unabated and with Great Determination

14 **SaSaD MESSAGE**
Hüseyin BAYSAK, Secretary General of SaSaD
2019 Performance of the Turkish Defence and Aerospace Sector

18 **Türksat**
Türksat to Improve its Services to Defence and Security Forces with Türksat 5A and Türksat 5B Satellitese

20 **UNİDEF**
Unidef Complements Utility Helicopters with its Weapon Integration Solutions

30 **Nero Industries**
Nero Industries Brings New Capabilities to MARS CBRN Systems

34 **SECANT**
SECANT takes the Comfort it Offers to its Business Partners to the International Arena

38 **SARSILMAZ**
Sarsılmaz's Indigenous Machine Guns Enter the Testing Phase

40 **SPECIAL COVERAGE**
Answers from the Highest Authority
What Kind of a Path will the Sector Follow in the Post-COVID-19 Period?

50 **CES Advanced Composites**
CES Advanced Composites: Your Global Partner in Advanced Composite and Armour Solutions

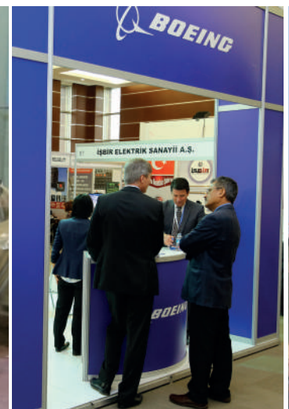
52 **İNDES Engineering**
Innovative Ideas, Practical Solutions and Reliable Results for Friendly and Allied Nations

54 **MİR Insulation**
MİR Insulation's Mircek Thermal Insulation Jackets Enhance Platform Survivability

56 **ICDDA**
Ankara Industrial Cooperation Days in Defence and Aerospace (ICDDA) to be the Starting Point of Collaborations that will Mark the New Era

İLANLAR / ADVERTISERS

Eurosatory 2022	Back Cover
AMAC Magazine	Inside Front Cover
SSI	Inside Back Cover
Türksat	First Page
CES Advanced Composites	13, 27
Eurasia Airshow 2020	51
ICDDA 2020	17
IDEF 2021	60
İNDES Engineering	11
MİR Insulation	9
MSI TDR	4
Sarsılmaz	46, 47
SaSaD	25
SECANT	23
SEDEC 2020	43
Turaç	32, 33
Unidef	36, 37
Anova	19, 29, 57
Nero Industries	16
www.msidergisi.com	22



© SSB

Turkish Defence Sector to Demonstrate Once Again its Progress at Eurosatory 2022

As the Turkish defence sector, we continue in our efforts to increase our exports to friendly and allied nations in many regions of the world by enhancing our cooperation with them. Accordingly, we are concentrating our efforts on promoting the capabilities of the Turkish defence sector at international fairs, and on improving our cooperation with allied countries.

Our defence sector has witnessed continuous growth since the 2000s. The most significant indicators of the ground covered by the Turkish defence sector so far are its turnover, which today has exceeded $10 billion, marking a 10-fold increase; its project budget of $60 billion, marking an 11-fold increase; its exports valued in excess of $3 billion, marking a greater than 12-fold increase; the fact that there are five Turkish companies ranking in the list of the top 100 global defence companies; and most importantly, the numerous indigenous products that have already entered the inventory of the Turkish security forces.

Throughout this journey, our universities, research institutions, Small and Medium-Sized Enterprises (SMEs), and other subsidiary industries and sectors have all contributed to the efforts to create a strong defence sector. The progress achieved to date is evidenced by the many platforms, systems and capabilities developed by Turkish companies that are generating demand also in foreign markets.

The Eurosatory Land and Airland Defence and Security Exhibition has always been an important event for the promotion of our capabilities. Although this year's event has been cancelled due to the COVID-19 outbreak, the exhibition is set to return in 2022, when it will once again serve as a highly important platform bringing together the global defence sector and its representatives.

I wish the best of success to all the companies that will participate in the Eurosatory Land and Airland Defence and Security Exhibition in 2022.

İsmail DEMİR Ph. D.
Presidency of the Republic of Turkey
President of Defence Industries

TAFF Continues its Activities Unabated and with Great Determination

Sadık PİYADE, Deputy General Manager of TAFF

It was during the Cyprus crisis of 1964 that Turkey first saw how dependency on foreign defence products could cause problems, even if the related country was an ally, and realised the importance of meeting its defence needs through indigenous solutions. In 1970, 1972 and 1974, respectively, Support Foundations for the Air, Naval and Land Forces were established. These foundations, which were established to bring modern technologies to Turkey through the development of defence systems and products for the Turkish Armed Forces, funded by donations of the Turkish Nation, were united on 26 September 1987 under the name of the Turkish Armed Forces Foundation (TAFF), in accordance with Law No. 3388.

Sadık PİYADE, Deputy General Manager of TAFF

Unless Otherwise Stated, All Photographs : © TAFF

As stated in the Foundation Act of the Turkish Armed Forces Foundation (TAFF), the Foundation was established to create a line of communication with and to provide moral and material support to the Turkish nation in order to work towards increasing the fighting strength of the Turkish Armed Forces (TAF) through:

- the development of a national armaments industry in Turkey,
- the establishment of new branches within the armaments sector, and
- the purchase of weapons, vehicles and equipment.

The Board of Trustees of the Foundation comprises the Vice President of the Republic of Turkey, appointed by the President of the Republic of Turkey, the Minister of National Defence, the Commander of Turkish Armed Forces and the President of Defence Industries, under the presidency of the President of the Republic of Turkey. Furthermore, in line with a decision of the Board of Trustees of TAFF in April, Prof. Dr. İsmail DEMİR, President of Defence Industries; Hasan BÜYÜKDEDE, Deputy Minister of Industry and Technology; Seyfullah HACIMÜFTÜOĞLU, Secretary General of the National Security Council; General Ümit DÜNDAR, Commander of the Turkish Land Forces; and Cenap AŞÇI, Chairman of the Board of Trustees of the Turkish Aeronautical Association, were appointed as members of the Executive Board of the Foundation. The sectoral and political experience of each of the Board members will contribute greatly to the Foundation's activities in the coming period.

Media Activities

With the specific purpose of creating a platform of communication and increasing the visibility of the Foundation:

- Media Activities are carried out directly by the Head Office;
- Promotional, Public Relations, and Donor Relations Activities are carried out by the Head Office; and the Regional Representative Offices in Istanbul, Izmir and Mersin, working in coordination with the Honorary Publicity Boards that have been established under the Governorships in the provinces and the District Governorships in the districts.

© TÜYAP

IDEF'19 – the 14th International Defence Industry Fair – hosted by the Ministry of National Defence (MoND) under the auspices of the Presidency of the Republic of Turkey, and under the management and responsibility of the General Directorate of TAFF, was held at the TÜYAP Fair, Convention and Congress Centre on 30 April–3 May 2019, with the participation of 588 delegation members from 71 countries and three international organisations.

Within the scope of the Media Activities:

- Representatives of Anadolu Agency, other press institutions and defence magazines are invited to the Foundation offices on the anniversaries of its establishment to be briefed by the General Manager on the key activities being carried out by the Foundation and its companies; and
- Verbal and written press releases are provided to the media organs about the important activities (visits, product delivery ceremonies, etc.) being carried out by the Foundation and its companies.

Within the scope of the Promotion, Public Relations and Donor Relations Activities,

- Public Service Announcements are prepared every six months with different themes to be broadcast on national and local television and radio channels upon the approval of the Radio and Television Supreme Council (RTÜK);
- Short publicity films are prepared to raise awareness of issues of public interest, to be broadcast on television channels which have high ratings; on national holidays and on other important days;
- The public is provided with information through Public Service Announcements, promotional films, visual materials and posters on various topics that are prepared for the promotion of our Foundation and companies, utilising the facilities of public, regional, local and non-governmental organisations;
- It is ensured to the maximum extent possible that sportsmen and sportswomen engaged in competitions and other events of public interest carry a banner of the Foundation when entering the field, and that emphasis is given to promoting the Foundation at individual events;
- Stamps issued under the coordination of the Turkish Post Office (PTT) that promote the works of the Foundation are being used for Foundation communications, and particularly for mail-shots to donors;
- Our Foundation and companies are promoted in the National Defence University and its affiliated military educational institutions, and in the relevant faculties of the Council of Higher Education (CoHE)-affiliated universities that offer master's programmes in the field of defence industries;
- Public Service Announcements, films and visual materials prepared about the Foundation, and our companies, donor activities, issues of public interest and important days, are shared on the social media accounts of the Foundation, and related films and visuals are displayed on the outdoor TVs and illuminated boards of our Head Office and the

The guided firing tests of the BOZDOĞAN and GÖKDOĞAN missiles developed within our first air-to-air missile programme.

HİSAR-A has been made ready for serial production, while a number of HİSAR-O missiles have been delivered and entered into use.

regional representative offices;

- In addition to the real estate donations and cash donations made to the Foundation's bank accounts by our loyal donors as contributions to the achievement of the Foundation's goals to strengthen our army, online donations are made through the Foundation's website using a credit card or cash card, or by SMS through all GSM operators to the phone number 1987, symbolising the establishment date of our Foundation.
- We promote our Foundation in the public arena in coordination with Honorary Publicity Boards, which serve voluntarily under the honorary presidencies of our Governors and District Governors in all provinces and districts. For this purpose, various events are organized aimed at contributing to the collection of donations and the promotion of our Foundation within the premises of the Governorships, District Governorships, universities, Municipalities, Chambers of Commerce and Industry, and other individual institutions, with the support of the Honorary Publicity Boards.

Preparations for IDEF'21 Continue

Another important activity of our Foundation is the organization of exhibitions, seminars and symposiums, both at home and abroad, as detailed in the Articles of Foundation. Among these, the International Defence Industry Fair (IDEF), which is among the world's leading defence industry exhibitions, serves as a significant platform for international promotion, marketing and cooperation, where high technology systems and subsidiary products in the fields of defence and security are exhibited, and has been held successfully 14 times between 1993 and 2019.

Promotional, Public Relations, and Donor Relations Activities are carried out by the Head Office; and the Regional Representative Offices in Istanbul, Izmir and Mersin, working in coordination with the Honorary Publicity Boards that have been established under the Governorships in the provinces and the District Governorships in the districts.

IDEF'19 – the 14th International Defence Industry Fair - hosted by the Ministry of National Defence (MoND) under the auspices of the Presidency of the Republic of Turkey, and under the management and responsibility of the General Directorate of TAFF, was held at the TÜYAP Fair, Convention and Congress Centre on 30 April–3 May 2019, with the participation of 588 delegation members from 71 countries and three international organisations. IDEF'19 hosted companies of all sizes, including small and medium-sized defence companies who were provided with support so that they could have the chance to promote their products to global markets, and was attended by a total of 1,061 company/firm representatives – including 481 local and 580 foreign representatives – from 53 countries.
During the fair, 2,700 scheduled meetings were held between authorities, delegations and participating companies in dedicated Interview Rooms. The fair also saw 100 signing ceremonies, nine meetings, four panels and eight presentations on various topics. IDEF'19 was visited by a total of 76,010 people, including 71,082 locals, and 4,928 foreigners from 96 countries.
Turkey's "IDEF International Defence Industry Fair", which has today become a global brand, has been registered in the name of TAFF by the Turkish Patent and Trademark Office. With a view to further increasing the success of IDEF, the preparations of TAFF for the 15th event, to be held on 25–28 May, 2021 at the TÜYAP Fair, Convention and Congress Centre, are continuing at full speed.

Partnerships and Affiliates of the Foundation Maintain Successes

Established in 1987 with the merging of the individual support foundations of the Air, Naval and Land Forces within the scope of the efforts launched in the 1960s and

Within the scope of the Media Activities, representatives of Anadolu Agency, other press institutions and defence magazines are invited to the Foundation offices on the anniversaries of its establishment to be briefed by the General Manager on the key activities being carried out by the Foundation and its companies.

1970s to achieve the dream of a stronger army, TAFF is today proud to represent a large family of 130,000 donors, and is looking to the future with confidence.
The Foundation is a direct shareholder in 14 companies, including six subsidiaries and eight affiliates, each of which operates in key areas of our defence sector. When we take into account the companies both at home and abroad in which the Foundation's subsidiaries are direct or indirect shareholders, we can say that the Foundation is a shareholder in 60 companies (including six branches and seven offices). In 2019, 42 percent of the total sales and 33 percent of the exports made by the Turkish defence sector were carried out by the subsidiaries of the Foundation.
On the 2018 list of the Top 100 global defence companies in terms of sales compiled by Defense News – one of the most prestigious publications in its field – ASELSAN was ranked 52nd, while Turkish Aerospace ranked 69th and ROKETSAN ranked 89th. Meanwhile, on the 2019 list of the Top 500 Industrial Enterprises announced annually by the Istanbul Chamber of Industry, ASELSAN ranked 15th, Turkish Aerospace ranked 22nd, ROKETSAN ranked 85th and HAVELSAN ranked 153rd.
On the other hand, the intellectual and industrial property rights of our companies are constantly increasing, from 928 in 2018 to 1,132 in 2019. Today, our companies are continuing their activities in 15 technoparks and 16 R&D centres, employing more than 9,500 people. In line with the goal of the Presidency of Defence Industries (SSB) of the Republic of Turkey to increase the local participation in the defence sector to 75 percent by 2023, the Foundation and its subsidiaries have defined performance targets and have planned the necessary activities.
In order to achieve the 2023 export target set by the SSB of the Republic of Turkey at $10.2 billion, the Foundation guides its subsidiaries to increase the number of targeted foreign markets, to carry out effective business development efforts addressing these markets, and to focus on activities aimed at creating long-term cooperation alternatives at home and abroad until 2023. Another issue of focus is the export of systems developed in Turkey through the establishment of effective organisational structures that are adapted to the defined target markets.
Our Foundation, which has been playing an active role in increasing the local participation rate through its subsidiaries for many years, continues to make significant contributions to the economy with the jobs created by its companies, with its increasing exports, and with the work share transferred to Small and Medium-Sized Enterprises (SMEs). In this context, the number of domestic and foreign subcontractors working with the Foundation's subsidiaries keeps increasing.
Works aimed at developing local, national and indigenous products, at enhancing local technological maturity levels, and at launching serial production in order to reduce the foreign dependency level of

Stamps issued under the coordination of the Turkish Post Office (PTT) that promote the works of the Foundation are being used for Foundation communications, and particularly for mail-shots to donors;

We promote our Foundation in the public arena in coordination with Honorary Publicity Boards, which serve voluntarily under the honorary presidencies of our Governors and District Governors in all provinces and districts.

the national defence sector, as well as the efforts to develop the critical subsystems, components and equipment that are currently subject to export licenses, through indigenous means continued unabated in 2019. In many projects that are critical for the survival of our country, critical stages have been passed and significant products have entered the inventory. The Foundation's subsidiaries have assumed important roles in these projects. To give a few examples, the first flight trials in the AKINCI, AKSUNGUR, GÖKBEY and ATAK Phase-2 projects have been successfully completed. The New Generation Indigenous Combat Management System ADVENT has been integrated into the TCG KINALIADA platform, which is the fourth MİLGEM ship to be entered into service. Furthermore, the first ATMACA naval missile has been launched from TCG KINALIADA, while the guided firing tests of the BOZDOĞAN and GÖKDOĞAN missiles developed within our first air-to-air missile programme, GÖKTUĞ, have been successfully completed. HİSAR-A has been made ready for serial production, while a number of HİSAR-O missiles have been delivered and entered into use. Within the scope of the KORKUT Air Defence System, the delivery of 13 systems has been completed and the naval version of the system, GÖKDENİZ, has been made ready.

