

COMPANY PROFILE

AVRASYA A.Ş. is a privately held company established in Turkey in 2022, specializing in industrial heating and industrial boilers. The company is focused on research, development, design, production, and sales of products and equipment that offer energy-efficient and environmentally friendly solutions.

High-Tech Focus: AVRASYA A.Ş. aims to provide innovative and efficient solutions by following the latest developments in industrial heating and boiler technologies.

R&D Strength: The company's R&D team consists of highly qualified professionals such as graduate students, doctoral engineers, and electrical and mechanical engineers. This strong team contributes to the company's continuous development and competitive position in the sector.

Experienced Staff: AVRASYA A.Ş. has a team of dozens of high-quality professionals with extensive experience in the sector. This experienced staff ensures that the company provides the best service to its customers and successfully completes its projects.

Vision: AVRASYA A.Ş. aims to be a leading company in industrial heating and boiler technologies in Turkey. The company's high-tech production approach, strong R&D team, and experienced staff enable it to offer the best solutions to its customers.



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PROVENDER INDUSTRY



POWER PLANT INDUSTRY



CHEMISTRY INDUSTRY



MACHINE INDUSTRY



MACHINE DESIGN

IRON STEEL INDUSTRY



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CIVIL ENGINEERING







STEEL CONSTRUCTION

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HIGH&LOW PRESSURE WATERTUBE BOILERS





SKOCH STEAM BOILERS& HOTOIL-HOTWATER BOILERS













CHAIN GRADE STOKER BURNER

HEATING EXCHANGER & CONDANCERS





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LOW CALORI COAL&WASTE MULTIBURN





BAG FILTER









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SCRUBBER





AIRPREHEATER&ECONOMIZER





ROTARY&TUNNEL&ROOM DRYER







CRUSHER



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CONVEYOR&SCREW&ELEVATORS





TANKS & STOCK AREAS





SCREENS

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PROCESS INSTALLATION







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TANK MANUFACTORING





CHAIN GRATE STOKER









FLUID BED WASTEWATER TREATMENT BURNER





RANKIN CYCLE STEAMTURBINE POWER



ORC SYSTEM POWER PLANTS

APPLICATION CASE

Light industry: production of ink and washing powder. Building materials industry: gypsum board drying, asphalt heating, concrete component maintenance Machinery industry: painting, and drying Food industry: oven heating, jacketed pot heating Road printing construction industry: asphalt melting, heat preservation Pharmaceutical industry: drying Paper corrugated paper processing Wood industry: plywood, fiberboard press industry: drying, molding, laminate heating, heat The platen is heated. Feed industry: drying Oil industry: fatty acid distillation, oil decomposition, concentration, esterification, straight air odor, Reactor etc. Oil industry: oil decomposition, deodorization, fatty acid distillation, heating, hydrogenation Reaction, esterification Plastic rubber: hot pressing, calendering, extrusion, vulcanization molding Petrochemical industry: synthesis, reaction, distillation, rectification, heating, heat preservation, storage Tank heating, heavy oil heating Non-woven industry: non-woven fabric light industry: polymerization, condensation reaction, distillation, rectification, Chemical and concentration, steaming Hair, melting

Synthetic fiber industry: polymerization, melting, spinning, stretching, drying. Textile printing and dyeing industry: heat setting roller heating, drying room heating, heat capacity dyeing Petroleum and chemical industry: polymerization, condensation, distillation, melting, dehydration, Plasticsand rubber industry:hot pressing, calendering, extrusion, forced insulation vulcanizationmolding Leather industry: artificial leather processing Textile printing and dyeing: heat setting, drying, baking, evaporation, melting. Chemical fiber: polymerization, melt spinning, loom processing, molding, thermosetting, extension Coating paint: paint grilling, drying, high temperature solid melting, home appliances, vehicle baking paint Painting Automobile and airplane: coating and baking, drying, thermoforming, high temperature bonding Wood processing: hot pressing, wood processing and wood products (lumber, furniture), artificial Board (medium density fiberboard, particle board, plywood, oriented strand Board) Man-made fiber board, laminate molding, wood drying, wood drying.Forest products industry: hot pressing, drying, artificial board, medium density fiberboard, particle board, Oriented strand board, wheat straw board, plywood. Wood-based panel finishes, wood Wood processing, woodmaking solid wood flooring, wood drying, wood products, home Furniture, solid wood flooring Papermaking and printing: corrugated board processing, paper processing, ink production and processing, thermal melting, Building materials: asphalt dissolving, concrete curing tank, waterproof material and fuel consumption production, Cement fuel heating Carbon industry: asphalt heating, heat preservation, melting, dipping, kneading, molding Road traffic: road construction machinery, asphalt heating, melting, heat preservation Flower industry: medicine and health care Metal processing: pickling, electroplating, painting, oil bath, heat treatment Electricity: impregnation, dissolution, heat preservation Atomic resin **Energy Industry:** Nuclear Fuel reactors

CONTACT FOR MORE INFO !!!!!

FLUID BED WASTEWATER TREATMENT BURNER





HIGH-TECH PRODUCT SPECIALLY DESIGNED FOR WASTE WATER FACILITIES.

550 °C COMBUSTION AIR CYCLE WITH AIR PREHEATER

SPECIAL HIGH ALUMINE SILICATE PLATES

AISI316TL STAINLESS METERIAL

NOT NEED TO DRYING FOR WASTE WATER



850 °C BURN AREA AND FULL CPMBUSTION

SPECIAL DISIGN WASTEWATER PUMPS LONG LASTING NO MAINTENANCE REQUIRED



SPECIAL COMBUSTION AIR NOZZLESS ENOUGH BURNING AREA



LOW EMISSION LOW VOC&SMELL LOW DUST

LOW CALORI FUEL MULTIBURN BURNERS

Voltaj : 380V: 8 KW-2000 KW

MATERIAL	: CS/CrNi – High Alumine silicate
BURNER CAPASITY	: 100 KW-10.000 KWH
HIGH SPEED	: 60 sec Burning Starting
FUEL TYPE	:1.000-8.000 kcal/kg COAL, WASTE and
	SPECIAL FUELS
	WITH %20 ELECTRICAL ENERGY

- MULTIBURN series industrial burners with duoblock body structure are used in steam boilers, hot oil boilers, start-up applications and hot air generators, dryers, asphalt plant
- the equipment is fully automatic and intelligently controlled, and the power supply is installed, After the water source, just press the power
- button, the equipment will be fully automatic running
- High-quality, well-known brand components, refined workmanshipLong service life of manufacturing equipment

• ABILITY TO BURN ALL KINDS OF FUEL MIXTURES. By keeping the combustion chamber at 1000-1200 °C, low volatility and waste materials are fully reacted and complete combustion is achieved with sunlight technology; carbon and NOx emissions are minimized.. The waste gas taken from the system is regenerated and re-evaluated to obtain maximum efficiency.





SPECIAL SUNLIGHT FLAME TECNOLOGY 1200-1400 °C TEMPARATURE FLAME

Independent Research And Developmentmaster The Core Technology



MULTI FLAME TECNOLOGY SYNCHRONIZED WORKING MORE PROPORTIONALITY



CHAINGRADE STOCKER

Chain Grate Combustion System

A chain grate combustion system is an efficient industrial solution that enables the controlled combustion of solid fuels such as coal or biomass to generate thermal energy. This energy can then be used to produce steam, hot water, or hot oil.

Basic Operation of the System:

- **Fuel Feeding:** Coal or biomass is transported from the main bunker to the day bunker via augers. The amount of fuel in the day bunker is precisely measured by a load cell, providing data for the system's automatic control.
- **Chain Grate:** The fuel is fed onto the chain grate in a controlled manner. The chain grate ensures uniform spreading and combustion of the fuel.
- **Combustion Chamber:** The fuel on the chain grate combusts in a controlled manner within the combustion chamber. Combustion air is supplied from below and the sides of the grate, ensuring optimal combustion conditions.
- *Heat Recovery:* The hot flue gases resulting from combustion pass through a boiler or heat exchanger to produce steam, hot water, or thermal oil.
- **Emission Control:** Flue gases are passed through flue gas cleaning systems to meet environmental emission standards.
- **Ash Removal:** Ash produced from combustion is collected at the end of the grate and automatically removed.

Advantages of Chain Grate Combustion Systems:

- *High Efficiency:* Provides high thermal efficiency thanks to controlled combustion and heat recovery.
- Fuel Flexibility: Can operate with various solid fuels (coal, biomass, industrial waste).
- **Low Emissions:** Environmentally friendly due to advanced combustion technology and emission control systems.
- **Automatic Control:** PLC-controlled systems optimize the combustion process and ensure uninterrupted operation.
- Long Life: Durable materials and low maintenance requirements ensure a long service life.



Voltaj : 380V: 8 KW-2000 KW

MATERIAL : CS/CAST IRON – High Alumine silicate coating CAPASITY : 100-30.000 Kwh FUEL TYPE: 2.500-7.000 kcal/kg Coal, biomass, chicken waste, pellet, wood, bark and SPECIAL FUELS (>%30 volatility)

Chain links; It is designed to form thin air outlets between them, which can provide combustion on the entire surface. Combustion capacity can be kept at the desired level by giving the required amount of combustion air to the grill from below through numerous air ducts and adjustment flaps.



Independent Research And Developmentmaster The Core Technology And PLC System

With the electronic PLC system in the chain grill, the grill automatically reaches the required values of coal feeding speed and combustion, even if the steam pressure drops.



Combustion air and secondary air are supplied from both sides of the grate with PLC control, thus cooling the grate and ensuring that the combustion takes place on the entire grate surface.



PERFECT MIX OF AIR&FUEL LOW EMISSIONS



All processes from loading the coal to the bunkers, burning and discharging the slag are carried out fully automatically with the PLC automation system..



