



# ISKID

# MAGAZINE

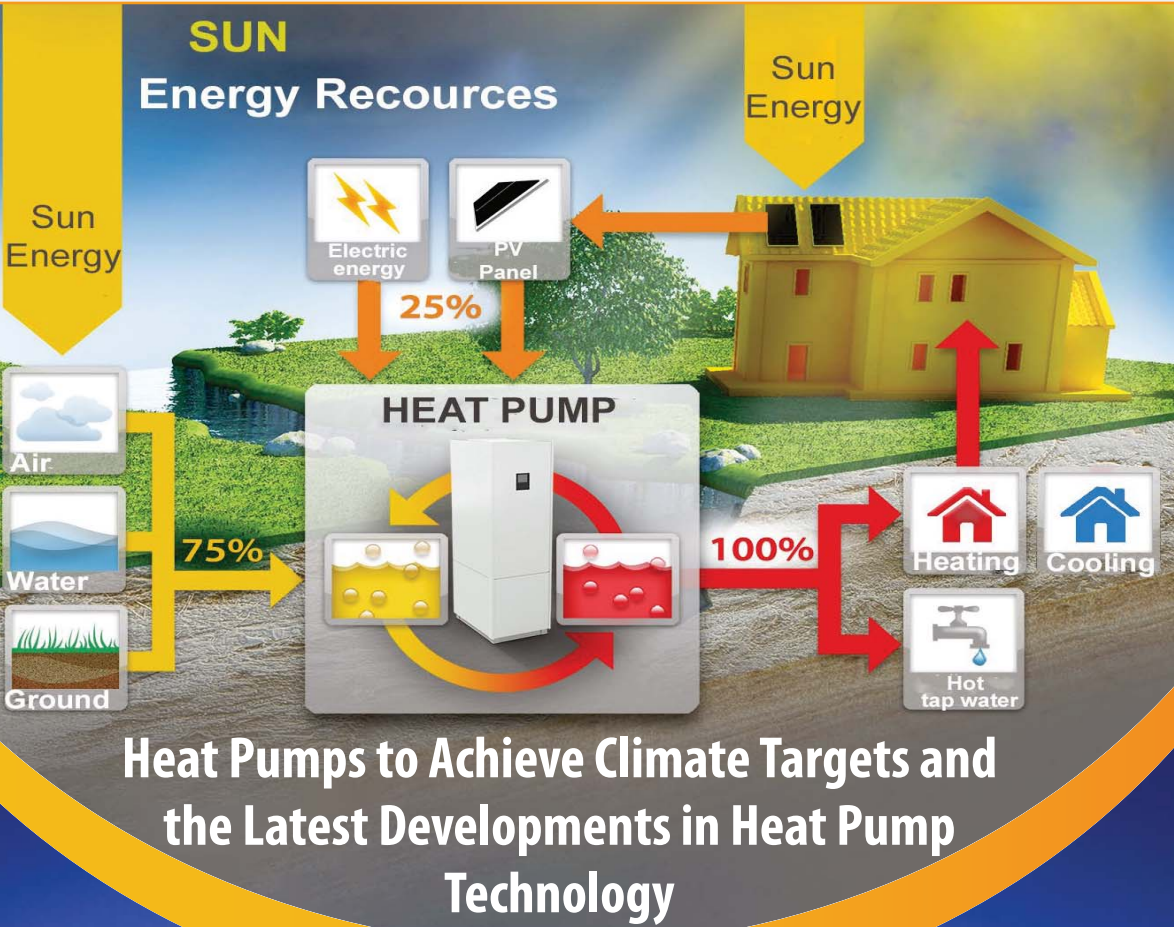
HVAC&R JOURNAL OF TÜRKİYE

ISKID AIR CONDITIONING & REFRIGERATION MANUFACTURERS' ASSOCIATION | PER SIX MONTHS - 2023 - VOLUME 25 | [f /iskidTR](#) [t /iskidTR](#) [i /iskidtr](#) [in /iskidtr](#) [y /iskidorgr](#)

## Rising Star "Türkiye" in HVAC&R World

### Türkiye

Turkish HVAC-R



The Mysterious Lands of Anatolia are Ready to be Explored: The Phrygian Valley



REACTOR COOLING APPLICATIONS CONCRETE MARINE APPLICATIONS

CRANE CAB COOLERS P L A N T S TEST EQUIPMENT DATA

ICE RINK COOLING APPLICATIONS PAINTING FACILITIES CENTERS

COMFORT APPLICATIONS INDUSTRIAL COOLING

MRI COOLING APPLICATIONS APPLICATIONS

INJECTION MACHINES

SPOT WELDING MACHINES

LAZER MACHINES INDUCTION FURNACES

EXTRUDER DEFENSE INDUSTRY

MACHINES

FOOD MACHINES

TEXTILE FILLING MACHINES

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# AIR CONDITIONING AND REFRIGERATION APPLICATIONS



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~ Unit Coolers

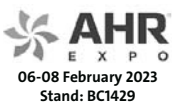
~ Air Cooled Condensers

~ Dry Coolers

~ Heating & Cooling Coils

~ DX-Evaporator and Condenser Coils

~ Air to Air Heat Recovery Exchangers



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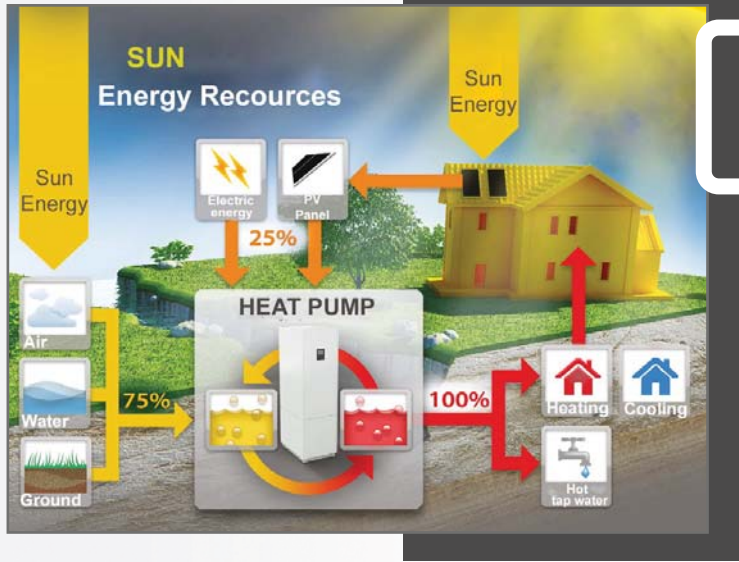
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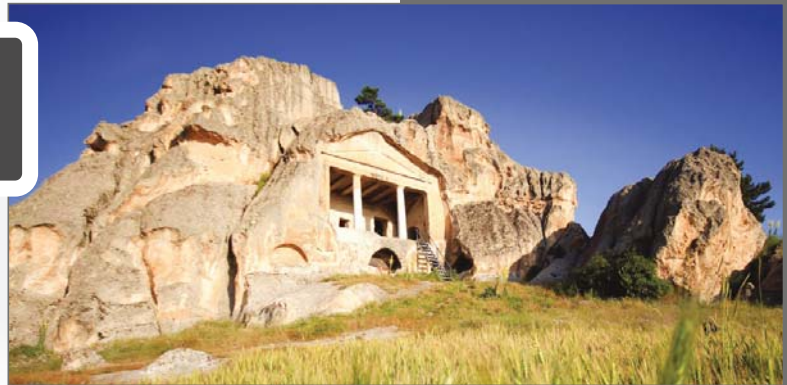
In memory of Metin Duruk...



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The mysterious lands of ANATOLIA  
are ready to be explored:  
THE PHRYGIAN VALLEY



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**AYK SERDAR DİDONYAN**  
**ISKID Board Chairperson**

## Hello 2023... Rising Star "Türkiye" in HVAC&R World

2022, which we began with hope and best wishes, has come to an end, along with all of its joys and hard times. For our industry and ISKID, another year has come and gone.

Our association spent the summer months of 2022 full of meetings and preparing for the Eurovent Summit. On October 25-28, we, with the Eurovent Association, hosted the Eurovent Summit, Europe's largest HVAC&R industry summit, organized in Antalya, Türkiye. With its main theme of "Building Bridges", the Eurovent Summit hosted meetings to build bridges between more sustainable, society-friendly, and eco-sensitive industrial products and systems among Europe and neighboring geographies. On 25-26 October, the first two days of the summit, ISKID and TTMD (Turkish Society of HVAC and Sanitary Engineers) shared the recent developments in the industry with local and foreign professionals of the air conditioning industry with a seminar on "New Technologies and Trends in HVAC&R". With the evening events held at the Summit, many HVAC&R professionals attending from Europe and neighboring countries had the opportunity to learn more about Türkiye's rich culture.

In 2022, the global problems causing enormous material damage and, particularly, the loss of many lives due to climate change, continued to deteriorate. It was a year with extremely high temperatures for Europe, particularly during the summer. Many rainy countries such as England experienced extraordinary droughts, and rivers and other water sources nearly dried up. Due to heavy population pressure and insufficient eco-friendly transformation of our production and consumption habits, issues related to climate change impact countries more and more every year. In this regard, water and agricultural areas, which are essential for the existence of humanity, are under great pressure. Carbon Border Adjustment Mechanism, which will be implemented as part of the EU Green Deal, a key step in the fight against climate change, is among the most significant issues on the Turkish air-conditioning industry's agenda. Accordingly, Türkiye needs to support R&D projects with the carbon-neutral goal, focus on clean energy investments in air-conditioning and other industries, and ensure that new steps are taken rapidly for using eco-friendly fluids in the refrigeration field to transform to carbon-zero production processes. We hope 2023 will be the year of more concrete steps.

The Turkish HVAC&R Industry ended 2022 with 6.7 billion dollars in exports, a 7.9 percent gain over the previous year.

While the industry's exports reached an all-time high, the export-to-import ratio was 93.5%. Germany, the United Kingdom, Italy, Russia, and France were the top export countries in 2022.

The HVAC&R Industry's capacity for adaptable and high-quality production, our country's geographic proximity to key markets, and our human resources' high level of education elevate our manufacturers to a very significant position in global trade. These advantages have brought foreign investors' attention to the Turkish HVAC&R industry. Leading international brands are investing in our industry. This situation ensures the quick advancement of our technological infrastructure and human resources even as Türkiye moves toward being the production hub of Europe. Focusing more on R&D, the Turkish HVAC&R Industry will surely carry the momentum achieved in exports to an even better position in 2023. In the next 3 years, Türkiye aims to get a share of 1.5% of the world air-conditioning market.

ISKID has a busy exhibition calendar in 2023. As an association, we will represent our members at numerous international exhibitions in 2023, including Euroshop-Düsseldorf (26 February – 2 March), Climate World – Moscow (28 February – 3 March), ISH Frankfurt (13 March – 17 March), HVAC UK London (18 – 19 April) and Climatization Madrid (14 – 17 November). This year, we intend to take part in ISK SODEX, the largest air conditioning industry trade exhibition in Eurasia, which will take part in Istanbul from October 25 to 28. Through various organizations, we also hope to meet face-to-face with all of our shareholders at this event. We invite all of our international shareholders interested in keeping up with the most recent trends and advancements in the air conditioning industry to make time for the ISK SODEX.

Lastly, I would like to respectfully commemorate a very beloved friend, Mr. Metin Duruk. Through my professional life and various industry-related organizations I was part of, I believe he set an example for all of us with his vision, discipline, energy, helpfulness, as well as his deep love and respect for people, nature, animals, and his country. Unfortunately, Mr. Metin Duruk passed away in October 2022. The loss of such an amazing professional in the industry was among the significant news of 2022, influencing all of us deeply.

While welcoming 2023, I wish all HVAC&R industry employees and stakeholders a happy new year. I hope 2023 will bring new hopes, success stories, and health.



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# AIR CONDITIONING AND REFRIGERATION MANUFACTURER'S ASSOCIATION İSKİD



The air conditioning and refrigeration industry, which has emerged in the 1950s in Türkiye, developed very quickly. İSKİD was established in 1992 with the contributions of prominent companies in the sector, to conduct work towards achieving sustainable and regulated HVAC&R Industry development in compliance with the world.

Over 100 member companies are gathering under İSKİD's roof to conduct activities for the development of the industry and to produce with high-quality standards.

## **The objective of İSKİD:**

To ensure cooperation between the members that are manufacturers and/or importers of climatization, refrigeration and air conditioning devices in Türkiye and work on finding solutions for their problems,

To protect the rights of air conditioning consumers and companies on a national and international level;

To conduct activities that will ensure companies to protect the environment while providing solutions for the country's HVAC&R needs and contribute to the country economy by supporting energy efficient product solutions.

## **Mission:**

To realize strategic plans for the development of the Air Conditioning Industry and the actions that will carry out these strategies in cooperation with the sector and the other stakeholders.

## **Vision:**

To raise the Air Conditioning Industry to a reputable and leading position both in our country and abroad through its work increasing public life quality, to be sensitive to the environment, innovative, reliable and competitive.

## **Goals:**

- To develop the sector's research-development infrastructure and university-industry cooperation,
- To encourage the training of a qualified workforce for the sector,
- To encourage the use of renewable energy resources, high-end products, innovative technologies and applications,
- To increase activity in the national and international media,
- To track and update regulations and standards, create specifications when needed, perform market monitoring more effective and prevent unfair competition to maintain a more trustworthy sector image,
- To promote and support industry-Government relations,
- To introduce high-quality Turkish product image to the international market and increase our reputation,
- To increase cooperation with international organizations.



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# The European Air Conditioning Industry Came Together in Antalya on October 25-28, 2022



The Eurovent Summit 2022, where ISKID (Turkish Association of Air Conditioning and Refrigeration Manufacturers) contributed as the organizing partner, was held in Antalya from October 25–28, 2022.

Current developments in the HVAC&R industry were discussed in sessions and panels with the participation of many domestic and foreign industry representatives at Europe's largest HVAC&R industry-specific event, which is held every two years. At the summit, meetings were organized between Europe and neighboring regions on more sustainable, community-touching, environmentally conscious products and systems in accordance with the theme of the event, "Building Bridges".

On Tuesday, October 25, the Eurovent Summit 2022 Antalya began with an official opening ceremony at the Akra Hotel. Ayk Serdar DIDONYAN, ISKID Board Chairperson, made a "welcome" speech at the opening ceremony. Didonyan said, "We will strengthen our ties together with the historical and natural beauties of Antalya" in "Building Bridges"-themed Eurovent Summit.

Our doyen Mr. Metin DURUK, who passed away in October, was commemorated with a moment of silence at the Eurovent Summit 2022 opening ceremony. Ayk Serdar DIDONYAN, ISKID Board Chairperson, stated, "Mr. Metin DURUK was a very valuable elder who touched the lives of all of us with the discipline, with the effort he made for people, nature and peace as well as the contributions he made to our







industry. We will always remember our industry doyen Mr. Metin DURUK with respect, love and the values he taught us."

The opening ceremony ended with the ribbon cutting after the welcome speeches of Mr. Raul Corredera Haner,

the EUROVENT President, Mr. Sylvain Courtey, the President of the Eurovent Certification, and with the attendance of Mr. Ozan Emrah Gök from the Ministry of Industry and Technology - The Department of Automotive, Energy and Imports.







During the summit, which it co-hosted with the European EUROVENT association, İSKİD organized "New Technologies and Trends in the HVAC&R Industry" seminars with TTMD (Turkish Society of HVAC and Sanitary Engineers) on October 25-26 for two half-days. Information on Indoor Air Quality, Energy Efficiency, The Green City Accord and the Preparation Process of the industry, Commissioning, TAB (Testing, Adjusting, Balancing) Certification, Digitalization and BIM (Building Information Modeling) were shared with the participants in the seminars that attracted great interest.



Eurovent Innovation/HUB, which focuses on the concepts of "Innovation" and "Sustainability", was organized at Eurovent Summit 2022 on Wednesday evening, October 26. It was emphasized that the HVAC&R industry focuses on designing safer and more sustainable products.

Mr. Tunç KORUN, who additionally served as İSKİD Board Chairperson for the 6th term (2003-2004), received the Eurovent Legend Honor Awards at the "Legend Of Eurovent" on Thursday, October 27. The Eurovent gives these awards to individuals, who have made significant contributions to the European air conditioning industry. It was also presented to Mr. Metin DURUK, the 7th Term İSKİD Board Chairperson, one of İSKİD's founding members and a doyen who passed away in October. The President of SOSİAD (Association of Refrigeration Industry And Businessmen), Mr. Hayati CAN received the award on behalf of Mr. Metin DURUK.

For four days, besides the natural splendors of Antalya, the Eurovent Summit 2022 welcomed many representatives of the HVAC&R industry from Europe and nearby areas. The event ended on Friday, October 28.







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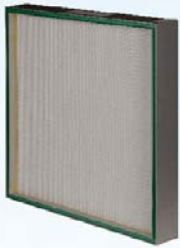
V-Compact Filters



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Carbon Filters



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## AIR FILTER TECHNOLOGY



## ISKID took part in the International COOL UP Program

ISKID supported the program by participating in the Cool Up Program, which is a part of the International Climate Initiative (IKI), with its consultant status.

Cool Up aims to support the transition of Egypt, Jordan, Lebanon and Turkey, which are the program's participating countries, to the sustainable cooling process. Through their responses to the program's survey on cooling technologies and the use of natural refrigerants, including the industry and usage habits in Turkey, ISKID member industry experts provided the data that the program needed.

The energy demand in the Middle East and North Africa (MENA) region is expected to increase by 50% by 2040 due to climate change, rapidly increasing population, urbanization and higher living standards. Cooling represents a large part of energy consumption, and many existing devices also use technologies with low energy efficiency and refrigerants with high global warming potential. To overcome these problems and mitigate climate change, Cool Up promotes accelerated technological change and



the early implementation of the Kigali Amendment, the Montreal Protocol and the Paris Agreement in Egypt, Jordan, Lebanon and Turkey.

The four objectives of the Cool Up strategy are to decrease cooling demand, phase out hydrofluorocarbons, replace and recycle inefficient equipment and refrigerants, and raise public awareness of

the issue. The program aims to create a catalytic change in the refrigeration and air conditioning industry and ultimately to spread sustainable cooling technologies in the market.

Cool Up is run by the German consulting company Guidehouse in collaboration with national partners, including UNDP. For 2023, more thorough investigations are planned in the following areas: industrial studies-policy development, national cooling action plan, demo projects, capacity building trainings, thematic workshops, COP and MOP events, and visibility studies. ISKID's industry expertise and vision in Turkey are expected to benefit the program's relevant areas.

## ISKID 3rd URGE Project is in progress



Started in March 2020 and completed within two and a half years, training and consulting activities continue following the activity schedule in the 3rd URGE project.

The "Total Quality Management in Production and Lean Manufacturing" consulting service started in April 2021 and was completed in February 2022.

Lean Office Processes Consulting activities began in June 2022 and are expected to be finished in February 2023. The consultancy activity began in November 2021 after determining the requests and needs of 14 willing companies in the BIM consultancy process.

It is expected to be completed by November 2023. Along with consulting, training on "Export Marketing Methodologies in B2B Goods and Services Export," "Supply Chain Management," "Cost Accounting," and "Inflation Accounting" was completed in 2022.



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## ISKID will organize a seminar on heat pumps at teskon+SODEX 2023

teskon+SODEX Heating, Refrigeration, Air Conditioning, Ventilation, Insulation, Pump, Valve Fair, one of the most significant gatherings of the Turkish air conditioning industry, will be held at the Izmir Tepekule Congress and Exhibition Center from April 26 to 29, 2023.

ISKID will hold a session on "**CURRENT DEVELOPMENTS IN HEAT PUMP TECHNOLOGIES AND EXAMPLES IN TURKEY**" as a part of the exhibition. The session, which will be moderated by ISKID Board Member Mr. Turgay YAY, aims to increase public awareness of eco-friendly heat pump technologies. The seminar will include presentations on a wide range of subjects, including different types of heat pumps, environmental policies and current laws, as well as the most recent developments and examples of heat pump technologies in Turkey and Europe, environmental policies and laws in effect today, and the role of heat pumps in energy efficiency.



teskon+SODEX, one of the most prominent exhibitions in the Aegean Region, plans to welcome over 100 exhibitors and 7,000 guests in 2023.

## ISKID took part in the Chillventa with its booth



ISKID took part in the Chillventa exhibition held in Nuremberg, Germany, between 11 – 13 October 2022, with its booth in Hall 9. Chillventa, the major worldwide

refrigeration technology exhibition, was held face-to-face for the first time following the pandemic as an important gathering place for professionals in refrigeration, air

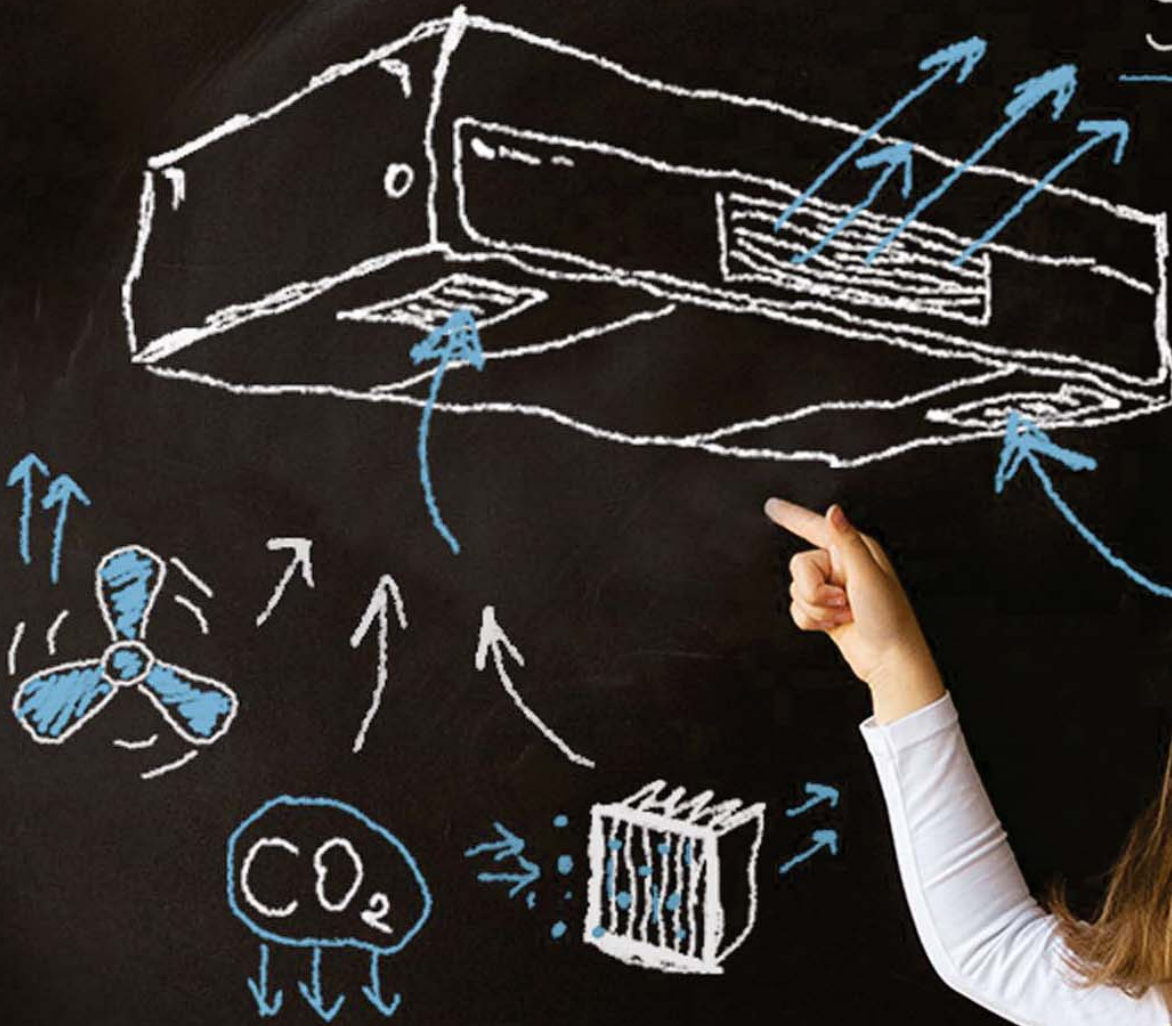
conditioning, ventilation, and heat pumps. The CHILLVENTA offered its participants the opportunity to establish face-to-face business contacts and follow industry trends through the forums organized during the exhibition.