Works on the HİSAR-U (Siper) air defence missile system, to which the knowhow acquired in HİSAR-A and HİSAR-O will be transferred, are underway. In 2020, our companies will continue to work on the technologies of the future, carrying our country to the next level through their developed know-how. İŞBİR and ASPİLSAN, which play a critical role in the provision of uninterrupted power and energy to our companies during their field operations, are working to complete their technological investments with funding provided by the Foundation to ensure their sustainable growth, allowing them to develop national and indigenous solutions to meet the needs of our country. Plans are in place to launch serial production at İŞBİR - Turkey's first R&D- and innovation-based alternator manufacturer - and to equip the company with the necessary capabilities to develop other advanced technology products.

It is aimed to support ASPİLSAN in its efforts to become Turkey's first R&D- and innovation-based battery cell manufacturer, and to equip the company with the capabilities required to develop other advanced technological products that can be used in both the civil and defence sectors. The main goal is to have ASPİLSAN meet our need for Lithium-Ion batteries and cells, which is currently met through imports, through indigenous and national means.

Support of Human Resources Development

We act with the awareness that human resources is the most important factor in achieving all our goals. Efforts aimed at increasing the efficiency of the training organisations recently established to raise the qualified human resources that will be needed by the sector in the future, and at ensuring the occupational and personal development of employees through the recently opened training academies, have continued. Among these institutions, the ASELSAN Vocational and Technical Anatolian High School, which was established under a Cooperation Protocol signed between ASELSAN and the Ministry of National Education (MoNE), launched its activities in 2019.

The high school is planned to teach such subjects as defence mechanics and defence electronics. In addition, a Cooperation Protocol on Vocational Training has been signed between Turkish Aerospace and MoNE, under which the name of the "Kızılcahamam Şehit Hakan Gülşen Vocational and Technical Anatolian High School" was changed to the "TUSAŞ Şehit Hakan Gülşen Vocational and Technical Anatolian High School", and the school has subsequently applied for civil aviation accreditation. Under the said protocol, the technicians that will be involved in the TF-X National Combat Aircraft and Heavy Class Attack Helicopter projects will receive training.

Our Foundation continues its activities with great dedication and determination with the aim of strengthening the existing communication between the Turkish nation and the Turkish Armed Forces, as an integral part of it, in line with aims and objectives set out in the Foundation Act and in the Articles of Foundation. ◆

2019 Performance of the Turkish Defence and Aerospace Sector

Hüseyin BAYSAK
Secretary General of the Defence and Aerospace Industry Manufacturers Association (SaSaD)

The Defence and Aerospace Industry Manufacturers Association (SaSaD) collects sector metrics through the surveys it shares with its members every year, and analyses and reports on these metrics. The data and analyses in these reports are taken as reference by all stakeholders in the sector, and are also used as a basis for decision-making.

As SaSaD, we have just completed the Sector Performance Metrics for 2019 and published it at the end of April upon the approval of the Presidency of Defence Industries (SSB).
The data we have collected indicates that our sector performed very successfully in 2019, based on the positive developments in almost all metrics. We present here a brief review of the performance of the sector.

Turnover

In 2019, the sector's turnover (Total Sales Amount) was $10,884,081,347, representing an increase of 24.23 percent on the 2018 figure. The Compound Annual Growth Rate (CAGR) for the last five years has been 16 percent, indicating significant development and growth.
The increasing demand due to the operations carried out by our security forces, as well as the highly satisfactory exports figures and related Overseas Sales Revenues played a significant role in this growth.
The largest share of the sector's turnover belongs to land systems, which generated total sales of around $3.5 billion. Following this segment comes the military aviation ($2.4 billion); civil aviation ($1.84 billion); and the weapons, ammunition and rocket/missile ($971 million) segments.

Overseas Sales Revenues

SaSaD reports take into consideration the foreign currency revenues earned from the engineering, training, maintenance/repair, etc. activities carried out by the sector abroad, as well as the export revenues of the sector. Foreign currency revenues and export figures are grouped together under the term "Overseas Sales Revenues".
The exports announced by SaSaD include the defence and aerospace products that are sent abroad with a type number (GTİP number) from customs, and the Overseas Sales Revenues includes the same amount. In addition, the revenues generated by foreign currency-earning services are also added before the figures are reported.
In 2019, Overseas Sales Revenues amounted to $3,068,519,809, representing an increase of 40.21 percent on the 2018 figure. While $2,741 billion of this came from export revenues, $327 billion was from foreign currency earning services.
The exports of the sector, on the other hand, reached $2,740,988,087, marking an increase of 34.6 percent on the previous year.
The increase in Overseas Sales Revenues, aside from the increases related to offset-related markets such as the United States and Europe, is of particular importance.
The fact that market potential has been established other than in the offset markets has is a clear sign of the success of sector players in marketing and business development. Over the last five years, the CAGR of Overseas Sales Revenues has been 10 percent, which is a significant indicator of the role played by the sector players in the global markets.

Imports

It is seen that there has been an increase in imports that parallels the increase in turnover. The imports by the sector in 2019 amounted to $3,088,465,821, marking an increase of 26.11 percent on the previous year.
The fact that our exports meet imports fully, and that the share of exports in total turnover is around 30 percent can be considered proof that the added value created by the studies in the sector is at a significant level.
Of the total, 47 percent of imports were made from Europe, 45 percent from the United States and 8 percent from other countries. It is thus considered that the sector should give priority to diversifying the sources of supply and identifying resources that are not subject to such control regimes as ITAR.
The fact that the highest share of imports are made by the military and civil aviation sectors ($648 million and $564 million, respectively), and that this ratio amounts to around 400 million dollars for land systems, indicates that our aviation sector is highly dependent on foreign resources.

Product and Technology Development Expenditures

The players in our sector carry out very limited basic research studies, as efforts are focused primarily on product and technology development. For this reason, we use the term Product and Technology Development Expenditures instead of R&D Expenditures.
Like in the above-mentioned metrics, positive developments have been observed also in the product and technology development studies conducted in our sector. The product and technology development expenditures amounted to $1,672,052,468 last year, marking an increase of 15.44 percent over the 2018 figure. While $1,423,067,193 of this amount was spent on Product Development, $248,985,275 was spent on Technology Development. Of the total Product and Technology Development expenditures, 19.8 percent ($331,291,055) was met by equity, and $1,340,761,413 was funded through project financing routes. The latter shows the extent of the state support provided to the sector, and is a clear indication of the importance attached by the government to increasing local capabilities. A look at the overall figures shows that equity expenditures and the sources funded through project finance increased by 14.7 and 15.6 percent, respectively, on the previous year.

Value of Orders Received over the Course of the Year

The new orders received by the sector over the course of the year decreased by 12.56 percent, representing a decrease in value to $10,671,519,679. Despite this decrease in new orders, there are still a significant number of projects being carried out by the sector.
While 60 percent of new orders came from the domestic market, 19 percent came from the United States, 6 percent from Europe and 15 percent from other countries Of the overseas orders, 71 percent were received from companies abroad and 29 percent from end customers.
Meanwhile, 67 percent of the orders received from the domestic market came from end customers and 33 percent from companies.

Employment

Employment in the sector increased by 9.71 percent on 2018, totalling 73,771 in 2019.
Of these, 25 percent are engineers, 48 percent are technicians/operators, 2 percent are managers, 10 percent are administrative/financial management/procurement staff (university graduates) and 16 percent are support/administrative/unskilled staff.
Of all the employees, 43 percent work in production and 21 percent in product and technology development.
While 65 percent of the engineers hold undergraduate degrees, 31 percent hold a graduate degree and 4 percent hold a doctoral degree.
Of the university graduate staff working in the administrative/financial management/procurement departments, 78 percent hold a bachelor's degree, 21 percent hold a postgraduate degree and 1 percent hold a doctoral degree.

Future Projections

After summarising the performance indicators of our sector for 2019, we carried out a separate survey to measure the future prospects of the players in the sector. According to the results of the survey:

1. The breakdown of the responses given to our question "Do you think your business will develop and grow in the next 24 months?" were as follows:
   a. The share of those who expressed their confidence that growth would be a priority issue for them was 75 percent; the share of those who expected improvement similar to the level achieved in the previous 12 months was 15 percent; and the share of those who expected contraction was 10 percent.
   b. While 39 percent expressed that they projected a growth rate of over 15 percent, 18 percent projected a growth rate of 10–15 percent, 20 percent projected a growth rate of 5–10 percent, and 23 percent projected a growth rate between 0 and 5 percent.
2. The breakdown on the responses given to the question "What strategies will you follow to achieve this growth?" were as follows: 65 percent said adding new products to the product range; 50 percent said making innovations in their service range; 55 percent said carrying out marketing activities in new geographical regions; and 83 percent said enhancing their presence in the existing markets.
3. Regarding their future plans, 42 percent of the companies stated that they would develop formal relations with other companies; 35 percent stated

that they would develop informal relations with other companies; 49 percent stated that they would make new investments; while 7 percent stated that they were planning to carry out mergers or acquisitions.

4. To our question about the share of equity that they will allocate to product and technology development efforts from their turnover, the responses were as follows: 30 percent said more than 10 percent; 20 percent said 6–10 percent; 20 percent said 4–5 percent; and 30 percent said 1–3 percent.
5. In the risk assessment regarding the suppliers in the supply chain, 33 percent of the industrialists stated that disruptions in the supply chain had a critical impact on their ability to fulfil their obligations; 52 percent said that the impact of such disruptions is critical for fulfilling some of the strategic partners' obligations, and that other problems could be overcome; and 15 percent stated that disruptions caused by suppliers are not important, and that they can always develop a new supplier pool to replace problematic suppliers.

Conclusion

The data collected for this study through the surveys we conducted in the pre-COVID-19 period show that the sector was progressing well and that the sector was looking to the future with high hopes. Considering the effects of the pandemic on the global economy, and especially on some particular sectors, and taking into account the post-epidemic development projections, it is clear that defence and aerospace companies will face many significant consequences associated with this pandemic.

Most countries will set new approaches detailing how to prioritise their budget allocations. When making such prioritisations, defence and aerospace may be at the bottom of the list of the sectors to be supported, and this may affect our export potential negatively. In this sense, the approach of balancing losses with the export of medical devices and equipment will be considered carefully by sector players. Other areas that should be followed carefully may include cyber defence, communications, automation/industry 4 and remote working.

Considering the importance of our sector for homeland defence and the criticality of the supplies it provides to our security forces, we believe that it will be among the priority sectors. We will attach considerable importance to supporting qualified industrialists, especially SMEs, that are suffering financially during this crisis by ensuring there are no delays in the project payment schedules, and providing for the uninterrupted continuation of the new project development process. ◆

Türksat to Improve its Services to Defence and Security Forces with Türksat 5A and Türksat 5B Satellites

With the entry into service of its new generation satellites Türksat 5A and Türksat 5B, Türksat will bolster its position as a reliable solution partner of defence and security forces, as well as of civilian users. The satellites will carry the services provided by Türksat to the next level with their technical capacities and orbiting positions.

Works on the production of Türksat 5A and Türksat 5B are underway, in response to the communication needs of the country. To date, Türksat has provided service through a rental satellite in a 31-degree East orbit, but with the launch of Türksat 5A, it will be providing its services in this orbit for the first time with its own satellite, thus gaining new frequency rights. The aim with Türksat 5B is to increase the current capacity in the 42-degree East orbit, allowing a wider geography to be served and the gaining of new frequency rights.
The production of Türksat 5A and Türksat 5B, developed to protect orbital rights in the 31-degree East orbit, and to permit the provision of communication solutions from a new orbit, to increase the Ka-Band data communication capacity, and to provide advanced data communication services to sea, land and air vehicles, is continuing at the facilities of Airbus D&S located in France and the United Kingdom.

Türksat 5A Project

Türksat 5A will serve in the 31-degree East orbit and operate in the Ku frequency band, providing service to a wide region covering Turkey, the Middle East, Europe, North Africa and South Africa. The satellite, with a launch mass of approximately 3,400 kg, will carry a payload of 10 kW power.
The production of Türksat 5A's Service and Communication Modules, as well as the mechanical integration of the modules with each other, have already been completed. The assembly of the antennae of Türksat 5A has also been completed, and the satellite is currently undergoing performance and environmental tests under space conditions.

Türksat 5B Project

Türksat 5B, which will serve in the 42-degree East orbit, is a broadband communication satellite operating in the Ku and Ka frequency bands. With its high data transmission capacity of 53 Gbps in the Ka frequency band, it will serve a wide geographical area that includes Turkey, the Middle East, North East Africa, Nigeria, South Africa, a large part of the Mediterranean and the Aegean Sea. The satellite has a launch mass of approximately 4,500 kg and will carrying a payload of 12 kW power.
Production of the satellite's Service Module has already been completed, and the integration of equipment into the Communication Module is continuing. In the next stage, the two modules will be combined, and environment and performance tests, to be conducted under space conditions, will be launched. Meanwhile, the production and delivery of the satellite's antennae have been completed. Production works for Türksat 5B are continuing to schedule.

Production Process of Satellites

The two new generation satellites operate with Electric Propulsion System technologies. This technology is used to manage the orbiting and positional correction of the satellite, making use of an electrical propulsion system, and resulting in a significantly longer orbital life.
The electric propulsion system also provides significant advantages in weight terms, permitting the integration of much more communication capacity.
To ensure Turkey retains experienced personnel in this area, a Technology Transfer Programme has been included in the Türksat 5A and Türksat 5B satellite programme. During the production of Türksat 5A, 12 Türksat engineers underwent practical and theoretical training at the facilities of Airbus D&S under the supervision of Airbus experts.
Türksat 5A and Türksat 5B swill be launched by a Falcon 9 rocket from the Florida-based Cape Canaveral, the launch site of Space X company. ◆

© Türksat

For further information, please visit www.turksat.com.tr/en/satellite

Unless Otherwise Stated, All Photographs : © Unidef

Unidef offers turnkey weapon integration solutions for aerial platforms.