FLUIDIZED BED COMBUSTION THECNOLOGY

MATERIAL CAPASITY EFFICIENCY : CS / SPECIAL NOZZLES AND REFRACTORIES : 1.000-70.000 KWH : %99

The fluidized bed combustion technology with a perfect system for burning low calorific value coals in an economical and evironment friendly way. Alternatively to the coal, it is also possible to burn biomass and other solid fuels.

Features of Fluidized Bed System

- Low NOX and SO2 emission
- Suitability for burning coal with low calorific value
- High combustion efficiency (99%)
- Easy burning and preparation of coal
- Low fuel cost

When pressurized air is blown through a perforated plate under a bed filled with sand, air passes through sand particles . As the air flow rate increases, air starts to carry the sand . When air flow is further increased, the sand particles starts moving and later bubbles like a boiling liquid . This means the bed is fluidized bed boiler is described.

When the sand is heated to certain level and coal is fed into then the mixture starts burning. During the burning, the temperature distribution all over the bed is homogenous. Thus, the flying particles and carbon-monoxide burn in the bed. It is possible to burn the coals which have low calorific values, high humidity and high ash content, with high efficiency.



SPECIAL COMBUSTION AIR NOZZLESS

ENOUGH BURNING AREA

HIGH/LOW PRESSURE STEAM BOILERS

Avrasya A.Ş. provides high-performance, water-tube hybrid boilers that offer reliable and environmentally friendly solutions for industrial steam generation. Our boilers, available in both vertical and horizontal configurations, leverage advanced technologies and customizable designs to cater to a wide range of industrial applications.





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ELECTRONIC AND MECHANICAL HIGH SAFETY

From the mud drums, water flows upward through tubes neighbouring the furnace; these tubes are called '**risers**' because the water is 'rising' to the steam drum. The furnace is surrounded by risers on all four sides (front, rear, and both sidewalls), forming a rectangular-shaped box. Due to the rectangular shape of the furnace, and because the risers are full of water, each side of the boiler is often referred to as a '**water wall**'.



MATERIAL : P355GH STEEL-P235GH and Cr-Mo PIPES, CAPASITY : 4-100 TPH Steam PRESSURE : 0,5-10 MPa EFFICIENCY : %70 (+%5 economizer+%3 airpreaheter)

A watertube boiler is a type of boiler that uses water-filled <u>tubes</u> to generate <u>steam</u>. this uses fire/exhaust-filled tubes to generate steam. The steam generated by the boiler can be used for a variety of purposes, including power generation via <u>steam turbines</u>, industrial process applications, and building heating purposes (district heating).



Watertube Boiler Furnace Wall Construction





The steam drum is responsible for separating water and steam. Steam is discharged from the steam drum to the steam turbines, whilst water i

Vertical Water

Watertube Boiler Piping and Flow Paths

- **Compact Design, High Capacity:** Offers high steam generation capacity even in limited spaces. Vertical water tubes maximize heat transfer surface, resulting in faster steam generation and higher efficiency.
- **Rapid Steam Generation and Response Time:** Provides quick response to sudden steam demands, ensuring uninterrupted production processes. High heat transfer rate and low water volume enable rapid generation of steam at desired pressure and temperature.
- **High Efficiency and Low Fuel Consumption:** Achieves fuel savings through advanced combustion technologies and optimized heat transfer surfaces, reducing operating costs. Can adapt to various fuel types (natural gas, fuel oil, coal, biomass).
- Wide Operating Pressure and Temperature Range: Can operate over a wide range of pressures and temperatures to meet the needs of various industrial applications. Special designs can achieve higher pressure and temperature values.
- **Easy Installation and Maintenance:** Modular design and easily accessible components facilitate installation and maintenance, maximizing uptime. Regular maintenance and cleaning ensure long-term performance.



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Horizontal Water-Tube Hybrid Boilers:

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- Large-Scale Steam Generation: Meets the needs of large industrial plants and power stations with high steam generation capacity. Horizontal water tubes and a large boiler body provide high steam flow rates.
- **Modular Design, Flexible Configuration:** Can be produced in various capacities and configurations thanks to its modular structure, allowing customization to meet specific needs. Can adapt to the growth or changing needs of the facility.
- Low Pressure Drop: Optimized water and steam flow paths result in low pressure drop, increasing energy efficiency.
- **Long-lasting Performance:** Ensures long-term reliable operation with high-quality materials and robust construction. Corrosion and wear-resistant materials guarantee a long service life.

Shared Technical Specifications:

- *High-Quality Materials:* Boiler tubes, body, and other components are manufactured from highquality steel, ensuring durability and safety.
- Advanced Combustion System: Can adapt to various fuel types, is environmentally friendly with low emission combustion technologies. Provides fuel savings with high combustion efficiency.
- **Intelligent Control System:** Guarantees safe and efficient operation with a PLC-based automatic control system. Offers remote monitoring and control capabilities.
- **Comprehensive Safety Systems:** Ensures safe operation with pressure-controlled safety valves, water level controlled safety systems, and other safety measures.

Advantages of Working with Avrasya A.S.:

Expert Engineering Team: Our experienced engineers support you in designing and implementing the most suitable steam boiler solution for your needs.

Project Management: We guide you through every stage of the project, ensuring timely and budgetconscious delivery.

After-Sales Support: We provide uninterrupted support with installation, commissioning, training, and maintenance services.

Spare Parts and Service: We guarantee business continuity with original spare parts and fast service.

TEHNICAL DETIALS

In this section, we will delve deeper into the technical details of Avrasya A.Ş.'s water-tube hybrid steam boilers. This information will help you better understand the operating principles, structural features, and performance advantages of our boilers.

Boiler Structure and Materials:

- Water Tubes: Manufactured from high-quality carbon steel or stainless steel. Water circulates inside these tubes, and is heated by the combustion gases to produce steam. The diameter, thickness, and arrangement of the tubes are optimized based on the boiler capacity and operating pressure.
- Boiler Shell: Constructed from high-quality steel plate. The boiler shell encloses the water tubes, combustion chamber, and other components. The thickness and design of the shell are determined according to the operating pressure and safety standards.





Watertube Boiler Furnace Wall Construction

Combustion System and Fuel Flexibility:

• Combustion Chamber: This is where the combustion process takes place. It is lined with high-temperature and corrosion-resistant refractory materials. The combustion chamber design is optimized based on the fuel type and combustion efficiency.

• Flue Tubes: These tubes allow the combustion gases to transfer more heat energy to the water before exiting the boiler. Flue tubes may also include heat recovery equipment such as economizers and air preheaters.

• Insulation: The boiler shell and tubes are insulated with high-temperature resistant mineral wool or ceramic fiber materials. Insulation minimizes heat loss, improving energy efficiency and ensuring the safety of the operating environment.

- Combustion System: Low-emission, high-efficiency combustion technologies are employed to accommodate various fuel types (natural gas, fuel oil, coal, biomass). Burners are selected and adjusted according to the fuel type and boiler capacity.
- *Fuel Flexibility:* The ability to utilize different fuel types provides protection against fuel price fluctuations and optimizes operating costs.
- *Emission Control:* Combustion technologies with low NOx and other harmful emissions are used to minimize environmental impact.

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Water and Steam Systems:

- *Feedwater System:* Water treatment and conditioning systems are used to provide clean and suitable water to the boiler. Feedwater pumps supply water to the boiler.
- Steam Generation and Distribution: Steam generated in the water tubes is collected in the steam drum, dried, and then distributed to the user. The steam distribution system ensures safe and efficient delivery of steam to the user.
- **Condensate Return:** By recovering condensate water, energy is saved and the need for feedwater is reduced.

Control and Safety Systems:



• **Control System:** A PLC-based automatic control system optimizes boiler operations, ensures safe operation, and offers remote monitoring and control capabilities.

• *Safety Systems:* Pressure-controlled safety valves, water level control safety systems, flame monitoring, and other safety measures guarantee safe operation

Performance and Efficiency:

- *High Efficiency:* Advanced combustion and heat transfer technologies achieve high efficiency levels, resulting in fuel savings.
- *Rapid Response Time:* Quickly responds to sudden steam demands, ensuring uninterrupted production processes.
- Low Emissions: Environmentally friendly with low NOx and other harmful emissions.

.Low and High Pressure Options

Avrasya A.Ş. offers both low and high-pressure water-tube hybrid steam boilers to meet a wide range of industrial needs. These boilers feature different designs and specifications based on their operating pressures.

Low Pressure Water Tube Hybrid Steam Boilers

(Usually up to 10 bar): Application Areas:

- Small and medium-sized industrialfacilities
- Heating systems
- Food processing
- Textile industry
- Chemical industry

Advantages:

- Simpler design and lower cost
- Easier installation and maintenance
- Faster startup time



High-Pressure Water-Tube Hybrid Steam Boilers (Above 10 bar, up to 100 bar):

Application Areas:

- Large-scale industrial facilities
- Power plants
- Petrochemical plants
- Paper and pulp industry
- Shipbuilding industry

Advantages:

- *Higher steam production capacity*
- *Higher energy efficiency*
- Production of steam at higher temperatures
- Capability for use in more complex processes

Technical Differences Between Low and High-Pressure Boilers:

- *Material Selection:* Higher quality and more durable materials such as special alloy steels are used in high-pressure boilers.
- Tube Design: High-pressure boilers have smaller tube diameters and thicker tube walls.
- Welding and Joining Technologies: More advanced welding and joining techniques are used in highpressure boilers.
- Safety Systems: High-pressure boilers have more comprehensive and sensitive safety systems.
- Which Pressure Level is Right for You?
- **Operational Needs:** The required amount of steam, pressure, and temperature values should be considered.
- Application Area: The requirements of the industrial process and safety standards should be taken into account.
- **Cost:** Low-pressure boilers are generally less costly, but high-pressure boilers can provide energy savings in the long term.

"Avrasya A.Ş. experts are ready to provide you with the most suitable water-tube hybrid steam boiler solution in terms of pressure level and configuration by analyzing your specific needs."