### Exhibitions that ISKID will participate in with its booth in 2023;

- February March 26th - March 2nd, 2023 / EUROSHOP  
Düsseldorf - Germany / 14th Hall,  
Booth No: D 43
- March 13-17, 2023 /  
ISH FRANKFURT - Germany
- February March 28th-March 3rd,  
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Moscow - Russia
- October 25-28, 2023 / ISK SODEX  
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## MEKTES'22 Mechanical Installation Summit was Organized

The leading companies in the industry attended the MEKTES'22 event on "Building Energy Performance Deficits-Energy Losses from Design to Operation", which was held at Ankara Technopark on October 5, 2022, and was organized by MÜKAD (the Women's Engineers and Architects Association) with support from İSKİD as a strategic partner. İSKİD Board Member Ms. Betül İMZALI gave an opening speech at the event.

At MEKTES'22, industry professionals discussed the main theme, "Deficits in Building Energy Performance Energy Losses from Design to Operation".

### MEKTES'22 focused on the following:

- Building Energy Performance Criteria in Design
- Building Energy Performance in the Application and Material Selection Process
- Commissioning and in Real Operating Conditions - Building Energy Performance.



To increase the Energy Performance in buildings, innovative approaches such as efficiency-enhancing system selections, calculations and measures, and renewable energy sources are of great importance in designing new buildings. Together with these approaches, MEKTES'22 focused on the improvements to be made in current systems and the importance of proper operation of the systems. MEKTES'22 was an important event where companies from all industry groups came together to find out how these approaches could be applied.

## Representatives from İSKİD gave a presentation at the 22nd OZONE PANEL



On December 29, 2022, the "22nd OZONE PANEL" was hosted by the Ministry of Environment, Urbanization, and Climate Change, at The Marmara Taksim Hotel.

Dr. Andaç YAKUT, Chairperson of Heat Pump Commission, on "Safety and Risk Management and Safety Standards in Alternative Refrigerants" and Ms. Neslihan FINDIK, Member of the İSKİD F-Gaz Working Group, on "The Effects of Alternative Refrigerants on Energy Efficiency and Product Design" delivered their presentations. As panelists, they participated in the

panel discussion on "How We Provide the Transition to Alternatives on Reducing HFC Use?".

Having been held annually by the Climate Change Department of the UN Industrial Development Organization (UNIDO) for more than 20 years, the Ozone Panel was held with the theme "HFC Reduction Process and Transition to Alternatives" to coincide with the beginning of the process of reducing the usage of hydrofluorocarbons (HFC).

Orhan Solak, the Head of Climate Change, and Süleyman Yılmaz, the representative of UNIDO Turkey, gave the opening remarks at the beginning of the 22nd Ozone Panel. In his speech, Solak said that the Kigali Amendment, ratified on November 10, 2021, started reducing HFCs (hydrofluorocarbons), which will contribute 0.5 degrees to the Climate Change objectives. He mentioned that the aim is to conduct collaboratively productive studies for reducing HFCs (hydrofluorocarbons) to eliminate ozone-depleting substances (OTİM), as in the past.



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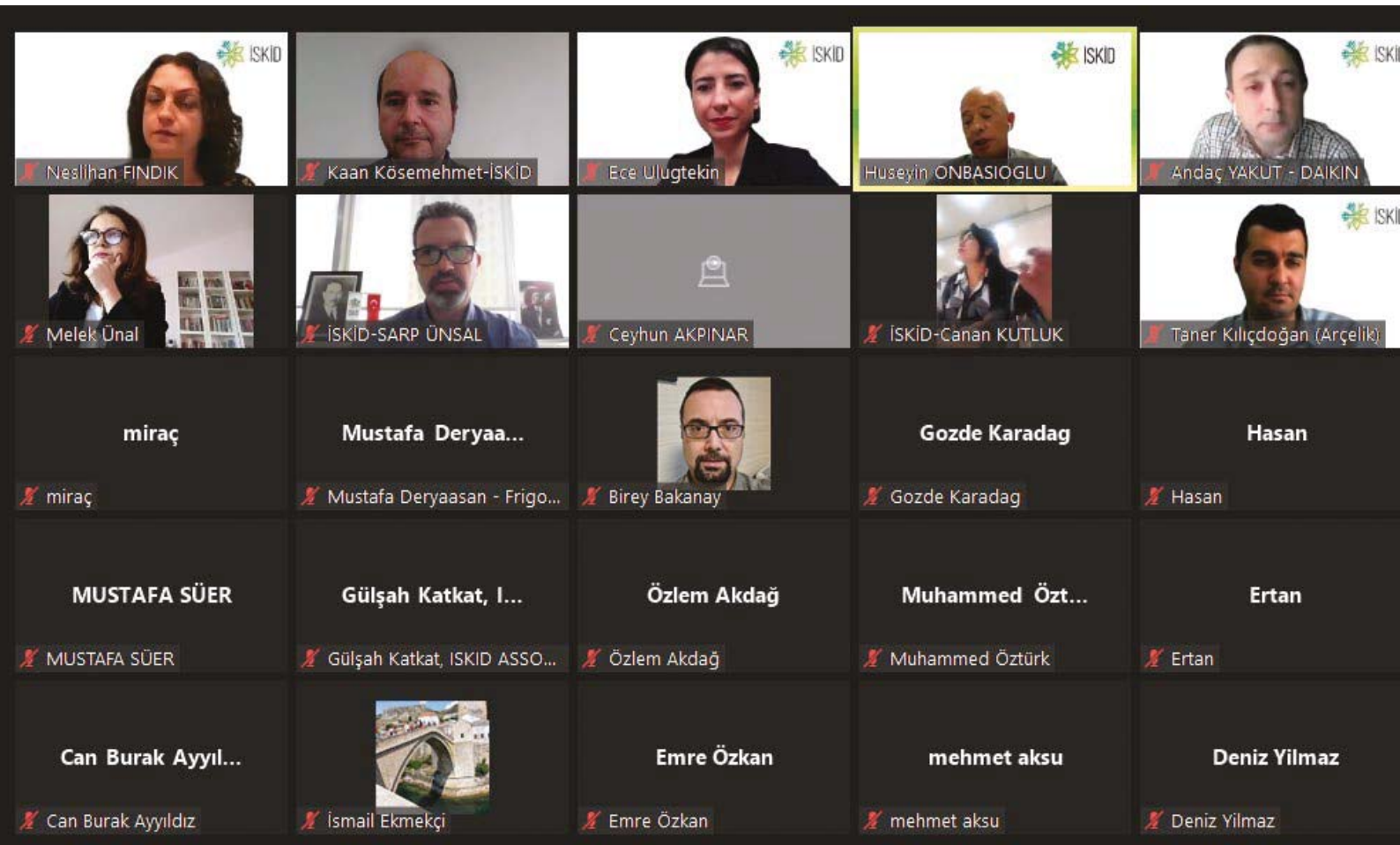
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## ISKID webinars attract great attention

Through the technical webinars it organizes with the support of its member companies, İSKİD is actively working to promote the Turkish HVAC &R industry and to participate as a global player.

## Webinar: "The Effects of the New F-GAS Regulation on the Industry"



As a part of this, İSKİD hosted a webinar on "The Effects of the New F-GAS Regulation on the Industry" on December 15. Our webinar, organized to increase awareness of the new obligations and practices required by the F-Gas Regulation, drew industry representatives' attention.

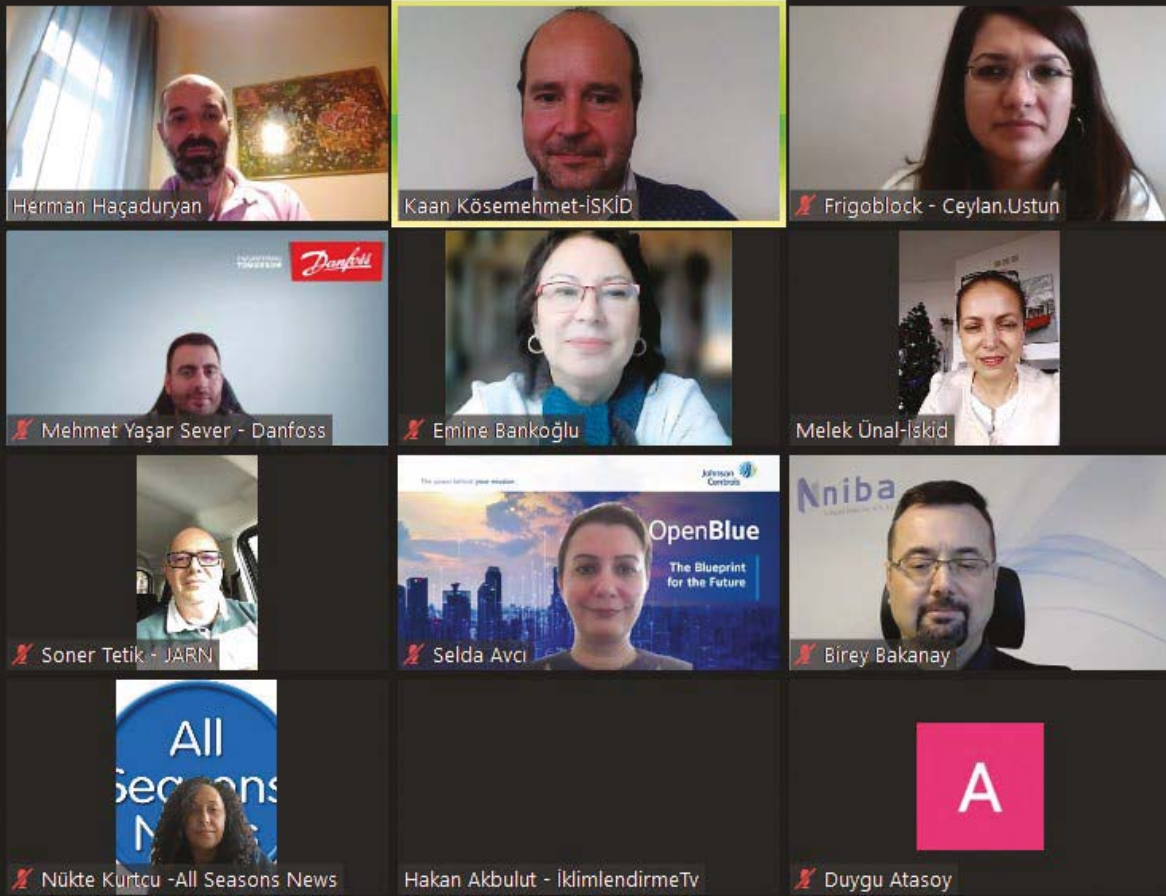
In the webinar, it was shared the opinion that the f-Gas reduction targets affect the global market for the use of climate-friendly alternatives. It was stated that as fluid and equipment suppliers develop new products, the challenges associated with switching to alternatives have been overcome.



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# Webinar: “Current Methods for Eco-friendly Cold Chain in Safe Food Supply and Reduction of Food Losses”



ISKID collaborates with non - governmental organizations that carry out activities in many industries to provide webinars for webinar organizations to inform members and the public, and raise awareness.

As a part of this, İSKİD co[1]hosted a webinar with the BUGDAY Movement on "Current Methods for Eco-friendly Cold Chain in Safe Food Supply and Reduction of Food Losses" on Monday, December 19.

Organized with the support of İSKİD Members, Daikin, EBMPapst and Fritem, the webinar aimed to create a different perspective for the participants for the new era in food by answering current questions about the COLD

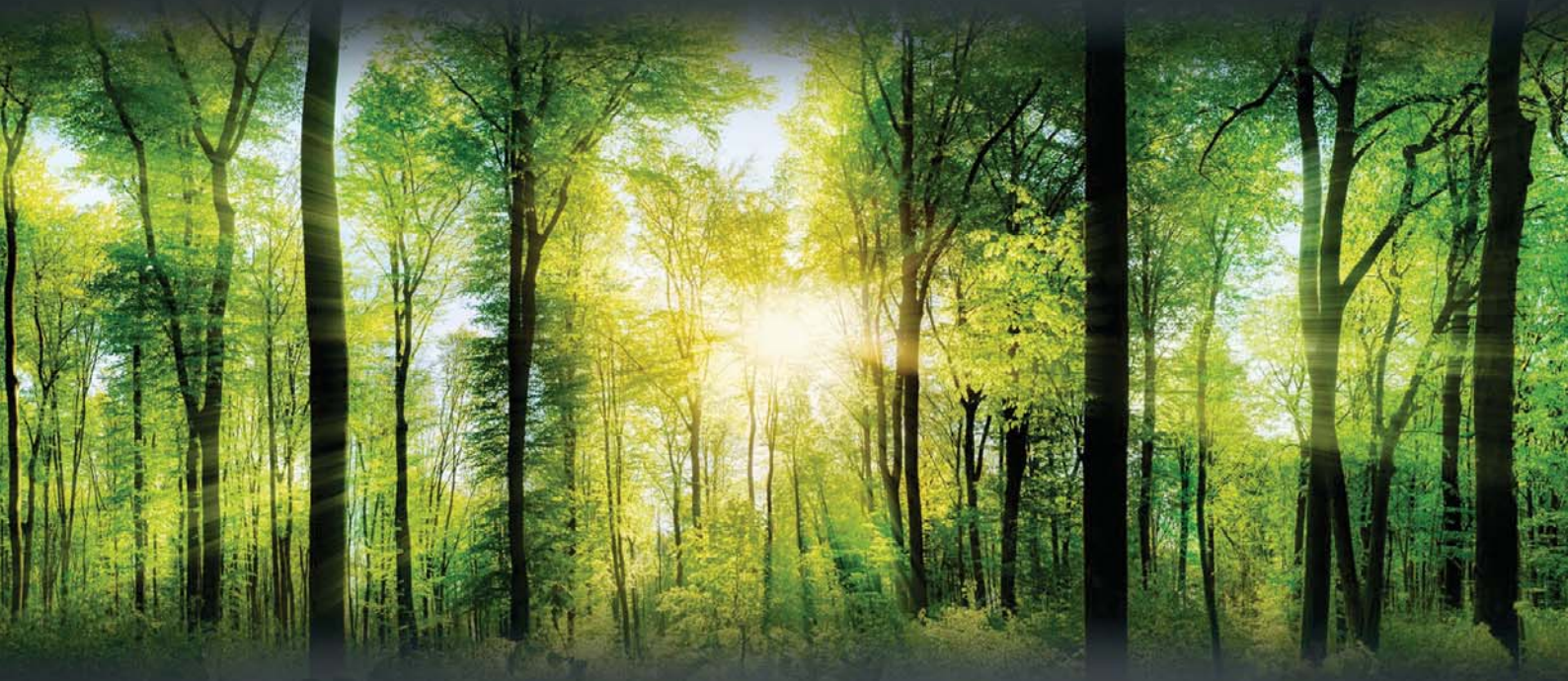
CHAIN — one of the important working areas of the SAFE FOOD SUPPLY and Air Conditioning industry, the basis for all living beings.

Organized with the Bugday Movement, which carries out activities supporting the producer in the production of organic agriculture and ecological agricultural products, the webinar was held with the attention of the industry and non[1]industry representatives, education industry, ministry representatives and the media.

The webinar videos are available on the İSKİD YouTube channel.



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# ISKID has been "Adding Value" to the industry for 30 years

Since its founding in 1992, İSKİD has been working to advance the Turkish Air Conditioning, Refrigeration, and Air Conditioning industry and take the lead in global competition. In 2022, İSKİD celebrated its 30th anniversary with a series of events centered around "Adding Value." As part of this, the İSKİD 30th Anniversary Memorial Forest was planted with the support of member companies. İSKİD part in the 44th Istanbul Marathon 15K run to promote awareness of the significance of indoor air quality in society and to call attention to its importance. Members of the board of directors and their families, representatives of member companies and association professionals visited Anıtkabir, the mausoleum of the founder of the Modern Turkish Republic, Mustafa Kemal Atatürk.

## 30th Anniversary Memorial Forest

With the help of TEMA (Turkish Foundation for Combating Erosion), İSKİD will plant an İSKİD 30th Anniversary Memorial Forest in Kayseri. The first seedlings for the memorial forest were planted in September 2022. Planting is expected to be completed in the spring of 2023. A total of 3,500 seedlings will be planted with the contributions of İSKİD member Bosch Thermotechnik, Eastern Air Conditioning, Erbay, Form and Termofan companies.







the marathon, which began on Sunday, November 6, at the July 15 Martyrs Bridge (The Bosphorus Bridge). It was a cheerful atmosphere with high participation thanks to the great weather.

ISKID carries out its activities to raise awareness about indoor air quality, which is necessary for health and efficiency. Created with this goal and having up-to-date information about Indoor Air Quality, [ichavakalitesi.org](http://ichavakalitesi.org) website offers content that will create and promote awareness.

ISKID paid a visit to Anıtkabir to celebrate its 30th anniversary

#### **ISKID participated in the 44th Istanbul Marathon to emphasize the value of "INDOOR AIR QUALITY"**

Together with the members of the board of directors and the representatives of member companies, ISKID participated in the 44th Istanbul Marathon to raise awareness about the value of INDOOR AIR QUALITY.

In order to draw attention to "Indoor Air Quality," one of the crucial issues that the industry has been working on, ISKID participated in the 44th Istanbul Marathon 15K run with the slogan "WE SUPPORT INDOOR AIR QUALITY" along with the members of the board of directors and the representatives of member companies. More than 60 thousand people from 102 nations participated in

As part of its 30th-anniversary celebrations, ISKID (Air Conditioning And Refrigeration Manufacturer's Association) paid a visit to Anıtkabir with members of the board of directors and their families, as well as with representatives of member companies and association professionals.

ISKID Board Chairperson Ayk Serdar DIDONYAN commented on the Anıtkabir visit: "As ISKID Board Members and industry leaders, we are very honored to be in the present of Atatürk as we draw closer to the 100th anniversary of our republic. As a professional organization with a 30-year history, we are here to represent non-governmental power and republican values. We honor the memory of the great leader Mustafa Kemal Atatürk, the founder of our republic, and all of his companions with respect, gratitude, and longing.









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# ISKID- Evaluation of 2022 and Targets for 2023 Remarks from MEHMET ŞANAL, Chairman of the Board of Directors of ISIB:



## **Exports of the Turkish HVAC-R sector in 2022 continued to grow each day with new markets.**

In the first 11 months of 2022, we recorded a growth of 8.4 percent compared to the same term of last year with an export volume of 6.1 billion dollars. We increased our exports in all sub-product groups except the Heating Systems and Equipment sub-group. Approximately 60 percent of our exports go to EU countries. We exported the most to Germany, the United Kingdom, Italy, Russia, and France, respectively. The sector's unit price per kilogram increased from 4.6 dollars in 2021 to 5.3 dollars as of the first 11 months of 2022. We anticipate that we will reach an export volume of 6.8 billion dollars at the end of the year.

In 2022, we increased our market share in European countries, as well as in Central Asian countries, Balkan countries, African and South American countries, which promise potential and where our country does not get as much market share as it deserves.

The Turkish HVAC-R sector is the European market leader in split air conditioner production capacity and the world leader in radiator and towel warmer exports. We continue to take firm steps towards becoming the world's production base in the production of boilers, ventilation equipment, and flexible air ducts. We aim to attain the same success in other product groups such as refrigeration, installation, and insulation, and to enter the top 10 in the world ranking.

In the first 11 months of 2022, we participated in 20 different international exhibitions for our exporters with our national participation and info stand concepts and organized Sectoral Trade delegations to Uzbekistan, Brazil, Argentina, and Hungary. We also organized separate buyers mission events for delegations from North African countries and Balkan Countries.

In June, Turkey became the Partner Country at Mostra Convegno Expocomfort Exhibition, one of the most important exhibitions of our sector, with the initiatives of our Association. A total of 139 companies from Turkey participated in the exhibition.

As for 2023, our biggest goal is to become a sector that generates a foreign trade surplus. To this end, we have planned and will implement more than 30 activities in the coming year, including trade delegations, exhibition participation, buyers missions, overseas training, and B2B meetings. In addition, we will continue our international sponsorships and advertising activities.

In 2023, we will continue our efforts to develop new products with our R&D and innovation vision without ceasing. Our primary mission is to support our exporters and stand by them at all times. In order to achieve this all over the world, we will carry on our activities non-stop.





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# ISIB Discussed the New Period Strategies of the Turkish HVAC-R Sector at the Sector Strategy Workshop



The HVAC-R Sector Strategy Workshop, where the HVAC-R Exporters Association (ISIB) determined the road map of the Turkish HVAC-R Sector for 2023, discussed the strategy and economic developments and shared the important administrative and commercial developments experienced during the year with its members, was held at Antalya Cornelia Diamond Hotel between November 28-29, 2022. During the workshop program, the ISIB Export Leaders Award Ceremony was held, and the ranking companies were awarded.