Unidef Complements Utility Helicopters with its Weapon Integration Solutions

Utility helicopters, which have become an essential element of the world's armed forces in many missions, ranging from transportation to search and rescue, and from reconnaissance to medical evacuation, are becoming the direct target of armed engagement during the execution of these various missions. Since the Vietnam War, when the concept of troop deployment from the air matured, arming these platforms and providing them with the ability to defend themselves has become a priority. However, integrating weapons onto utility helicopters that were not designed as attack helicopters can be challenging for various reasons. At this point, Unidef steps in, with broad experience in the development of weapon integration solutions for the aerial, land, and naval platforms of the Turkish defence and aerospace sector, standing out as a solution partner that the end-user can trust. Unidef's capabilities and experience, and the integration projects it has successfully completed, allow it to come up with solutions that the end-user can utilise effectively in the field, with low lifecycle costs.

Weapon Component of Utility Helicopters

Utility helicopters have proven themselves time and time again in the operations they have participated in since the Vietnam War, proving their worth as vital combat vehicles. Designed for a variety of missions, this helicopter class offers excellent flexibility, which makes the integration of different systems and weapons easier. It is possible to integrate these platforms with various weapons, including air-to-air and air-to-land missiles, guided and unguided rockets, and guns ranging from 5.56 mm machine gun to 30 mm cannon.

The integration of guns may involve two different applications: The first one comprises crew-served systems mounted at the doors and windows of the helicopter for self-defence, and the second comprises fixed forward systems that are operated by the pilot or co-pilot.

With the integration of weapons, utility helicopters can serve as combat search and rescue helicopters, can undertake counter-insurgency (COIN) missions, can carry out patrols, can transport troops and equipment to the combat zone without the need for support, can assume many of the roles undertaken by attack helicopters and can perform armed reconnaissance missions.

What is the Purpose of Arming a Utility Helicopter?

It is possible to design mission-specific platforms for each of the new missions that can be undertaken by utility helicopters when armed. So why is there a need to arm utility helicopters under these conditions? To answer this question, there are various factors to be taken into account.

For a specific mission, the use of a dedicated platform designed for that particular mission rather than a general-purpose platform may seem necessary to achieve optimum performance. However, in terms of weapon issue, it is seen that the difference between dedicated platforms and utility platforms does not differ. Thanks to the breakthroughs achieved in military aviation technologies in recent years, cost-effective solutions, especially in such subsystems such as fire control systems, ground target detection systems, and target tracking systems, have become easily accessible. The fact that many developing countries prefer to design their defence and aerospace systems also increases the subsystem options in the export markets. Accordingly, the subsystems that were previously monopolised by developed countries have become more accessible.

With this greater availability of these subsystems, utility helicopters are now able to compete with dedicated platforms in armed missions, in all phases of a mission, ranging from target detection to target destruction or suppression. Armed forces have thus become capable of meeting their needs in a cost-effective manner by using utility helicopters that can take on many of the tasks previously conducted by dedicated platforms.

Besides, there are other developments in the battlefield that have made the use of utility helicopters in armed missions cost-effectively. Dedicated platforms are designed for optimum performance from the outset, while the payload of utility helicopters can be scaled as needed. Scalability allows utility helicopters to perform their mission with less payload in asymmetrical and low-intensity conflicts, resulting in significant reductions in mission costs.

In short, thanks to technological developments, utility helicopters can perform many tasks that require the use of weapons, as effectively as dedicated platforms. They are thus more cost-effective in low-intensity conflicts and against asymmetrical threats. In such an environment, the ability to carry out armed and other missions with a certain number of utility helicopters has emerged as an attractive solution for armed forces that operate under tight budget constraints and that have other spending priorities.

Cem Kurter, Managing Partner and Co-Founder of Unidef

Commenting on this cost-effectiveness, Cem Kurter, Managing Partner and Co-Founder of Unidef, said: "The rapid military technological advances seen today increase costs accordingly, making combat an expensive option that pushes the limits of budgets. As such, developing countries or countries that are seeking to allocate a considerable proportion of their military budgets to social and commercial investments are trying to gain a superior position in the low-intensity and asymmetrical conflict environment by integrating various capability-enhancing subsystems into more cost-effective platforms that can be sustained with much lower costs. Today, it is widely acknowledged that it is not enough to win a war only on the battlefield, being also necessary to win the war in the account books."

The qualification of Unidef's weapon integration to the S70i / UH-60 BLACK HAWK helicopters has been completed.


Unidef team together with end-users.

The Other Side of the Coin: Technical Challenges

Although the flexibility offered by utility helicopters is a plus for weapon integration, it does not eliminate the major difficulties encountered in the weapon integration process.

First of all, seamless integration with ideal conditions can be achieved in only a few cases. Ideally, the platform should be designed with weapon integration in mind. For example, it should have reinforced structural parts in the sections where integration will be made. In many cases, however, the platform onto which the weapon will be integrated lacks the required infrastructure.

Another ideal condition is having all the documentation and interface information about the platform and obtaining support from the platform manufacturer. However, this also cannot be met in many cases.

Other challenges may need to be considered are:

- User requests to ensure the performance of the platform is unaffected by the weapon integration;
- Restrictions associated with the warranty conditions set by the manufacturer;
- Design restrictions related to certification requirements.

In the absence of these ideal conditions, it is the experience and expertise of the integrator responsible for the weapon integration that makes the difference. The approach of the integrator to the subject, the project processes, and the communication between the integrator and the end-user also play a significant role in achieving successful results, and Unidef has already accomplished many successful weapon integration projects to date thanks to its outstanding capacity in all these respects.

Unidef Offers Unique Weapon Integration Solutions for Specific Requirements

Unidef integrates crew-served small- and medium-calibre weapon systems onto rotary-wing platforms. Unidef's approach to integration can be defined as: "Making weapons a part of the platform to create a power factor on the platform without changing its structural integrity, but by developing additional systems to increase their effectiveness". In this way, the capabilities of the gun and the platform, which are different from each other, become a new capability and power when they are integrated by a useful or smart interface.

The scope of the services provided by Unidef includes

The weapon integration performed by Unidef has provided S70i / UH-60 BLACK HAWK helicopters with significant firepower.

equipping a specific-purpose vehicle with additional performance-increasing weapons, components, and auxiliary subsystems in line with the vehicle's concept of use; and redefining and detailing repair & maintenance and user training programmes.
Unidef also supports the platform with a stock of spare parts related to the capabilities that have been newly acquired.
Kurter described their approach to this issue as follows: "In today's conditions, possessing an effective helicopter fleet is costly and expensive in many ways. Thus, the users have started to look for cost-effective solutions. They are seeking to simplify their inventories as much as possible. If your resources are limited, and you want to spend your military budget in a disciplined manner without undermining your level of deterrence, you need to improve your integration capabilities. This is what we, as Unidef, aim for: to develop integration capabilities that enable a solution-oriented and cost-effective platform to be operated at its maximum performance."
Unidef carries out its weapon integration activities with a turnkey solution approach. Describing the services they provide, Kurter said: "In the simplest terms, what we are doing is making life easier for the end-users, giving them no reasons for concern. We develop solutions that have no impact on the platform's performance, and that will not void its warranty. The user shows us the platform and defines its needs, and our solution takes care of the rest.
When it comes to weapon integration, each end-user has its unique mission profile and operational definitions, which is why Unidef places emphasis on first gaining a comprehensive understanding of their operational requirements. For example, if the vehicle in question is an aircraft, the company conducts detailed meetings with both the pilots and flight technicians to analyse the conditions under which it will be used and the threats to which it will be exposed.
It is of critical importance that the conceptual designs, developed as part of the integration works, not only meet the relevant requirements and resolve the existing problems but are also compatible with the platform's infrastructure. On the other hand, technical constraints tend to prevent each work or project from meeting the requirements 100 percent. In such cases, Unidef sits down with the end-user to specifically identify these constraints and to determine how they can be optimised."
Kurter continued: "One point that Unidef pays particular attention to in all of these works is that the platform holds certain certifications. For example, in the case of air platforms, Unidef constantly bears in mind that it is 'working on a platform that has already received an airworthiness certificate and has passed qualification'. For this reason, Unidef avoids making any changes to the platform's frame, designing suitable interfaces and gun mounts that are compatible with the platform's infrastructure. While such technical constraints complicate the design process significantly, Unidef's competent engineering team conducts extensive studies, resulting in five preliminary prototypes on average before arriving at a final design.
The applications on helicopters that Unidef has developed for Turkish users can be cited as an example of these works. In one such project, the end user's mission profile required the gun mount to be collapsible towards the platform's interior, such that it would not protrude outside the body of the aircraft or be affected by environmental factors during flight. Unidef has to date implemented this design on two different platforms, with great success. For this solution, a key and locking mechanism that automatically cuts and connects the electric current to the weapon was designed for the gun mount to keep the gun in safe mode when folded and taken inside the platform. This action not only reduced the gunner's reaction time in combat and out-of-combat settings but also enabled the safe preservation of the weapon inside the platform. Furthermore, an ergonomic design was implemented that prioritised the comfort of the gunner and even determining a position that would not adversely affect flight safety.
Based on the end user's requested fire angles, Unidef also places various physical limits on its gun mounts to prevent the gun from accidentally hitting the platform onto which it is mounted, while operating. Following the final design, a finite element analysis is performed to assess the resistance and sturdiness of the supports, and reinforcements are made if deemed necessary."

Capabilities that Make the Difficult Possible

It would not be possible to complete projects on time, within the budget, and with the results meeting the needs, without the distinctive approaches and capabilities Unidef has developed in the challenging projects it has undertaken to date providing flexible working environments to its end users.

What Kurter emphasises is that Unidef often works under non-ideal conditions and scenarios where there is no similar integration that can be taken as a model. The company has developed significant capabilities in carrying out the overall design of the weapon integration using the factory-installed infrastructure on the platform, and these capabilities have been successfully delivered. And, they have proven themselves on the systems in the inventory.

Completed Projects Fulfil Promises

Unidef has worked on seven different solutions for five different helicopter platforms since 2014. All but one of these solutions comprise crew-served solutions, known more commonly as door machine guns.

The weapon integration works successfully completed by the company to date are:

- **Integration of M134 Miniguns onto AS532 COUGAR Helicopters:** The integration has been completed and qualified for the AS532 COUGAR Helicopters of the Combat Search and Rescue (CSAR) Fleet of the Turkish Air Force, and has been accepted by the user and taken into the inventory. As part of these works, NATO stock codes were also obtained for the weapon and its supports and interfaces. The project is a global first; being is the first time a Minigun-type weapon has been integrated onto AS532 COUGAR helicopters.

© MSI TDR

Unidef showcased at IDEF'19 the concept design of the integration of a retractable weapon to be mounted at the windows of CH-47F helicopters.

© MSI TDR

Unidef has also developed a weapon integration solution for AB412 helicopters to satisfy a requirement of a country in the Middle East.

- **Integration of M134 Miniguns onto S70i/UH-60 BLACK HAWK Helicopters:** Weapon integration works have been carried out for the BLACK HAWK helicopters of the Department of Aviation under the Turkish National Police and of a special union. In this solution, the support and the weapon can be retracted into the helicopter, preventing the weapon from affecting the helicopter's flight performance. The company's integration solution has passed the relevant qualification processes and has entered the inventory following acceptance by the user. NATO stock codes have been obtained for the weapon and its supports and interfaces.
- **Integration of M134 Miniguns onto AB412 Helicopters:** Unidef has also developed a weapon integration solution for AB412 helicopters to satisfy a requirement of a country in the Middle East. The solution includes an ammunition box that can be located either inside or outside the helicopter, along with an external weapon and mounting.

These helicopters with the weapon integration are mostly operating as Combat Search and Rescue helicopters. With the works carried out by Unidef, the helicopters have gained the ability to suppress enemy fire and protect themselves and their crew during landing and take-off, as the riskiest phase of any operation.

In these projects, the M134 Minigun weapon system produced by Profense was preferred as the weapon to be integrated onto the platforms. The reason for this preference is that the six-barrelled weapon, capable of firing more than 3,000 rounds of 7.62 mm ammunition per minute, has been explicitly designed as a platform protection weapon, and can thus respond to asymmetrical threats in the fastest and most decisive way. All the interfaces required to integrate the weapon system onto the platform have been developed and produced by Unidef using local indigenous means.

What Kurter particularly emphasises about these processes is that the end-user was able to define its tactical needs in one-to-one meetings held in the design phase. For this reason, the designs differ from their foreign counterparts. For example, the mount and the weapon are retractable into the platform's interior; and the system is equipped with an electric locking mechanism to secure the weapon. When looking at the offered integration solutions and interfaces from the perspective of material quality, coating technology, and ergonomic use; it can be said that they stand out as products embodying a much higher engineering effort, timewise.

Field-Proven Performance

The weapons integrated by Unidef onto AS532 COUGAR and S70 BLACK HAWK helicopters have been taking part in a lot of exercises and operations of their respective end users since the day they entered the inventory. As a result, these integrations qualified as combat proven. Noting that the end users they work with remain undisclosed due to the nature of the tasks they undertake, Kurter summarised the feedback they had received to date as follows: "We have not received any negative feedback about our integration works. As we conduct flight compatibility tests together with the end user and receive their approval for the final design, we eliminate negative feedback from the very beginning. We hang on our end users' every word in every aspect. Based on the experience we have gained from the field, we have intensified our efforts on such issues as material quality and accessory development."

At IDEF'19, Unidef showcased the concept design of a solution that is currently under development that will allow the weapon to be fixed outside the S70i/UH-60 BLACK HAWK helicopter.

More comprehensive Range of Solutions and New Platforms on the Way

"Unidef is continuing its forward-looking works in almost every aspect. The company's agenda is marked by a wide range of issues, including various platforms and weapons, as well as new integration capabilities," said Kurter, stating that Unidef aims to acquire the load certification capabilities that are required to be able to perform weapon integrations involving more complex engineering and design effort. "Unidef has intensified its investments in two areas: The development of the necessary additional test infrastructure, and the receipt of comprehensive training on the subject." It is also among the priorities of our company to make investments in this field to ensure compatibility with EMAR 21, MIL-HDBK-516C and MIL-HDBK-1763.

The next weapon intended to be integrated onto platforms following the Minigun is the 12.7 mm M2 heavy machine gun. Under a project for the mounting of an M2 heavy machine gun and external weapon station, onto an S70 BLACK HAWK helicopter, both crew-served and fixed-forward solutions will be offered to the user.