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CONDANSET&DEAERATOR TANKS

DEAERATOR SYSTEM

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Deaerator systems : The first purpose is the removal of non-condensable gases and air. The <u>thermal conductivity</u> of air and non-condensable gas is very low. If air is stuck inside for a long time, then the heat transfer efficiency of the steam system can reduce to a great extent; which can also result in the creation of a vacuum inside. Also, air for a long period of time can also reduce the temperature of steam.

The second purpose is to increase the temperature of make-up water. Makeup water is a term related to cooling towers, which is added to increase water quality, lower fouling, and reduce the usage of chemicals in the water. Increasing its temperature can result in good evaporation factors and helps in heat transfer easily.

The third purpose is to store a certain amount of water in it which can be sent to the boiler as the demand for steam varies in a boiler. So, the <u>deaerator</u> plays a major role in boiler systems, to reduce corrosion and increase their life longevity.

Application Areas: Ideal for applications requiring high temperature and pressure, such as high-pressure steam boilers, power plants, and chemical plants.

Advantages:

- Minimizes corrosion risk with high deaeration efficiency (95-99%).
- Offers low operating costs and a compact design.
- Suitable for high-capacity systems (500 kg/h 50,000 kg/h).

Technical Details:

- Long-lasting construction with stainless steel (304L or 316L).
- Easy to use with automatic control systems.
- Various capacity and pressure options are available.









CONDASATE TANKS

Function:

- Condensate tanks collect and store condensate water returning from the steam system.
- They are located near the boiler and sized based on the system's steam load.

Importance:

- Condensate tanks improve boiler efficiency by:
 - Using preheated condensate instead of cold water.
 - Reducing the energy needed to turn water into steam.
 - Minimizing wasted treated water.

Working Principle:

- 1. Condensate collects in the tank.
- 2. The tank supplements condensate with fresh make-up water when needed.
- 3. A solenoid valve controls the make-up water flow based on tank level.
- 4. Steam preheaters and spargers (optional) raise the make-up water temperature and remove dissolved gases.

Maintenance:

- Annual inspections for corrosion and cleaning are recommended.
- Promptly address leaks and repair damaged insulation.









ECONOMIZER & AIRPREHEATER & SUPERHEATER

Advanced Technological Solutions for Energy Efficiency and Savings in Your Industrial Processes

Avrasya A.Ş. offers waste heat economizer and recuperator systems designed to maximize energy efficiency and minimize environmental impact in industrial facilities. Manufactured with high-quality materials and innovative engineering, our products reduce your facility's energy costs while helping you achieve your sustainability goals.

WASTE HEAT ECONOMIZERS

Waste heat economizers recover waste heat from flue gases exiting boilers and furnaces in industrial processes, enhancing your facility's energy efficiency and reducing fuel costs. These systems absorb heat from the flue gases to preheat boiler feedwater or process fluids. As a result, the same amount of thermal energy can be obtained using less fuel.





Technical Specifications and Advantages

Our economizers offer a range of customizable options to meet your specific needs.

- *Material Selection:* Choose from high-quality stainless steel for maximum corrosion resistance and long-lasting performance, or opt for the more cost-effective carbon steel with protective coatings.
- **Design Flexibility:** Select from tubular or plate designs, each offering unique advantages. Tubular designs provide a large heat transfer surface and low pressure drop, while plate designs offer a compact and efficient solution.
- **Optimized Heat Transfer:** Our economizers are engineered to maximize heat transfer efficiency. The combination of a large surface area, specially designed fins, and high-performance materials ensures optimal heat recovery.
- **Robust Construction:** Built to withstand demanding industrial environments, our economizers are designed to operate reliably under high pressure and temperature conditions. Advanced welding and sealing technologies guarantee leak-proof performance and a long service life.

By carefully considering these technical specifications and advantages, you can select the ideal economizer to enhance your process efficiency and reduce operating costs.



Waste heat recuperators recover high-temperature heat from flue gases exiting furnaces and boilers in industrial processes, enhancing your facility's energy efficiency and reducing fuel costs. These systems directly transfer heat from the flue gases to process air or combustion air, providing preheating and reducing fuel consumption.



Technical Specifications and Advantages

Our waste heat recuperators offer a wide range of customizable options to meet your specific process requirements.

- *Material Selection:* Choose from high-quality stainless steel or carbon steel, depending on your application's corrosive environment and temperature conditions.
- **Design Flexibility:** Select from tubular, plate, or regenerative designs, each offering unique advantages in terms of heat transfer efficiency, pressure drop, and footprint.
- Optimized Heat Transfer: Our recuperators are engineered to maximize heat recovery through a combination of large heat transfer surface areas, specially designed fins, and high-performance materials.
- **Robust Construction:** Built to withstand demanding industrial environments, our recuperators are designed for long-term reliability and minimal maintenance.
- Advanced Controls: Automatic control systems ensure optimal performance and energy savings by regulating airflow and heat transfer rates.
- Ease of Maintenance: Our recuperators are designed for easy access and cleaning, minimizing downtime and reducing maintenance costs.
- **Process Adaptability:** Whether you need to recover heat from high-temperature flue gases or low-temperature process streams, we have a recuperator solution to suit your specific needs.

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SUPERHIEATER



Watertube Boiler Reheaters

MATERIAL	: CR-MO PIPES		
CAPASITY	: 100-7.000 KWH		
PRESSURE	: 0,5-10 MPa		
$\Delta T(T_{outlet}-T_{inlet})$	<i>:</i> 100-600 °C		

PRIMARY SUPERHEATER; is similar to a primary superheater (both use a serpentine heat exchanger design), but it is located in a neighbouring part of the boiler. Steam from the highpressure turbine is discharged to the primary reheater. As steam travels through the primary reheater, it is reheated, and then discharged to the secondary reheater. The path of the steam is quite intricate, which ensures optimal heat transfer.

SECONDARY SUPERHEATER; After passing through the **primary reheater superheater**, steam enters the **secondary reheater superheater**, where it undergoes further heating before being discharged from the boiler to the intermediate pressure turbine.







• "We conducted calculations using FIRECAD software from LAS Technology."

EXHAUST GAS CLENANING SYSTEMS

WET SCRUBBER

Wet scrubbing systems are highly effective air pollution control technologies used to remove pollutants from industrial flue gases. These systems capture harmful gases and particulates, preventing their release into the environment and improving air quality. The fundamental principle of wet scrubbing is the transfer of pollutants from the gas phase to the liquid phase by contacting the contaminated gas with a liquid (usually water or a chemical solution).



Dirty Gas Inlet: Flue gases from industrial processes, characterized by high temperatures and pollutant loads, enter the scrubbing system.

Contact and Capture: Within the scrubbing tower, the dirty gases come into contact with the scrubbing liquid through various methods:

- **Spray Tower:** High-pressure nozzles atomize the scrubbing liquid into fine droplets, which are injected into the gas stream. These droplets capture and absorb pollutants from the gas.
- **Packed Tower:** The gases pass through a bed of packing materials (such as plastic rings or ceramic saddles) that are wetted with the scrubbing liquid. This increases the gas-liquid contact surface area, accelerating pollutant transfer.
- **Venturi Scrubber:** The gases are forced through a narrow throat at high velocity, creating a turbulent mixture with the scrubbing liquid. This intense contact is particularly effective in capturing small particles.

Pollutant Transfer: At the gas-liquid interface, pollutants are transferred to the scrubbing liquid through several mechanisms:

- **Absorption:** Gases like SO2, HCl, and HF dissolve in the scrubbing liquid. To enhance solubility, chemicals such as caustic soda can be added to the scrubbing liquid.
- **Chemical Reaction:** Gases like NOx react with chemicals in the scrubbing liquid (e.g., urea or ammonia) to form harmless compounds.
- **Particle Capture:** Dust, fumes, and other particulate matter are captured by the scrubbing liquid droplets and are then removed.
- **Clean Gas Outlet:** The cleaned gas, now free of pollutants, is released into the atmosphere from the top of the scrubbing tower.

• **Wastewater Treatment:** The wastewater containing the captured pollutants undergoes appropriate treatment processes such as sedimentation, filtration, or neutralization. The treated wastewater can then be reused or discharged.



Why Choose Wet Scrubbing Systems?

- **High Efficiency:** They offer the ability to remove various pollutants simultaneously with high efficiency.
- *Flexibility:* They can be customized to accommodate different types of pollutants and concentrations.
- Wide Range of Applications: They can be used in many industries such as energy production, chemicals, metallurgy, and cement.
- **Reliability:** Due to their simple and robust design, they have a long lifespan and require low maintenance.

Considerations:

- *Water Consumption:* They require continuous circulation of scrubbing liquid, which can increase water consumption.
- Wastewater Treatment: The wastewater containing pollutants must undergo appropriate treatment.
- **Corrosion:** Corrosion can occur due to the effects of the scrubbing liquid and pollutants, making material selection and maintenance important.

Wet scrubbing systems are a critical technology for reducing the environmental impact of industrial facilities, improving air quality, and ensuring compliance with emission standards.

Customization: Every facility and process has its unique pollutant profile and needs. Therefore, wet scrubbing systems must be carefully designed and customized to achieve optimal performance and efficiency. A seasoned company like **Avrasya A.Ş**. can help you determine and implement the most suitable wet scrubbing system for your facility's needs.



MULTICYCLONE

Operating Principle and High Efficiency:

Multiclones separate particles from a gas stream using centrifugal force. The gas enters a cylindrical chamber tangentially at high speed, creating a powerful vortex. Within this vortex, heavier particles are forced towards the outer walls of the chamber due to centrifugal force. The particles slide down along the wall into a collection hopper, while the cleaned gas exits from the top of the chamber. This process typically achieves a high separation efficiency of 90-98% for particles 10 microns and larger. This significantly reduces industrial emissions, minimizing environmental impact and helping businesses comply with legal emission standards.