At the workshop hosted by ISIB Chairman Mehmet Şanal with the participation of more than 200 sector

stakeholders, new generation export models and supports, the effects of current economic developments on the sector, and the issues in the sector strategy document for 2023 were discussed.

## ISIB Awarded the Most Exporting Companies of 2021

At the final session of the workshop, ISIB awarded the companies that played an effective role in the export market and realized the highest exports in 2021.

Please access the award-winning companies and their categories from ISIB's web page.







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# ASHRAE's Global HVACR Summit and RAL CRC Meeting was Held in İstanbul with over 400 Representatives



The Global HVACR Summit and RAL CRC organization of HVAC-R Exporters Association (ISIB) is the main sponsor, organized by ASHRAE, was held at İstanbul The Green Park Pendik Hotel & Convention Center October 9-14.

ASHRAE Global HVACR Summit meetings were held in the first two days of the event, and ASHRAE RAL CRC meetings were held in the last three days. In the events where more than 25 meetings including parallel sessions were held, opinions were exchanged on issues such as decarbonization, reducing the climate crisis, food safety, cold chain, and energy security, and recommendations were taken on behalf of the World HVAC-R Sector. Around 400 sector representatives and participants from all over the world were hosted at the meetings.





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# Business trip organizations from ISIB

## Business trip to Hungary And Countries In The Region



Türkiye HVAC-R Manufacturers joined ISIB'S business trip. ISIB brought together Turkish HVAC-R Sector exporters



with businesspeople from Hungary, Slovakia, and Czechia in Budapest, the capital of Hungary, on 19-21 September 2022. 71 companies from Hungary, and 7 companies from Slovakia and Czechia participated in this important organization which was attended by 23 companies from Türkiye within the scope of the trade mission program.



Within the scope of the mission program, bilateral talks were also held between the Slovak Association For Cooling Air Conditioning and Heat Pumps, the Czech Association for Cooling and Air Conditioning Technology, the Hungarian Chambers of Engineers, and the Hungarian Chamber of Commerce authorities.

Gülşen Karanis Ekşioğlu, Republic of Türkiye Ambassador to Hungary, hosted our mission at dinner given in the Embassy residence and exchanged information within the frame of this important organization.

## 30 Balkan companies visited Türkiye

HVAC-R Exporters Association (ISIB) brought together the company owners and executives who came to Turkey from different countries in Balkans with Turkish business people.

30 professionals and businesspeople of 30 companies from Albania, Bosnia-Herzegovina, Macedonia, Romania, Slovenia, Kosovo, Croatia, Serbia, and Bulgaria participated in the organization held at Lazzoni Hotel in Istanbul on September 13 within the scope of the Balkans Buyer Mission Programme program. B2B meetings were held between the Turkish and foreign committees within the scope of



the program which was attended by 73 companies in the Turkish HVAC-R Sector.





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# ISIB's National Participation Organizations

## Aquatherm Tashkent Exhibition



Türkiye HVAC-R Manufacturers joined ISIB'S national participation organization in the Aquatherm Tashkent Exhibition held in Tashkent, capital of Uzbekistan, on 28-30 September.

16 companies from Türkiye participated in the exhibition within the scope of National Participation. Apart from the national participation organization, 19 Turkish companies also participated individually.

Uzbekistan which imports approximately 1,8 billion dollars in the HVAC-R sector annually, is a critical market for Türkiye. Turkish HVAC-R Sector currently meets 8 percent of the Uzbekistan HVAC-R sector imports.

## Indonesia Refrigeration&HVAC Exhibition

HVAC-R Exporters Association (ISIB) organized a national participation organization in the Refrigeration&HVAC Exhibition held in Jakarta, capital of Indonesia, on 21-23 September. 6 companies from Türkiye participated in the exhibition within the context of National Participation.

Republic of Türkiye Ambassador to Indonesia Ahmet Cemil Miroğlu and Chief Commercial Attache Erkan Kiper and Commercial Attache Burak Avcı visited the ISIB stand and gained information from the exhibition mission and participants.

Also, ASHRAE Indonesia Chapter President Yongkie Tileno visited our stand at the exhibition. In the meeting



held with him, information about trade in Taiwan, Hong Kong, Thailand, Malesia, Singapore, and the Philippines, apart from Indonesia was obtained. Murat Bakanay and Cem Savcı introduced ISIB in general terms and mentioned the activities of the Association before ASHRAE.







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Türkiye HVAC&R Industry attended a national participation organization at the Agro Food Drink Tech Exhibition held in

## Agro Food Drink Tech Exhibition

Tbilisi, the capital of Georgia, between November 18 and 20. Within the scope of National Participation, six companies from Türkiye attended the exhibition.

George Khanishvili, Deputy Chief Minister of the Ministry of Environmental Protection and Agriculture of Georgia, visited the booths of Turkish companies after the launch of the exhibition and was informed by the officials of the participating companies. Ali Kaan Orbay, Ambassador of the Republic of Turkey to Tbilisi; Ahmet Darçın, Commercial Counselor of the Republic of Turkey to Tbilisi, and ISIB Board Member Levent Aydın also visited the booths at the exhibition and engaged in negotiations.

## Aquatherm Baku Exhibition

Türkiye HVAC&R Manufacturers participated ISIB's national participation organization in the Aquatherm Baku Exhibition, which was held in Baku, the capital city of Azerbaijan, on October 19-21.

12 ISIB member companies participated in Aquatherm Baku, which is the largest HVAC-R exhibition in Azerbaijan and the Caucasus, within the scope of the national participation organization. 12 ISIB member companies in the exhibition, held more than 250 business meetings within the scope of ISIB's national participation organization.

Assoc. Dr. Cahit Bağcı, Baku Ambassador of the Republic of Turkey, and Levent Aydın, Member of the



Board of Directors, on behalf of ISIB participated in the exhibition and held meetings with ISIB officials and company representatives. Also, Yakup Sefer, Murat Yaman, and Ahmet Erdal, Baku Commercial Counsellors of the Republic of Turkey, visited the exhibition and got information from our participating companies and ISIB officials.



## Mega Clima Algeria Exhibition

The HVAC-R Exporters Association (ISIB) made a national participation organization in the Mega Clima Algeria Exhibition, which was held in the city of Algeria, the capital of Algeria, on October 10-13. 9 companies from Türkiye participated in the organization of national participation to Mega Clima Algeria, which is the biggest HVAC-R Exhibition in Algeria.

As well as Türkiye, companies from India, Tunisia, Kenya, France, Ireland, China, Serbia, and Germany participated in the exhibition where 75 international participant companies took part. Products for Cooling, Air-Conditioning, and Installation systems were exhibited mainly at the exhibition.



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# ISKAV TAB (Testing, Adjusting and Balancing) CERTIFICATION PROGRAM



Founded in 1997 by the leading firms and education associations of Turkish HVAC-R Industry, ISKAV-Heating, Refrigerating, Air Conditioning Research and Training Foundation continues its education, certification, and publication operations related to air conditioning industry.

TAB (Testing, Adjusting, and Balancing) operations in existing and new building projects must be performed by expert technicians and engineers.

If the measurement of the water and air aspects of mechanical systems in buildings is balanced accurately, it will offer its users a comfortable environment and provide its investor an energy-efficient building at a low operating cost.

The preparation of separate training programs for technicians and engineers who will perform TAB practices, offering training by academics and professionals, holding theoretical and practice exams, creating an examining board, and issuing certificates to those who succeed are performed by ISKAV.

Certificated technicians and engineers can extend their certificate expiration date through scores obtained for activities such as their TAB practices, the training they receive, organizations they attend, and their published articles. ISKAV also follows up on the validity of the certifications.

Having equipment determined by ISKAV, firms that employ a sufficient number of ISKAV TAB Certified technicians and engineers and are organized to perform TAB practices are certified as "ISKAV TAB Certified Firm".

If an employer files a complaint or disagrees regarding the work conducted by ISKAV TAB Certified Firms, ISKAV forms an



independent committee to investigate the issue and prepare a report. Thus, ISKAV provides the follow-up assurance regarding the performed practices.

The book involving the summary of estimates, specifications, and business conduct for ISKAV TAB practices is available in English and delivered to individuals and institutions upon request.

Theoretical and applied training and theoretical exams of the TAB certification program for technicians and engineers can also be held online. For the practice exam, examinees need to be present at ISKAV TAB Applied Training and Exam Center for a day.

ISKAV TAB Certification program accepts requests from abroad. Also, ISKAV TAB Certified firms hold the experience and equipment to conduct TAB practices abroad successfully.

Following your application to ISKAV, you can benefit from our certification program, and we can enable our ISKAV TAB Certified firms to communicate with you.

ISKAV TAB engineer certificate program has carried out 9 training periods since 2016. There are 33 ISKAV TAB engineers and 1 ISKAV TAB technician in the programs attended by 104 national and international participants.

The 10th term ISKAV TAB engineer certificate program will be opened on October 5, 2022. You can contact ISKAV for participation in the program and details.

## Address and Contact

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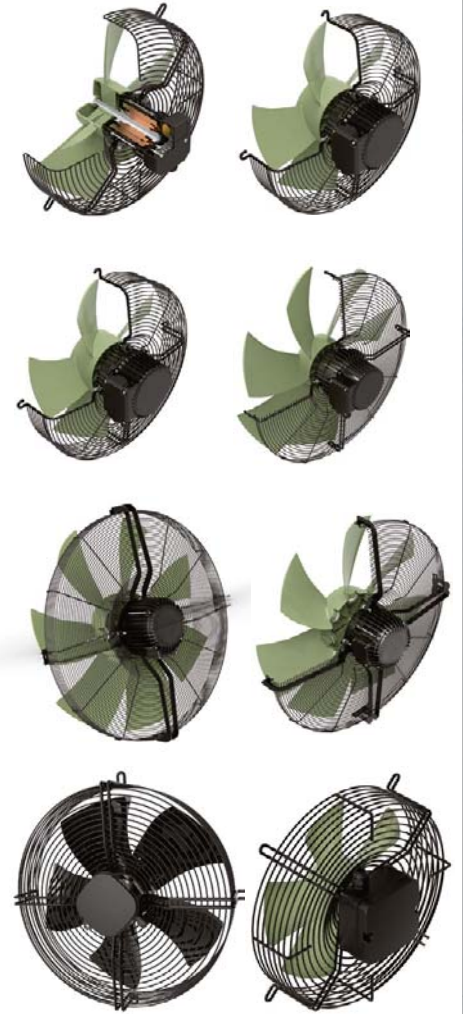


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# Mechtalks Outlined the Roadmap for Sustainability in the Building Industry



The second of the MechTalks series of events hosted by the Turkish Society of HVAC&Sanitary Engineers (TTMD), Mechanical Contractors' Association (MTMD), and Borusan Mannesmann, a Borusan Group Company, was held on November 24, 2022, at Istanbul Mandarin Oriental Hotel Kuruçeşme. The event, which focused on sustainability in the building industry, shared measures and technologies to reduce carbon emissions in buildings and suggestions on the steps the industry should take.

The second meeting of the MechTalks events, which focused on sustainability in the building industry, was held on November 24, 2022, at Istanbul Mandarin Oriental Hotel Kuruçeşme in cooperation with TTMD, MTMD, and Borusan Mannesmann. In four sessions where the sustainable transformation of the industry was discussed, industry professionals shared essential tips on the sustainability journey with their findings and suggestions for today and the future.

Commenting on the second meeting of MechTalks, which consisted of "Climate Crisis and Management Technologies," "Zero Energy Building Management," "Low Delta T Syndrome," and "Good Practices" sessions organized with the participation of the Platinum Sponsors of the event, Meriç Sapçı, Chairman of the Board of Directors of TTMD, said: "We prepare these events under the name of MechTalks both to strengthen our sectoral unity and to

increase professional knowledge sharing. In the second of our MechTalks event series, we have brought up very important topics that we have learned about in order for us, engineers working in the building industry, to be more proactive in the use of 'Correct, Clean, Safe and Efficient Energy', since the climate crisis is the biggest problem of humanity in the coming period. MechTalks, which I believe will be one of the most important information and idea-sharing platforms of our industry, will continue to open different doors to all participants with new meetings."

Hüseyin Erdem, Chairman of the Board of Directors of MTMD, said, "With our business expertise, we have important know-how to prevent the climate crisis, which is one of the world's biggest problems. I think it is essential to unleashing more of this knowledge. MechTalks will move our industry forward with its guest speakers and the topics it chooses."



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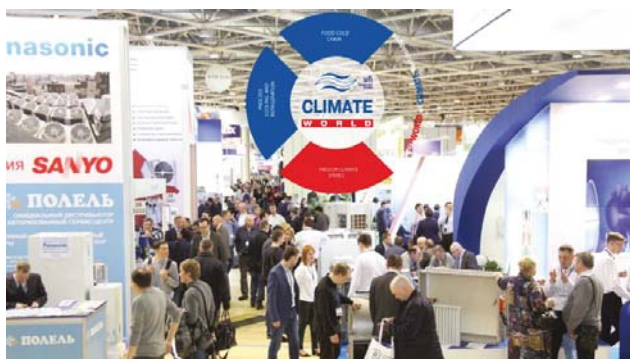


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# Climate World Expo 2023 Unique opportunities for HVAC&R businesses

The Climate World Fair will take place on Feb. 28 March 3, 2023 at the Expocentre in Moscow, Russia.



Feb. 28 March 3, 2023 Join the 18th Climate World Expo at the Expocentre Fairgrounds in Moscow taking place at the end of February for four days.

The Climate World Expo is the leading event in the field of heating, air conditioning, ventilation, industrial and commercial refrigeration. This year's event is slated to welcome world renown companies and provide great networking opportunities for businesses.

The Climate World Expo 2022 is almost sold out. Many companies have already claimed a coveted spot to participate in the expo, among them are Aiken, Bahcivan Elektrik, Breezart, Briscool, Buhler, Caksan Caka, Eletrokonfor Rowen, Refkar, Fachman, Frigoblock, Frivent, Galvent, Gemak Genel, ISIB, Invent, KSK group, Marcon, Ruspromholod, Sarbuz, Turkov, Tica, Termoflou, Ventfan, Veza, Ventart Grupp. The list of already confirmed Exhibitors 2023 is available here.

In Russia, the HVAC&R market is growing with opportunity. When COVID 19 shook the world, the HVAC&R market was imperative to the world's health and safety, providing efficient ventilation to buildings and hospitals. As hospitals saw numbers of patients increase, so did their HVAC needs.

The Russian market now has unique opportunities for HVAC&R businesses as western companies withdraw from Russia and leaving a big gap in the market. The Climate World Expo is the ideal venue for business networking and finding new customers to fill the gap in the market.



The expo expects to attract more than 9,000 professionals: from dealers, distributors, engineers, and installation and service companies, to company directors, management companies, sports facilities, museums and more.

Recent statistics show that 90% of World Climate Expo attendees are professionals in the field, and 81% of visitors directly influence purchasing decisions.

Highlights of this year's event is the wide ranging 2023 business programme that will include the participation over 2,500 delegates presenting on all aspects of the industry.

Presentations will span the four days and will include discussions on new trends and sales channels, as well as informational talks on how to maintain and increase profit margins, how to stimulate sales through industry marketplaces and how to optimize service costs.

This year's Climate Expo will also include a special tour for journalists, which will be an excellent publicity opportunity for businesses. This will be similar to the tour held at Mitex, the international exhibition of tools and equipment, that was held in November and resulted in more than 150 professional publications.



Strong participation of Turkish companies in 2023!



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# EuroShop in Düsseldorf: the Prime Time Event of the Global Retail Industry



From 26 February to 2 March 2023 EuroShop, The World's No.1 Retail Trade Fair, will bring together the international retail world and its partners at Düsseldorf Exhibition Centre. 1,700 exhibitors from 56 nations not only pick up on global developments, but also present the entire spectrum of current trends and future-oriented solutions on 100,000 m<sup>2</sup> net exhibition space in 16 exhibition halls.

The hot topics of EuroShop 2023 are: Connected Retail, Sustainability, Smart Store, Energy Management, Third Places, Customer Centricity, Experience, Lively City Centres.

The structure of EuroShop 2023 has been further developed to meet the needs of the industry. The eight dimensions of EuroShop 2023 are: Shop Fitting & Store Design/Visual Merchandising, Surfaces & Materials, Lighting, Food Service Equipment, Refrigeration & Energy Management, Retail Technology, Retail Marketing, Expo.

Besides the extensive ranges displayed by participating companies, EuroShop's USP is the quality and bandwidth of its unique line-up of side events. The backbone are the seven EuroShop stages. These are lecture and discussion forums addressing latest developments, innovative trends, and best practice; admission is free for all visitors (simultaneously interpreted into German/English).

The Special Areas of EuroShop comprise various areas that offer free spaces for specialists, ideas, visions and innovative products, including the Designers' Village, the Start-up hub, POPAI Shop Global Village and IFES Global Village as well as the Italian Lighting Lounge.

Admission tickets for EuroShop 2023 are available online as well as detailed information at [www.euroshop-tradefair.com](http://www.euroshop-tradefair.com)





# EuroShop

THE

WORLD'S NO. 1

RETAIL TRADE

FAIR 26 FEB –

2 MARCH 2023

[www.euroshop.de](http://www.euroshop.de)



Messe  
Düsseldorf

## ISH 2023 presents solutions for a sustainable future



ISH is both the flagship and the heart of the sanitary and HVAC sector. As a unique driver of innovation, it is the place where solutions for a sustainable future become tangible. Highly ambitious socio-political goals at international and European level require decisive action and the use of viable innovations and solutions. As the leading international sanitary and HVAC event, ISH shows what marketable solutions the European industry is already developing. In keeping with this, the motto of the world's leading trade fair in 2023 is "Solutions for a sustainable future".

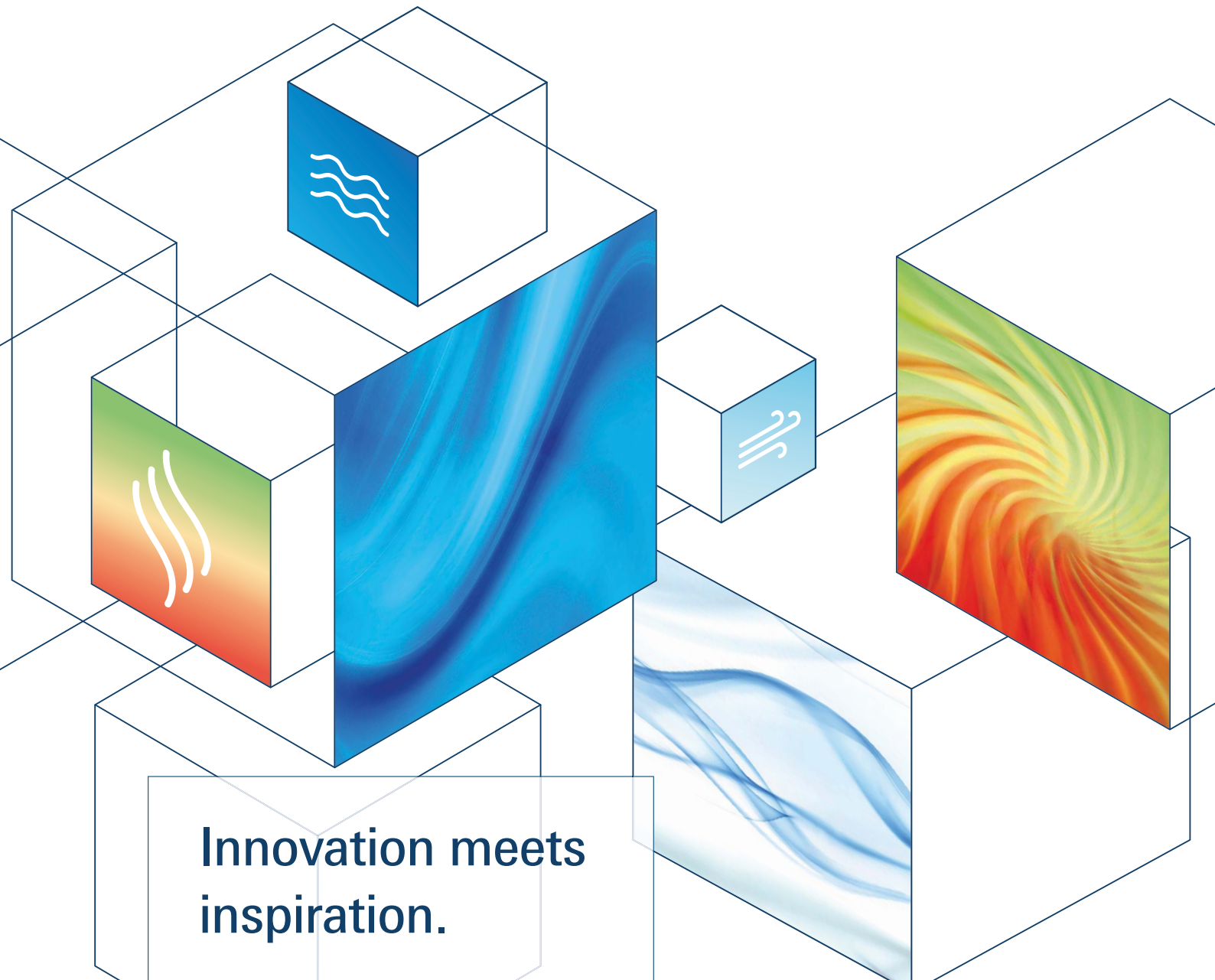
The link between the two ISH sections, Energy and Water, is formed more than ever by the theme of sustainability. For instance, the ISH Water 2023 section focuses on the two top themes of "Sustainable Bathroom" and "Resource Water". The ISH Energy section focuses primarily on the

top themes of "Solutions for Heat Transition and Climate Protection" and "Energy Efficiency & Sustainability" for 2023. The topic of air, which is anchored in the ISH, also makes an important contribution to the overriding goal of CO2 reduction and energy saving. This will be comprehensively illuminated under the top theme of 'Indoor-Air Quality' at ISH 2023.

The world's leading trade fair for HVAC + Water will bring the sector together at the Frankfurt Exhibition Centre from 13 to 17 March 2023. It takes aim at the issues of the future, paves the way to achieving goals and delivers concrete solutions. In addition to the physical event, there will also be a digital platform with the ISH Digital Extension.

Detailed information about ISH is available at [www.ish.messefrankfurt.com](http://www.ish.messefrankfurt.com)





# Innovation meets inspiration.

Discover trailblazing innovations, fresh ideas and intelligent solutions for a sustainable future.