This will constitute a pilot project for Unidef's integrated weapon solutions and load certification studies.

The projects completed by Unidef to date cover the integration of 7.62 mm calibre weapons. However, in the coming period, we aim to offer a broader portfolio of weapon integration solutions addressing various calibres, ranging from 12.7 mm machine guns to 30 mm guns. To this end, Unidef intends to reach a capability level that will enable it to perform structural alterations to platforms and to acquire the related load certification capabilities. The company also has other critical goals, including:

- The design and production of its Store Management System, under the aviation requirements and standards;
- The creation of an ecosystem with its solution partners for avionics-related and structural modernisations within the scope of integrated weapon system solutions.

In this way, we also seek to be recognised as the most reliable solution partner of leading platform manufacturers, both at home and abroad, in weapon integration projects."

Highlighting the importance of an ecosystem for Turkey, Kurter said: "We believe that our efforts in this regard will help the aviation sector and culture in our country expand towards the base and mature, and will result in an increase in the diversity of our capabilities. We are working relentlessly in this regard."

Kurter added that the integration of weapons onto new rotary-wing platforms is also on the agenda of Unidef: "Unidef has started works on the integration of weapons, to be mounted at the right and left windows and the ramps of CH-47F helicopters, for which the company is considering specific designs and is planning to use unusual weapon solutions. The said integration will require no structural modifications to the platforms. The concept design of the integration for a retractable window-mounted weapon was on display at the company's stand at IDEF'19. Unidef is also working on the integration of a Minigun onto a SH-60 SEA HAWK helicopter. Once the integration is complete, it will be the first time a Minigun has been fitted onto this helicopter model.

Intensifying its activities abroad, Unidef is working on a special S70 BLACK HAWK programme for a potential overseas user that has expressed a need for a carefully designed tactical weapon for a specific mission profile.

The likely user requested that a certain number of helicopters be armed with the same configuration provided by Unidef for a platform in Turkey. The client believes it needs additional attack helicopters for this mission profile, but its budget will not stretch to such a purchase. We are working on a project proposal for the transformation of some of the same BLACK HAWK helicopters into gunship helicopters cost-effectively manner without modifying the platform. Our project is not about creating a solution that will meet the firepower need of an attack helicopter; being instead a study that will achieve a part of its capability on BLACK HAWK." ◆

Partners Offering the Best Solutions

Offering solutions to meet the critical needs of the Turkish defence and aerospace sector, Unidef continues to work in cooperation with companies at home and abroad, including Profense, Ohio, AEI Systems, Samsun Yurt Savunma, Anova, and 3EOS, for the systems and subsystems it uses in its different projects. These partners support Unidef's projects by offering the best solutions in their field, and in this way, help maximise both project success and customer satisfaction.

For further information, please visit www.unidef.com.tr

Nero Industries Brings New Capabilities to MARS CBRN Systems

All photographs: © Nero Industries

MARS Systems

Offering many solutions in the field of life support systems for land vehicles, Nero Industries has developed a broad range of products including the MARS systems, which offer protection against Chemical, Biological, Radiological and Nuclear (CBRN) threats on the battlefield. With a series of R&D activities it has carried out recently, the company has carried the capabilities of these systems to the next level. Nero Industries has expanded the MARS product family of Overpressure and Mask type solutions, by adding Portable Mask-Type Systems to it. This addition permits mechanised infantry units to safely exit the vehicle, even under CBRN threat conditions.

Nero Industries' Portable Masked CBRN Filtration Systems adds the ability to be used by dismounted personnel, on top of all the advantages of conventional Masked Systems. Thanks to this system, when the personnel who is wearing a mask that is connected to the vehicle's filtration system, as in the case of classic masked systems, needs to leave the vehicle, they can easily disconnect the clean air hoses attached to the mask and replace them with the portable filters that are stored in the vehicle. This way, even in the presence of a CBRN threat outside the vehicle, the personnel can leave the vehicle for periods of up to one hour.

Commenting on this new capability of MARS systems, Alican Ökçün, Chairman of the Board of Nero Industries, said: "One of the biggest problems faced by mechanised infantry that have to fight in areas where they may be exposed to a CBRN threat is that once they get into an armoured vehicle, they cannot dismount until it arrives at a clean area. The portable masked systems we have recently developed eliminate this problem completely."

The System Can Now Also be Integrated into Shelters

The new version of the Nero Industries MARS product family can also be integrated into shelters. Unlike the previous version of MARS systems, the new version, which has been developed as a result of extensive R&D studies, uses cassette type filters. Developed for the shelters of radar systems, as well as those of the ground control stations of UAVs and satellites, this version has already recorded its first sales successes and has started to be used in the field. Among the first users of the product is Baykar, which is using the product in the ground control stations of its BAYRAKTAR TB2 UAVs. So far, seven systems have been delivered to Baykar.

Overpressure or Masked Systems for Different Users

In addition to its Portable Mask Type Systems, Nero Industries also offers Overpressure and Masked CBRN filtration solutions, as more conventional systems. Overpressure MARS systems comprise of a control unit, filters and release valves, while the masked systems include personnel masks in addition to the control unit and filters.

CBRN Mask Types

Overpressure CBRN systems are utilised in vehicles that can be rendered airtight by means of hatches and gaskets. In these types of vehicles, the personnel enter the vehicle and close the hatches, cutting off any contact between the air inside the vehicle and the outside world. The overpressure generated by the CBRN filtration system inside the vehicle ensures that contaminated air cannot enter from the exterior of the vehicle. Ensuring such airtightness, however, may not be possible nor practical in every vehicle. For example, in vehicles such as armoured personnel carriers, hatches may need to be opened and closed repeatedly during combat, making such airtightness unfeasible due to the basic design of the vehicle. Mask type CBRN systems are preferred in such cases, in which the decontaminated air is supplied to personnel masks through hoses.

The overpressure systems in the MARS product family generate 230–260-pascal pressure inside the vehicle relative to the exterior by pumping purified air inside. The release valve located on the vehicle is set to a pressure of approximately 200 pascals, and keeps the internal pressure under control by expelling a portion of the compressed air inside the vehicle. These valves operate in a fully mechanical manner and have no electronic components.

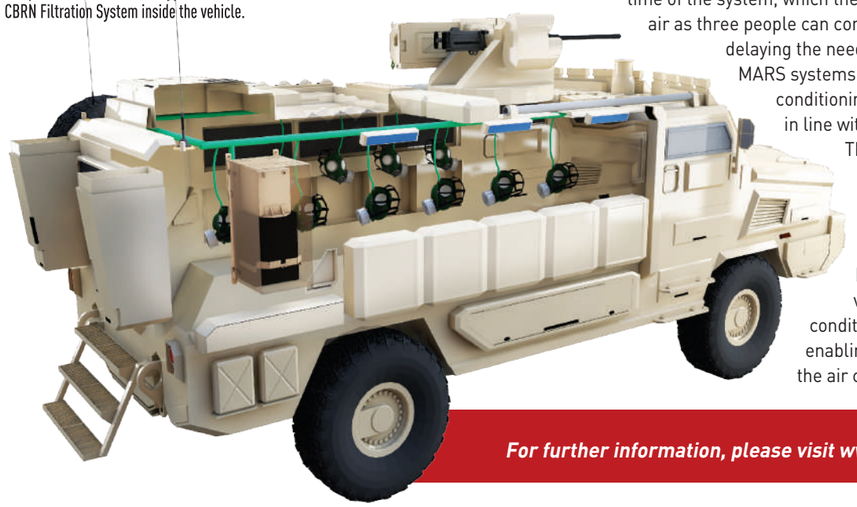
The mask-type systems in the MARS product group have significant capabilities. Featuring a wide angle anti-fogging visor, the masks can be readily connected to the vehicle's intercom system. Moreover, using special apparatus, personnel can also drink water while wearing the mask.

Different Filters Stop All Threats

The MARS CBRN Filtration system extracts any contaminated air to the outside of the vehicle using a fan, and then passes it consecutively through a cyclone filter, a pre-filter and an active carbon filter. In each filter, the air is sequentially decontaminated of radiological, nuclear, biological and chemical threats, thus protecting the crew and, if any, passengers from external CBRN threats.

Filtration systems can deliver between 80 to 200 cubic metres of purified air per hour. The filters within the system require no power to operate, while the fan that conveys fresh air to the inside of the vehicle functions with a current of only 12 amperes.

The placement of the mask type MARS CBRN Filtration System inside the vehicle.



The MARS product family

Three months ago, Nero Industries performed and successfully passed filter tests against real war agents (sarin, soman, mustard etc.) with an internationally accredited company for CBRN filters. These tests were applied under two different conditions as wet and dry. As a result of the tests Nero Industries' CBRN filters was approved and certified for all war agents.

Capabilities of the Control Unit

The control units of MARS systems can be either analogue or electronically. Aside from switching the filtering system on and off, the analogue control units also measure the overpressure difference inside the vehicle and report it to the user. The system also issues a warning signal in the event of an incorrectly fitted filter.

In addition to these functions, the electronic control unit also issues an alarm if the overpressure cannot be achieved inside the vehicle due to a vehicle door or hatch being open. The system also monitors the operating time of the filters, as well as their extent of use or saturation. Should the user wish to use one filter for a maximum of one hour for safety reasons, the system will sound an alarm at the end of this predefined period. Similarly, the system also gives an alarm if it becomes clogged through overuse. In addition, the control units can be adjusted to operate at different flow rates. In this way, when 9 personnel dismounts from a vehicle with a capacity of 12 people including the crew, for example, the MARS system is adjusted accordingly, and it is ensured to operate at a lower flow rate. Thus, the total running time of the system, which then cleans only as much air as three people can consume, is increased, delaying the need to change the filters.

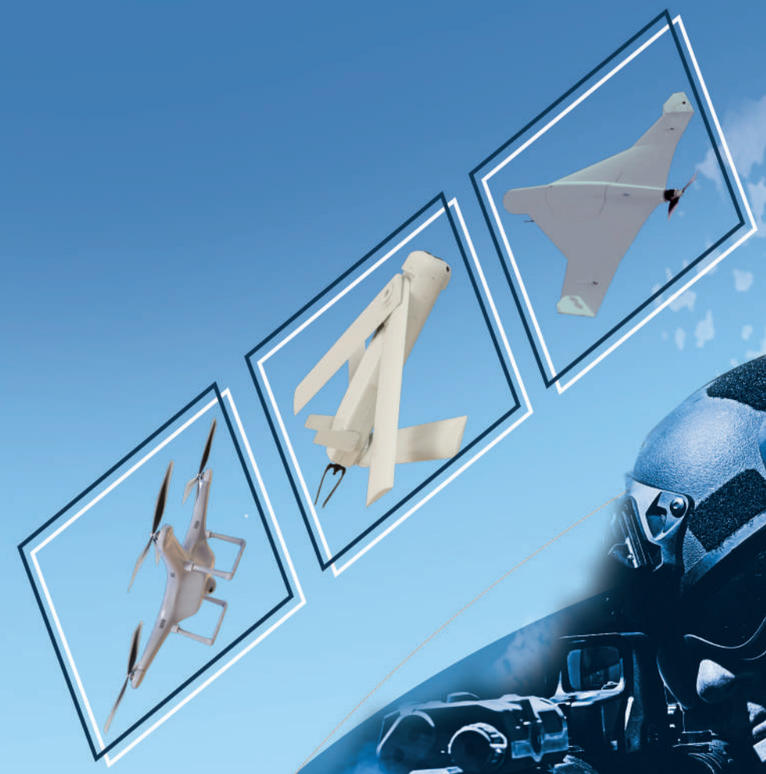
MARS systems can also have an air conditioning system added to them, in line with user requirements. Thus, the decontaminated air can be delivered into the vehicle at the desired temperature. MARS systems can also be connected to the vehicle's own air conditioning system, thereby enabling the product to control the air conditioning system. ◆

For further information, please visit www.neroindustry.com

STERLING®
HIGH QUALITY AMMUNITION

YERLİ ÜRETİM

TACTICAL SERIES
ANTI DRONE
DRONSAVAR



TAKTİK SERİSİ
Tactical Series

Semi Magnum (70mm)

Semi Magnum (70mm)

Semi Magnum (70mm)

ANTI DRONE
Dronsavar

YERLİ ÜRETİM

Semi Magnum (70mm)
Range 100-130

Magnum (76mm)
Range 110-140

Super Magnum (76mm)
Range 120-150

sterling·com·tr

SterlingAmmunition

Sterling_Ammunition

@SterlingComTr

Sterling Ammunition

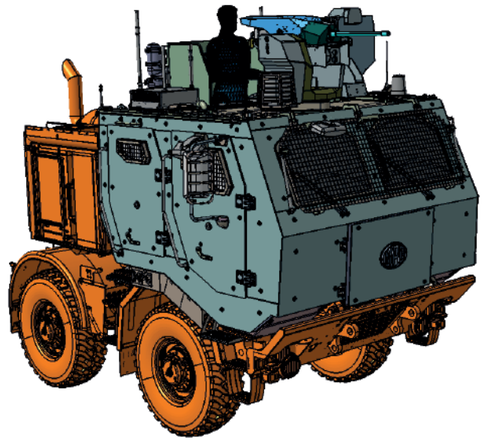
turac·com·tr

TURAÇ
DIŞ TİCARET LTD. ŞTİ.
1987'den Beri...

SECANT takes the Comfort it Offers to its Business Partners to the International Arena

As the complexity of systems and projects increases, end users and prime contractors begin looking for firms with competencies they can trust. Specialised in survivability, platform development and advanced composites, SECANT has repeatedly demonstrated its competencies in the projects it has been involved. The company offers considerable peace of mind to end users and prime contractors by handling all aspects of the challenging projects that are not undertaken by other parties, and is now ready to serve international users.

All Photographs: © SECANT



In MPG's M4K 8X8 Multi-Purpose Armoured Recovery Vehicle project, which was launched with a very tight schedule to meet urgent needs, SECANT designed the vehicle cabin from scratch, equipping it with the highest level of ballistic and mine protection.

With its advanced engineering, design and production capabilities, SECANT offers turn-key solutions for projects within its field of expertise. To date, the company has completed numerous projects for land, marine and air platforms.

In the field of land platforms, SECANT has successfully carried the works it has undertaken in various armoured vehicle projects to the production line. The company differs from its competitors in the international market with its combined expertise and experience in the fields of survivability, platform development and advanced composites. Providing services for armoured vehicle projects in various countries, including Turkey, SECANT is seeking to expand its customer portfolio.