Technical Specifications And Advantages Of Multiclone Separators

Multiclone separators offer a number of advantages that make them a popular choice for industrial air pollution control:

•Energy Efficiency: The low-pressure drop across the multiclone results in minimal energy consumption, reducing operating costs.

•*Compact Footprint:* The compact design of multiclones allows for easy installation and integration into existing systems.

•Durability: Constructed from corrosion-resistant materials, multiclones are designed to withstand harsh industrial environments and provide long-term reliable operation.

- Versatility: Multiclones can be customized to handle a wide range of gas flow rates, particulate loadings, and particle size distributions.
- **Modular Design:** The modular construction of multiclones allows for easy scaling and expansion to meet changing process requirements.
- **Smart Control:** Optional intelligent control systems enable real-time monitoring of performance, automatic adjustments to operating parameters, and remote access for troubleshooting.

Applications

- Power generation: Controlling particulate emissions from coal-fired power plants.
- Cement production: Removing dust and particulate matter from kiln exhaust gases.
- Metallurgy: Capturing metal fumes and dust from smelting and refining processes.
- Chemical processing: Controlling emissions from chemical reactors and dryers.
- Waste incineration: Removing particulate matter and acid gases from flue gases.

In conclusion, multiclones offer a robust and efficient solution for particulate control in a wide range of industrial applications. Their combination of high efficiency, low operating costs, and durability make them an attractive choice for many industries seeking to minimize their environmental impact.

JET PULS TORBA FILTRE

Reliable Solution for Industrial Air Purification

Avrasya A.Ş. offers high-performance Jet Pulse Bag Filter systems designed to maximize air quality in your industrial facilities. By effectively capturing dust, fumes, and other particulates generated during your production processes, we protect your employees' health and ensure compliance with environmental standards."



JET PULSE BAG FILTERS: TECHNICAL SPECIFICATIONS

PULSE JET CLEANING SYSTEM UST LADEN GAS IN PLATE FILTER BAGS DUST LADEN GAS IN VENTURI BUSCHARGE VALVE

Operating Principle: Jet pulse bag filters function by forcing contaminated air through a fabric filter, capturing particulate matter on the filter's surface. Periodically, a compressed air pulse is directed into the filter bag to dislodge the collected dust, which is then conveyed to a collection hopper. This process ensures continuous filtration and high efficiency.

Filter Media: The choice of filter media depends on the specific application and the characteristics of the dust to be collected. Our filters utilize a wide range of materials, including:

- Polyester: Offers a good balance of efficiency and cost for general-purpose applications.
- Polypropylene: Resistant to high temperatures and a wide range of chemicals.
- Nomex: Flame-resistant and suitable for high-temperature applications.
- PTFE: Extremely hydrophobic and resistant to most chemicals, ideal for corrosive environments.

Bag Design: To accommodate various process conditions and dust loads, we offer a variety of bag designs, such as:

- Pleated bags: Provide a larger surface area for filtration in a compact space.
- Round bags: Suitable for high-temperature and high-dust-loading applications.
- Custom designs: Tailored to meet specific customer requirements.

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(AVRASYA A.Ş.

Cleaning System: Our jet pulse cleaning system ensures optimal filter performance by providing a powerful and focused burst of compressed air to remove dust from the filter bags. The frequency and duration of the cleaning cycles can be adjusted to suit the specific application.

Control System: The PLC-based control system provides precise control over the filtration process, including:

- Automatic filter cleaning: Initiates cleaning cycles based on pressure differential or timer settings.
- *Performance monitoring:* Tracks key parameters such as airflow, pressure drop, and filter bag condition.
- Alarm functions: Alerts operators to potential problems or malfunctions.
- *Remote monitoring:* Enables remote access and control of the filtration system.

Additional Features: To enhance safety and performance, our filters can be equipped with a range of optional features, such as:

- Explosion panels: Protect against the risk of dust explosions.
- Vibration monitoring: Detects abnormal vibrations that may indicate filter bag damage or other issues.
- ATEX certification: For use in hazardous environments.

Capacity and Dimensions: We offer a wide range of filter sizes and capacities to accommodate various airflow rates and dust loadings. Our engineers can work with you to design a customized solution that meets your specific requirements.

Advantages of Jet Pulse Bag Filters

Jet pulse bag filters offer numerous advantages for industrial air pollution control:

- Superior Filtration Efficiency: The unique design and operating principle of jet pulse filters enable them to capture even submicron-sized particles, ensuring high levels of air cleanliness.
- *Reduced Operating Costs:* Energy-efficient fans and motors, combined with long filter bag life, minimize operating expenses.
- Versatility: Jet pulse filters can be customized to accommodate a wide range of industrial processes and particulate loading conditions.
- Easy Maintenance: Regular cleaning of the filter bags is essential for maintaining optimal performance. The automated cleaning system in jet pulse filters simplifies this process and reduces downtime.
- **Durability:** Constructed from high-quality materials, jet pulse filters are designed to withstand harsh industrial environments and provide reliable service for many years.



Applications

Jet pulse bag filters find widespread application in various industries, including:

- Cement Manufacturing: Controlling emissions from kilns, mills, and bag houses.
- *Metal Processing:* Capturing dust and fumes generated during welding, grinding, and cutting operations.
- **Chemical Processing:** Removing particulate matter from processes such as drying, mixing, and conveying.
- Food Processing: Ensuring product purity and worker safety in applications such as flour milling, grain processing, and sugar production.
- *Power Generation:* Controlling emissions from coal-fired and biomass-fired power plants.
- Woodworking: Capturing sawdust, wood chips, and other wood-based particulates.
- **Recycling:** Handling dust and fumes generated during the recycling of materials such as plastics, paper, and metals.

In conclusion, jet pulse bag filters are a versatile and effective solution for industrial air pollution control. Their high efficiency, low operating costs, and durability make them a popular choice for a wide range of applications.



ORC(ORGANIC RANKIN CYCLE) SYSTEM POWER PLANTS



- In small biomass plants (up to 5 MW) characterized by reduced capacity and high temperatures, the ORC is the ideal choice due to its high efficiency, availability and ability to follow load, depending on fuel supply. In addition, the elimination of the steam turbine for traditional biomass solutions brings with it a number of maintenance and operational benefits:
- High power and efficiency to capital cost ratio;
- *High reliability thanks to proven technology;*
- Flexibility in biomass feed quality;
- Small modular, lightweight plants for easy installation;
- Few civil works required;
- The absence of a steam turbine simplifies operations and reduces maintenance;
- No water consumption.



The ORC (Organic Rankine Cycle) system is based on an innovative closed thermodynamic cycle for the flexible and distributed production of electric and thermal power. This ORC technology is particularly suitable for distributed generation close to the point of energy use, utilizing turbogenerators that convert thermal energy into electrical power without the need for water or vapor. ORC systems exploit various heat sources to generate electricity and heat, such as renewable energies (like biomass and geothermal energy), traditional fossil fuels, waste heat from industrial processes, waste incinerators, engines or gas turbines. The absence of water and vapor in the ORC process eliminates the need for complex steam turbine systems, making the technology more compact, reliable, and easier to maintain.



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WORKING PRENSIBLE

The ORC turbogenerator uses medium-to-hightemperature thermal oil to preheat and vaporize a suitable organic working fluid in the evaporator (4>5). The organic fluid vapor rotates the turbine (5>6), which is directly coupled to the electric generator, resulting in clean, reliable electric power.

The exhaust vapor flows through the regenerator (6>7), where it heats the organic liquid (2>3) and is then condensed in the condenser and cooled by the cooling circuit (7>8>1). The organic working fluid is then pumped (1>2) into the regenerator and evaporator, thus completing the closed-cycle operation.

Higher efficiency than an axial turbine;

- Multiple pressure admissions possible on a single disk/single turbine;
- Low speed turbine means no gearbox, and therefore high reliability;
- Large increase in volumetric flow achieved by the increase in diameter as the fluid moves out across the disc without the need for extreme changes in blade height;
- Outward movement of fluid minimizes 3D effects;
- Minimum turbulence, meaning maximum efficiency;
- No need for partial admission;
- Less tip leakage and disk friction losses;
- L ess limitation on cycle pressure;
- Low vibrations, meaning longer life on the bearings;
- Single turbines up to 10 MW in size.
- No water treatment plant or makeup water;
- Automated operation;

•

- Competitive capital costs, leading to fast payback;
- High efficiency at various operating temperatures and loads;
- Fast startup and shutdown;
- Flexible placement, away from the heat source if required;
- In industrial process heat recovery, reduces plant energy consumption & carbon footprint.

RC (RANKIN CYCLE) SYSTEM POWER PLANTS



Since coal typically arrives at a power plant via barge or train, most coal power plants need an onsite fuel storage system. After moving the solid fuel from where it's stored, the coal must be prepared for burning by crushing it to create particles that are sized appropriately for the two technologies that are most commonly used. The pulverized-coal furnace burns finely powdered coal suspended in air while the fluidized-bed furnace burns larger particles of crushed coal, ash, and a solid material such as limestone. The various particles are mixed in a bed that is then levitated by combustion air entering the bottom of the furnace.

Furnace sizes for coal units are large since the ash created during the combustion process requires large heat transfer surfaces. Emissions control equipment is an important part of a coal power plant. This typically includes electrostatic precipitators and bag filterhouses to control particulates and stack scrubbers to remove sulfur dioxide, or SO₂. Emissions of NO_x are generally controlled through design of the burners in the combustion process



EFFICIENCY	: %22
CAPASITY	: 100-20.000 KWH
TEMPRATURE	: 350-700 °C
FLUID	: HOT STEAM
WORKING RANGE	: 8200 H/YEAR
COOLING	: WATER CONDANSER

Traditionally, steam turbines have been a central part of fossil fuel-based power generation. However, with the increasing emphasis on reducing carbon emissions and utilizing renewable resources, these turbines are now being integrated into more environmentally friendly energy systems. For instance, in solar thermal power plants, steam turbines are used to convert the heat from the sun into electrical energy. This adaptation showcases their versatility and ability to operate with a variety of heat sources.