World's leading trade fair for HVAC + Water

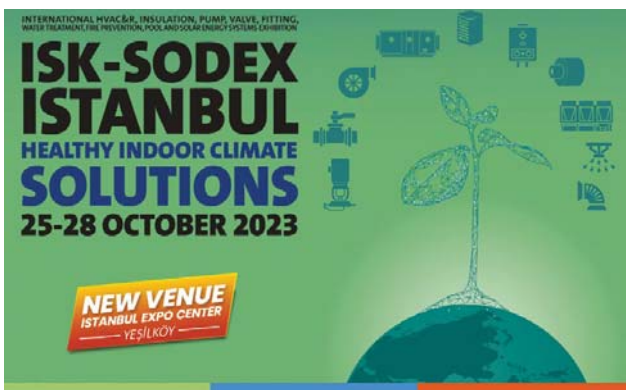


# ISH

13.–17. 3. 2023  
Frankfurt am Main

# ISK – SODEX Gathering Point of the Air-Conditioning Industry

Preparations have been kicked off for the new period at ISK – SODEX assembling the air-conditioning industry once in two years under the same roof and hosting 86 thousand visitors from 95 countries and 812 participating companies from 27 countries in 2021.



Having been organized for exactly 26 years and one of the strongest exhibitions of the air-conditioning sector, ISK-SODEX – International HVAC&R, Insulation, Pump, Valve, Fitting, Water Treatment, Fire Prevention, Pool and Solar Energy Systems Exhibition has become the limelight of the world with its trading volume of 500 million dollars achieved after each exhibition. Receiving a total of 86 thousand visitors from 95 countries in 2021, with 12 thousand being foreign, the exhibition hosted 812 participating companies from 27 countries. ISK-SODEX where 300 professional purchasers from 53 countries are given the opportunity to conduct bilateral negotiations will keep rising in 2023, too. The targeted trading volume of the exhibition, which is expected to host local and foreign 90 thousand visitors and more than 1,000 companies between 25 and 28 October, 2023, is 500 million dollars.

## The Center of the Air Conditioning Industry

ISK-SODEX, which was organized in 1997 for the first time, contributes dramatically to the Turkish export with the position it has attained over the years and achieved a trading volume of 500 million dollars to be realized by 2023 with its version actualized in 2021, has maintained its contribution to the air-conditioning industry from past to present. The fair where thousands of products and services of the sector of heating, refrigeration, air-conditioning, ventilation, insulation, pump, valve, fitting, water treatment, fire prevention, pool and solar energy systems meet visitors beat a record for the number of visitors.

Home to thousands of exhibitors and hundreds of thousands of visitors, ISK-SODEX received on an area of 36,000 square meters 86 thousand visitors from 95 countries, 12 thousand of whom were foreign, in 2021, with a 27 percent increase compared to 2019 with 812 participators from 27 countries. ISK-SODEX allowing bilateral negotiations with the participation

of 300 professional buyers from 53 countries has achieved an exportation potential of million dollars. In addition to allowing participants to present their new products and solutions with the Forum Area created every period when the exhibition is organized, new generation devices with low global warming potentials or natural cooling fluids have lately stood out alongside of especially heat pumps, smart and high automation air-conditioning products with high energy efficiency, fresh air units, low-energy and environment-friendly products, and digital and hygienic coolers.

## Conferences and Events About the Sector

The exhibition that has always been a great center of interest for Asian, Middle Eastern and North African countries gives those who would like to follow latest trends and updates in the air-conditioning industry the opportunity by the help of events and conferences organized separately in which leading persons from all of the business branches of the air-conditioning sector participate as speakers. The fair also awarded its top-ranking competitors in criteria like timing, accurate assembly, project compliance and aesthetics via the Masters League competition organized in order to draw attention to the need of qualified personnel by the industry.

## 2023 Is an Opportunity for the Growth of the Market

In recent years, in parallel with climate change, temperatures have changed very frequently on a seasonal basis, and the fact that the effects of the climate crisis we feel today will increase more in the future has further increased the importance of healthy climate solutions. With the pandemic amplifying the interest in this, solutions to be applied in mutual living spaces and infrastructures, and fair where they are exhibited have come to the forefront. Held on an area of 36,000 square meters previous year, the fair will be open to visitors between 25 and 28 October, 2023 at renewed Istanbul Expo Centre in 2023 with an area of 42,000 square meters. Products able to operate by alternative energy, formation of fresh and comfortable indoor air quality, smart HVAC-R automation systems, and product consuming less energy, with higher performance and multiple functions are expected to rise to prominence at International ISK-SODEX 2023 Exhibition planned to be held with the motto 'Healthy Indoor Climate Solutions'. A significant contribution to the trading volume of the industry is expected to be made by means of B2B bilateral negotiations to be conducted within the scope of the Sectoral Qualified Buyer Delegation to be organized by the Turkish HVAC&R Exporters Association (ISİB) with the support of the Turkish Ministry of Trade in the fair which is expected to host more than a thousand exhibitors from Europe, Asia, and North Africa, and 90 thousand visitors from all around the world.



INTERNATIONAL HVAC&R, INSULATION, PUMP, VALVE, FITTING,  
WATER TREATMENT, FIRE PREVENTION, POOL AND SOLAR ENERGY SYSTEMS EXHIBITION

# ISK-SODEX ISTANBUL

## HEALTHY INDOOR CLIMATE SOLUTIONS

### 25-28 OCTOBER 2023

**NEW VENUE**  
ISTANBUL EXPO CENTER  
YEŞİLKÖY



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Türkiye



#### Official Airline



A STAR ALLIANCE MEMBER

#### Fairground



#### Co-Organizers / Supporting Associations



THIS FAIR IS ORGANIZED WITH THE TOBB (INSPECTION OF THE UNION OF CHAMBERS AND COMMODITY EXCHANGES OF TURKEY)  
IN ACCORDANCE WITH THE LAW NUMBER 5174

# Bomaksan grew by 50 percent in 2022 and planning to grow 6 times more by opening to the Indian and American markets



Bomaksan, a domestic brand that has been producing solutions for the dust, gas and smoke problems of industrial plants for 36 years, has announced its 2022 year evaluations and 2023 targets. The company, known for its foundry dust collection systems and welding fume extraction systems, closed the year 2022 with a 50 percent growth in euro terms and aims to grow 6 times by opening to the Indian and American markets in the new period.



According to Bomaksan General Manager R. Bora Boysan, the company has many investment plans for the coming period. They plan to launch five new products in addition to their human resources investments. Speaking about the warehouse target covering the North and South American market, Boysan said, "We focused on the distribution warehouse investment for the American market, which has many characteristics in terms of logistics and dynamics, especially for the metal and steel industry. We want to share the technical knowledge and experience we have gained in dust collection and ventilation systems in the foundry industry with local partners in the North and South



American market. 2023 is the year we want to complete these preparations. In 2024, we want to make our first market entry trials. In the light of the signals we will receive from here, we have a warehouse planning in 2025."

In addition to their American market expansion plans, Bomaksan also plans to open a production center in India with a local partner. Boysan stated, "The Indian and American markets are about 15-20 times the size of the markets we are currently addressing. The sectors we target in both markets are different. The Indian market is one of the largest markets in the world, especially in terms of sectors such as iron and steel and metalworking." By opening to these markets, Bomaksan aims to grow six times its current size.

Bomaksan's integration of the latest technologies into the products it develops has made a difference in its field. With its plans for expansion into the American and Indian markets, the brand aims to continue its growth and success in the coming years.





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*Always*  
with you  
on the way of  
Excellence

# Boreas Technology Air Handling Unit Responds to the Changing Needs of the New Age



Modern cities, where production, education and service come together and growing day by day with their increasing population, also draw attention with the structures they have and the needs that come with them. HVAC-R systems also offer ideal solutions for ensuring the indoor air quality of these buildings and creating healthy environments.

Air handling units; It ensures fresh air flow adjusting humidity and temperature ratios, and purifying the air from dust and particles. Air handling units that provide comfort by stabilizing the temperature and humidity in the indoor environment under desired conditions have been produced by various brands for many years and their features developing according to the needs of the age. Izzet Tanyol, Deputy General Manager of Boreas Technology,



known for his experience in the air conditioning sector regarding the importance of air handling units, said: "As Boreas Technology, we produce air handling units that have dominated with their technology the market for many years and shape our products in line with the needs of today's cities. As a result of our R&D and P&D studies, we are currently offering solutions that will respond to the varying demands of the city with technological options. Boreas Technology Air Handling Units are produced with EN 1886 TB1/ T2 level of Eurovent certificate, which is the highest very high value that takes world standards as a criterion, and is made with durable materials that comply with the working principle in all conditions. The Air Handling Unit is one of Boreas Technology's products with the highest market share due to its wide area of use. The success we have achieved in the Air Handling Unit is the working principle that contributes to sustainability as well as the quality and durability of the product. With its long-lasting and highly efficient components, Boreas Technology Air Handling Unit saves energy and provides added value to sustainability studies by contributing to the controlled use of environmental resources."

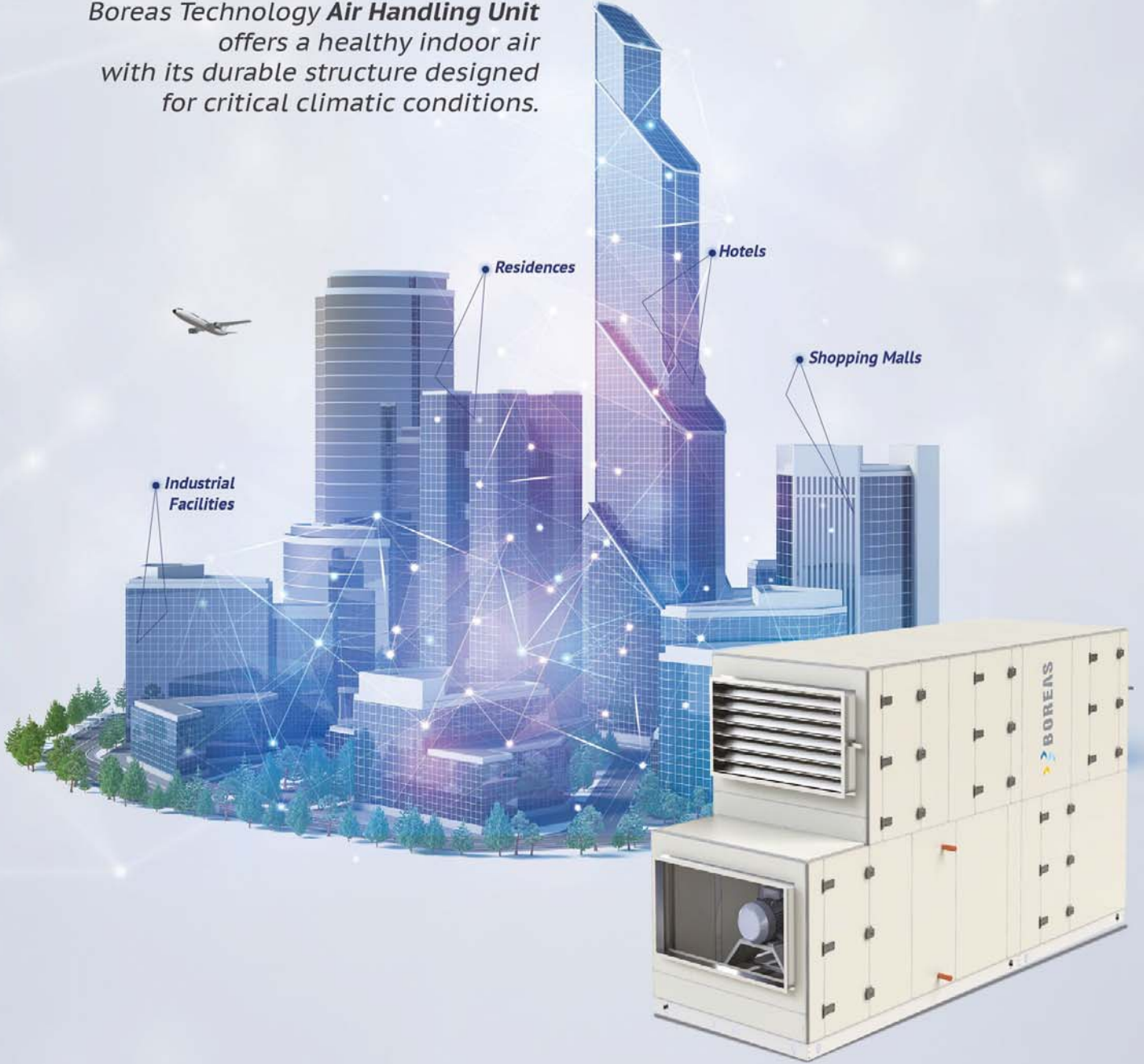
In addition to the trouble-free operation and durability of air handling units, it is also important that it has a positive impact on sustainability, which has been talked about the most in recent years. In today's world where consumer demands differ, purchasing decisions made in every field are not only need-oriented, but also include responsible investment awareness. For this reason, companies that look at the market with foresight and make a difference with their technology come to the fore.





# CONDITIONED AIR FOR EVERY ENVIRONMENT

*Boreas Technology Air Handling Unit  
offers a healthy indoor air  
with its durable structure designed  
for critical climatic conditions.*



# World Leader Daikin Preferred for Silk Road Samarkand, the Most Important Project of Central Asia



Standing out from its competitors with its environmentally friendly, high-tech and saving products, as well as its extensive service network and solutions, Daikin has been the air conditioning solution partner of many large projects until today. Successfully taking part in important projects in the international arena, Daikin has become the air conditioning solution partner of the 'Silk Road Samarkand' project, which is a multifunctional tourism complex built in the historical city of Samarkand in Uzbekistan. The most important criteria in the selection of the Daikin brand were the reliability of the brand, the quality of the devices, the wide product range, the quality of pre-sales and after-sales services, and the fact that it provides advantages in product delivery times and logistics costs thanks to its factories in different regions. In the complex, whose HVAC solutions were completely carried out by Daikin, a total of 15 MW of cooling was provided by using 22 chillers with free cooling, 170 air handling units, 1200 Fancoils and 150 VRVs with R32 gas developed and offered to the sector by Daikin.

## End-to-end HVAC solutions with Daikin Technologies

As a solution partner in the Silk Road Samarkand project with 150 VRVs, Daikin is a prominent brand in terms of efficiency with its 'Variable Refrigerant Temperature Technology' (VRT) for high seasonal efficiency and concealed ceiling units with circular flow cassette and optional self-cleaning filter. Daikin VRV technologies are preferred in solutions as they provide a high level of comfort with low noise indoor and outdoor units and high blowing temperatures in cooling mode. Standing out with its fancoil devices, which are widely used to create a comfortable environment in areas such as hotels, offices, hospitals, shopping malls and residences, Daikin also offered a



solution to the Silk Road Samarkand Project with 1,200 Daikin brand fancoils. 170 air handling units were used in the project, of which Daikin is a solution partner from start to finish, which includes air handling units with different capacities from 500 m<sup>3</sup>/h to 120,000 m<sup>3</sup>/h in its product range. Air handling units produced with a full automation system are equipped with the necessary features to ensure the sustainability of indoor air quality in the facilities.

Daikin's R32 chiller product group, which raises the bar of the sector with its distinctive products and sets the standards, was also used in the project. Daikin, which has set new standards with its R-32 Chiller product, the first chiller with scroll compressor in the market, draws attention with its innovative technology. Chiller with R-32 is a product that offers a wider capacity range than its competitors and has 3 different sound options as standard, low and reduced. This feature of the device makes it 'adaptive' for the different requirements of the projects. One of the highlights of the device is that it offers 2 different efficiency alternatives in both the cooling and heat pump versions, as silver and gold series. Occupying less space in the mechanical area with its compact design, the R-32 Chiller differs from its counterparts by giving less harm to the environment thanks to its low GWP fluid.

## SAMARKAND, WORLD TOURISM CAPITAL of 2023

Silk Road Samarkand, which will host 8 world-class hotels, 1 caravanserai, contemporary public spaces, parks, recreation and sports areas, authentic restaurants, cafes, an international congress hall and cultural interests, was built on an area of 135 hectares. Samarkand has been selected as the 'World Tourism Capital of 2023' by the World Tourism Organization, and "Shanghai Cooperation Organization Summit", "ICT Week Uzbekistan" and "Turkish States Organization Summit" in November 2022 with high-level participation were held so far in Silk Road Samarkand, a signature project.





# Air Cooled Water Chiller with Integrated Free Cooling and Adiabatic Cooling



ERBAY Water Chillers are designed to outdoor installation and provide chilled water leaving temperatures which are given on capacity tables in our factory carrying out EN ISO 9001:2015 Quality Management System. The Units are supplied to ready for installation. All connections, oil and refrigerant charge and required tests are made in our factory. Our units are in conformity with health and safety requirements of European Union directives and relevant harmonized standards.

**Main Body:** Chassis of the unit is made from steel sheet iron and it's designed in special construction for able to carry weights on it. Frame and covers of the unit also made from galvanized steel sheet iron. Frame of the unit is removable connections completely and it's painted with electrostatic powder paint.

**Cooling Compressor:** 1 or 2 pieces semi - hermetic compact screw compressors are used according to customer request. Screw compressors as it's characteristics can operate without maintenance need for a long time. Maintenance of the screw compressors are quite simple because of the less amount of the moving parts in it. Screw compressors are equipped with discharge shut-off valve, check -valve that prevents to return back of the refrigerant from the discharge line, oil level switch, oil sight glass, oil separator, oil filter, crankcase heater, capacity control solenoids, vibration dampers, motor protection device and temperature sensors (PTC).

**Condenser :** Air cooled condensers are manufactured by collating special profile aluminium fins on copper tubes. Copper tubes are expanded special process in order to increase thermic conductivity between copper tubes and aluminium fins. By this means heat transfer reaches to maximum level.

**Fan:** The high efficient axial fan which is directly coupled with the motor, noiseless bearing, balance statically and dynamically is mounted on the device to provide the condensation of the refrigerant in the condenser.

**Evaporator:** Direct expansion evaporator is manufactured in Shell & Tube form and special high efficient copper tubes are fixed

to steel tubesheet holes with tube expander method. It's allowed to maintenance and clean up because of the removable tube bundle. Evaporators are in conformity with EN 14276-1 and EN 13445 standards and designed for chilling glycol brines. External surface of evaporators and compressor suction lines are insulated with insulation material with suitable thickness.

**Electrical Control Panel:** The panel is designed to IP54. To operate the Unit automatically and securely, the panel is composed of two different sections. The first section is power section and the other one is control section. The panel is equipped with enough number of contactors, thermic, fuses and on-off switches. The panel and wiring are in conformity with EN 60204-1 standard.

**Microprocessor Control System:** Microprocessor Control System is used on the unit. By means of this; entering and leaving water temperatures, entering water temperature of free cooling coil, ambient temperature, refrigerant pressures on suction and discharge lines, occurred superheat temperature, operating times of compressors, all faults occurred on the system and all alarm history can be seen on digital screen and also capacity control can be made easily. Microprocessor control system decides to which modules (mechanical and/or free cooling) will be active depending on ambient temperature and required water leaving temperature. Operating times of each compressor is balanced so optimum efficiency is provided on multi compressor units.

**Components of the Cooling Circuit:** To operate the Unit automatically and securely; electronic expansion valve, drier-filter, sight glass, relief valve, flow - switch, high - low pressure switch and shut - off valves are included.

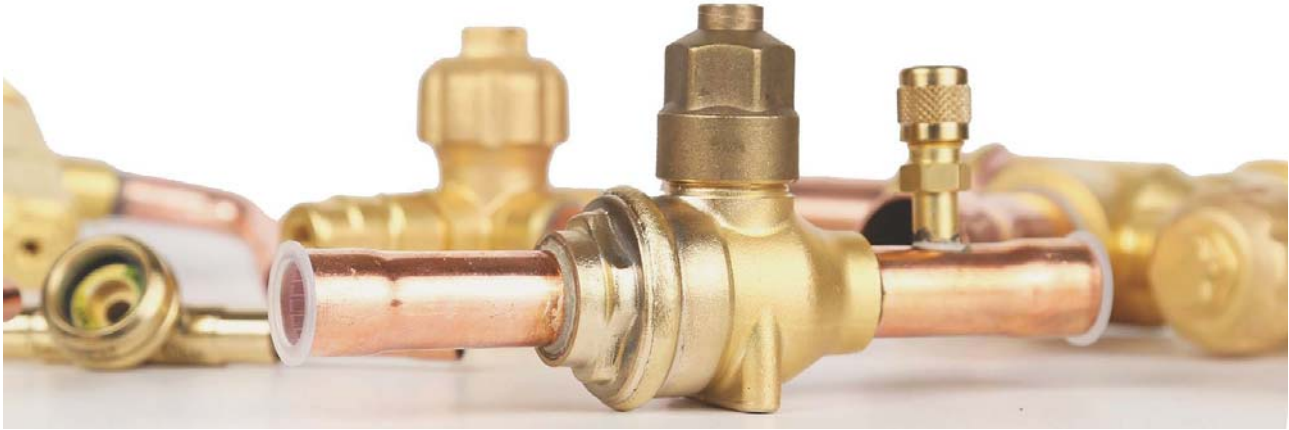
**Adiabatic System:** Adiabatic Cooling System is optional and it's integrated to mechanical cooling module of the unit and works in summer season. This system is based on spraying water intermittently from special nozzles on to a nonmetallic mesh. The water on the mesh provides an adiabatic cooling effect on the entering air of condenser. Thereby entering air temperature is reduced and depending on it, the unit works with lower condensing pressure energy consumption of the unit is decreased and cooling capacity is increased.

**Free Cooling Coil:** Coils are manufactured by copper tubes and aluminum fins. Coils can be manufactured with epoxy coated fins on request. Current overload protected, high efficient direct drive axial fans which have noiseless bearing are mounted on the unit to provide cooling of entering water. Besides there is air discharge connection on the coil.

**3-Way Valve:** 3-way valve which is controlled with servomotor opens or closes the entering ports depending on incoming signal from microprocessor. 3-way valve works on/off.

**Hydraulic Kit:** Hydraulic Kit is optional and comprises circulation pump, closed expansion vessel, safety valve, manometer, suction-discharge shut-off valves and brine filling connection.