The company's engineering and design capabilities allow it to offer seamless design and production experience to the companies with which it cooperates. The company prefers to work with its users in a business model that covers all phases of the project, from the requirement analysis stage to the qualified production stage. In cases where such a model is not applied, SECANT goes beyond user demands, considering every demand as a separate project that starts at the requirements stage. In this process, SECANT brings to the table its engineering capabilities and experience in survival systems, and also intervenes in vehicle design when necessary. It can even design complete armoured platforms for its customers upon request.

Challenging Problems Overcome

SECANT's young and determined team takes a keen interest in overcoming the challenges posed by difficult problems, and so when SECANT meets a new user, its first request is to be given the opportunity to solve the user's most difficult problems. A prominent example of this approach can be seen in MPG's M4K 8X8 Multi-Purpose Armoured Recovery Vehicle – a project in which SECANT took on a significant design task.

In this project, which was launched with a very tight schedule to meet urgent needs, SECANT designed the vehicle cabin from scratch, equipping it with the highest level of ballistic and mine protection. Within the scope

In the M4K 8X8 Multi-Purpose Armoured Recovery Vehicle project, the armoured cabin designed by SECANT passed all the tests with a single prototype.

of the project, despite almost all the solutions available on the market at this level are composite-based, an indigenous ballistic protection solution was used developed by SECANT. On the other hand, the solution offered by SECANT, while in the same weight level as its counterparts, offers four times the performance, and is completely metallic. In this way, many of the troubles and uncertainties arising from the use of composite solutions in the field that cause inconveniences to the users were eliminated. Then, the requirement for the spall liner for the vehicle was met with local-sourced materials, developed as a result of related R&D studies, in line with the principle established at the project outset to use only indigenous and national solutions. Many indigenously developed sub-components, such as the single-point-controlled mine locking system and universal gun holder were used for the first time in this project.

SECANT also undertook the design of the engine compartment for BMC's KİRPİ-II MRAP Vehicle, and solved the problems that arose during this project in a similar way.

Summarising their approach, Yılmaz Erbil, Founder of SECANT, said: "We are taking part in challenging projects. Generally, the users who contact us for the first time are seeking a solution to a problem that has not been encountered before."

Success Already Achieved in the First Prototype

Another feature that distinguishes SECANT from its competitors is its willingness to stand by the prime contractors from the very outset of the design process to the moment serial production begins. The company, which is committed to this approach, is able to intervene in the design of the vehicle as a whole, or confidently utilise its experience in other processes of the project when required.

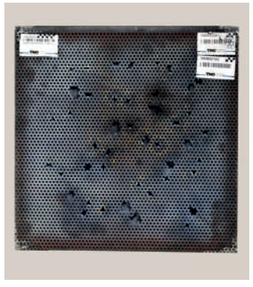
Combining advanced engineering techniques with experience, SECANT creates a digital prototype of the armour systems or platforms it develops. It then matures its designs through the analyses and simulations it performs on the digital prototypes, generally fulfilling the test requirements in the very first prototype it develops, without the need to produce a second prototype.

Erbil gave MPG's M4K project as an example of its prototype approach: "Designers of armoured vehicles usually produce a series of prototypes and test these prototypes themselves first. Once these tests have been completed successfully, they test the vehicle together with the end user. In these tests, individual prototypes are used to detonate mines placed under the belly and under the wheels of the vehicle, and each prototype is tested separately. However, the M4K project, launched to meet an urgent need of the Turkish Land Forces, had a very tight schedule. With full confidence we had in our cabin design, to overcome the time restriction we suggested conducting all tests on a single prototype, and upon the approval of the end user and the procurement authority, we successfully completed all mine blast tests, which were performed one after the other, on a single prototype."

SECANT is specialised also in the field of advanced composite radomes, reflector structures and missile/sensitive equipment handling systems.

Ballistic and IED Armour Solutions for Ultimate Protection

SECANT develops indigenous ballistic armour solutions for all levels of protection defined by NATO STANAG 4569 standard and detailed in the NATO AEP 55 procedure, and offers these ballistic solutions at the same weight levels as their high-performance competitors that hold predominant positions in the global market, but at much lower costs. Defining their solutions, Erbil said: "Our ballistic armour solutions stand out not only with their low weight, but also with their multi-hit capabilities, their capability to neutralise low-level threats, their ease of integration, and, most importantly, their sustainability." When designing



SECANT develops indigenous ballistic armour solutions for all levels of protection defined by NATO STANAG 4569 standard and detailed in the NATO AEP 55 procedure. The ballistic solution family offered by SECANT to the market under the name SMAS consists of metallic and composite based add-on armours, spall liners and IED solutions.

ballistic solutions, SECANT makes a detailed threat analysis that covers terrain and environmental conditions, threat diversity and attack scenarios. Recently, in addition to traditional ballistic protection, the company has focused also on solutions that provide hybrid protection, taking into account also asymmetric improvised explosive device (IED) threats.
The ballistic solution family offered by SECANT to the market under the name SMAS consists of metallic and composite based add-on armours, spall liners and IED solutions.

Making a Difference also through Technology Transfer and Training Activities

The services offered by SECANT to its users are not limited to design and production, in that it also organises training programmes for its users, especially on survivability. Unlike the other examples of training provided around the world in this area, which are predominantly academic, these trainings include also extensive field experience and know-how. For the international aspect of the trainings, SECANT cooperates with TNO, a Netherlands-based research organisation. The company has held five trainings to date, and is attracting great attention in the international arena in this regard.
SECANT also supports its users with the necessary technology transfer that will be needed throughout the lifecycle of their vehicles and has to date completed "know-how transfer" regarding survivability to BMC, MPG and IAG.

Engineered Advanced Composites

In addition to its expertise in survivability, SECANT is also specialised in advanced composite structures. In this area, it develops solutions especially for advanced composite radar and sonar dome structures, reflectors and missile/sensitive equipment handling systems.

SECANT also organises training programmes for its users. Unlike the other training that is provided around the world in this field, which is mostly academic, these trainings include also extensive field experience and know-how. For the international aspect of the trainings, the company cooperates with TNO. The trainings, which have been held five times so far, are attracting great attention in the international arena as well.

In the field of advanced composites, all processes, from the conceptual design to the serial production, including detailed engineering calculations and tests, are carried out with great precision by SECANT and it stands out from its competitors also in this sense.

Ready for the International Market with its Experience and Know-How

To date, SECANT has successfully completed nearly 35 projects with more than 15 national and international institutions, organisations and companies, including BMC, ASELSAN, MPG, Meteksan Defence and IAG, working on nearly 20 platforms and systems. With this experience and know-how, the company is ready to solve the most difficult problems of its international users. ◆

For further information, please visit www.secantglobal.com

Sarsılmaz's Indigenous Machine Guns Enter the Testing Phase

Sarsılmaz has provided an update of its continuing works on the indigenous development of different calibre machine guns and shared new information on its 7.62x51 mm SAR 240 and 12.7x99 mm SAR 127 machine guns. Sarsılmaz, which quickly produced the first prototypes of the weapons as a result of its R&D studies, has now entered the testing phase, and is now accelerating the works on the infrastructure that will be required for the serial production of the guns.

Alper ÇALIK / a.calik@milscint.com

SAR 240 Machine Gun

The SAR 240 comes in three different models. The SAR 240A is designed for use in remote controlled weapon systems (RCWS). The SAR 240B, developed for infantry use, can be fired either from a bipod or a tripod. The SAR 240C has been designed to be the ALTAY Main Battle Tank's, co-axial machine gun. The body of each of the SAR 240 models is designed to fire at least 50,000 rounds, while the lifetime of the barrel is at least 25,000 rounds. The gun can operate at temperatures between of -52 °C and +72 °C. The effective range of the machine gun is 1,200 metres for area targets while the maximum range is 3,725 metres. The average weight of the three models is 12 kilograms.

SAR 127 to Get the Final Say

The SAR 127 heavy machine gun, which will provide significant fire support in combat situations, is a selective -fire weapon and can both operate fully automatically or semi automatically.
The SAR 127, like the SAR 240A, can be integrated into RCWS, and can also be mounted on land, naval and aerial vehicles after the necessary interface connections have been made. The weapon, weighing around 38 kilograms, has an effective range of 1,830 metres for area targets and a maximum range of 6,764 metres.

Latif Aral Aliş, Chairman of the Board of Sarsılmaz

Unless Otherwise Stated, All Photographs : © Sarsılmaz

Uninterrupted Fire with Quick Change Barrel

Both of the fully automatic weapons are fed with an ammunition belt. As the ammunition belt can be fed from either the right or left, the guns can be easily integrated
to the existing structure of an RCWS.
These air-cooled guns feature a quick change barrel (QCB), which allows the gunner to replace an overheating barrel with a spare in a fast and safe manner when uninterrupted fire is required, such as in combat situations requiring sustained cover fire. In this way, guns can continue to serve in the combat arena with
no compromise to firepower.

Prototypes Produced in a Year

Sarsılmaz started working on the SAR 240 as part of the PMT 7.62 Project, for which a contract was signed with the Presidency of Defence Industries (SSB) on 10 December, 2018. The first stage in the project was to carry out a study of equivalent guns of the same calibre. In the following stage, the design process was initiated. Sarsılmaz created product trees of the parts to be produced, and completed the related design works in a short time. Shaped with the help of computer-aided programmes and laser scanners, the design was verified via simulation programmes and the prototype parts were produced. Design verification tests commenced with 25 prototype rifles, which were produced in less than a year.
Sarsılmaz started developing the SAR 127 heavy machine gun as part of the PMT 12.7 Project, for which a contract was signed on 25 April, 2019. Based on the experience gained with the SAR 240, the company followed a similar process in this project, beginning with an assessment of similar guns on the market as a first step. Under the project, which was conducted in line with the development works for the SAR 240, Sarsılmaz completed the design process

SAR 240

Sarsılmaz exhibited the first examples of its machine guns at IDEF'19.

© MSI TDR

SAR 127

and verified its designs via simulation studies. As a relatively high calibre gun, the entry of the 12.7x99 mm SAR 127 into the product range of Sarsılmaz for the first time necessitated considerable new investments. Having completed these investments, the company renewed its machinery and production line, and launched prototype manufacture.

Infrastructure for Serial Production Being Established

Although Sarsılmaz has produced prototypes of both guns and has reached the testing phase, it had to suspend its tests temporarily as part of the measures taken against Coronavirus (COVID-19), which has affected the whole world. Currently, the company is focused on strengthening its serial production infrastructure, ensuring excellence in its manufacturing processes and enhancing its capacity.
Sharing his views on the issue with MSI TDR, Latif Aral Aliş, Chairman of the Board of Sarsılmaz, said: "Sarsılmaz has always endeavoured to do its best in every project that it has been awarded by the SSB. We are continuing deliveries of large numbers of our SAR9 METE pistol, which came first in the pistol project of the SSB. Our SAR109T submachine gun has already gained popularity among the Turkish National Police and the General Command of Gendarmerie as it is an effective urban warfare weapon. In recent years, we have also launched production of three different types of assault rifles, namely, the SAR223 P (5.56x45 mm), SAR308 (7.62x39 mm) and MPT76 (7.62x51 mm), of which deliveries are continuing according to schedule. Our latest task is to develop 7.62 mm and 12.7 mm machine guns in accordance with the requirements of our country, and we have made a rapid start in these two projects, fulfilling all the necessary requirements within the scope of these new projects, and completing the necessary investments into the production line."
Speaking about the COVID-19 outbreak and its effect on all sectors including defence and aerospace, Aliş said: "During this outbreak we are going through, the Sarsılmaz family is taking all the necessary precautions, and is trying to minimise the adverse impact. To this end, we have adopted a partial and controlled working style, which allows us to continue with our in-plant tests and part production activities. We are also strengthening our infrastructure in preparation for the serial production of our rifles. All of these activities show, once again, how committed we are to supporting our state under all circumstances." ◆

Table 1. Technical Specifications of SAR 240 and SAR 127 Machine Guns

	SAR 240	SAR 127
Calibre (mm)	7.62x51	12.7x99
Mode of operation	Fully automatic	Fully automatic, semi automatic
Length (mm)	1,200	1,655
Barrel length (mm)	547	1,143
Height (mm)	250	190
Working principle	Open position mechanism / gas operated	Short recoil operated
Feed type	Ammunition belt	Ammunition belt
Feed direction	Right or left	Right or left
Empty shell discharge	From below	From below
Gun weight (excluding accessories, grams)	12,000	38,000
Barrel weight (grams)	-	11,800
Muzzle velocity (m/s)	850	930
Rate of fire per minute	650–950	450–600
Maximum range (m)	3,725	6,764
Effective Range (for area targets, m)	800 (bipod mounted) 1,100 (tripod mounted)	1,830 (tripod mounted)
Effective Range (for point targets, m)	600 (bipod mounted) 800 (tripod mounted)	1,500 (tripod mounted)

For further information, please visit http://www.sarsilmaz.com/en/

SAR 240

Answers from the Highest Authority

What Kind of a Path will the Sector Follow in the Post-COVID-19 Period?

© SSB

Our main function at present is to follow the process, to keep our finger on the pulse of the sector, to foresee problems that are likely to arise, and to take the necessary measures in consultation with the relevant state authorities. We want small companies to contact us especially about any cash flow-related problems they encounter. Our goal is to ensure their continuity and growth.

Prof. Dr. İsmail Demir, President of Defence Industries, answered the questions of the sectoral press in an online interview on 7 May. The broadcast, during which questions were posed by Ümit Bayraktar, Publisher and Executive Editor of MSI TDR; Özgür Ekşi, Editor in Chief of C4 Defence; and Cem Akalın, Managing Editor of Defence Turkey, was watched by sectoral representatives and members of the public with great interest.

Alper ÇALIK / a.calik@milscint.com
Turan SALCI / t.salci@milscint.com

Prof. Dr. Demir was posed many questions during the broadcast, and discussed a broad range of topics, such as the expected effects of Coronavirus (COVID-19) on the sector, the future sectoral targets, and the current situation in various defence and aerospace projects:

In which markets do you think the sector will concentrate its efforts in the post-COVID-19 period?
We should access every market where there is potential. I don't think our efforts before and after COVID-19 will be any different, in this respect. In this period, the measures taken in the healthcare sector, the disciplined approach that has been demonstrated, and the support provided to foreign countries by Turkey have brought about a change in perception, and we expect this to have positive effects. The transfer of defence technologies to the healthcare sector will demonstrate the level of our technological development to the world. We will make use of this recent development to change the previously [negative] perception of the Turkish defence sector.