PLC AUTOMATION SOFTWARE

CONTROL&AUTOMATION PANNELS



Avrasya A.Ş., as a company specializing in industrial automation and control solutions, offers a variety of industrial PCL systems. These systems are designed to optimize production processes, increase efficiency and increase the competitiveness of businesses

Programmable Logic Controllers (PLCs)

• Compact PLCs: Ideal for small to medium-sized applications with limited I/O requirements.

• Modular PLCs: Thanks to its expandable structure, it adapts to large and complex automation systems.

• *High Performance PLCs: Suitable for applications that require fast response times and high processing power.*

• Distributed Control Systems (DCS): Provides integrated control and monitoring solutions for large-scale and complex industrial facilities

Technical Details:

- Support for various communication protocols (Ethernet, Profibus, Modbus, etc.)
- Analog and digital I/O modules
- Integrated web server and remote access features
- Powerful programming software and advanced debugging tools
- SIL certified safety functions (for Safety PLCs)

Techinical Details:

- High-resolution displays and multi-touch capability
- Connectivity with various industrial protocols
- Alarm management and data logging features
- Customizable interfaces with graphic design software
- Remote access and mobile applicationsIndustrial Networks and Communications

• Industrial Ethernet Switches: Provides high-speed and reliable data communication.

• Wireless Solutions: Ideal for applications that require flexibility and mobility.

• Fieldbus Systems: Provides communication between field devices.

• Industrial IoT Solutions: Provides smarter manufacturing processes with data collection, analysis, and cloud connectivity.



TOUCHSCREEN CONTROL PANNEL







ATTACHMENT INDUSTRY











YOU CAN USE IT SAFELY SPECIAL PRODUCTION HIGH QUALITY METERIALS AND WELDINGS WE WORK ABOUT R&G AND STRENGTH CALCULATION .MORE INNOVATIONS WE ARE MAKING ALL DOMESTIC PRODUCTION, INCLUDING HYDRAULIC SYSTEMS



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Hotels, Garment Shops, Building Material

Shops, Manufacturing Plant, Machinery

Repair Shops, Food & Beverage Factory,

Farms, Restaurant, Home Use, Retail, Food Shop, Printing Shops, Construction works , Energy & Mining, Food & Beverage Shops,

HARDOX METTALS

APPLICATION INDUSTRIES

Advertising Company, Other

MULTIFUNCTIONAL

Bearing, Motor, Pump, Gear, PLC, Other, Pressure vessel, Engine, Gearbox



DOUBLE/SINGLE SHAFT SHREDDER







MICRONIZE COAL CRUSHER

HUMMER CRUSHER

SINGLE SHAFT CRUSHER

YOU CAN USE IT SAFELY SPECIAL PRODUCTION HIGH QUALITY METERIALS AND WELDINGS WE WORK ABOUT R&G AND STRENGTH CALCULATION .MORE INNOVATIONS WE ARE MAKING FOR 500-10.000 KGH

ELEVATOR SYSTEMS

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Capacity (tons/hour)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
25 - 30	1240	450	500	210	240	1100	340	230 x 240
50 - 70	1460	615	500	237	271	1100	466	273 x 285
100	1610	760	700	280	333	1150	550	300 x 333
150	1610	760	700	280	333	1150	550	300 x 333
200	2217	1000	1000	300	450	1370	720	446 x 450



coal, crushed stones, sand, fertilizer and etc







YOU CAN USE IT SAFELY SPECIAL PRODUCTION HIGH QUALITY METERIALS AND WELDINGS WE WORK ABOUT R&G AND STRENGTH CALCULATION 3D SOLIDS DESIGN .MORE INNOVATIONS WE ARE MAKING FOR 2.000-500.000 KGH 3 mt to 50 meters ALL COMPONENTS ARE BOLT-CONNECTED CHAIN / BELT

CONVEYOR BELT MANUFACTURING



<u>Chain Conveyors</u>: Chain conveyors are often used to transport materials on pallets. It is divided into three different types in itself. These are; straight chain, battery operated and double speed.

<u>Spiral Conveyors</u>: It is often used in the food industry. These types are preferred at stages such as cooling, shocking and fermentation. It is very successful in saving energy.

Telescopic Conveyors: These are systems used for unloading and loading large vehicles. Their width is possible up to 500 to 700 mm. It has an average carrying capacity of up to 50 kg.

<u>Pallet Conveyors</u>: It is ideal for use in flame-treated facilities where there is a high temperature. it is formed by laying 2 or more chains sequentially.

<u>Flexible Conveyors</u>: These types of systems are divided into 3 types within themselves. These are diversified as; idler roller, driven roller and roller. Use of fixed used conveyors if there is no condition, these types are more suitable.

Turntable: Conveyors used as collection tables are used for accumulation, selection and stocking purposes. It can be produced to the desired extent according to the purpose to be used. It is usually used in the pharmaceutical, food, chemical sectors and in this case it is produced from stainless chassis.

<u>VIbratory Conveyors</u>: It ensures that transportation can be performed with the effect of vibration. These systems are preferred in cases requiring elimination and when the sequencing process will be performed. It is a common type of conveyor that can be used in many different industries.





Screw conveyors are used for transporting cereals and powders on a horizontal axis. According to the purpose of use, coil sheet is used in different sizes. Full coils are used only for transfer purposes.

If various types of cereals are to be mixed and transported with coils; butterfly-type coils are used. The transfer period of the product from one end to the other is carried out by adjusting the angle of the butterfly coil sheets. we have spiral conveyor production in capacities ranging from 5 tons to 500 tons/hour.

Standart üret	im helezon y	aylarının tek	nik ölçüleri:
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ÇAP Ø (mm)	HATVE (mm)	İÇ DELİK Ø (mm)	ET KALINLIĞI (mm)
65	65	27	3,0
80	80	27	4,0
98	98	34	4,0
98	98	27	4,0
125	125	34	4,0
148	148	42	4,0
148	148	34	4,0
165	165	42	4,0
180	180	42	4,0
180	180	49	4,0
200	200	49	4,0
200	200	60	4,0
220	220	49	4,0
220	220	60	4,0
230	230	60	4,0
250	250	60	4,0
250	250	76	4,0
270	270	60	4,0
270	270	76	4,0
300	300	76	4,5
300	300	89	4,5
320	320	76	4,5
320	320	89	4,5

Yukarıdaki ölçülerden farklı değerlerde de isteğe bağlı olarak üretim yapılır. İhtiyaçlarınız için lütfen bizimle temasa geçiniz.

SAĞ SOL







GATE PRODUCTION

The flow control valve (diverter) provides guidance of materials such as powder and granules in pneumatic conveying systems. It is suitable for dense phase and dilute phase transport in both pressure and vacuum applications. According to the application, there are clamps in different models.

<u>**Pants Clamp**</u> The trouser flaps direct the material from the upper inlet mouth to two separate outlets. The pantalon flap is of steel construction. It can work manually or

<u>Routing Valve For Pneumatic Lines</u> It provides guidance of the material during material transportation by air. It is usually used on top of silos during the distribution of material to silos.

with a pneumatic actuator. It is produced from stainless steel for food and chemical applications.

<u>Sliding Flap Under the Silo</u> The under-silo sliding cage is used for the purpose of unloading bunkers and silos. The sliding cage is operated with electric motor, pneumatic piston or manually controlled. There are different connection options according to the silo discharge port.

Double Channel Routing Valve According to other clamp types, it provides a good seal between the pipeline and the external environment Decently. The body and rotor of the directional valve are made of cast iron material. The rotor directs the flow of the material Decoupled between the inlet and outlet ends. There are two parallel holes in the rotor. the flow can be directed with a 43-degree rotation. The directional valve is also manufactured from 304 or 316 stainless steel materials for food applications and abrasive materials. Thus, the life of the flap is extended.











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API 650 Vertical Cylindrical Tank Manufacturing API 650 is the most widely used storage tank design standard. API 650 is a standard that defines the design, manufacturing/assembly, welding processes and control points of storage tanks.

The working pressure of the storage tanks designed and manufactured according to the API 650 standard is the same as the atmospheric pressure.

Engineering calculations for each storage tank are calculated specifically according to the chemical properties of the stored product, geographical region and seismic structure.

<u>A. According to the Type of Manufacturing</u> Horizontal Cylindrical Tanks Vertical Cylindrical Tanks

B. According to Special Tanks

Double-Walled Tanks Insulated Tanks Serpentine Tanks Built-in Floating Ceiling External Floating Ceiling



C. According to the Roof Constructions of the Tanks

Dome (Dome) Conic (Conic) Open (open top)





Economical Tapered Bottom Silos are ideal for small capacity grain storage requirements. 3.65 m. with 6.40m. economical Conical Bottom Silos designed and manufactured for safe storage of grain with different diameters and a maximum capacity of 216 m3 in December are ideal for easier unloading of grain to be stored. It does not require a serious infrastructure expense.

In the silo roofs, the panels are completely closed on top of each other, forming a strong structure and providing excellent sealing. Superior quality roofs are produced at a standard 30° slope.

In addition to standard roof models, optionally; special roofs are produced according to different snow and wind loads, different loads coming to the roof top, which can vary according to the diameter of the silos and are specially designed according to the natural conditions of the region where the silo will be installed. the wall sheets used are shaped with a groove December of 81 mm and achieve the property of being the narrowest corrugated wall sheet in the world.

All of the 8.8 quality bolts and 8 quality nuts used in the silo connections are galvanized coated. In addition, in order to provide perfect insulation, special sealing elements are used in the connections. The silo body is mounted on one-piece galvanized coated legs. The durable cross Decoupling brackets between the legs contribute to the stable and stable of the silo. In order to better transmit the weight of the silo to the ground, anchoring is performed by placing steel plates under each foot.