# Ercan Teknik & E.C.A Solutions for Cooling System Valves with Maximum Durability and Adaptation



**ERCAN TEKNİK and E.C.A's refrigerant valves, draw all attention towards themselves in the cooling market with their high performance and durability features.**

Although E.C.A. is the biggest valve manufacturer in Türkiye, for more than 50 years they have focused on water, steam, sanitary and gas valve production. With the collaboration of E.C.A. and ERCAN TEKNİK engineers, the new refrigeration valve range has been introduced to the market almost 10 years ago. With "continuous improvement" motto, E.C.A. became the preferred brand passing its European competitors in Türkiye. Currently Turkish HVAC-R market uses 85% of E.C.A. with its esteemed brand and high quality. E.C.A. product range covers all CFC, HFC, HCFC, HFO and Natural Refrigerants excluding the Ammonia (NH<sub>3</sub>). Nowadays the E.C.A. CO<sub>2</sub> product range becomes very popular in Europe due to the F-Gas Regulation and its wide range of products.

**E.C.A. Refrigeration Product Range:** Bi-flow Ball Valves, 2-3 Way Motorized Ball Valves, Safety Valves, Sight Glasses with Moisture Indicator, Changeover Valves, Y-Filters, Service Valves, Check Valves, Solenoid Valves.

**SMART SYSTEMS WITH ENERGY EFFICIENCY THANKS TO 40 YEARS OF KNOWLEDGE AND EXPERIENCE FROM ERCAN TEKNİK!**

As it is well known, 40 years of existence in a sector brings with a strong experience and solutions. With this experience and skills, Ercan Teknik team; offers high-level systems to their customers. For Ercan Teknik, it is also important to reduce costs in systems with eco-friendly methods. Therefore, Ercan Teknik solutions consist of eco-friendly equipment focused on minimizing consumption while maximizing energy efficiency in applications.

## Ercan Teknik Solutions

### **RIPEN-IT:**

Thermoregulation, Humidification, CO<sub>2</sub> Level Control, Air & Gas Homogenization, C<sub>2</sub>H<sub>4</sub> Level Control, Periodically Generation of Food Quality & HACCP Reports, Live monitoring of the Ripening Process, Complete Control of the Refrigeration Cycle.

### **POT-8-0:**

Precision Thermoregulation, Humidification, CO<sub>2</sub> Level Control, Air & Gas Homogenization, Free Cooling via Outdoor Air, Periodically Generation of Food Quality & HACCP Reports, Alarm Management & Notification via email or SMS, Potato Core Temperature Monitoring up to 3 different probes, Daily Potato Core Temperature Reduction Algorithm.

### **FRESH as EVER:**

Thermoregulation, Humidification, CO<sub>2</sub> Level Control, C<sub>2</sub>H<sub>4</sub> Level Control (optional), Complete Control of the Refrigeration Cycle (Split Units), Inverter Compressor Management, Digital Scroll Compressor Management, Condensation Management, Management of up to 3 Evaporators in a single Room.

### **DRYCOOLER**

DRY Cooler application; manages pump stations, adiabatic coolers and heat exchangers with advanced ventilation regulation. The flexibility of this application allows it to work in combination with many other applications. Application can work either stand alone or integrated to a chiller unit as a free cooling source.

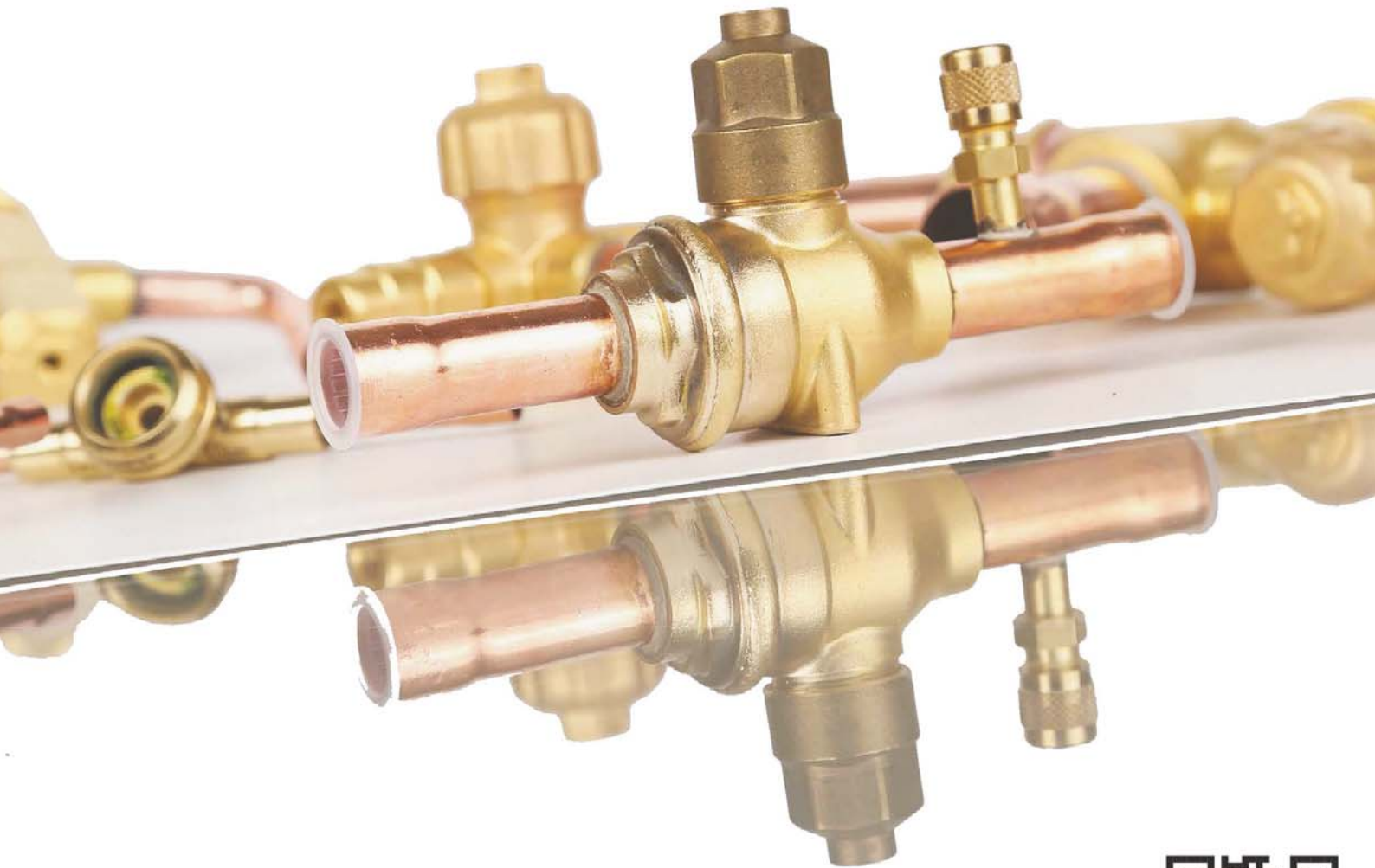


**E.C.A.**<sup>®</sup>

TOGETHER FOR YEARS



**ERCAN TEKNİK**



CONTROL & PROTECT  
YOUR LINES WITH **E.C.A.**



**PASCAL**



**EAC**

# Flexibility in design, quality in production, saving in energy, customer happiness in service is the general policy of FANMAK



FANMAK family is engaged in production in Atasehir / Istanbul. Following the changing world technology and aiming to use the technology at the best level, Fanmak aims to increase production and service quality based on international standards.



Fanmak ventilation equipment, heating and cooling systems with its expert staff with many years of experience in the sector has succeeded to become one of the most sought after companies in the market with its superior service quality, customers in numerous regions in Türkiye, offering all kinds of efficiency, proving the quality conscious and experienced personnel with many small to largesized companies serve quality product and after.

In our facilities where quality standards are produced, all products are carefully controlled at the input and post-production stages. In line with customer demand, Türkiye and according to world standards, following the developing technology, continuously improving the quality of products and systems to provide quality products to our customers with team spirit and understanding.



Fanmak exports to many countries, especially the



Asian region. The air handling unit supply of Tajikistan Rogan Dam will be done by Fanmak until 2026. Products were sent to another important project, the Iraq Skytower project, and there are still some devices that are still in production. Apart from these, intensive exports are made to many countries such as Iraq, Tajikistan, Kazakhstan, Turkmenistan, Libya, Uzbekistan, Georgia, Azerbaijan, Austria and Kosovo.





# EFFECTIS HAS TESTED AND VERIFIED

FANMAK CAN BE SAFELY USED IN  
AXIAL AND JET FANS!

Efectis

Efectis, which evaluates the fire safety of global products, has also verified the safety and quality of Fanmak.

We continue to provide solutions for all fields of climatization and show the Fanmak difference. We always give confidence with our certified quality in car park and tunnel ventilation systems, which has a growing demand nowadays.

Thank you to everyone who has contributed to our success!



## “FAF-125”

Smoke and Heat Exhaust Axial Fan

### FIRE RESISTANCE CLASSIFICATION

**F<sub>300</sub> 60**

**Ff<sub>300</sub> 120**

# All Stars to FKS Air Handling Units



FORM has released new Eurovent certified FKS air handling units (AHUs) to provide customers with the best possible solution for all types of project requirements.

FKS air handling unit, which has a world-class competitive performance, is attracting great attention from domestic and international markets.

It stands out especially with T2 (TT Class) in Thermal Transmittance class and TB1 (TBF Class) in Thermal Bridging class values which represent very low energy loss.

FORM FKS Air Handling Unit, which can be produced in 60 different modules with a flow rate between 1,000 m<sup>3</sup>/h and 100,000 m<sup>3</sup>/h, has a special steel casing structure and 60 mm double skinned panels with thermal barrier PVC profile.

FKS air handling units meet the required level of indoor air quality while maintaining the humidity and the temperature under control. With modular, flexible and environment friendly solutions, it provides ideal comfort for commercial and residential buildings while providing high energy savings.





# Frigoblock launches new product series with R455a Refrigerant



As transition from traditional refrigerants to low-GWP refrigerant system solutions is going through more severe restrictions due to F-Gas regulations, alternative mixed refrigerants which has no or low impact to the environment has been introduced to the market to be able to meet these standards. One of the most promising alternative refrigerants is R-455a which has GWP<150, wide range application temperature and higher COP levels with respect to traditional and alternative refrigerants. Seeing such improvement in the refrigerant manufacturing technology, FRIGOBLOCK has decided to adapt its product portfolio and introduce its brand-new technology using R-455a refrigerant.

**Using R-455a Refrigeration Systems can be advantageous as it has;**

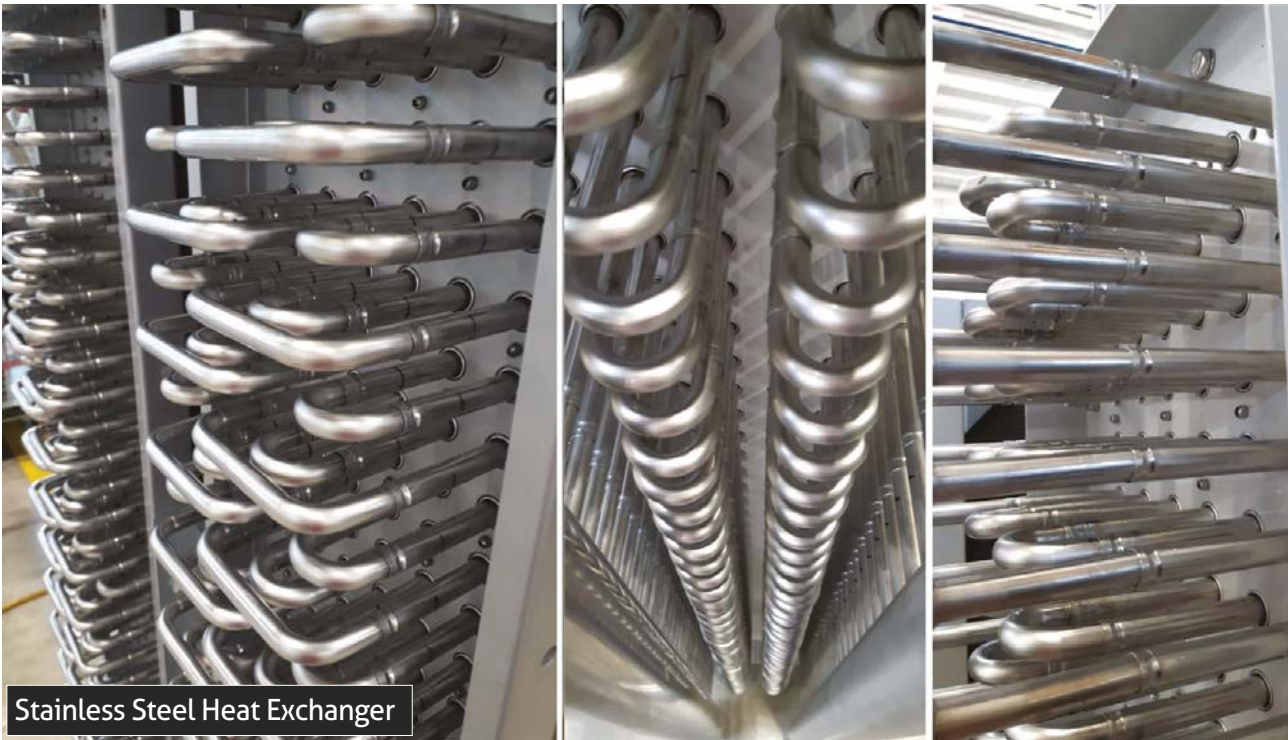
- Higher efficiency in medium and low-temperature applications with respect to R-404a,
- Higher capacity per circuit vs. R-290 and lower safety risk,
- 46% lower capital cost and 36% operational cost vs. R-744 condensing unit (MT),



- More simple, safe and easy to maintenance vs R744 and R-290 systems,
- Smaller systems which conclude in reduction of power consumption,
- Much more versatile as it can cover low, medium-temperature and AC/chiller applications,
- Wide range of application area as it can be suitable for; cold rooms, convenience rooms, small/medium sized markets and large supermarkets,
- GWP<150 making it applicable through all restrictions covered by F-gas regulations



# Friterm Continues to Expand its Product Range



Stainless Steel Heat Exchanger

Since 1979 Friterm has been developing and manufacturing heat exchanger for any type of applications. Stainless fin material was integrated into fin die 50x50, with this investment Friterm is able to design and manufacture completely stainless steel heat exchanger made of SS304 (1.4301) or 316L (1.4404).

For following applications, the use of a stainless steel heat exchanger is appropriate to take into consideration

- 1- Internal corrosion risk due to fluid in tube; demineralized water, NH<sub>3</sub>, CO<sub>2</sub> etc.
- 2- External corrosion risk
  - environmental reasons or industrial markets with a corrosive environment such as off shore, sewage treatment plants
  - food industry such cheese, fish cold rooms, wine cellar
  - for aggressive sanitizing washings
  - for minimum of susceptibility to soiling and demanding hygienic areas
  - for continuous passage of water as for hydro cooling applications
- 3- Temperature reason (air inlet temperature below -40°C)
- 4- High material strength

Depending on application, the suitable material combinations are selected from a wide range of materials. Tube material is copper, K-65, stainless steel, aluminium and fin material is aluminium, copper, aluminium alloys, coated aluminium, stainless steel for finned type heat exchanger. Carbon steel and titanium tubes are also possible for custom made solution.

Please visit the website [www.friterm.com](http://www.friterm.com) for further information or please contact Friterm sales engineer. Friterm engineers are happy to advise the best solution using our know-how and thermal software.



Custom made Stainless Steel Air Cooler for NH<sub>3</sub> Pump System



# GEMAK offers “Product Selection Programme”



## GEMAK Product Selection Program

Main Page
Sections
My Project (0)
Actions
Help
Languages
Exit

Capacity   
Watt

Min/Max Range    
%

Inlet Air Temperature   
°C

Evaporation Temp.    
°C

SC1 SC2 SC3 SC4

Refrigerant

Altitude   
m

Fin Material

Serie Selection

Fin Spacing

Number of Fan   
Pcs

Fan Diameter   
mm

Stock

Single Unit Selection

Distance    
m / dBA

Max. Length   
mm

Max. Width   
mm

Max. Height   
mm

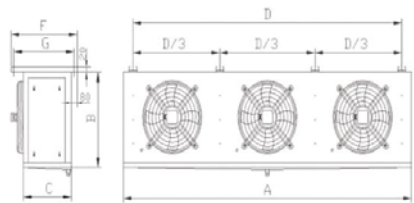
Product Select

Evaporator Product Selection List

	Model	Capacity Watt	Heat Transfer S	Air Flow m <sup>3</sup> /h	Fan Diamete	Number of F	Total Power Inp	LWA dBA	LPA dBA
1	8 GNE 35.3.6	10 000.00	38.2	7200	350	3	0.41	69	47
2	8 GTT 35.3.2 M	10 000.00	43.3	7500	350	3	0.50	69	47
3	4 GNE 35.3.4	10 520.00	47.9	7050	350	3	0.41	69	47
4	8 GNE 45.2.6	10 650.00	38.6	8400	450	2	0.49	76	54
5	6 GNE 45.2.5	10 750.00	41.6	8600	450	2	0.49	76	54
6	4 GNE 50.1.8	10 800.00	59.6	5100	500	1	0.68	77	55
7	6 GTT 40.2.2 M	10 900.00	48.4	6300	400	2	0.32	88	66
8	6 GNE 50.1.8	9 000.00	41	5300	500	1	0.68	77	55
9	4 GTT 35.2.2 M	9 050.00	55.1	4500	350	2	0.33	67	45
10	4 GNE 50.1.6	9 150.00	44.7	5350	500	1	0.68	77	55

Page 1 of 2    View 1 - 10 of 15

Dimensions    Technical Specifications    Fan Specifications



A: 1720 mm    We: kg

B: 510 mm

C: 365 mm

D: 1530 mm

F: 485 mm

G: 429 mm

ØDin: 16 mm

ØDout: 28 mm

Engineered by ROADMAP Product Innovation Engineering

Follow @productselect

Gemak provides Standart product selection software which is available free on our web site [www.gemakltd.com](http://www.gemakltd.com) with multiple language options like English, German, Russian, Italian and Arabic. Gemak standart product selector software is an application developed to select the most appropriate standart condensers and evaporators by entering the parametres

such as capacity, operating conditions, fin spacing, diemensions etc.

With its motto “Quality First” GEMAK has identified its success with the quality product policy. Our Quality Management System is of a structure in which all employees feel that they are a part of the system and evaluate their work. Aiming to achieve continuous

improvement, our company continues to work with a customer oriented approach. Focusing on customer satisfaction our company has the principle of assuring customers with its products and product quality. Diversity of products, opting to use international standards and advance technologies is the proof of this mindset.

# General Filter Havak and Bion Collaboration in the Molecular Filtration Market



Air pollution has become worse year by year especially by the spread of the industrial revolution and therefore a more important issue. Adding the pollutants sourced by the transportation means increased the speed of pollution to a much higher level. The effects of the air pollution on human health, environment and economic assets are better comprehended in the latest decades. Particulate air filtration has been the mainstream measure against air pollution. But it provides no use on molecular particles of the chemical substances like volatile organic compounds, gases, or odors. As our knowledge and experience deepened about the consequences of molecular particle presence in the air, we better realized the damage it gives to human health,

sensitive equipment in industry, food, historical artifacts, and many other merchandises.

Molecular air filtration is the particular solution in these situations. BION has a comprehensive product range like activated carbon pellets, alumina-based ones and many different products and their blends, which are engineered to be utilized on controlling the emissions of specific gases, chemicals, and odors. BION provides complete molecular filtration solution systems designed with combination of appropriate filtration media type, quantity and filtration devices tailored to each project's requirements.



GENERAL FILTER HAVAK and BION united their powers on molecular filtration in the Turkish and Azerbaijani markets. GENERAL FILTER HAVAK became the official distributor of BION for Türkiye and Azerbaijan, by the agreement undersigned between them. They offer solutions for;

- \* Odor control
- \* Corrosion control
- \* Indoor air quality
- \* Bio-gas industry



To announce their collaboration and provide an in-depth introduction about their products and services to potential clients, they held seminars in İstanbul and Ankara in November 2022. Guests received information about pollutants, standards, the sectors those molecular filtration solutions used, product types, devices, and sample solution cases. Seminars took place with success by high attendance and a great interest by the audience.



# Ges Teknik R&D



## Gateway Devices

GES Teknik R&D team completed the development of the Gateway product, which enables systems with Modbus RTU, BACnet, KNX, MQTT and other communication protocols to be accessed over the network and added it to its product range.

## Parametric & Programmable Logic Controller

Smallart controllers are developed by Ges Teknik R&D team as standard or customer-specific parametric and logic programmable devices in both hardware and software.

Ges Teknik was established in 2003 by its founders who have more than 25 years of professional and commercial experience in the air conditioning sector.

Since the day our company was founded, we started to provide technical services to our customers in the field of HVAC controls, building automation systems and tailor-made OEM solutions.

After 2008 we decided to focus on R&D process as a strategic growth path. For the last 15 years, we have been developing control solutions that are designed, developed and produced by our teams for domestic and international markets.

We are aware that sustainable growth, which we place on the main axis of our activities, is possible as long as we keep the sustainable environment and energy principles alive. In order to follow these principles in a systematic way we completed ISO14001:2015 certification steps and got certified in 2022.

We always follow the latest trends to meet today's needs with tomorrow's technology.

These devices with BACnet/Modbus communication protocols offer cost-effective solutions to our customers' automation needs.

## BMS I/O Modules

The latest addition to our product range is the Smallart I/O modules with 30 I/O and 44 I/O models.

One of the most feasible solutions to collect the scattered data from the field is to use the communicating I/O modules. Smallart branded modules with BACnet / Modbus are cost-effective solutions to fit the automation needs of our customers.

## Thermostats

The latest versions complete the fan coil thermostat range and provide a control for different combinations of fan, valve, VAV and trench heater. These range from 3-stage or EC fans, on/off or modulating valves or heaters.

All our models are fully parametrically defined in order to meet the demands of the end-user and the commissioning team.



# Güven Soğutma company's new cooperation



Güven Soğutma A.Ş., which has been producing high quality and fast solutions for cooling system manufacturers since 1985, is saying hello to the new year by making an authorized dealer agreement with SANHUA company.

Sanhua is a leading HVAC&R manufacturer of controls and components with a global footprint and 30 years of experience and has 9 important production bases and more than 20 factories, located in China (Zhengjiang, Anhui, and Jiangxi), Poland, Austria, Mexico and America with more than 25 thousand employees all over the world.

Güven Soğutma Ünit. San. ve Tic. A.Ş. produces liquid receivers and compressor protective equipment and increases its equipment variety suitable for eco-friendly air conditioning

liquids each day. We are happy to inform you about our expanded product range.