Taking into account the effects of COVID-19, what changes do you expect to see in the performance of the Turkish defence and aerospace sector in such areas as total turnover, exports, R&D expenditures, backlog, etc. over the next few years? In this context, how will the 2023 targets, especially in regards to exports, of the Turkish defence and aerospace sector be affected by the pandemic?
The civil aviation segment of the defence and aerospace sector has been highly affected by this epidemic, and recovery may take a while. This may affect our companies that are engaged in the manufacture of products for civil aviation. [I think that] the companies that are able to recover the fastest are those that will come to lead the global market. On the other hand, the experience of the United States regarding [the components supplied from Turkey for] the F-35 project have shown them how much they need Turkey. We have already witnessed the challenge they have faced in identifying new sources for the components previously supplied by Turkey, and this challenge may continue to increase. This will generate a new perception of our contribution to the F-35 project. We don't think this situation will be as devastating for the field of defence as it has been for civil aviation.
From now on, the consideration will be in a much wider range when it comes to the defence [matters]. The world will see much more clearly that not only weapon technologies, but also other areas, such as healthcare, energy, food, water, transportation and communication, are also matters of interest to the defence sector. The consideration will be in a much wider range when it comes to the defence. In this respect, we, as Turkey, intend to export package solutions. We believe that a multi-aspect [solution] model involving a public security management network, a vehicle tracking system, a communication infrastructure and cyber security, can be proposed to countries that are seeking to establish a secure infrastructure. From now on, proposing a model or a structure, rather than a specific product will become more prominent.

There have been significant changes in the working order of many sector companies as part of the measures taken to counter the COVID-19 pandemic. What kind of studies are you carrying out to address such issues as irregularities in the production processes and cash flows of our companies; their struggle to keep qualified personnel in employment; and the provision of funding or low interest loans to take the pressure off companies? Furthermore, have you looked into the postponement of the deliveries of existing contracts, the removal of penalties for defaults, and addressing pandemics in existing and future projects as potential force majeure?
We made an announcement about the working order, and are aiming to provide psychological relief in this regard. We are working on a model through which the situation of each institution will be addressed separately in a project-based manner, and the necessary steps to be applied will be determined accordingly. First, however, we want to change the current perception. We want to reduce the impact as much as possible so as to let all enterprises continue production. For example, we have obtained a special work permit in line with the demands of our companies so that the curfew does not disrupt their activities, and we are being very responsive to the issues of financing and cash flow.
As you know, we have numerous projects underway. The defence sector consumes a significant amount of resources, and our main priority is to ensure no one loses their job. One of the main tasks of the Presidency of Defence Industries (SSB) is to support the defence sector to ensure the sustainability of the ecosystem. We are closely monitoring the problems and challenges faced by subcontractors, including SMEs, so that we can develop solutions as required. When necessary, we can also bring such issues to the agenda of the Defence Industry Executive Committee (SSİK) and discuss the measures that need to be taken, as our main function during this process is to follow the developments, to keep the pulse of the sector very clearly, to foresee possible problems in the sector, and to stay in contact with the relevant state authorities to ensure that the required measures are duly taken. We want small companies to contact us especially about any cash flow-related problems they encounter, as our goal is to ensure their continuity and growth.

© SSB

The live broadcast with Prof. Dr. Demir was made through the Karel Video Conference programme, which is an indigenous product.

Scheduled Deliveries Unaffected by COVID-19

While the operations of businesses in various sectors have come to a standstill due to COVID-19, R&D and production activities in the defence and aerospace sector have continued without interruption. To better understand what has been done to support this, could you brief us about the related activities being conducted?
Deliveries are continuing in various areas. We have made the first delivery of the serially produced KAPLAN ATV, and deliveries of KARGU-2 are going on. We are continuing to perform various activities related to the Utility Helicopter programme. Agreements have been signed with ASELSAN for the Gendarmerie Integrated Communication and Information System (JEMUS) project and the Urban Security System. The New Generation Crime Scene Vehicle KIRAÇ has been delivered. HAVELSAN's Submarine Command and Control Systems have been delivered. The manufacturing of UAVs is continuing. We signed a subcontractor agreement for the TF-X National Combat Aircraft. Sector companies are continuing to work on laser guns and electromagnetic guns. These are the main activities in March and April, and all are proceeding as planned. Nothing that

had been planned before has been postponed during this period. There are, however, some problems resulting from our international connections. For example, in T129 ATAK helicopter project, we are partnered with the Italians, and deliveries of helicopters have been affected by the situation in Italy. There have been minor disruptions, but they have originated abroad. We are keeping the effect to a minimum. We are taking firm steps to ensure interruptions to our strategic projects are prevented.

Considering the financial values of the ongoing projects, has there been any discussion of increasing the revenues of the Defence Industry Support Fund?

Steps have been taken to increase the volume of the fund. The projects, however, continue increasingly, thus requiring more resources. As the number of projects further increases in the future, we will need significantly more resources, especially for the indigenous projects concerning tanks, aircraft engines, etc. This issue is always on the agenda of the Defence Industry Executive Committee (SSİK).

The T-129 ATAK projects for Pakistan and the Philippines and the sale of SOM missiles to Azerbaijan, as well as the ALTAY Main Battle Tank project for domestic use, cannot be finalised due to the engine embargoes. Could you give us information on the latest situation with these embargoes? What are you doing to overcome them? Are there any plans B and C to be put into practice should it not be possible to obtain export licenses?

In the current situation, embargoes are a concept that are not spoken about, but applied, and our emphasis on national and indigenous concepts is based on our foresight related to this issue. We must develop an independent defence sector. We are cooperating with many countries in joint projects in which technology is being transferred, but when Turkey applies its national and independent policies, we encounter obstacles. The steps taken by Turkey to protect its national interests are responded to

© ASDS Media

The TF-X National Combat Aircraft was first displayed at Paris Airshow 2019 as a mock-up.

© MSI TDR – Onur Kurç / Tayfun Yaşar

The structural and avionic modernisation of F-16s is on the agenda of the SSB.

© SSB

An image from the test firing of the ATMACA Surface-to-Surface Guided Missile developed by Roketsan.

with strange attitudes by countries that we consider friends and allies. However, Turkey relies on its people; we rely on our engineers. Related works have already begun, but we need to be patient. No product can be produced in a day. We already have Plans B and C, but the obstructive attitudes are damaging everyone. Meanwhile, we will continue our export activities. As you know, we are not a country that has designed various aircraft in the past. For our first attempt, we are designing a fifth-generation aircraft, and this will take some time.

Naval projects have gained momentum recently. What is the current status in these, and are there any upcoming projects in this area?

At present, our New Turkish Type Fast Patrol Boat project and indigenous submarine project are continuing, and the TF-2000 project keeps improving to reach a certain point. Today, we have a better understanding of the importance of the Blue Homeland. The shipyards operating under the Ministry of National Defence and the Turkish Naval Forces, and the private shipyards have developed significant competencies. The systems installed aboard the vessel are also extremely important, and to some extent, the systems that we will install aboard naval platforms are dependent on abroad for the engine. These are also on the agenda in our indigenisation and nationalisation roadmap.

We had started designing our submarine with the Germans, however, whenever any country or company with which we had previously started cooperating in this context become reluctant and do not want to continue this cooperation, we continue on our own. We emphasise that all parties should always be constructive in relationships and projects. Indeed, the companies with which we are engaged in joint projects are willing to do business with us, but it's their government decisions and the obstacles they put in their way that prevent them from doing so.

We are engaged in works and tenders for unmanned surface and submarine systems. We think that the time has come for autonomous naval systems. We direct our young people to conduct research not only into airborne systems, but also land and naval systems.

In the coming period, what developments can we expect to see in Turkey's involvement in the international arena and in international cooperation?

It is possible that the first fruits of our activities and support in this period will be reaped in the F-35 project. Turkey's performance, as well as its meticulous execution of the works, will contribute to this. Regarding international relations, we are collaborating with other companies. The previous model we adopted in such collaborations was based on the procurement of certain aspects, like the designs, from abroad, but we soon started to see this model transforming into one in which the parties could contribute to each other's works. Our current model is aimed at ensuring that all activities result in a win-win relationship.

The issue of the removal of Turkish companies from the F-35 programme was being discussed in March 2020. What is the current situation?

In the F-35 project, the date planned to halt the contribution to production was March 2020, although that is not yet being applied. Our companies are continuing with production and delivery. These dates will be reconsidered, but as can be seen, excluding Turkey from the programme is not so easy. We are a loyal partner in the F-35 project, and the contribution of Turkish companies is clearly evident. Accordingly, we do not believe Turkey's departure from the programme will occur. We will continue to stick to the production. Circumstances prevent us from being offended and breaking the relationship.

What is the latest situation in the defence and aerospace projects that are currently on the agenda?

Our main target for the TF-X project is to utilise Turkey's capabilities to the maximum extent possible. We remain in contact with all stakeholders, and especially the major defence companies and TÜBİTAK (Scientific and Technological Research Council of Turkey). [Although it may be acceptable], the utilisation of foreign subsystems, even only during the transition process [to an indigenous defence industry], would obstruct us in the future. We will not rely on any foreign systems. No matter how binding the agreement, there can always be blockages. We have had our fingers burned in similar cases. In fact, making every system indigenous is a very expensive process in the global system. In this sense, we remain open to non-binding international collaborations. In the first phase, we will use an off-the-shelf engine, but the final engine will be indigenous.

Our negotiations with another country regarding ALTAY are continuing, and we can say that it is only a matter of time until we sign an agreement. We can say that once that cooperation agreement is signed, we will have a Plan B and even a Plan C for the engine. Our efforts toward [the development of] a national and indigenous engine, which is our ultimate goal, are continuing. On the other hand, we are also conducting R&D studies for certain power systems, whether electric or hybrid.

Regarding HİSAR-A and HİSAR-O, the need for these systems has become apparent during recent operations, with the need for a medium-altitude system being more essential. HİSAR-O has entered the field with certain features, but there are works that are still to be completed. Despite a minor slowdown in works this month, certain systems will start operating in the field in a few months. Our work on torpedoes is continuing. We have completed the tests of ATMACA and we expect serial production to start soon. We have made significant progress regarding the engines of our ATMACA and SOM-type missiles, and their integration and commissioning will start soon.

We will complete the creation of a full cruise missile family. GEZGİNs will be effective at longer distances and will be equipped with higher impact warheads. Our engine studies for ATMACA and SOM are in a good situation. Regarding the guidance technologies, we will be taking this matter into our own hands. Our companies are working intensely in many areas. In addition to the ship-to-ship ATMACA, new versions that will be effective from land-to-land and land-to-sea will be developed.

There is also a project for the integration of AESA radars into F-16s. Structural and avionics-related modernisations are also on the agenda. As is known, we are currently dependent on the main manufacturer for these systems, however, we are working on ÖZGÜR project that is aimed at equipping these aircraft with indigenous systems.

There has been no request to extend the lifecycles of F-4s, but studies are also underway to look at the potential for this.

The modernisation of C-130s is continuing.

We are determined in our efforts in the Jet UAV project. We have been working on a wide range of UAVs including mini, micro, swarm, ship-deployed and autonomous UAV platforms.

Among our main goals is ensuring that the weapon systems to be integrated aboard our frigates are indigenous. If there is enough time, maybe one of the İSTİF (İ) class ships can be integrated with GÖKDENİZ and ATMACA. Regarding the Vertical Launch Systems (VLS), we can continue using a foreign product, but we prefer to give the task to Roketsan for its integration, and to have an indigenous system at hand for the TF-2000. The situation with torpedoes is the same. As the development of systems is completed, we will begin integrating them into ships.

Works on the ANADOLU ship are progressing well and according to schedule, and studies into the integration of systems are ongoing.

The technologies used in the HİSAR-A and HİSAR-O will be transferred also to SİPER. Using a longer range and more modern radar is on the agenda, as well as equipping seeker heads with various functions.

In addition, the indigenous and national production of MANPADS (Man-Portable Air Defence Systems)-type shoulder-fired systems in Turkey is underway, and deliveries will start soon.

Who will undertake the maintenance and sustainment of the S-400s?

It will definitely be Turkish companies. Some of the training has already been received, and some are continuing. Works on the installation phase are also underway. In line with the training received, the maintenance and sustainment will be the responsibility of Turkey, with

AKINCI Unmanned Combat Aerial Vehicle, two prototypes of which have already been developed by Baykar, will serve as important trump cards for Turkey in the field of UAVs.

Prof. Dr. Demir gave the good news that the issue of the engine of the ALTAY Main Battle Tank to be manufactured by BMC will soon be resolved.

SAR 109T (9 mm x 19)

SUBMACHINE GUN WITH A UNIQUE DESIGN, FOR USE BY LAW ENFORCEMENT AND ARMED FORCES IN URBAN WARFARE SITUATIONS.

SAR109T is a light, ergonomic and effective gun with high rate of fire. Designed to meet tactical requirements of close combat conditions. Ten thousands of SAR 109T are already in use by Turkish Police and Gendarmerie.

SAR 223P (5.56 mm x 45)

THE RESULT OF THE COLLABORATION WITH LEADING UNIVERSITIES AND TUBITAK, THE FIRST RIFLE BORN IN TURKEY.

Designed to meet the specifications ordered by Turkish Police and Gendarmerie Forces. Due to its ability to shoot without a glitch even in extreme conditions and less maintenance requirement, it quickly became the weapon of choice by Turkish Law Enforcement and Armed Forces.

(7.62 mm x 39) **SAR 308**

REBIRTH OF A LEGEND BY SARSILMAZ.

While its classical design transformed for 100% indigenous manufacturing with high durability components like steel reinforced polymer magazine, ergonomically designed stock and hand guard, it presents a modern look and high performance.

MPT-76 (7.62 mm x 51)

The new infantry rifle, designed and produced in accordance with the Modern Infantry Weapon Project managed by Presidency of Defense Industries, to meet the requirements of Turkish Armed Forces.

SAR 9 METE (9x19mm)

ARMED AND SECURITY FORCES BEING OUTFITTED WITH THE NATIONAL PISTOL METE.

Contracted by the Presidency of Defense Industries, Sarsilmaz is manufacturing SAR9 METE Pistols. With most of the contract requirement is already fulfilled, a total of 180.000 METE pistols will be delivered by Sarsılmaz's masterful hands.

SAR 127 (PMT 12.7 x 99mm)

HEAVY MACHINE GUN - A very powerful select fire heavy machine gun, capable of penetrating the engine block of a motor vehicle at a distance of 1800m, with a maximum range of 6700 m.

SAR 240 (PMT 7.62 x 51mm)

MACHINE GUN - Designed to be installed in armored vehicles, it can perform its duty under harsh environmental conditions with extreme temperatures between -52 to 73 degrees. It has a maximum effective range of 1200 m.