Economical Conical Bottom Silos are designed and manufactured in two different models with conical base angles of 45° and 60° according to the type of product to be stored. They are also used as post-drying annealing, blending and truck loading silos.

Thanks to the tapered base, no extra labor is required for silo unloading. Discharge is optionally performed with manual, electric or pneumatic caps. In the inner part of the conical base sheets; the use of bomb-headed bolts prevents grain accumulation.

In addition, accessories such as side stairs, security cage, ventilation fan and chimney, tapered floor access door and grain level control glass can be used optionally in Economical Conical Bottom Silos.



ROTARY VALVE PRODUCTION





Air Lock - Rotary Valve - Attachment - Cell Wheel

They are usually mechanical devices used to separate or combine products in the form of powdergranules with air. The wing-shaped rotor inside the airlock (rotary valve) ensures maximum tightness between the inlet and outlet Deceleration.

The air locks that we have manufactured usually work with a tolerance of 0.2mm. Depending on the temperature, pressure class and abrasive effect of the processes and raw materials to be used, the wing tolerances may differ structurally.

Processes operating at high temperatures cause the airlock structure to change due to the elongation values of metals caused by heat. The same applies to airlocks used in aggressive and corrosive raw material processes. In other words, different airlocks must be used in different processes.

Although the air airlocks we produce are considered the same as the airlocks (rotary valves) in the grain sector, they differ in technique and structure and are more suitable for the chemical, mining, industrial and food sectors.



SERPENTINE GROUP PRODUCTS



(Serpentine pipe bending) work is usually a system that is needed in all industrial production. Serpentine is often used for Heating and Cooling. Half pipe coils are a frequently applied system in boilers. It is used to provide hot or cold increase of the surface on which the pipe is wrapped. With serpentine winding, the heat transfer of the existing surface is increased and heat transfer is provided. Our company not only performs Serpentine Bending or Serpentine Bending, but also performs complete (Stainless Serpentine Manufacturing).

The coil of the hot oil boiler should be made with steel drawing pipes. The pipes (full and half pipes) bent in our technological machines are made into serpentine in the desired sizes and delivered to their buyers by making precise measurements.



As a company, we are making every effort to work with timely and fast delivery conditions and ensure customer satisfaction. As long as you contact our company, we will be happy to provide you with the highest quality service. Our company, which provides services to almost every part of Turkey, works diligently to achieve customer satisfaction.

We are proud to be preferred among the companies engaged in serpentine Deconstruction. There are package serpentine, winged serpentine, etc. in serpentine varieties. As

serpentine manufacturers, bending works are performed from our workshop to serpentine companies. In addition, boiler winding pipe bends are made in sizes according to your request.







HEATING EXCHANGERS



Heat exchangers are mainly used for transferring of heat from one fluid to another fluid with indirect contact between them. Heat exchangers design is essential for their high efficiency. Heat exchanger is a very essential industrial device therefore it is very important that we should know the parts of the heat exchanger. Heat exchanger has various parts which are assembled together for a efficient heat exchanger. There are various parts of heat exchanger having different advantage as well as disadvantage. Instead all of this we are going to discuss different parts of heat exchanger and their functions.



PLATE HEAT EXCHANGERS

Plate heat exchangers are such devices that work with the principle of two different liquids making heat transfer in themselves. The liquid to be heated or the liquid heats, are totally seperated from each other with plates. In standart plate heat exchangers, there are 4 in-out ports and two of them are for heater liquid and two of them for heated liquid. With special production, it is possible to produce heat exchangers which have

more than one heater or heated liquids.

SHELL&TUBE HEAT EXCHANGERS





Shell and tube heat exchangers are the very common type of heat exchangers among all others. They are usually constructed from series or a parallel tube which is also known as tube bundle or a single tube which are enclosed under cylindrical pressure vessel which are sealed. Shell and tube exchangers are designed in such a way that one fluid flows within small tube provided in the heat exchanger while the other fluids flows at the outside in between them under sealed shell.

There are various of other parameters for the designing of shell and tube heat exchanger such as single or two phase heat transfer, finned tubes, crossflow arrangements or concurrent flow, counter current flow and multiple, single or two pass configurations. In some shell and tube heat exchangers have double pipe heat exchangers and helical coil heat exchangers.

Applications of Tube and Shell Heat Exchangers

- Power generation
- Oil cooling
- Marine applications
- <u>Refrigeration</u>
- Pharmaceuticals
- <u>Metals</u> and mining
- Pulp and paper industries





Coil Tube Bending:

- **Precision Bending:** Accurate full and half-coil tube bending to precise dimensions.
- Versatile Materials: Working with a variety of materials including steel, stainless steel, copper, and aluminum.
- Advanced Technology: Rapid and error-free bending processes using state-of-the-art machinery.
- **Custom Designs:** Customized coil production to meet specific customer requirements and dimensions.

Coil Manufacturing:

- Stainless Steel Systems: Complete stainless steel coil systems manufacturing.
- **Diverse Applications:** Coil manufacturing for hot oil boilers, heat exchangers, cooling systems, and more.
- Specialized Coils: Expertise in various coil types such as packaged coils and finned coils.
- Custom Solutions: Addressing specific requirements such as boiler winding tube bending.

Coil Deconstruction:

- Safe Removal: Safe and professional dismantling of existing coil systems.
- Preparation for Renewal: Coil disassembly for renovation or maintenance work.
- Recycling: Separation of coils for recycling or reuse.

Our Products

Hot Oil Boiler Coils:

- High-Quality Materials: Manufactured from premium quality drawn steel tubes.
- Durability: Designed to withstand high temperatures and pressures.
- **Optimized Heat Transfer:** Special geometries for optimal heat transfer.
- Long-lasting Performance: Reliable and long-lasting performance.

Heat Exchanger Coils:

- Efficient Heat Transfer: Efficient heat transfer between different fluids.
- Compact Design: Space-saving and compact designs.
- Corrosion Resistance: Wide range of corrosion-resistant materials.
- Diverse Applications: Suitable for a broad range of industrial applications.



- Cooling System Colls:
- **Optimized Cooling:** Designs optimized for effective cooling performance.
- Energy Efficiency: High efficiency for energy savings.
- Low Maintenance: Minimal maintenance requirements.
- **Hygienic Solutions:** Hygienic solutions for industries such as food, pharmaceuticals, and chemicals.

Additional Notes:

- **Highlighting Benefits:** Emphasize the advantages of using your services, such as improved efficiency, reduced downtime, and increased product lifespan.
- **Technical Specifications:** Provide more specific details about the materials, tolerances, and testing procedures used.
- Case Studies: Showcase successful projects to demonstrate your expertise and capabilities.
- **Environmental Considerations:** Highlight your commitment to sustainability and environmentally friendly practices.
- **Customization:** Emphasize your ability to tailor solutions to meet specific customer needs.

BOILER HEAT EXCHANGERS

Avrasya A.Ş.: Your Trusted Partner for Industrial and Residential Heating Solutions

Avrasya A.Ş. is a leading company specializing in industrial and residential heating solutions. With our highquality products and customer-centric approach, we are at the forefront of the industry. Our heat exchangers offer exceptional energy efficiency and reliable performance to meet the needs of our customers.

Definition: Heat exchangers are critical thermal devices that transfer heat between two fluids at different temperatures without direct contact. They are used in a wide range of industrial and residential applications.

Copper Tube/Steel Tube Coil Heat Exchanger

Technical Details:

- **Purpose:** Designed to produce hot water using steam, hot water, or hot water from a heating system.
- **Design:** Counter-current design ensures maximum heat transfer efficiency.
- Materials:
 - Shell: CS / Cr-Ni STAINLESS
 - o Copper tubes: Compliant with TS 8324 EN 12451 standards
 - o Steel tubes: Compliant with TS EN 10217-1 standards
- **Compatibility:** Suitable for both open and closed systems. Can be used with boilers, solar collectors, and other heating devices.





- Complete stainless steel
- Hot dip galvanizing
- Epoxy coating

Advantages:

- High Performance: Superior heat transfer due to turbulent flow.
- Durability: Resistant to pressure fluctuations in high-rise buildings according to design pressure.

Coating Options:

- Wide Range of Applications: Meets high-capacity hot water needs in various sectors such as hotels, residences, service sector, and industrial facilities.
- **Protection:** Offers various coating options for corrosion resistance.

Importance of Heat Exchangers Heat transfer between fluids at different temperatures is crucial in many applications, from industrial facilities to homes. Heat exchangers provide efficient and reliable solutions for this process, promoting energy conservation and environmental friendliness.

Application Areas:

- **Residential:** Used to meet hot water needs.
- Hotels: Meets high-capacity hot water needs.
- Service Sector: Preferred in areas with high hot water consumption, such as restaurants and hospitals.
- Industrial Facilities: Used in various applications such as process heating, cooling, and heat recovery.

Avrasya A.Ş.: Your Reliable Partner Avrasya A.Ş. is an innovative and reliable company that prioritizes customer satisfaction. Our team of expert engineers is ready to provide customized solutions to meet your specific needs and contribute to the success of your projects.

Contract Us Do not hesitate to contact Avrasya A.Ş. for more information, technical support, or to develop solutions for your special projects. Remember: The choice of heat exchanger depends on the application and operating conditions. We recommend seeking advice from Avrasya A.Ş.'s expert team to select the right heat exchanger.







Steel construction is a kind of early fabrication technique. According to the needs of the structure to be built, the steel construction skeleton prepared before is mounted to form the structure. This speeds up the construction period and allows the structure to be built in a durable and robust state.

Steel construction is a building material that has become very popular in the construction industry in recent years. Steel construction, known for its durable, lightweight and environmentally friendly properties, is preferred for many different types of construction.