Now our customers can reach quality products and wide varieties at best prices. We have firstly included the German DEKA company, which produces liquid and oil control equipment, and then the engineering experience of American Parker Sporlan to the value-added product sales we initiated with the Italian OLAB brand, which manufactures valves and connection equipment for cooling systems.

Thanks to our nearly 38 years of experience in HVAC&R industry. Exporting to 65 countries and having sales representatives in 47 countries, Güven Soğutma, powered by its customer's needs, continues to take bigger and firmer steps each day.

<b>Güven (TURKEY)</b>	<b>SANHUA (CHINA)</b>	<b>OLAB (ITALY)</b>
<ul style="list-style-type: none"> <li>• Liquid Receivers</li> <li>• Collectors</li> <li>• Suction Line Accumulators</li> <li>• Filter Drier Shells</li> <li>• Mufflers</li> <li>• Oil Strainers</li> <li>• Oil Level Regulators</li> <li>• Oil Reservoirs</li> <li>• Oil Separators</li> <li>• Liquid Line Filter Driers</li> <li>• Vibration Eliminators</li> </ul>	<ul style="list-style-type: none"> <li>• Thermostatic Expansion Valves</li> <li>• Electronic Expansion Valves</li> <li>• Solenoid Valves</li> <li>• Check Valves</li> <li>• Ball Valves</li> <li>• Electronic Controls</li> <li>• Sight Glasses</li> <li>• Pressure Controls</li> <li>• Filter Driers</li> <li>• 4-way valves</li> <li>• Micro-Channel Heat Exchangers</li> </ul>	<ul style="list-style-type: none"> <li>• Solenoid Valves</li> <li>• Check Valves</li> <li>• Ball Valves</li> <li>• Safety Valves</li> <li>• Oil Pressure Valves</li> <li>• Change Over Valves</li> <li>• Humidity and Liquid Indicators</li> <li>• Fittings</li> </ul>
	<p><b>DEKA (GERMANY)</b></p> <ul style="list-style-type: none"> <li>• Electronic Level Sensors</li> <li>• Electronic Oil Level Regulators</li> </ul>	<p><b>PARKER / SPORLAN (USA)</b></p> <ul style="list-style-type: none"> <li>• Thermostatic Expansion Valves</li> <li>• Electric Expansion Valves</li> <li>• Filter Driers</li> </ul>



# 2022 the Year of Growth and Investment for HTK



Exporting to over 20 countries in 2022, it had been a very productive year in the HVAC industry. By opening a new production line in Baku, the capital of Azerbaijan, HTK Klima became privileged and strengthen its position regionally. With this new facility in Baku, it has become the most preferred company with its product quality and price policy in member countries of the Eurasian Customs Union such as Uzbekistan, Kazakhstan, Turkmenistan, and Russia.

In addition, many successful and prestigious projects were completed with customer satisfaction in Turkey and abroad in 2022. Besides, HTK Klima invested in R&D for product certifications and received the EN 1366/2 classified Fire Damper certificate with 120 minutes of fire resistance at high temperatures, suitable for horizontal and vertical use.

Within this year, we are planning to reach 125% growth in export markets in new regions globally.



# KARYER Heat Exchangers



KARYER is one of the leading manufacturers & exporters of Heat Exchangers, Evaporators and Condensers capable of realizing both serial and custom projects. Our 45 years of experience enables us to export 78 countries in 6 continents (mainly in Europe) by ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 27001:2013, CE, UL, EUROVENT, PED, EAC certified standards, while 60% of our turnover is obtained from export sales. KARYER won the ISIB Successful Exporters Awards in 2021. KARYER was nominated as the First company that "Exports Most Heat Exchangers" among heat exchanger manufacturers industry.

The product range of KARYER contains Heating & Cooling Coils, DX- Evaporators, Condenser Coils, Unit Coolers, Blast Freezers, Air Cooled Condensers, Air Coolers, Condensing Units (w/o compressor), Dry Coolers, Oil Coolers and Air to Air Heat Recovery Heat Exchangers.



## KARYER presented new product series "Banana Unit Coolers"

Banana fruit, has a high commercial value, should be kept at the right temperature, humidity and proper conditions for ripening and storage. It is aimed to ensure that all bananas in the cold room ripen more quickly and evenly. Banana unit coolers are designed slightly different than traditional unit coolers as they require specific conditions for the fruit. EA-DR and ED-DR model banana unit coolers are able to reach small and medium amount of cooling needs for cold storage of bananas. The products have been optimized to operate effectively in low temperature differences and to provide low humidity loss. Sucking or blowing fans which have high static external pressure are used in the products. The coils, in unit coolers, are compact in addition to their thermally highly efficient performance.



EA-DR and ED-DR banana unit coolers, are designed copper tubes with high thermal efficiency and suitable for different usage conditions. Manufactured with electrostatic powder painted galvanized sheets to resist corrosion with attractive view in addition to its rigidity. In addition, easily removable screwed side covers and hinged drain pans are used for installation and maintenance operations. The unit coolers are offered with coated foil, stainless steel casing, EC fan options according to customer needs. Upon request, heating coils with electrical heaters can also be added to the products.

EA-DR and ED-DR banana unit coolers are optimized with the highest efficiency. Our company guarantees the right banana unit coolers with reliable engineering and quality manufacturing.



# ISO 16890 General Ambient Ventilation Filter Tests



The ISO 16890 standard is the new standard that has replaced the EN779:2012 standard. This standard covers Coarse filters (Class G), Medium filters (Class M) and Fine filters (Class F). MGT Filter performs tests within the framework of ISO 16890 standard, exposing a filter to particles from 0.3 µm to 10 µm in size. This means testing the filters in conditions much more similar to real life and getting a product with the performance you expect.

MGT Filter performs tests on its products according to ISO 16890, EN 779 and ASHRAE test standards. Eurovent, which is independent, also has tests done on the capacity and performance test data of the products it produces in order to ensure "proven/confirmation".

R&D activities are carried out according to the pressure and efficiency performance results of the filter. In line with the customer's request, filter testing service is also offered.

## EN 1822 and ISO 26463 High-efficiency Hepa-Ulpa Filter Tests

Efficient air filters (EPA), high efficiency air filters (HEPA) and ultra-low penetration air filters (ULPA), filters produced for ventilation and air conditioning systems such as clean room applications are tested according to EN 1822 and ISO 29463 standards. MGT Filter tests every product it produces according to these standards and determines the filter performance.

R&D activities are carried out according to the pressure and efficiency performance results of the filter. In line with customer demand, filter testing service is also offered to customers.

## ISO 16890 General Ambient Ventilation Filter and EN 1822 Media Tests

MGT Filter makes detailed comparisons by pre-testing the media produced by raw material manufacturers. The selection of the most suitable quality raw materials is supported by the test results obtained from here. Pre-tests of raw materials before filter production are carried out with this system and controls are carried out.



# Refkar produces innovative and eco-friendly products with its new factory in Kırklareli / Türkiye



Refkar was established to offer technologically advanced and high-quality products for the refrigeration industry in 2008.

The company was first established with 3002 operating area and 2 employees. Based on a long experience organized in a new structure within years, moved into its new plant located in Kırklareli, with 30002 indoor production area and more than 55 employees. Choosing to specialize in shell and tube type heat exchanger production, Refkar is now one of the few companies producing equipment for HVAC-R industry. Since the year it was established, Refkar kept investing to keep up with the technological innovations. Moving into their new factory, Refkar improved its CNC machinery and added new advanced production machinery such as an automatic tube bender, finning machine and robotic welding machine.

In corporation with their Italian solution partner Unilab, S.RL, Refkar also launched its updated Selection Software this year, making its solution partners operations run more smoothly. The updated version of the software is available can be downloaded directly from Refkar's web page.

Refkar is an environment-friendly company with an ecologic conscious and works to impose this on everyone.



Refkar embraces reliability as its key value. Seeing Refkar's customers as their business partners "we will work hard to provide better service and top-quality products for our business partners" companies chairman Şant Özbülül says.

Exporting to over 35 countries at this moment, Refkar keeps participating in local and international exhibitions, trade missions and summits to present its products and services.





# New Design Dry Cooler with Adiabatic



SARBUZ HEAT EXCHANGERS Industry and Commerce Inc. was established in 1953 with the purpose to serve HVAC-R industry. Through its gradually increasing experience and knowledge by years, SARBUZ has started manufacturing finned type of heat exchangers in 1974. Sarbuz manufactures evaporators, condensers, heating and cooling coils, steam coils, dry coolers and O.E.M. coils for over 45 years for the companies which are active in the HVAC-R, energy and mobile refrigeration industry and also provides finned type heat exchangers for different companies in the country or internationally.

SARBUZ serving you customers by their new design DRY Cooler with Adiabatic Cooling Pad Systems.

## Adiabatic Cooling Pad Systems

Efficiency has come to the fore in cooling systems due to increasing energy consumption costs. One of the most important energy consumption elements in cooling systems is defrost. In many applications, electric heaters are used for defrosting, negatively affecting energy consumption. Sarbuz company continues to take measures to reduce this energy consumption. Thanks to this technology called glycol defrost, a glycol circuit is used inside the evaporator instead of an electrical heater, providing a hot glycol-water mixture to pass through this circuit and defrosting is performed. It is possible to obtain the hot water-glycol mixture by using a desuperheater between the compressor and the condenser. In this way, there is an extra saving as it also reduces the need for condensers.

Condenser selection is very important in cooling systems and directly affects system efficiency and cooling capacity.

In the well-known finned and tube condenser, the heat transfer is directly limited by the dry bulb temperature. Therefore, it is possible to increase the efficiency of the system in dry and hot weather by using an adiabatic pad. The system works by evaporative cooling reduction of the condenser air inlet temperature by placing specially designed pads at the air inlet of the condenser and wetting pads. The air temperature entering the condenser reaches levels close to the wet bulb temperature. In this application, thanks to the pads, it is aimed to increase the efficiency by targeting the minimum water consumption.

As a Company Quality Policy, first quality material usage is very important subject also for this new series.

SARBUZ Family is racing with herself about increasing her turnover, export percentage and quality bar by long term customer relations and supports.



# Optimum indoor air quality in schools with Systemair



## Fresh air in classrooms impacts educational success and health

It is important that the ventilation systems of kindergartens and schools have conditions that will not cause health problems in the classrooms and contribute to increasing the physical and mental performance of students. In fact, it has been proven by scientific experiments that the performance of students studying in classrooms with fresh air increases... Moreover, reducing the CO<sub>2</sub> rate in the classroom with fresh air also reduces the spread of Covid-19 and other flu infections, especially in winter. Considering that the classrooms have an average capacity of 30 people, a fresh air flow of 30 m<sup>3</sup>/h per person is required to guarantee a CO<sub>2</sub> level below 1,000 ppm in the air of the space. This corresponds to a fresh air flow rate of 900 m<sup>3</sup>/h, thus achieving four to five times the air exchange rate. Systemair's ventilation systems for schools, on the other



hand, bring this air volume to the classrooms without drafts and provide heating and cooling functions. The company, which brings the large temperature fluctuations that occur in the classrooms due to different variables and the temperature level that does not spread unequally to the classroom, to an optimum balance with its technology, offers energy efficient solutions with its mechanical ventilation applications. Since classroom ventilation has become mandatory in many European countries, Systemair produces devices for classroom ventilation in its factories in Slovenia, the Czech Republic and Canada.

## Technologies that eliminate heat loss

Due to the uncontrolled air entering the classroom when letting fresh air in by opening the windows, serious energy losses occur, especially in the winter months when schools are open, and students are exposed to external ambient noise. Systemair provides fresh air filtered by mechanical ventilation and energy losses are kept to a minimum thanks to the high efficiency heat exchangers inside. Energy efficient air handling units equipped with the Systemair heat recovery system reduce heat losses to almost zero. The company's new generation Sense units provide comfortable air conditioning at all times, from hot summer months to cold winter days. Systemair, which provides high efficiency while providing indoor air quality thanks to its controlled mechanical air conditioning solutions, also responds to different normative requirements. It creates the necessary indoor conditions for students of different age groups to get fresh air in new generation insulated school buildings where there is no air permeability. Offering a wide range of products from cooling systems to demand-controlled air conditioning systems for schools of different sizes and capacities, Systemair also helps to ensure low noise levels for productive workspaces with its products and services.





# THERMOWAY provides heat exchanger solutions for HVACR experts



Thermoway Inc. since its establishment, it has been following the technological developments, making needs oriented designs regarding customer expectations, and making growth oriented investments every day by observing the principles of energy efficiency and environmental protection.

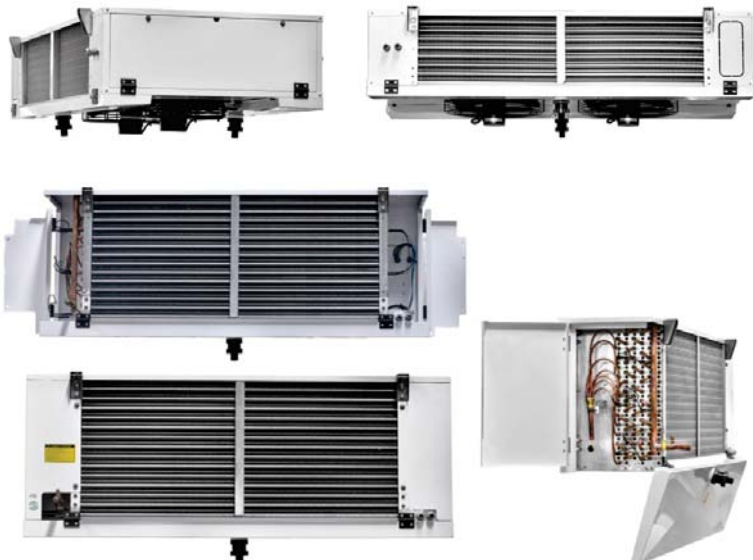
**For these purposes, Thermoway Inc. it expands its product range by adding new products to its product range.**

- In our newly designed TLG series condensers, thermal efficiency has been increased and energy efficiency has been brought to the forefront by using inner grooved pipes and changing the lamella surface structure.



**Capacity Range:** between 17,8kw - 709,4kw  
**Lamella Spacing:** 2,1mm - 2,5mm  
**Fan Diameter Range:** From Ø500mm to Ø800mm

- Our new TEC series for cold room evaporators which have been designed to insure high heat transfer efficiency along with along easier assembling and maintenance processes are begin produced with 4-6-8-10 mm fin spacings.



TEC series evaporators are offered to your service in 4 different series according to their intended use.

- TEC C series standard room wall type,
- TEC S series corner ceiling type in small sized rooms,
- TEC D series is generally double blow ceiling type in working environments and places where low air velocities are preferred,
- TEC A series is designed to reduce product loss in fruit and vegetable storage, to increase thermal efficiency and to provide more homogeneous air distribution in the room.

**Capacity Range:** 2,0kw – 83,4kw  
**Lamella Spacing:** 4-6-8-10mm  
**Fan Diameter Range:** From Ø250mm to Ø500mm



- Box series condenser units designed in line with customer demands are designed to be able to install many types of compressors and auxiliary equipment, and 4 different types (TBOX, MBOX, SBOX, HBOX) are offered to our customers.

**Capacity Range:** between 2kw - 224kw  
**Lamella Spacing:** 2,1mm - 2,5mm  
**Fan Diameter Range:** From Ø250mm to Ø800mm



Thermoway Inc. it will continue to work with the aim of improving its machine park day by day, ensuring that its personnel are trained in a way that will ensure their development, and making product traceability possible under all conditions by improving the quality management system and will continue to be your reliable business partner by offering new products to our customers.

For the further information please visit our website.

# Ulpatek Filtre continues its activities for a better future...



ULPATEK leads the industry in terms of filtration, whose significance is better comprehended with the pandemic. Answering the filter demands of this period by offering solutions with engineering know-how rather than the popular approach, that is, just producing and selling, Ulpatek has pioneered the industry with its production quality and guidance in identifying the filter classes to be inserted in the "Air Cleaner Devices", whose usage areas were expanded during this period. Although "indoor air quality" was more widely recognized in particular industrial practices until the pandemic, its importance in office spaces, meeting rooms, hotels, gyms, stores, and similar day-to-day living spaces was a part of our post-pandemic daily life is now better understood. During this period, air purifiers with HEPA filters have become the most frequently-utilized devices in our living spaces. Manufacturing filters for air cleaner devices to combat the pandemic, Ulpatek also produces custom design filters for its national and global business partners.

After managing to achieve growth aims despite the pandemic conditions and conducting successful R&D activities, ULPATEK ended 2022, the year that created a

difference in product support, product development, and engineering activities with the brand's thriving R&D engineers and professional employees in the R&D department. With the activities conducted in its filtration testing laboratories called ULPALAB, the brand continues to offer the optimum filtration solutions to the industry.

Besides the improved and updated version of its available product group, Safe Change Housing-BIBO, equipped with cutting-edge technology and test systems, ULPATEK also exhibited all its ventilation filter groups manufactured under the standards in the fairs and organizations held in many different cities of the world. Moreover, the brand introduced its "Laminar Flow Unit for Weighing and Sampling" and "Laminar Flow Unit with Fan Filter (FFU)" during the pharma events. "Safe Change Housing-BIBO" in the high-tech product category was the most notable product group in these pharma markets.

At the fairs attended, the brand highlighted the significance of proper filtration yet again, exemplifying the ideal engineering practices to protect the environment, processes, and human health. Regarding filtration, the fairs focused mostly on how enhancing the energy performance of buildings with the ideal engineering solutions affects the total cost.

With the awareness of elevating its brand value via the positive feedback received from the partner companies regarding product quality and performance, Ulpatek also continues to excel in the European market with its product quality and engineering activities.

ULPATEK Filtre manufactures cartridges under the ISO 16890 standard, metal oil slingers, bags, panels, rigid filters, also EPA (E10, E11, E12), HEPA (H13, H14) and ULPA (U15, U16, U17) filters and gas turbine filters in accordance with the ISO 29463 & EN 1822 standards, cylindrical and cartridge filters, active carbon filters (AFV), fan filter units (FFU), safe change housing, laminar flow units, and hygienic air conditioning equipment.

As a global brand selected by many companies in the hygiene industry, including medicine, food, hospital, and electronics industry, with its expertise in air filtration, Ulpatek Filtre continues to increase its market share in over 78 countries each day. Aiming to expand its partnerships, the brand will also attend the fairs of the German Filtech to be held in February this year and the ISH Frankfurt in March.

With the motto of "High Quality Filtration for a Better Future" in mind, ULPATEK Filtre will continue its journey with firm steps by increasing its product range while maintaining its quality in 2023.



# Üntes HEAT-X Heat Pumps Provide High Comfort and Low Energy Consumption



operating costs, hot water production, cooling function, control, and integration.

### High Efficiency

The efficiency values of the ÜNTES HEAT-X heat pump products are up to 4.84. In this way, approximately 5 units of energy can be obtained with 1 unit of energy supplied to the system.

### Low Energy Consumption and Low Cost

With their great energy efficiency, ÜNTES HEAT-X heat pumps help users save energy in specific application areas. Since the energy consumption of the devices is low, it also reduces operating costs.

### Eco-Friendly Technology

Due to their lower carbon emissions, ÜNTES HEAT-X heat pumps contribute to reducing CO2 emissions.

### Suitable for All Weather Conditions

ÜNTES HEAT-X heat pumps function properly even when the outside temperature is -20 °C, enabling you to provide a comfortable indoor environment.

ÜNTES, which sells Hisense split air conditioners and Nibe heat pumps through its distributors throughout Turkey, is now introducing the ÜNTES branded HEAT-X Heat Pump.

ÜNTES HEAT-X Heat Pump Systems offer many advantages such as energy efficiency and low operating costs thanks to renewable technology. The advantages of ÜNTES HEAT-X Heat Pump Systems—which use energy from the atmosphere to provide comfort in living spaces—include the use of renewable resources, energy efficiency, lower

## Üntes introduces a new series of rooftops that meet eco-design criteria



Having been in the air-conditioning business for over 53 years, Üntes announced late last year that it had collaborated with the Sweden-based NIBE Group, which is known for its heat pumps and has more than 15,000 employees worldwide. So, it continues its investments and R&D activities uninterrupted.

Having been an exporter of rooftops to the Middle East market for almost three years with its Tropical Rooftop Series, Üntes is now introducing its new ECO-SER series rooftop device, which meets Eco-design standards.

Offering flexible options with ten distinct models based on varying capacity demands, ECO-SER distinguishes itself with its 100% fresh air operation, ErP 2021-compliant design criteria, and eco-friendly R454B gas with a low GWP value.

The unit contains a gas burner heating module, electric or water heating, cross-flow, plate heat recovery choices, and a control system called the Effective Efficiency Control System (the EEC System), which prioritizes high efficiency.



MORE THAN  
**50**  
YEARS  
EXPERIENCE

147 – 1448 kW

## VSA-CHILLER Series

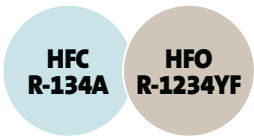
WATER CHILLERS WITH SCREW COMPRESSORS  
AND AIR COOLED CONDENSERS



**VSA-CHILLER Series** introduces compact and reliable water chillers to the plastic, packing, machining and, air conditioning, and pharmaceutical industry which require reliable cooling for their processes. They incorporate all the features and components required for outdoor operation. High EER and ESEER values are guaranteed by utilizing ecological R134A refrigerant.

The standard series can operate at high ambient temperatures up to +50°C as standard. Special high temperature and low temperature versions are available.

- |   |  |  |   |
|---|--|--|---|
|  COOLING   |  SCREW COMPRESSOR           |  AIR COOLED CONDENSER |  SHELL&TUBE EVAPORATOR |
|  AXIAL FAN |  ELECTRONIC EXPANSION VALVE |  PGD SCREEN           |   |



### STANDARD FEATURES

- |   |  |   |
|---|--|---|
| <ul style="list-style-type: none"> <li>- Counter-flow shell&amp;tube heat exchangers optimized for R134A.</li> <li>- <b>Reliable semi-hermetic twin screw compressors.</b></li> <li>- Generously sized copper pipe aluminum finned condenser coils with integrated subcooler for high efficiency.</li> <li>- <b>Microprocessor controlled multi-lingual control panel with 4x20 LCD display.</b></li> </ul> | <ul style="list-style-type: none"> <li>- Stepless capacity control (100%-25%) for precise cooling and high efficiency.</li> <li>- <b>Electronic expansion valves with PID control.</b></li> <li>- Compressor suction and discharge valves.</li> <li>- <b>Oil Level Switch.</b></li> <li>- INT 69 RCY motor protection module .</li> <li>- <b>Part-winding or Y/Δ start.</b></li> </ul> | <ul style="list-style-type: none"> <li>- Suction and discharge pressure transmitters.</li> <li>- <b>Anti vibration dampers.</b></li> <li>- Water Flow-switch.</li> <li>- <b>Main interlock switch.</b></li> <li>- Alarm output relay.</li> <li>- <b>Back-up battery for EEV.</b></li> <li>- ON/OFF Fan pressure control.</li> </ul> |
|---|--|---|



# Venco V Remote Eye and V Remote Plus apps available now



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V Remote Eye Jet Fan Remote Monitoring and Control System allows you to control VENCO Car Park Ventilation with your smartphone, tablet or computer through Wi-Fi or wired internet connection.