K11 (9x19mm)

WITH ITS LEGENDARY RELIABILITY, the most preferred stainless steel pistol for decades.

sarsilmaz@sarsilmaz.com
www.sarsilmaz.com


Uncertainties surrounding the F-35 continue.
© Lockheed Martin

every part of the system or every work that involves the system being undertaken within the country.

The COVID-19 outbreak has shown us once again that the capabilities of the defence sector can be adapted to other areas. Mechanical ventilators have been manufactured under the guidance of ASELSAN and Baykar, and are now saving lives. The BIOSENS product, developed by NANObiz with the support of the SSB, has been adapted to suit COVID-19, and a new product called the LAMP4U molecular diagnostic kit has been developed. We can also say that the pandemic has provided a boost to studies in the field of CBRN. In this sense, which issues and areas do you think will stand out after the pandemic?

The healthcare sector is a field with its own dynamics, and our priority is to see how we can serve this sector with our defence technologies. Accordingly, we have identified the following areas:

- Patient care, examination and remote treatment procedures
- Disinfectants and antiviral processes
- Data analysis and data analytics modelling
- Imaging devices and image processing activities

These will be the focus of our contributions to the healthcare sector, and we are conducting various R&D studies to this end.

The national and indigenous model adopted by the defence sector will be implemented also in the healthcare sector. In public procurements, it is our recommendation and priority to make purchases considering indigenous products, regardless of time. Preferring foreign products to obtain rapid results will not be healthy in the long term.

The construction of the first frigate under the İSTİF (İ) Class Frigate Project is underway, what about the construction of the remaining three frigates? Are there any problems in the supply of off-the-shelf engines for the TF-X National Combat Aircraft? There was an ongoing project conducted with EUROSAM. What is the latest situation in that project? For the depot-level maintenance of F135 turbofan engines of F-35s, TEI was selected as the final assembly line in the region. What is the latest situation regarding this issue?

All elements of the F-35 project have been suspended, and the work at TEI has also been ceased. We have already started working on the engine of the TF-X, but in the first phase the F110 engine will be used. We are working on two different designs: one for the F110 engine, and one for our indigenous engine. Currently, there is no problem regarding the supply of F110 engines, which we know very well. We started with this engine because we wanted to be on the safe side. While on one hand we are continuing to work on an indigenous engine, on the other hand we are also cooperating with certain countries. The agreement with EUROSAM regarding definition studies was signed, and these studies have already been concluded. Following these definition studies, some disruptions occurred. Now, we need to be putting our signatures under the results. Next, we will take part in the project definition phase.

Regarding the İSTİF (İ) class frigates project, works on the first frigate are continuing, while both private sector and Turkish Naval Forces shipyards are being considered for the remaining three. To speed up the process, we have put forth a course of action. What should be done is clear. As soon as we press the start button, we will rapidly conclude the tender phase and launch the next phase.

SSB Keeps an Eye on All Payment Processes

Will there be any delays in payments?

There will be no delays linked directly to COVID-19, but if a delay in deliveries occurs, payments will also be delayed as payments can only be made at certain milestones. In line with the increase in the number of projects, the volume of the Defence Industry Support Fund should be increased, as our mission is to support the sector and keep the ecosystem alive. In that respect, we are following all of our companies, including their cash flows. When necessary, we delay the payment of an enterprise [that has no cash-flow problems] to ensure no cash flow-related problems are experienced [by others]. We are also advising prime contractors do the same for their subcontractors. The main principle to be applied in the prioritisation of payments should be to ensure that nobody becomes a victim. The principle of ensuring that no one loses their jobs should also be applied. This period has placed certain burdens on all countries, and Turkey is no exception. At this point, we must move forward while taking the pulse of the sector.

After this situation has passed, important opportunities will arise, especially in the export markets. We believe it is very important to ensure that our companies have a dynamic structure that allows them to take advantage of such opportunities.

What do you predict for the land vehicles sector?

The steel used especially for the armour frames of our land vehicles comes from foreign sources. OYAK has taken a step forward in this area, and the production of armour steel in Turkey is now on the agenda. Another component for which we are dependent on abroad is the engine. It is very important for us to have the armour, engine, turret and optical systems produced indigenously, and we will also have a stronger presence in foreign markets once we achieve this. Meanwhile, we are already developing very important subsystems and equipment for these vehicles.

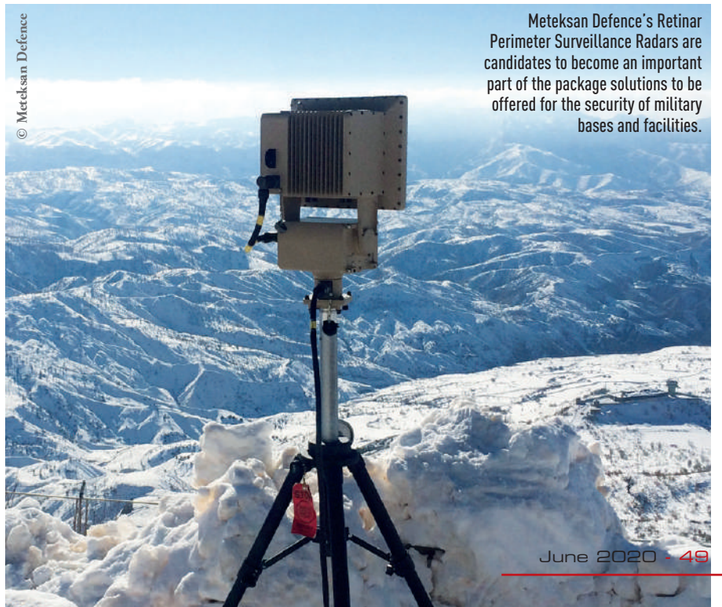
Having indigenous fire control systems, stabilisation systems and personnel protection systems provides important advantages also in terms of marketing. ◆


Deliveries of KAPLAN ATV, developed by FNSS, have continued during the COVID-19 outbreak.
© FNSS


Construction and system integration activities related to the Multipurpose Amphibious Assault Ship ANADOLU are continuing as planned.
© SSB

Turkey is strong in the field of land vehicles. EJDER YALÇIN Armoured Combat Vehicles of Nurol Makina, which is among the companies representing Turkey abroad, from the Impregnable Guard 2020 Exercise held by the Joint Special Forces of Qatar.


© Ministry of Defense of Qatar


Meteksan Defence's Retinar Perimeter Surveillance Radars are candidates to become an important part of the package solutions to be offered for the security of military bases and facilities.
© Meteksan Defence

CES Advanced Composites: Your Global Partner in Advanced Composite and Armour Solutions

For aircrafts, CES provides; wing armour and exterior panels for enhanced survivability; modular armour panels for floor protection; complex shapes with glass, aramid and carbon fibre reinforced materials; and lightweight Armour solutions for cockpit and pilot seat protection

CES Advanced Composites & Defense Technologies Inc. (CES) has established itself as a designer, developer and manufacturer of advanced composite parts and assemblies. Moreover, it has taken place among the world's leading manufacturers of ballistic protective solutions.

CES has the infrastructure, capability and capacity to position itself as the leading supplier of advanced composite materials, ballistic protective armour, engineering services and tooling equipment in the targeted global composites and defence market.

With its expertise in composite material design, development and production, its know-how has enabled the development of a leading range of products for a broad spectrum of applications. As well as focusing on the defence and aerospace industry, CES is continuing research and development activities to utilise expertise in land, aerospace and naval platforms, whilst increasing capacity in ballistic plates manufacturing. Ballistic armour product portfolio includes helmet, vest, insert, shield, EOD Search Suit, Add-on Armour and Spall Liner.

Having substantive experience and know-how in the armouring of land, aerospace and naval platforms, CES also provide a wide range of services from survival analysis of the vehicle to the development of alternative armour solutions at the requested level.

Having been certified with the international aviation quality management standard AS9100 and ISO9001 since 2013, CES acquired NADCAP Nondestructive Inspections (NDT) accreditation in 2018 and NADCAP Composite Certificate in 2019. CES conducts R&D activities to improve expertise in land, aerospace and naval platforms. The company's main factory built on 17,000 square meters in Ankara, Turkey, is an accredited R&D centre.

Most recently, in-house Ballistic Test Lab opened in Ankara in August 2019 with a broad scope of ballistic testing service including all levels of NIJ 0101.06 and NIJ 0101.04, STANAG 4569 Threat Level-1 to Level6, VPAM personal armour ballistic tests and VPAM BRV standards for special vehicles. Testing service will be internationally accredited soon.

Moreover, CES Advanced Composite produces reinforced polymer fibre (CTP) composite parts for the main industries in the automotive plants in the field of conventional composite in Izmir facility in 2019. ◆

CES develops and produces combat helmets, ballistic vests, bomb/EOD search clothing and shields for personal protection.

Reduced weight, design and engineering flexibility, anti-corrosion products put CES forward among competitors for armour, cupola, radome, antenna and sonar dome in marine sector projects.

For further information, please visit www.ces.com.tr

Innovative Ideas, Practical Solutions and Reliable Results for Friendly and Allied Nations

As countries continue to progress in the development of indigenous main systems and platforms in the field of defence and aerospace, they start to seek business partners who can develop subsystems as products. They are also experiencing a need for innovative and cost-effective solutions that will meet their urgent needs. İNDES Engineering is keen to become a solution partner to friendly and allied nations, based on the experience it has gained in the sector and its design capabilities in the fields of mechanics and electro-mechanics in which it has vertical expertise.


Melih Özkan, Founder and Chairman of the Board of İNDES Engineering

In the defence and aerospace sector, besides technological developments, there are also non-technological developments bringing significant changes to the agenda. Regional disputes and conflicts are compelling armed and security forces to find ways of responding also to unforeseen needs, and to find ways of meeting these needs in a fast and cost-effective manner. Amid the extraordinary developments of recent times, countries are trying to come up with indigenous solutions in the field of defence and aerospace, and all these developments also change the nature of collaborations. The need to meet urgent requirements with fast and cost-effective systems increases the importance of solution partners that can provide innovative and flexible solutions, as well as reliable business partners that are able to develop specialised subsystems and components for indigenous solutions.

Since its establishment, İNDES Engineering has been keeping pace with all these developments, and have been serving end users and prime contractors as a valuable solution partner that can keep abreast of these developments. In this sense, İNDES Engineering meets urgent needs with a flexible approach, aiming to satisfy the demands of the end user by working together with them in the field. On the other hand, İNDES Engineering is ready to step in when prime contractors identify a need for certain systems and subsystems, test equipment, special-purpose machines and software that involve specialisations in the mechanical and electromechanical disciplines. İNDES Engineering offers solutions in cases where the requested products do not fall directly within the fields of activity of the relevant institutions and organisations.

Products Developed Just in Time

To date, İNDES Engineering has rapidly introduced many products, especially those needed for surveillance and security systems, life support systems and energy generation and storage systems, in very short times, well below the sectoral average.

Since its establishment, İNDES Engineering has completed almost 80 projects of varying sizes, working in collaboration with prime contractors. In addition to these projects, İNDES Engineering has also realised some 15 R&D projects to date, and has signed a joint product agreement with ASELSAN for three of the product families it has developed.

İNDES Engineering is consistently working to develop new products and to expand our product family.

Unique User Experience

İNDES Engineering never delivers any system without first making sure that it will perform its duties in the field in the best and most reliable way. To this end, İNDES Engineering carries out full physical and functional testing on all of our solutions prior to delivery.

To respond to its users' requirements and demands, İNDES Engineering endeavours to be constructive and flexible, and to carry out our business to the highest of standards.

Furthermore, İNDES Engineering takes care to create cost-effective solutions in our works, and strive to maintain a stable and sustainable price policy for its users. Concerning labour time and unit costs, İNDES Engineering has managed to keep its costs at a competitive level by taking works on previous projects as reference.

İNDES Engineering carries out self-financed R&D studies, taking into consideration the experience it has gained in the sector, as well as the problems it has observed in the field. Its goal here is to address problems that its users may encounter in the future, and to make necessary preparations to offer potential solutions in a very short time as the need arises.

In order to respond to its user's demands in the best way, İNDES Engineering has an extensive hardware and software infrastructure as well as a large facility that can meet the requirements of different projects, with the desired quality. İNDES Engineering keeps its infrastructure and facility up-to-date, taking into account the demands its users may bring to the agenda in the future.

As a result of these efforts, İNDES Engineering can provide its customers with a significant added value and make their work easier. As a result of all these advantages, those who work with İNDES Engineering for the first time tend to again opt for İNDES Engineering in their new projects.

İNDES Engineering is consistently working to develop new products and to expand its product family.

İNDES Engineering never delivers a system without first making sure that it can perform its duties in the field in the best and most reliable way. To this end, it performs full physical and functional testing on all of its solutions prior to delivery.

Ready to Cooperate

Melih Özkan, Founder and Chairman of the Board of İNDES Engineering, has the following message for the international partners: "We are ready to offer our experience, capabilities and products to meet the needs of friendly and allied nations, after starting to focus in this direction some time ago. We are trying to turn opportunities for cooperation into long-term relationships. I invite you to review our capabilities and projects that are available on our English and French websites, which are accessible via the QR codes given on this page, to contact us and to visit our facilities. We look forward to starting new and long-term cooperations with new international partners." ◆

English version of İNDES Engineering website

French version of İNDES Engineering website


İNDES Engineering carries out self-financed R&D studies, taking into consideration the experience it has gained in the sector, as well as the problems it has observed in the field.

MİR Insulation's Mircek Thermal Insulation Jackets Enhance Platform Survivability

The Mircek thermal insulation jacket solutions offered by MİR Insulation for land, marine and air vehicles reduce the thermal and acoustic signatures of platforms, thus increasing their survivability. Mircek products, which mask the high temperatures generated by vehicle engines, also prolong the life of engine components, save energy, enhance work safety, reduce the risk of fire, increase the performance and efficiency of air conditioning systems, and prevent components from hitting and damaging each other in the event of sudden acceleration or collision.

All Photographs: © MİR Insulation

MİR Insulation can also design and produce large scale insulation jackets which are used on the steam turbines of civilian and military marine vessels.

Outstanding Features of MİR Insulation's Products

The outstanding features of MİR Insulation's Mircek thermal insulation jackets include: High and low heat resistance, high tightness, hydrophobic structure that repels water, lightness, easy and rapid installation, project-specific customised design, volumetric suitability, resistance to atmospheric conditions inside and outside the jacket, environmental compatibility, suitable weight ranges, being environment- and human health-friendly, packaging to international standards and suitability for use in all sectors.

The Mircek thermal insulation jackets offered by MİR Insulation, together with the sales and after-sales support services provided under warranty, bring significant benefits to the platforms used in the defence and aerospace sector. Such benefits include:

Prevention of Thermal Signature:

- Used to reduce the surface temperatures of equipment installed aboard high heat-emitting combat vehicles, thus increasing the survivability of vehicles.