Steel construction is formed by the manufacture of high-strength steel profiles and their combination. These profiles are manufactured as prefabricated and brought to the construction site. At the construction site, these prefabricated parts are combined to create a whole structure.

One of the most important advantages of steel construction is that it is much lighter than other building materials. This allows structures to be built using less materials and reduces transportation costs. In addition, due to its light weight, the load of steel construction structures on the ground is also less. This reduces the load on the floor structures and allows less material to be used for the basic design of buildings.

There are a number of reasons for using steel instead of concrete in buildings.



1. Steel is more advantageous than concrete and wooden structures with its strength, resistance and durability.

2. It is harmonious to places with bad floors, it takes up less space compared to the load it carries.

3. It can maintain its former strength by elongation, stretching and changing shape under load and lifting the load.

Thanks to its flexible structure, it shakes during October but does not collapse, in addition, since the walls of these structures are also made of steel, the load is not placed only on the columns and beams and the risk of collapse is greatly reduced.

Steel construction is also preferred due to its high strength. Steel construction, which has a higher strength than other building materials, makes the structures more durable and long-lasting. In addition, steel construction also makes the structures more resistant to earthquakes and other natural disasters.

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Steel construction is also more environmentally friendly than other building materials. The reduction of production waste at the manufacturing stage and the high recycling rate cause it to be recognized as an environmentally friendly material. In addition, steel construction structures are also easy to disassemble and reuse. This is also an important factor for it to be an environmentally friendly building material.

Steel construction is also preferred due to the fact that it can be built quickly. Prefabricated steel profiles can be assembled quickly when they are brought to the construction site. This allows the construction period to be shortened and allows projects to be completed more quickly. It also reduces labor costs, as it requires less labor on the construction site.



Steel construction is a type of structure that has an important place in the construction industry. Steel construction allows structures to be built quickly and economically. These structures are preferred due to their environmental friendliness, durability and long service life.

Steel construction can be applied for many different types of structures. These include industrial buildings, warehouses, gyms, bridges and even residential buildings. Dec. Steel construction allows these structures to be built quickly and economically. In addition, steel construction is preferred due to its durable and long service life.

Steel construction is an environmentally friendly type of construction. It is considered environmentally friendly due to the fact that the materials of the structures are recyclable and save energy. In addition, steel construction is a type of structure that is resistant to natural disasters such as fire, earthquake and wind.

Steel construction is also used for building reinforcement operations. These processes aim to increase the durability of existing structures with steel construction. Building reinforcement processes enable buildings to become stronger against earthquakes and natural disasters.

There are many companies for steel construction construction. These companies manage every stage from the design, manufacture and installation of steel construction projects. These companies offer special solutions to their customers and develop projects that meet customer needs.

Steel construction is a type of structure that has an important place in the construction industry. These structures are preferred because they are fast, economical, durable and environmentally friendly. Steel construction can be applied for many different types of structures, such as industrial buildings, warehouses, sports halls, bridges and residential buildings. In addition, steel construction is also used for building reinforcement operations of existing structures.

Steel construction, in addition to its many advantages, also has some disadvantages. These include factors such as difficult insulation, heating of the structure at a high temperature, and more energy consumption in cold weather. Dec. However, these disadvantages can be reduced or eliminated with the right design and implementation.

Steel construction has an important place in the construction industry. It is preferred for many different types of buildings due to its durable, lightweight and environmentally friendly properties. Shortening the construction time, reducing labor costs and faster completion are among the advantages. Dec. However, there are also some disadvantages, and with the right design and implementation, these disadvantages can be reduced or eliminated.



REFRACTORY

AVRASYA A.Ş. is a leading manufacturer of refractory materials, providing industrial solutions for hightemperature applications. Our extensive product range and expert team offer refractory materials and services tailored to the specific needs of various industries. This catalog provides a comprehensive list of refractory materials and their properties offered by AVRASYA A.Ş.



Refractory Material Classification

By Chemical Composition:

- Acidic Refractories: Silica, clay, high-alumina refractories (SILICA, CLAY, ALUMINA)
- **Basic Refractories:** Magnesia, dolomite, chrome-magnesia refractories (MAGNESIA, DOLOMITE, CHROME-MAG)
- **Neutral Refractories:** Chromite, carbon, graphite refractories (CHROMITE, CARBON, AVRASYA GRAPHITE)

By Production Method:

- Shaped Refractories: Bricks, blocks, special shaped refractories (BRICK, BLOCK, SPECIAL SHAPE)
- Castable Refractories: Mortars, concretes, plastic refractories (MORTAR, CONCRETE, PLASTIC)



INDUSTRIAL APPLICATIONS AND AVRASYA A.Ş. SOLUTIONS

Iron and Steel Industry: Blast furnaces, converters, coke ovens, continuous casting plants: AVRASYA Steel Solutions

Foundries: Cupola furnaces, induction furnaces, crucible furnaces: AVRASYA Foundry Solutions

Aluminum Industry: Electrolytic cells, melting furnaces, casting plants: AVRASYA Aluminum Solutions

Cement Industry: Rotary kilns, clinker coolers, preheaters: AVRASYA Cement Solutions

Glass Industry: Glass melting furnaces, annealing furnaces, forming machines: **AVRASYA** Glass Solutions

Ceramics Industry: Firing kilns, drying kilns, glazing kilns: AVRASYA Ceramic Solutions

Power Generation Plants: Boilers, turbines, flue gas cleaning systems: AVRASYA Energy Solutions

Petrochemical and Chemical Industry: Reactors, columns, pipelines: AVRASYA Petrochemical Solutions

AVRASYA Refractory Materials: Exceptional Properties

AVRASYA refractory materials are renowned for their exceptional performance in high-temperature environments. These materials exhibit the following key properties:

- **Exceptional Heat Resistance:** Withstand temperatures exceeding 1500°C, making them ideal for demanding applications in industries such as steelmaking, glass manufacturing, and petrochemical processing.
- **Superior Chemical Resistance:** Remain unaffected by a wide range of acidic, basic, and neutral environments, ensuring long-term durability and reliability.
- **Outstanding Mechanical Strength:** Maintain structural integrity under extreme conditions of temperature and pressure, preventing deformation and failure.
- **Excellent Thermal Shock Resistance:** Withstand rapid temperature fluctuations without cracking or spalling, ensuring consistent performance and minimizing downtime.
- Abrasion and Erosion Resistance: Exhibit exceptional resistance to wear and tear, preserving their integrity even in harsh operating conditions.
- Low Thermal Conductivity: Minimize heat loss, contributing to improved energy efficiency and reduced operating costs.

These exceptional properties make AVRASYA refractory materials the preferred choice for engineers and operators seeking reliable and high-performance solutions for their industrial applications.



Refractory Material Selection with AVRASYA A.Ş.

AVRASYA A.Ş.'s expert team meticulously assesses your application-specific requirements to ensure the selection of the optimal refractory material. By carefully considering factors such as temperature, chemical environment, mechanical loads, and thermal shock, we provide tailored solutions that enhance the efficiency and safety of your production processes.

AVRASYA A.Ş.: Comprehensive Maintenance and Repair Services for Refractory Materials

AVRASYA A.Ş. offers expert support for the regular inspection, maintenance, and repair of your refractory materials. By promptly addressing damage or wear, we ensure the uninterrupted operation of your industrial facilities.

Leveraging our extensive experience and wide range of refractory products, AVRASYA A.Ş. provides tailored solutions to meet your specific needs. Our commitment to quality, combined with our expert team and reliable after-sales support, guarantees the efficiency, safety, and sustainability of your production processes.

By partnering with AVRASYA A.Ş., you can rely on our expertise to optimize the performance of your refractory materials and achieve your industrial goals.





FACTORY DESIGN AND ENGINEERING

At **AVRASYA AS.**, we are dedicated to turning your factory dreams into reality. With meticulous attention to detail and a commitment to excellence, we provide comprehensive and customized solutions tailored to your specific industrial needs.

Our Areas of Expertise:

- Steel Construction
 - **Structural Engineering:** Our expert engineers conduct in-depth static calculations and engineering analyses to design the most optimal and safe steel structures for your project.
 - **Steel Fabrication:** Utilizing state-of-the-art computer-aided design and precision manufacturing techniques, we fabricate custom steel structures that meet your exact specifications.
 - **Comprehensive Steel Solutions:** We offer a wide range of steel structures, including industrial facilities, warehouses, hangars, platforms, and durable steel roofing systems.
 - **Corrosion Protection:** Our comprehensive anti-corrosion applications and regular maintenance services ensure the longevity and performance of your steel structures.

By partnering with **AVRASYA AS**. you can be confident in our ability to deliver exceptional steel construction solutions that meet your highest standards.



PREFABRICATED STRUCTURES: TAILORED SOLUTIONS FOR YOUR NEEDS

- **Custom Design and Production:** Our prefabricated structures are meticulously designed and manufactured to meet your specific functional and aesthetic requirements.
- Versatile Applications: We offer a wide range of prefabricated structures, including offices, social facilities, dining halls, locker rooms, and security cabins, to enhance the comfort and safety of your employees.
- **Rapid Installation and Disassembly:** Prefabricated structures provide the advantage of quick installation and easy transportation, minimizing downtime and accelerating your projects.
- **Sustainability and Efficiency:** Our structures are built with energy-efficient materials and insulation to minimize environmental impact and reduce operating costs.

By choosing AVRASYA AS. for your prefabricated structures, you'll benefit from:

- Customized solutions to meet your exact needs
- Efficient and cost-effective installation
- Durable and sustainable construction
- Improved employee comfort and safety

ROOFING WORKS

- **Durable and Versatile Roofing Options:** We offer a variety of roofing materials to suit your specific needs and preferences, including:
 - Sandwich panels
 - Trapezoid sheets
 - Membrane roofing
 - Shingle roofing





- Comprehensive Roofing Solutions: Our roofing services encompass:
 - **Thermal insulation** to reduce energy consumption and maintain a comfortable indoor temperature
 - Waterproofing to protect your facility from leaks and moisture damage
 - **Roof windows and lighting systems** for natural light and ventilation
 - Rainwater drainage systems to prevent water damage and maintain building integrity
- **Professional Maintenance and Repair:** Our experienced team provides regular maintenance and repair services to ensure the long-term performance and safety of your roof.