Thus, it prevents loss of life and property.



# Heat Pumps to Achieve Climate Targets and the Latest Developments in Heat Pump Technology



## 1. INTRODUCTION

While Europe plans to become the first climate-neutral continent by 2050, the EU Commission aims to reduce emissions by at least 55% by 2030. Within the EU Green Agreement, today's carbon border tax practices reached the final stage.

Operating with renewable energy sources, heat pumps, a potential tool for achieving this goal, are a low-carbon heating technology and are compatible with the EU Green Deal.

Considering the development of technology, this article first gives information about R32 refrigerants with low global warming potential and high energy efficiency, expressing heat pumps using R32 and the latest technological developments in these devices. For the application, it then presents research that compares the energy efficiency and CO2 emissions of an air-to-water heat pump using R32 refrigerant for heating and an air-to-water heat pump using R410A. In conclusion, it also provides suggestions that can contribute to the popularization of heat pump technology in Turkey.

## 2. WHAT IS A HEAT PUMP?

As we know from thermodynamics laws, heat transfer occurs spontaneously from higher to lower-temperature bodies but never spontaneously in the reverse direction.

This can only happen with refrigeration machines operating on a cycle basis (for example, refrigerator).

The most widely used refrigeration cycle is the vapor-compression refrigeration cycle which contains four components: Compressor in which a refrigerant is used as the working fluid, condenser, expansion valve/throttle valve, and evaporator.

Although the operations of heat pumps and refrigeration machines are based on the same cycle, they have different usage purposes. While a refrigerator extracts heat from a cool environment, a heat pump provides heat to the warm environment, thus, heating the environment. Thus, the heat extracted from a low-temperature source is transferred to the higher-temperature environment by providing it from outside. The source of heat can be air, water, and ground, while the higher-temperature environment can be a house or another.

## 3. WHAT ARE THE TYPES OF HEAT PUMPS?

In terms of heat source, heat pumps can be divided into three as follows: Air-source, water-source, and ground-source.

**Air-Source Heat Pumps:** Air is a free and easily accessible source of heat in nature. These pumps are devices that





extract natural energy from the air and transfer it to the environment to be heated via underfloor heating, fancoil, or radiators. They also provide easy installation and service options.

**Water-Source Heat Pumps:** These heat pumps obtain water from a well, lake, river, or city network and use it as a heat source. In case there are rivers, lakes, seas, or underground waters near the area to be heated or cooled, heat carrier pipes are placed inside these sources.

**Ground-Source Heat Pumps:** Heat exchange with the ground is performed via "ground heat exchangers" buried horizontally or vertically in the ground. The refrigerant or usually brine<sup>3</sup>, as it is less expensive, is passed through the pipes buried under the ground.

#### 4. WHAT ARE THE BENEFITS OF USING HEAT PUMPS?

We can list the benefits of heat pumps as follows:

- One of the most important benefits of heat pumps is "energy efficiency". Thanks to the development of technology, an air-source heat pump provides five units of heating energy while using one unit of electrical energy (for instance, COP=5)<sup>4</sup>.
- Heat pumps are also budget-friendly. While its operating costs are low, maintenance, repair, and service needs require less than other systems.

They are profitable investments that pay for themselves in a short time.

- Heat pumps are also safe, providing zero risk of explosion, fire, and poisoning since they do not contain any combustion phenomena.
- Heat pumps are open to technological development. For example, developments in compressors and refrigerants

are increasing day by day. With solar collectors, they can be used integrated both for hot water heating and supporting the environment heating.

- Heat pumps do not use fossil fuels, thus, becoming an important tool for limiting greenhouse gas emissions. They do not produce any waste such as gas, smoke, slag, odor where they are used. They only emit CO<sub>2</sub> in the power plant where electrical energy is produced.
- They do not create visual pollution in buildings. They can also be designed with various usage patterns and compact outdoor units to make them compatible with the building envelope [1].

#### 5. THE EUROPEAN UNION ENVIRONMENTAL POLICIES AND GREEN DEAL

The European Union (EU), which is known for its awareness of environmental and social sustainability issues, especially on topics such as fighting climate change, reducing greenhouse gas emissions, and using renewable energy since the 1990s, took this a step further and presented a package of initiatives, a commitment by the Union to take firm and ambitious steps towards environmental and sustainability issues: the European Green Deal [2].

Published by the European Commission, the European Green Deal is a complete roadmap that aims to make Europe the first climate-neutral continent by reducing greenhouse gas emissions with a target of 50-55% by 2030 and net-zero emissions by 2050, without the economic growth being decoupled from resource use and leaving nobody and no place behind. The Deal also aims to create jobs and improve quality of life while reducing emissions.

The European Union aims to achieve this goal with the actions it plans to implement as part of its three main

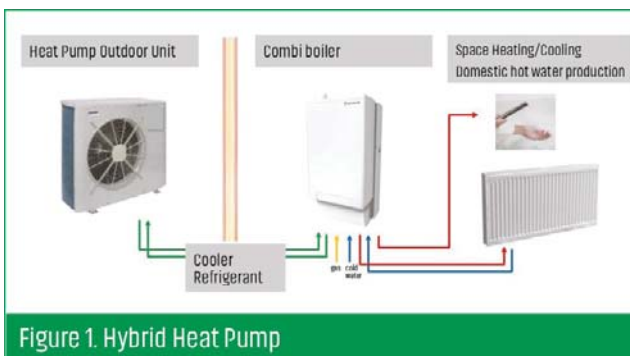
priorities: Sustaining global competitiveness, being a carbon-neutral continent by 2050, and shaping Europe's digital future.

While achieving these goals, the European Union issued various regulations and rules in the past, continuing to update them by considering the developments and changing conditions. These include the energy performance of buildings directive, renewable energy directive, F gas regulation, eco-design for product groups, and energy label regulations.

Being eco-friendly with its low emissions, high-efficiency heat pump systems that use renewable energy sources have become more significant due to the decrease in fossil fuel reserves and the environmental pollution of these fuels. Thus, they will play a key role in achieving the goal of a neutral continent.

## 6. THE RECENT DEVELOPMENTS IN HEAT PUMP TECHNOLOGY AND REFRIGERANT R32

Considering the recent developments and trends in heat pumps, we see a rise in hybrid heating systems technologies, presenting the concept of hybrid heat pumps. In these systems, the indoor unit of the heat pump and the condensing combi boiler are combined in a single unit. With the algorithm of the device, the outside temperature, the current fuel prices and other parameters are evaluated. A decision is made based on the more efficient and budget-friendly option. Then, the heat pump or combi boiler operation can be provided when necessary. Thus, the highest efficiency values can be achieved. The dependency on natural gas can also be reduced by switching to these types of devices instead of changing the boiler [3].



Another important development is related to refrigerants. R32 refrigerant is now widely used in many device types, including split air conditioners and chillers.

### 6.1 Why R32 for a r cond t oners and heat pumps?

The most significant feature of R32 refrigerant is that its coefficient of damage to the ozone layer is zero (ODP=0). The Global Warming Potential (GWP) value is one-third of the R410A refrigerant, the primary choice in current heat pumps and air conditioners. R32 also occupies less volume than R410A refrigerant.

For instance, when R32 refrigerant is used instead of R410A in a 4 KW heat pump, there is a 30% decrease in the amount of refrigerant and a 6% increase in the efficiency value.

As we can see from this example, more compact designs can be made using R32 refrigerant with the ability to achieve higher energy efficiency.

R32 was started to be used in air-to-water heat pumps in 2017-2018. Thanks to R32, a hot water outlet temperature of 65°C and energy efficiency class A+++ have been achieved. (with the ability to operate up to -25 °C.)

With the latest developments in technology, using 30% less refrigerant compared to R410A in systems with single compressors R32 can provide hot water at 70°C at high capacities and A+++ energy class in energy efficiency (COP exceeds 5). The operating temperature range has been reduced to -28°C (outdoor temperature) [4]. These devices, which pay for themselves in a short time while providing savings, can be easily monitored and controlled via mobile devices thanks to the online control feature.

## 7. THE CONTRIBUTION OF THE HEAT PUMP TO AIR CONDITIONING SYSTEMS

In international markets, fossil fuel costs are increasing day by day due to war, global problems, and political reasons (for example, on 08.03.2022, the price of Brent Oil per barrel increased to 128 USD).

Issues such as the goal of ending fossil fuel-based air conditioning systems in the EU by 2050, the green deal, and carbon emission restriction have led to a rapid increase in electrical air conditioning systems.

Particularly with the rise of concepts such as almost zero-energy and zero-energy buildings, the usage areas of heat pump systems integrating thermal solar energy and photovoltaic systems are gradually becoming popular.

Today, there is now a technological infrastructure that can solve the heating, cooling, and domestic hot water needs of a building's air conditioning system that obtains electrical energy from a single heat pump. Although such applications can usually be seen in the European Union region, they have recently started to be implemented in our country as well.

While designing cities, buildings can be planned based on an integrated design in which architecture, engineering, and city planning disciplines work together. Thus, systems that produce electrical energy and obtain their air conditioning solution with a thermal solar-powered heat pump can form the future of air conditioning design in the short and medium term.

## 8. APPLICATION EXAMPLES

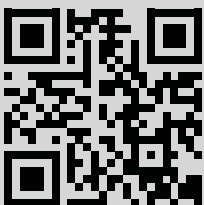
### 8.1 Comparison of R32 and R410A Usage

To provide an example, a heating application only with an air-to-water heat pump (wall type) using R410A and R32



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**Figure 1. Comparison of R32 and R410A Refrigerant Usage**

Air to Water Heat Pump (R410A)		Air to Water Heat Pump (R32)	
Required heating capacity	min. Space (-15.5°C): 14.11 kW	Required heating capacity	min. Space (-15.5°C): 14.11 kW
Water discharge temperature range heating	25 °C - 35 °C	Water discharge temperature range heating	25 °C - 35 °C
% covered by heat pump	99.4%	% covered by heat pump	99.7%
% covered by backup heater	0.6%	% covered by backup heater	0.2%
Heating capacity of the heat pump	min. Environment (-15.5 °C): 10.07 kW	Heating capacity of the heat pump	min. Environment (-15.5 °C): 11.44 kW
Capacity of backup heater	6 kW	Capacity of backup heater	6 kW
Energy consumption for heating	8329.2 kWh	Energy consumption for heating	7907.5 kWh
Seasonal coefficient of performance of heat pump (SCOP)	3.53	Seasonal coefficient of performance of heat pump (SCOP)	3.71
Heating CO2 emission	3266.7 kg	Heating CO2 emission	3101.3 kg
Energy Label	A+	Energy Label	A++
Space Heating		Space Heating	

**Figure 2. R32 and R410A Refrigerant Usage Comparison in Different Geographies**

	AIR TO WATER HEAT PUMP - R32	AIR TO WATER HEAT PUMP - R410A	
Required heating capacity	min. Environment (-4.6 °C): 11.72 kW	min. Environment (-4.6 °C): 11.72 kW	DENİZLİ
Water discharge temperature range	25 °C - 35 °C	25 °C - 35 °C	
Energy consumption for heating	3262.3 kWh	3850.6 kWh	
Seasonal efficiency - SCOP	5.36	4.67	
CO2 Emission	1914.8 kg	1910.2 kg	
Energy Label	A++	A+	
	AIR TO WATER HEAT PUMP - R32	AIR TO WATER HEAT PUMP - R410A	
Required heating capacity	min. Environment (-0.4 °C): 7.82 kW	min. Environment (-0.4 °C): 7.82 kW	ANTALYA
Water discharge temperature range	25 °C - 35 °C	25 °C - 35 °C	
Energy consumption for heating	1861.4 kWh	1845.6 kWh	
Seasonal efficiency - SCOP	5.04	5.26	
CO2 Emission	661.6 kg	723.8 kg	
Energy Label	A++	A+	

refrigerant in a properly insulated environment of 120 m<sup>2</sup> in Ankara was conducted and evaluated in the simulation program. As a result, the values provided in Table 1 were obtained [5].

By comparing the results, it can be seen that the heat pump system using R32 refrigerant consumes 421.7 kWh less energy in heating annually compared to the system using R410A, resulting in higher seasonal efficiency. Moreover, while the system using R410A has an A+ energy label in space heating, the system using R32 has upgraded to A++ energy class. Considering the CO2 emissions related to space heating, we can see that the system using R32 emits less CO2 than the system with R410A.

### 8.2 R32-R410A Usage Differences in Diverse Geographies

For this example, air-source heat pumps using R32 and R410A refrigerants for low temperature heating were selected for the heat loss calculated over the simulation program of the independent environments with a 120 m<sup>2</sup> usage area in the provinces of Antalya and Denizli with an air distance of 175 km [5]. While analyzing the outputs of the simulation program, it is seen that the design and the air-source heat pump to be used are directly related to the geographical conditions and outdoor temperature.

The common output in both provinces is that the R32 refrigerant emits between 11% and 14% less CO2 than the R410A refrigerant. According to the performance analysis, the reduction in emission values is an inference due to the efficiency difference of the R32 refrigerant. Considering the energy label, the system with R32 refrigerant has achieved A++ energy class in both outdoor conditions.

### 9. CONCLUSION

Although the heat pump market in Europe was expected to exceed 1 million units in 2022, ISKID5 2021 data stated that 11,000 heat pumps were sold in Turkey. Moreover, according to DOSİDER6, over 1 million fossil fuel combi boilers were sold in Turkey.

Considering the European trend process, we can say that the Turkish market has not yet fully developed. While analyzing the reasons why the heat pump market has not fully developed, we can reach the following conclusions:

- Turkey imports natural gas at the rate of 99% and transfers it to the districts with a population of 15,000 via BOTAŞ with the Presidential Decree [6], conducting practices to bring natural gas to the regions without natural gas,
- The high cost of natural gas is supported by the state,
- The increase in initial investment costs due to lack of necessary incentives for heat pumps.

Thus, we can say that users are increasingly shifting to natural gas combi boilers.

Considering the latest developments and trends in Heat Pumps, it is seen that heat pumps are globally accepted as a significant tool in reducing the carbon footprint.

The production and use of heat pumps are rapidly increasing thanks to the incentives provided within the framework of the policies to reduce the use of fossil fuels and therefore emissions in Europe. In terms of Turkey, we can say that production and sales can be developed with applications such as tax reductions (VAT - SCT), direct incentives for the initial investment costs for end users, and low-interest bank loans for the development of the state-of-the-art heat pumps in the national market.

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# In memory of Metin Duruk...



*Born in Akseki in 1948, Ali Metin Duruk was a valuable industry doyen with a versatile and leading character who dedicated himself to institutionalizing the Turkish air conditioning and refrigeration sector to transform it into an internationally acknowledged power as an organized structure. He not only struggled for the sector to adopt ethical values but also pioneered many social responsibility projects. What you are about to read is a compilation of his interviews published in sectoral journals about various themes.*

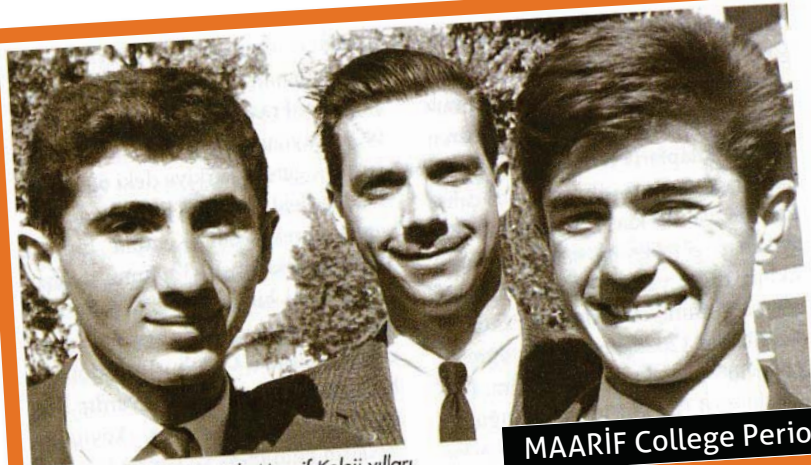
## "First years in the industry"

### **First step forward: the Faculty of Mechanical Engineering in Istanbul Technical University (ITU) ...**

I was born in Akseki, Antalya in 1948 and graduated from Istanbul Technical University as a professional engineer in 1973. I started my career at Alarko, but I created my own company, Friterm, later, in 1975. Currently, I also serve as the

CEO of Aroma, a family company. Friterm is also one of the founding members of the Turkish Ethics and Reputation Society. For a certain period, I worked as the chairman of the board of directors at the Air Conditioning and Refrigeration Manufacturers' Association (ISKID) and Research and Education Foundation on Heating, Cooling, and Air Conditioning (ISKAV). I was one of the executives of the Istanbul branch for the Chamber of Mechanical Engineers (MMO), one of the constituent chambers of the Union of Chambers of Turkish Engineers and Architects (TMMOB).





Amerikalı öğretim üyesi ile Maarif Koleji yılları.

### MAARİF College Period

I chased after gender equality, respect for nature and ethical values in the organizations I established. As a founding member of the Turkish Ethics and Reputation Society, I have always argued that ethics is an "indispensable" element of the "sustainability" approach and that any achievement without ethics would be no different from a soap bubble. I should say that I have worked hard to create an understanding of ethics, published its ethical principles, and defined ethical codes in my industry.

### Specialization in Refrigeration Engineering...

I decided to choose refrigeration as my specialization thanks to Mr. Kosti Pakker, the lecturer of refrigeration courses at Istanbul Technical University. At that time engineering drawing was not an important part of the study program at the university; therefore, I can say that I learned a lot in the companies I worked for during the first years of my career. Indeed, I produced the initial drafts of a product named "Aldağ Konformatik." Later, my father Ömer Duruk and my uncle Mustafa Duruk requested my "professional" contribution to the establishment of a pasta production facility in Konya. I went to Switzerland to learn the details, and returned as a 'pasta expert' and created a process line for pasta production in this facility.

### "Big projects and new horizons"

#### TÜBİTAK's custom projects

They contacted me for a laboratory construction for TÜBİTAK (The Scientific and Technological Research Council of Türkiye). These were very special projects. As a contractor, I contributed to the construction of laboratories such as the Precision Casting Laboratory, Milk Laboratory, and Semiconductor Technology Laboratory, each of which was "a first" in TÜBİTAK... Later, we established a borax plant in Bandırma as the first pilot project of its kind. Back then, Turkey had decided to process its borax reserves. Turkey has 75% of the world's total borax reserves. We developed a plan with a group of chemical engineers to process the

borax. Turkey began to process the reserves and to export processed borax.

#### Bock GmbH and Gram's agent in Turkey

I visited Germany for IKK after I had handed over my rights as a representative of Bitzer to my previous partners. I was looking for a compressor brand. At the fair, I made acquaintance with the Bock's officials. Moreover, I discovered Gram, another compressor brand. We exchanged our business cards, and I got a promise from them that they would visit me in Turkey. In the end, we had a meeting and signed an agreement during Soren Gram's Turkey visit. I started to promote Gram's compressors in the market.

#### Algida: The only project completed in 9.5 months in the Unilever's history

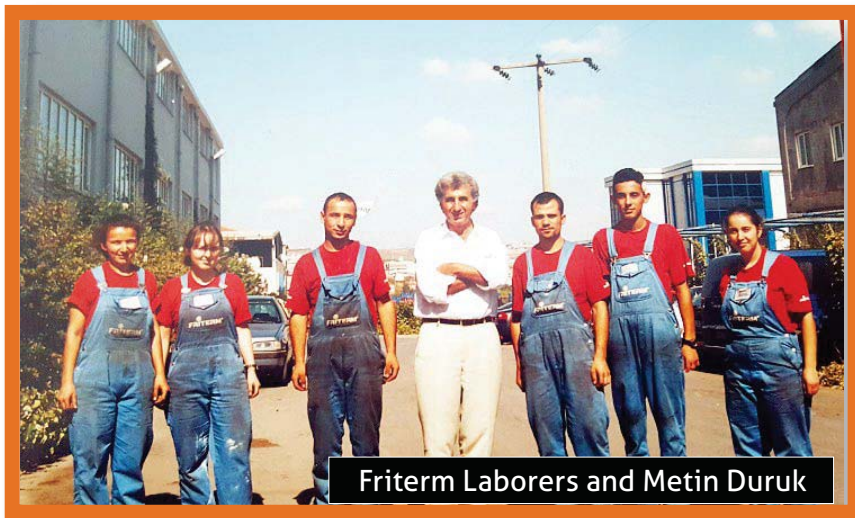
In 1989, Unilever launched a project for Algida's ice cream plant. While I included the Gram-branded devices for the cooling part of the project, we offered Friterm for the construction part. The General Director of Unilever was present in the final meeting and we won the tender.



İ.T.Ü. yıllar 1968.

### Istanbul Technical University Period

By building one of the most efficient facilities in the world, we completed 13.5 months of work within 9.5 months. This was the only project completed in 9.5 months in the Unilever's history. We needed to install ammonia pipes in diameter of 12-fingers that require special weldings as per the very tough specifications. "You will produce the first ice cream on the 1st of July," I said. Inspecting the facility, the officials of Unilever recommended that the start of the production should be delayed a year as they considered that we would not be able to finalize the refrigeration phase, although we had completed the rest of the construction. I told the chief inspector that "Refrigeration was my responsibility. I promised that I would finish it." Vanwiesel, a Dutch, trusted in me and they continued the investment. Taking this responsibility on my shoulders, I was sleeping only for 8 hours a day, and working with my teams in two shifts for the remaining 16 hours. I remember that one day I was so tired



Friterm Laborers and Metin Duruk

that I fell asleep in a hotel room with my clothes on. I was only able to take off my shoes. We finished the construction of the facility within 9.5 months by working hard. After Algida, I was offered similar facilities in Turkey and China, but I did not accept. These were the good old days...