Sound Insulation, Noise and Vibration Control:

- Thermal insulation, when applied to the exhaust system, also reduces the level of exhaust noise and is effective in reducing engine noise.
- The soft-fibre structure of the jackets reduces the deformations caused by equipment vibration.

Mechinical Components in the System:

- By insulating the high temperatures emitted by the exhaust system, surface temperatures are reduced and other components in the system are protected from heat damage.
- The condensation and corrosion that can occur after the prolonged operation of the exhaust are prevented.
- Hydraulic locking due to corrosion is prevented.
- Burnt particles from the exhaust system are prevented from entering the open cells of other components because of vibration.

Thermal Insulation:

- Saves heat energy by preventing unwanted heat losses or gains.
- Eliminates the freezing risk of equipment such as oil tanks, fuel tanks, etc.

Fire Risk:

- Prevents high temperatures emitted by equipment to penetrate into such components as electric cables, etc. which in turn prevents potential fires.
- In the event of fire, the fire-retardant feature of the layered fabrics delays the risk of flaming or explosion in the equipment around which they are wrapped, and of the engine room cabinets in which they are laid.
- Mircek thermal insulation jackets reduce surface temperatures and prevent the collection of flammable materials because of the heat on the surface high temperature equipment, thus prevent fires.
- By creating a flat surface on amorphous surfaces, such as exhaust pipes, manifolds and filters, prevent the collection of flammable materials in the pockets and cavities of equipment.

Air Conditioning Performance:

- Minimise heat losses during the transmission of hot and cold fluids through the vehicle's air conditioning system.

Shock Absorption and Protection from Atmospheric Conditions:

- With their soft-fibre structure, MİR Insulation Jackets prevent leakages in vehicles that may arise in the event of sudden cracks, breaks or deformations to equipment, which may be caused by a the sudden acceleration or collision.

Stability of Homogeneity:

- In order to ensure stability in the homogeneity of various chemical, gaseous or viscous materials, insulation jackets containing heat support systems and heated cables should be used.

Work Safety:

- Insulating equipment that generates high surface temperatures ensures health and safety of the personnel.

Compatible with All Kinds of Components aboard Land, Marine and Air Vehicles

Mircek thermal insulation jackets should be used on the many items of equipment installed on combat vehicles, anti-riot vehicles, construction equipment, logistic vehicles, aircraft, helicopters, military and commercial ships, submarines, ferries, boats, yachts and rail systems.

A non-exhaustive list of such equipment is as follows: Exhaust pipes, turbos, manifolds, intercooler pipes, Webasto products, shift cables, air filters, spare tires, fuel and oil tanks, flex connectors, sensors, air conditioning pipes, filters, clamps, flanges, electrical cables; equipment used between structural elements such as aircraft fuselage and wings; and mechanical installation valves and exchangers, heating boilers, water pumps, compressors, fresh water generators, heat exchangers, gas and steam turbines, and generators used aboard marine vehicles.

Mircek thermal insulation jackets can also be used as fire barriers and heat shield in engine panels, as a cloth bellow in vehicles, and as a shock absorber on sandblasting robots.

10 Years in the Defence and Aerospace Sector

Established in 2003 in Ankara, the capital of Turkey, MİR Insulation today indigenously manufactures thermal, sound and water insulation jackets for land, marine and air platforms under its Mircek brand. Carrying out its operations in compliance with AS 9100, MİR Insulation brings added value to the global economy with the energy savings it provides through its products.

The company, which is a member of SAHA Istanbul (Defence and Aerospace Cluster Association) – Europe's second largest cluster – manufactures world-class products in its semi-automated facility located on a large area, manned by well-organised staff. ◆

For further information, please visit www.mirizolasyon.com/en/

Unless Otherwise Stated, All Photographs : © ICDDA

ICDDA is an important opportunity for the development of cooperation between local and foreign prime contractors and SMEs.

Ankara Industrial Cooperation Days in Defence and Aerospace (ICDDA) to be the Starting Point of Collaborations that will Mark the New Era

Organised biannually by the OSTİM Defence and Aviation Cluster (OSSA) with the support of the Presidency of Defence Industries (SSB) and the Ministry of Trade of the Republic of Turkey, ICDDA is preparing to open its doors on 13–15 October for the fifth time. The event will contribute to the defence and aerospace ecosystem by hosting new collaborations, as in previous years. The foundations of the collaborations to be established in the post-COVID-19 (Novel Coronavirus Disease) period are expected to be laid at ICDDA 2020.

ICDDA 2020, for which MSI TDR is the Official Publication and Media Partner, will be held at the Hacettepe University Beytepe Congress Centre. The event will bring together prime contractors and decision-makers in the sector with (SMEs), offering its participants the opportunity to:

- engage in B2B meetings;
- improve existing business relationships;
- create new business relationships; and
- address the problems encountered by the sector and to propose solutions.

Event: Ankara Industrial Cooperation Days in Defence and Aerospace (ICDDA)
Date: 13–15 October, 2020
Venue: Hacettepe University Beytepe Congress Centre
Contact: www.icdda.com.tr
info@ostimsavunma.org

Panels and B2B Meetings

ICDDA 2020 will host panels to be moderated by experienced names in many areas, such as civil aviation, land-naval-air systems, homeland security technologies and supply chain development. These panels will be held with the participation of over 2,000 people, including military, defence and commercial attachés to Turkey, public officials, end users, and company representatives from Turkey and abroad. In the panels, sectoral innovations, as well as the problems faced by the sector and their solutions will be discussed. In addition, scheduled B2B meetings will be organised between exhibitors and purchasing delegations.

© SSB

ICDDA 2018, organised by the OSTİM Defence and Aviation Cluster (OSSA), has hosted many prominent names from Turkey and abroad, including Prof. Dr. İsmail Demir, President of Defence Industries of the Republic of Turkey.

260 Companies from 60 Countries Attended ICDDA 2018

The fourth outing of ICDDA, which was held on 23–25 October, 2018, hosted 260 companies from 60 countries. Furthermore, 5,700 registered B2B meetings were held during the event, which was attended by representatives of many international organisations and companies, including **Airbus, the Ministry of Defence of Azerbaijan, BAE Systems, the United Arab Emirates Armed Forces, Boeing, the Brazilian Air Force, CERN, Dassault Systems, International Group for Security and Safety (IGSS) Kuwait, Korea Aerospace Industries, Leonardo, the Qatar Armed Forces, Lockheed Martin, MBDA, Mexico Femia, NATO/ NSPA, Navantia, the Pakistan Air Force, PTC, Rolls Royce, Sikorsky, Stelia, Ukroboronprom, Thales and thyssenkrupp.** In addition, prime contractors from Turkey, including **ASELSAN, Baykar, BMC, FNSS, HAVELSAN, Kale Aero, Mechanical and Chemical Industry Company (MKEK), Otokar, Roketsan, STM, Turkish Aerospace, TEI and Turkish Technic** also participated at ICDDA 2018. The Turkish organisations that took part in the event included; **the Disaster and Emergency Presidency (AFAD), the Ministry of National Defence (MND) General Directorate of Military Factories, the MND General Directorate of Shipyards, the Ankara Chamber**

The prime contractors participating at ICDDA brief SMEs about their supply chains, offering them opportunities for new collaborations.

Protocol members attending ICDDA 2018 pose for a family photo.

of Industry, the Ankara Chamber of Commerce, the Information Technologies and Communication Authority (BTK), the State Supply Office (DMO), the Turkish National Police, the Small and Medium Enterprises Development Organisation (KOSGEB), the Defence and Aerospace Industry Exporters' Association (SSI), the Union of Chambers and Commodity Exchanges of Turkey (TOBB), the Scientific and Technological Research Council of Turkey (TÜBİTAK) and the Defence and Aerospace Industry Manufacturers Association (SaSaD).

ICDDA Awarded by the SSB

ICDDA, which was first organised in 2013 to bring together SMEs and local and foreign institutions and organisations for the purpose of cooperation, has become a professional connection point for the defence and aerospace sector at every outing since then. Maintaining its position as the largest B2B meetings platform in the region since its first outing, ICDDA continues to take its place in the success stories of its exhibitors. **According to information received from OSSA member ICDDA exhibitors, there has been a 62.5 percent increase in employment rates, a 317 percent increase in the number of markets and a 77 percent increase in exports, and the ICDDA event has played a role in these increases. This fact is clear evidence of the efficiency of the B2B meetings held during the event.** This efficiency has also fostered continuity among the companies participating at the event.

Christina Wills, Senior Supplier Development Leader at Boeing, said they will meet with SMEs, once again at ICDDA 2020.

As a result of the successful and effective B2B meetings held with the attendance of foreign purchasing authorities, the ICDDA organisation was awarded with a "Defence Industry Special Award" in 2014 by the SSB, followed by a special award for "Defence Industry Promotion" in 2017. ◆

International Aspect of ICDDA

As in previous outings, institutions and organisations from many countries have been invited to the 5th ICDDA, which will be held on 13–15 October, 2020, and confirmations of attendance from such institutions and organisations are continuing to be received. The foreign participation at ICDDA in previous years is as follows:

YEAR	COUNTRIES	COMPANIES	PARTICIPANTS	B2B MEETINGS
2013	22	220	1,500	2,000
2014	34	250	1,800	4,800
2016	33	200	2,000	5,400
2018	60	260	2,200	5,700

The panels held at ICDDA focus on the future of the sector.

Opinions from the Sector about ICDDA 2018

Prof. Dr. İsmail Demir, President of Defence Industries of the Republic of Turkey

Supported by the SSB and organised by OSSA, ICDDA is an important event that nurtures interactions between companies in our defence ecosystem.

Cem Altınışık, Corporate Communications Manager at FNSS

ICDDA is a unique organisation where we can come together with the players in our own ecosystem and with our subcontractors. So I think it is a very useful activity. Being able to successfully execute such an event in such a short time is a team success. OSTİM has a strategic importance for FNSS, and for this reason, we are delighted to be supporting all events arranged by the OSTİM Organised Industrial Zone and OSSA.

Ahmet Kain Programmes Director at TEI

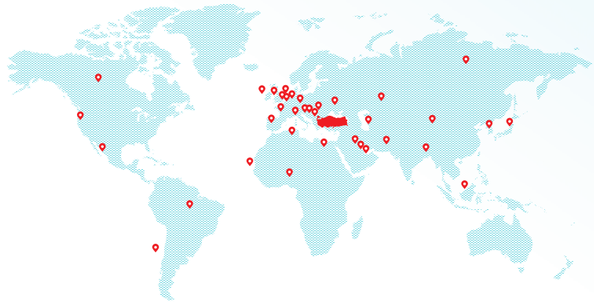
Since we are both a purchaser and a manufacturer, we have an idea of both sides of the coin. At the event, we had the opportunity to come together with the representatives of our clients and we discussed how we can support and improve the subsidiary industries with many companies. We also made several business contacts, and so it was a very fruitful event for us.

ICDDA 2013
220 Participant Companies
From 22 Countries
34,8% From Abroad
2000 B2B Meetings

ICDDA 2014
250 Participant Companies
From 34 Countries
35,2% From Abroad
4800 B2B Meetings

ICDDA 2016
200 Participant Companies
From 33 Countries
36% From Abroad
5400 B2B Meetings

ICDDA 2018
260 Participant Companies
From 60 Countries
38% From Abroad
5700 B2B Meetings



● LAND PLATFORMS ● AIR PLATFORMS ● NAVAL PLATFORMS

EMBASSIES & ATTACHES

ORGANIZED BY OSSA OSTİM DEFENSE AND AVIATION CLUSTER abe advanced business events advbe.com

www.icdda.com.tr

Hosted by
Ministry of National Defence

Milli Savunma Bakanlığı
Ev Sahipliğinde

Under the Management and
Responsibility of
Turkish Armed Forces Foundation

Türk Silahlı Kuvvetlerini Güçlendirme Vakfı
Yönetim ve Sorumluluğunda

Avrasya Buluşması

Türkiye

Eurasian Meeting

IDEF'21

15'inci Uluslararası Savunma Sanayii Fuarı
15th International Defence Industry Fair

25 - 28 Mayıs / *May 2021*

www.idef.com.tr

TÜYAP

www.tuyap.com.tr

DESTEKLEYENLER / *SUPPORTED BY*

T.C. DIŞİŞLERİ BAKANLIĞI
T.C. HAZİNE VE MALİYE BAKANLIĞI
T.C. İÇİŞLERİ BAKANLIĞI
T.C. KÜLTÜR VE TURİZM BAKANLIĞI
T.C. SANAYİ VE TEKNOLOJİ BAKANLIĞI
T.C. TİCARET BAKANLIĞI
T.C. ULAŞTIRMA VE ALTYAPI BAKANLIĞI

T.C. İSTANBUL VALİLİĞİ
KOSGEB
SaSaD

ufi Küresel Fuar Endüstrisi Birliği Onaylı Fuar Approved Event — *The Global Association of the Exhibition Industry*

ICCA Member — Üye Kuruluş Uluslararası Kongreler Birliği *International Congress and Convention Association*

TFYD — Üye Kuruluş / *Member* TÜRKİYE FUAR YAPIMCILARI DERNEĞİ TURKISH FAIR ORGANIZERS ASSOCIATION

M - C TSE - ISO 10002 · K - O TSE-ISO-EN 9000 · TS EN ISO 9001:2015

BU FUAR 5174 SAYILI KANUN GEREĞİNCE TOBB (TÜRKİYE ODALAR BORSALAR BİRLİĞİ) DENETİMİNDE DÜZENLENMEKTEDİR.

THIS FAIR IS ORGANIZED WITH THE AUDIT OF TOBB (THE UNION OF CHAMBERS AND COMMODITY EXCHANGES OF TURKEY) IN ACCORDANCE WITH THE LAW NO.5174.

Turkey
Discover
the potential

turkishdefenceindustry.gov.tr
ssi.gov.tr

SSI
DEFENCE AND AEROSPACE INDUSTRY EXPORTERS' ASSOCIATION

LAND AND AIRLAND DEFENCE AND SECURITY EXHIBITION

2022

EUROSATORY

13-17 JUNE 2022 / PARIS

THE UNMISSABLE **WORLDWIDE** EXHIBITION

1,802 Exhibitors +14,7%
from 63 countries
65,9% of international
65 startups at Eurosatory LAB

98,721
Total attendance
(exhibitors, visitors, press, organisers)

227
Official delegations
from 94 countries
and 4 organisations
(representing 760 delegates)

696
Journalists
from 44 countries

75 Conferences
2,102 Business meetings made

2018 key figures

GICAT www.eurosatory.com COGES