**Naci Sahin on Metin Duruk, his closest colleague**

Metin was a pioneer of the air conditioning and refrigeration industry, one of the founders of the MMO community and Turkish Ethics and Reputation Society, and one of the most active managers of Turkish Foundation for Combating Soil Erosion (TEMA) in his last years. He was working only for the companies and the projects that shared his worldview. He was a proud member of the 68ers, which played a great role in shaping his understanding of the world.

Sharing common targets, we worked together at Friterm for many years. I accepted him as a boss, an elder and as a mentor. He was an example to me with his words and deeds. The behavior code in the company was a protective shield to us, and it was comforting as we were believing that we do the right things during work. Because of that, I have always felt lucky during my tenure with Mr. Duruk. His visionary and innovation-focused character is undoubtedly the reason why he was an important figure and a pioneer in the industry. Even when the Turkish air conditioning industry was in its infancy, he was closely following the last developments in the world and making intensive studies on how to draw the sector's future path in our country.

**Metin Duruk was in the lead to obtaining the first EUROVENT Certification in Turkey**

He initially applied his prospective plans for the entire sector within our company to create a model. On every platform, he advocated that Turkish companies should achieve international standards and have the necessary qualifications and certifications. That is how Friterm pioneered the sector, being the first company in Turkey to have the EUROVENT Certification. If today many Turkish companies have international certifications, we cannot overlook his pioneering contributions.

He was the one who convinced the industry to initiate relations with the Eurovent Association and to become one

of its parts and led ISKID to become a member of this association in 1997. He was following quite closely the Eurovent's activities and encouraged us to take active roles under its roof. Mr. Duruk's encouragement had an important role in my story to become the President of Eurovent between 2018-2021, where we had already been in its board of directors since 2012.

He believed that the enterprises were not places just to make a profit. Producing and sharing as a family in a business environment was very important to him. Being a part of the Friterm family equals to adhering to ethical principles, absolute gender equality, caring for nature and animals, and being beneficial to society. Our most important priority is to continue his legacy.

I salute him with all of my respect.

**"Played a Leading Role in the Industry to Adopt the International Standards"**

**Export: Only way-out for Turkish air conditioning industry**

The Turkish air conditioning industry has the opportunity to increase its export potential thanks to its organized power, and to increase its competitiveness with high-quality products that are also cost-effective. Our companies should





# The World Was Not Flat **WE WANTED TO WITNESS IN SITU**

Starting from the expression, “not the one who lives longer but a traveler knows a lot” we explored it by exporting to 55 countries in 4 continents.  
The world wasn't really flat at all.



decrease the share of domestic market in their turnovers, take measures to increase export shares, and need to change their structures. The Customs Union agreement helped our industry to advance technologically and become more competitive than in the past. And today, the members of the European Union are Turkey's main export partners. By not forgetting that the Custom Union agreement has problems, Turkey should not give up its pursuit to become a member of the EU. We need to negotiate to remove the barrier of free trade agreements with third countries created by the Customs Union. The members of the EU are not only the export partner of our country. Turkey has trade relations with Australia, Argentina, Chile, and African countries, as well. Moreover, our export volume with these countries tends to increase.

lean offices to make the production process in the offices easier. New digital tools, new software, new qualities, and new views are needed for the work in the offices of the engineers.

Whether it is in Europe or in other corners of the world, robotization is only possible if there is a repeated process during the production stage. However, the air conditioning sector has the inclination to have more boutique production. Whatever you do, some parts of our products are required to be tailor-made. Even if you plan to follow mass production understanding, some modifications are inevitably needed in the application or design phases. However, we can apply digitalization and robotization to ensure cost-effective and efficient production only in the facilities producing products with identical and repetitive characteristics such as 1 or 5 million pieces of the same combi boiler. That's why Turkey needs to meticulously plan its future investments if they are related to robotics and software.

### **The design will be developed in the BIM structure from now on**

BIM is a structure requiring all products to be smart and to be gathered in a collective library, not only in websites, with the purpose of retrieving and using them anytime by finding them via search motors. Design is the first phase of all of this process. Application and operation are the other phases of the structure. Digitalization grants you access to all the features of any device to be produced when you click on its project. You can make changes or review the device's characteristics. This structure

is not only for the design, application, maintenance, and operation phases, but it is also becoming a core structure of the marketing phase. As long as you do not know the dimensions and qualities of your own products to be placed in these libraries with the right information, the younger generations cannot reach your products, even though they are the best in the world. BIM has been a discussion theme of the last four years in Turkey.

## **Social Responsibility Projects and Cooperations with Civil Society**

### **Ethical principles are a "must for sustainability"**

Freedom, democracy, and independence are vitally important to me. Based on my worldview, I have been involved in the organization of the Chamber of Engineers since 1973. I served as a founder or manager in various NGOs, and I will continue to do so. In every organization I established, I have always followed my principles of gender equality, respect for nature, and ethical values. We declared a declaration on ethical principles. We also created a Supreme Board on Ethical Principles. What makes me happy the most is the fact that all processes started via grassroots



### **Our sector has to complete its digitalization process, too**

Digitalization is a vast subject. But all I can say is that the younger generations are now born into a world of digital devices. They grow with them. A world with digital devices was a far idea for our generation. But now there are generations called Gen X, Y and Z. And Gen Z is the most interesting among them, as they were born into a digital era. We live in an ever-changing world. And every change today has a digital element in it. On the one hand, the question of how to define ourselves in a digital world while still living in it is confusing, too. On the other hand, we all know that websites and social media platforms are not enough to answer this question. Digitalization will move us to some undefined point. Apart from that, the production and consumption relations as well as the relations we have with design are thoroughly transforming.

### **We need lean offices**

As a part of our UR-GE (Supporting the Development of International Competitiveness) project, we studied counseling on lean production.. Counseling on lean production is often considered as a counseling service only for the production phase. However, our sector sells its engineering producing especially value-added services in an office-based environment. That's why we need to create





demand. I have worked to develop an awareness of ethical principles in the sector, published ethical principles for the sector, and defined ethical codes. I am a proud founder member of the Turkish Ethics and Reputation Society.

I have also served as a member of the board of directors in TEMA since I believe that capitalism critically jeopardizes our planet and country considering its results on climate change and the environment. I still continue to work actively under the foundation's roof.

### Meaningful Support for Akseki's Agricultural Development

Duruk Family supports Akseki's agricultural development. About the project, Metin Duruk said, "The Agricultural Boarding School will accommodate 500 male and 500 female students. The students will have theoretical and practical lessons on agriculture and agricultural production. The school has its own field of 15 hectares alongside the 30 hectares donated by the Duruk Family next to it for the practical lessons. For Turkey, it is essential to develop its agricultural production on a scientific basis. We try to create employment opportunities for them by teaching agriculture, which is the future of our planet. Our students will contribute to both the Turkey's economy and bring a revenue to the school, not to mention that they will have education on agriculture. We should also note that another circle of this project is "Akseki Woman Cooperative" initiative. After the official procedures, we will open Akseki Woman Cooperative that will sell the products produced in the school accros Turkey. I believe that the Akseki Agricultural School will be famous with its products."

Akseki Sahinler Vocational and Technical Anatolian High School Agriculture

Department aims to be a model school. Students of the agriculture department of the school learn agricultural models both theoretically and practically.

### Stray Animals are now Safe with "Children of Our Street" Project

I intensively supported the "Children of Our Street", which was one of our corporate community projects. The project involves regular feeding of stray dogs and health checks. In addition to the permanent staff, we include others after a short training to distribute food and water with a vehicle allocated to the project. The veterinaries included in the project check the health of the animals and the teams of the municipality helps us for vaccination and neutering.

### Resources:

- Termodinamik Dergisi / October 2022
- Tesisat Dergisi / Issue No. 275
- HVACPortal
- Tesisat Dergisi / Issue No. 33





*Travel*

# The mysterious lands of ANATOLIA

# THE PHRYGIAN

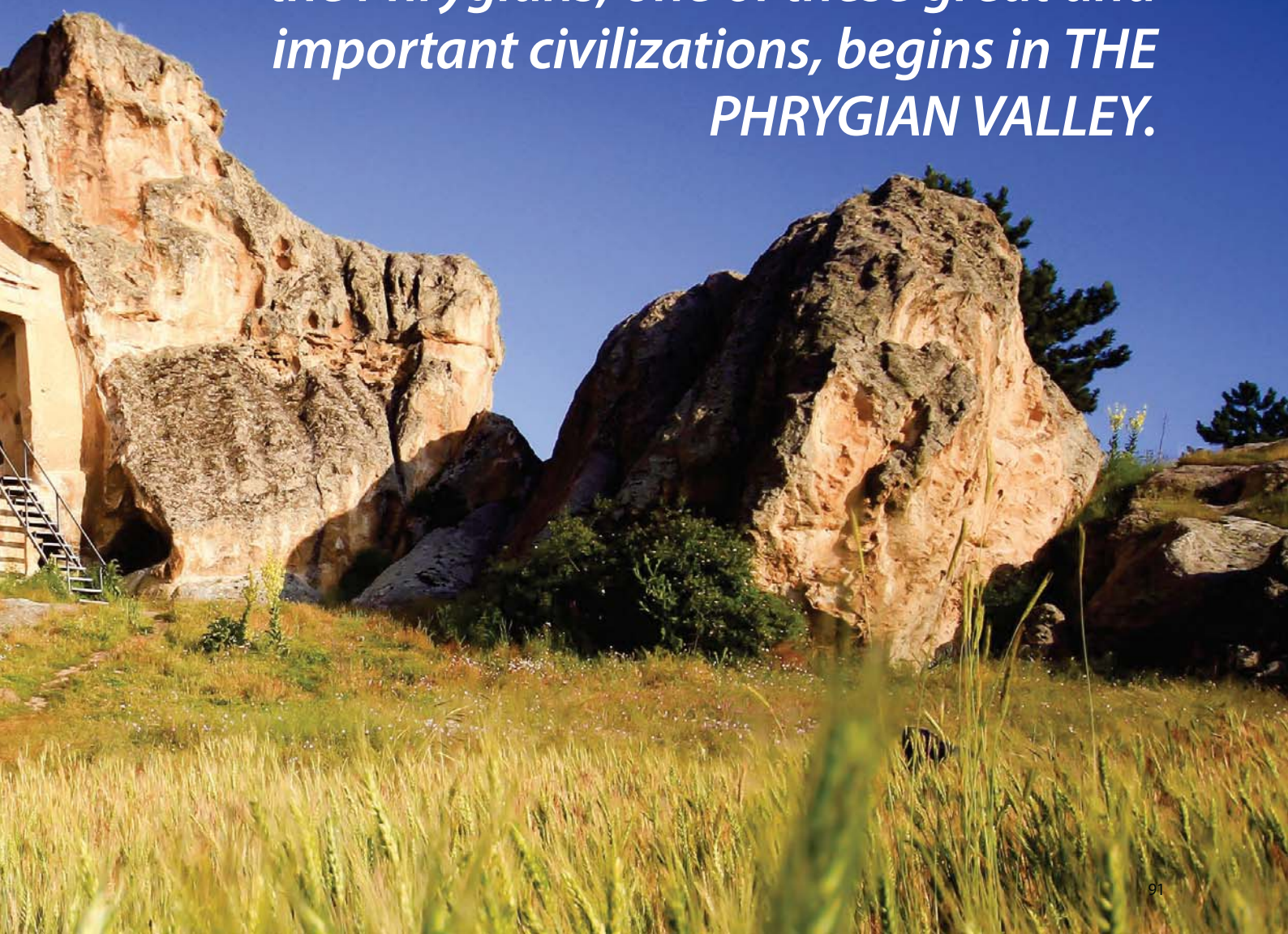




are ready to be explored:

# VALLEY

*The mysterious Anatolian lands have been home to many great civilizations that have shaped human history for thousands of years. The journey to the history of the Phrygians, one of these great and important civilizations, begins in THE PHRYGIAN VALLEY.*







The region defined as the mountainous settlement of 'Phrygia Epictetus' (Lesser Phrygia) in the triangle formed by Kütahya, Afyonkarahisar, Eskişehir is today referred to as 'the Phrygian Valley'. The Mountainous Phrygia region has a universal value because it preserves remnants of the religious rituals and social life of the Phrygian Civilization. The rich carvings on the rock monuments also give important clues to the development of the Phrygian Civilization.

The Phrygians settled in the Phrygian valleys decked with the tuffs of the Turkmen Mountain, an extinct volcano to the east of Kütahya, between 900-600 BC. Founded by a community called Brig who migrated to Anatolia from the Caucasus, the Phrygian Civilization resided solely in the Mountainous Phrygia region and became a great guide to later civilizations. The Mountainous Phrygia region is a mountainous territory characterized by deep valleys extending to the provincial boundaries of Kütahya, Afyon, and Eskişehir today. It has a volcanic structure made of easily-processed volcanic tuff. This natural structure caused the birth of an original architectural model built by carving rocks and was also taken as an example by later civilizations. The

fact that volcanic tuff is an easily processed rock enabled the Phrygians to process them easily using carving and sculpturing methods. The remnants of the period include altars, rock tombs, open-air temples dedicated to the Mother Goddess Cybele, and numerous structures for both protection and shelter. Madder crosses, curved motifs, remnants of writings and frescoes can still be found in the churches and chapels of the region, where the Romans and Byzantines later settled. The 'Deliktaş Castle' and the 'Penteser Castle' are worth seeing as natural castles. The Phrygians and Byzantines built them by carving rocks.

Despite having Indo-European roots, the Phrygians quickly adopted the Anatolian culture. They existed as a distinct Anatolian civilization that was influenced by both the Late Hittite period and the Ionian civilization. The artifacts produced by the Phrygians in mining, woodworking and weaving formed the basis of trade with the Ionian civilization. Bronze plates and bronze cauldrons with handles, belts for clothes from precious metals, buckles, textile products, furniture items decorated with geometric patterns had been popular and imitated in Ionia (the name given to the coastline of Izmir and Aydin provinces in



ancient times). The art of rugs called "TOPATES" influenced the rugs and carpet arts of the later Anatolian civilizations. It is an attractive pristine region covered with pine trees and natural rock structures reminiscent of Cappadocia.

The Mountainous Phrygia region is divided into 3 routes. The first route is located within the borders of Afyonkarahisar, the second within the borders of Kütahya, and the third within those of Eskişehir.

The longest route in Mountainous Phrygia is the Phrygian Valley, which is 80 km from Eskişehir and is known as the third Route. This track connects Gordion and Yazilikaya, the two most important centers of the Phrygians. The Phrygians chose Gordion as their political hub during the 7th century BC, when they were most prosperous. However, it is Yazilikaya that they have structured as the most sacred and religious center. Along with the Yazilikaya Valley in Mountainous Phrygia, the Kumbet Valley, the Zahran Valley, the Asmainler Hidden Valley, and the Porsuk Valley are also particularly rich in Phrygian Civilization artifacts and works of art.

## The PHRYGIAN Valleys: YAZILIKAYA, KUMBET, ZAHKAN, ASMAYLER, PORSUK

### Yazilikaya Valley

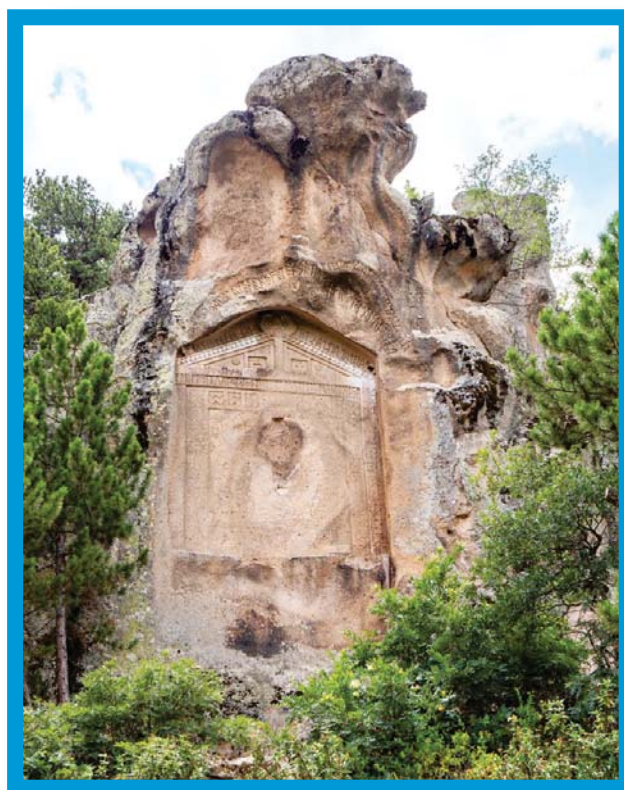
Located in the Yazilikaya Valley of Mountainous Phrygia, Yazilikaya is the place chosen by the Phrygians as a religious center. Yazilikaya Frig Kibele İnanç Merkezi (Yazilikaya Phrygian Cybele Faith Center) is located in Yazilikaya village of Han district of Eskişehir and it is also known as "Midas City". The center and its surroundings have been protected by the Phrygian castles (Akpara Castle, Işak Castle, Gökgöz Castle and Kocabaş Castle). The noble military class of that period lived in these castles. Yazilikaya, which is 75 km away from Eskişehir, is located at the southern end of the Yazilikaya Valley, to the west of the village. It was established on the Yazilikaya Plateau, which consists of high and steep tuff rocks. The main entrance to the city is in the eastern direction, and the road with a ramp leading to the bedrock

is known as the "King's Road". Yazilikaya has many valuable religious monuments and is considered to be in a favorable situation. This indicates that Midas was considered a "Holy City" by the Phrygians and was practically the metropolis of faith in the region. For the Phrygians, the capital is Gordion, the most potent political center of the state. It was not abandoned after the political collapse of the kingdom and was enriched with additional architecture used during the Hellenistic and Roman-Byzantine periods.

### Kumbet Valley

The Kumbet Valley on the route to the Yazilikaya monument is located in the village of Kumbet, 75 km from Eskişehir. Located 2 km from the Afyon highway, the mound contains the Tomb of Solon (Lion Temple) and the Tomb of Himmet Baba, which was used in the Phrygian and Roman periods.

Solon's Tomb was constructed in the Phrygian period, but it was also used in the Roman period with monumental arrangements and reliefs on its facade. There is a shield in the middle and an eagle relief on either side of the tomb's reliefs.



## Zahran Valley

It is located in Göçenoluk village, Seyitgazi district of Eskişehir. The Zahran Valley is famous for its Phrygian Rock Tombs painted in red soil and Roman-Byzantine rock settlements. The geography, which contains every shade of green, offers a highly exotic landscape with rock tombs.

## Asmainler Hidden Valley

The little-known Asmainler Hidden Valley region of Phrygia appears to be a hidden paradise that has managed to preserve its forested, exotic and natural beauties. Asmainler Hidden Valley, which is also home to Tabancakaya Ancient Settlement, takes its name from the rock tombs on the slopes.

## Porsuk Valley

Porsuk Valley, which reaches the city center from Porsuk Dam in the southwest of Eskişehir, is a tourism and attraction center that has been giving life to its surroundings since ancient times. One of the important centers of the Porsuk Valley, which preserves its original structure thanks to its natural beauty and thermal water sources lined up along the valley, is Çatalkaya.

The Sivrikaya Monumental Open-Air Temple, along with the numerous tumuli (small hills with graves or cemeteries built by piling soil on them) in the city, which takes its name from a monumental rock carved in the shape of a fork,

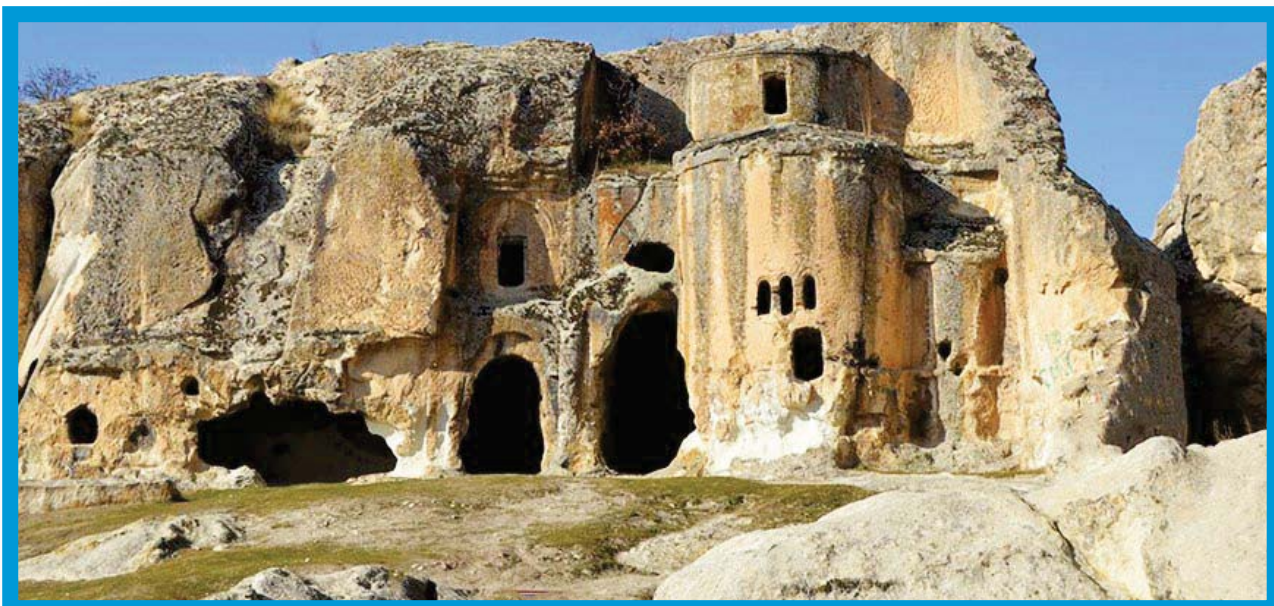


where the Phrygians following the Hittites settled, is also a noteworthy historical place that attracts attention.

## Transportation to the Phrygian Valley

The Phrygian Valley covers a large area consisting of 3 provinces, 1 district, four towns, 45 villages and six neighborhoods. With their cars people can travel the 59 km, - a drive that takes about 45 minutes, to the Mountainous Phrygian region, where there are 67 hiking paths.

It is also possible to reach the Phrygian Valley by public transport. You can use the Seyitgazi buses that leave from Eskişehir center. A short taxi drive will get you to the Phrygian Valley after getting off at Seyitgazi. However, many visitors prefer to reach the Phrygian Valley by walking after Seyitgazi and taking photos of the surroundings, even though it takes a little longer. Eskişehir can be reached by bus, plane and train from every province of Turkey.





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