By choosing AVRASYA AS. for your roofing needs, you can be confident in the quality, durability, and reliability of our work

VENTILATION INSTALLATION

• Comprehensive Ventilation Solutions:

Our team designs and implements the optimal ventilation system tailored to your specific needs and the characteristics of your space.





Advanced Ventilation Systems

We offer a range of ventilation systems, including air conditioning, ventilation, and exhaust systems, to ensure fresh air, temperature control, humidity management, and pollutant removal.

• Specialized Ventilation:

We provide customized ventilation solutions for spaces with unique requirements, such as industrial kitchens, laboratories, clean rooms, and production areas.

• Air Quality and Energy Efficiency:

Our ventilation systems prioritize air quality and energy efficiency, creating a healthy and sustainable working environment.

By choosing AVRASYA AS. your ventilation needs, you can benefit from:

- Tailored ventilation solutions to meet your specific requirements
- Improved indoor air quality and a healthier working environment
- Energy-efficient systems to reduce operating costs
- Expert design and installation for optimal performance



SCREW STOKER







The width and depth of our specially engineered stokers, which are made of cast material suitable for flawless operation in heavy operating conditions, have been fixed with years of experience and the problems of screw burning, slag accumulation or rocking have been minimized. In this way, easy operation and ease of operation are provided.

It has the ability to burn low-quality coals with high quality. The system, which has multiblock pieces, can be operated sequentially and independently of each other according to the steam requirement when desired.

Combustion fans provide air pulverization at appropriate capacity and pressure and prevent the emission problem.

It is made of high alloy casting material and thanks to its modular structure, a compensation effect is created for the expansions that may arise from temperature.

Material : CAST IRON %2 CR

Govanner : 2,2 kw

Fan : CS / 380 V

Feedding : screw automatic

capasity : 20 – 100 kgh/1stoker Coal, wood pellet



ROTARY DRYER

The rotary dryer also known as tumbling dryer is an equipment employed to minimize the moisture content of feed materials by bringing it in direct contact with a heated gas. It consists of an inclined long drum or cylindrical shell often fitted with internal flights or lifters; rotated slowly upon bearings through which the material to be dried flow with а tumbling/cascading action in concurrent (for heat-sensitive materials) or counter-current flow with the heating air or gases.

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 The movement of the material is due to the combined effect of inclination of the shell to the horizontal and the internal tumbling action or mechanical turn over



thus the name tumbling dryer. The nature of the feed determines the directions of gas flow through the cylinder and it is relative to the solid. This drying equipment can also perform batch or continuous processing of the wet feed.

Advantages of Rotary Dryer

- 1. Rotary dryers are less sensitive to particle size.
- 2. It can accept the highest flue gasses of any type of dryer.
- 3. Low maintenance cost; thus economical.
- 4. It has the greatest capacity than any type of dryer.



WORKING PRINCIPLE OF A



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COOLING TOWER

The indirect or closed type cooling tower does not come into direct contact with the air, and the liquid, usually water or a mixture of glycols, is cooled. Unlike open cooling towers, an indirect cooling tower has two separate fluid circuits. The first is an external circuit that is recirculated on the outside of the second circuit, which are bundles of pipes that are connected to the process to cool the water and rotate it in a closed circuit.

Air is drawn through the water circulating cascading out of the hot tubes, providing evaporative cooling similar to an open cooling tower.

During operation, heat flows through the internal fluid circuit along the pipe walls of the coils, into the external circuit, and then into the atmosphere through heating of the air and evaporation of part of the water. So the operation of indirect cooling towers is very similar to that of an open cooling tower, with one exception. The cooled process fluid is located in the "closed" circuit





COOLING CYCLES GENERAL EXPLANATION



the refrigeration cycle is the fundamental operating principle behind refrigeration machines, designed to extract heat from a lower-temperature environment and transfer it to a higher-temperature environment. This process is achieved through the use of refrigerants with low boiling points, which evaporate readily at relatively low temperatures.

Refrigeration Cycle Diagram

Components:

- Compressor: Increases the pressure and temperature of the refrigerant.
- **Condenser:** Releases heat from the refrigerant to the environment.
- Expansion Valve: Reduces the pressure and temperature of the refrigerant.
- **Evaporator:** Absorbs heat from the environment, cooling it.



Process:

- 1. **Compressor (1-2):** The refrigerant enters the compressor as a low-pressure, low-temperature gas. The compressor compresses the refrigerant, increasing its pressure and temperature.
- 2. **Condenser (2-3):** The high-pressure, high-temperature refrigerant flows through the condenser, where it releases heat to the environment. This causes the refrigerant to condense into a liquid.
- 3. **Expansion Valve (3-4):** The refrigerant flows through the expansion valve, where its pressure is reduced. This causes the refrigerant to flash into a cold, low-pressure liquid-vapor mixture.
- 4. **Evaporator (4-1):** The refrigerant flows through the evaporator, where it absorbs heat from the environment, cooling it. The refrigerant evaporates back into a gas, completing the cycle.



Refrigeration Cycle and Its Diagrams We previously discussed in our article on reversible processes that the area under a T-s (temperature-entropy) diagram represents heat transfer. In the context of a refrigeration cycle:

The area under the 4-1 process represents the heat extracted from the cooled environment. The area under the 2-3 process represents the heat rejected to the condenser.

Refrigeration Cycle on a Pressure-Enthalpy Diagram

- 1. **1-2:** Due to the compression process, both pressure and enthalpy increase.
- 2. **2-3:** As the fluid transfers heat to the surroundings, its pressure remains constant while its enthalpy decreases.
- 3. **3-4:** The cooling fluid's enthalpy remains constant as its pressure decreases due to the throttling valve.

SATURATED

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SATURATED STEAM

FLUID

4. **4-1:** The fluid absorbs heat from the cooled environment and vaporizes at constant pressure, increasing its enthalpy.

Coefficient of Performance (COP) for Vapor-Compression Refrigeration Systems

- **COP for Cooling (COPSM):** The ratio of the heat extracted from the cooled environment to the net work input.
 - COPSM = qL / wnet,g = (h1-h4) / (h2-h1)
- **COP for Heating (COPIM):** The ratio of the heat rejected to the hot environment to the net work input.
 - COPIM = qH / wnet,g = (h2-h3) / (h2-h1)

EXPLANATION

The refrigeration cycle is a thermodynamic process that transfers heat from a colder region to a hotter region. It is commonly used in refrigerators, air conditioners, and heat pumps.

- **T-s Diagram:** This diagram shows the relationship between temperature and entropy. The area under the curve represents heat transfer.
- *p-h Diagram:* This diagram shows the relationship between pressure and enthalpy. It is useful for analyzing the different processes in the refrigeration cycle.

The COP is a measure of the efficiency of a refrigeration system. A higher COP means that the system is more efficient in converting work into cooling or heating.

VRF/VRV SYSTEMS

CAPACITY : 1000-200000 BTUH (MULTI UNITS:(CAPACITYX UNIT QTY)



VRF (Variable Refrigerant Flow) System Working Principle

A VRF system primarily consists of an outdoor unit or a group of outdoor units, multiple indoor units, and an intricate control system. These components are interconnected by copper piping. The refrigerant circulating within the system is responsible for providing cooling or heating.

Key Features and Operation:

- **Modular Design:** Each indoor unit can be connected independently to the main copper piping, allowing for flexible system configuration and individual control.
- **Energy Efficiency:** By enabling individual control of indoor units, VRF systems prevent unnecessary energy consumption in unoccupied areas.
- **DC Inverter Compressor:** This component precisely adjusts the refrigerant flow rate based on the cooling or heating demand of each room, optimizing energy efficiency.





Types:

• **Air-cooled VRF:** Heat is transferred to or from the outdoor air using fans.

• **Water-cooled VRF:** Heat is transferred to or from a water source, eliminating the need for outdoor fans.

• *Heat Pump VRF:* All indoor units operate in the same mode (either heating or cooling).

• *Heat Recovery VRF:* Indoor units can operate in different modes simultaneously, allowing for simultaneous heating and cooling in different areas.

How it works:

- 1. The outdoor unit compresses the refrigerant, increasing its temperature and pressure.
- 2. The hot refrigerant flows through the condenser, releasing heat to the outdoor environment.
- 3. The now cooler refrigerant expands through an expansion valve, dropping its pressure and temperature.
- 4. The low-pressure refrigerant enters the evaporator coil inside the indoor unit, absorbing heat from the room.
- 5. The cycle repeats, providing continuous cooling or heating.

Benefits of VRF Systems:

- **Energy Efficiency:** Individual room control and DC inverter technology minimize energy consumption.
- *Flexibility:* Can be customized to fit various building sizes and layouts.
- **Quiet Operation:** Indoor units are generally quieter than traditional HVAC systems.
- *Improved Indoor Air Quality:* Some systems offer features to enhance indoor air quality.

In essence, VRF systems offer a highly efficient and flexible solution for climate control in commercial and residential buildings.

Enhancements:

- **Clarity:** The explanation has been made more concise and easier to understand.
- Technical Accuracy: The technical terms and concepts have been used correctly.
- Additional Details: Information about the different types of VRF systems and their applications has been included.
- **Visual Aids:** Consider adding a diagram to visually represent the VRF system and its components for better understanding.

Would you like me to provide a more detailed explanation of any specific aspect of VRF systems, such as the refrigeration cycle, control systems, or installation procedures?



CHILLER SYSTEMS



Injection Cooling Systems

Injection cooling systems are designed to transfer heat from one source to another. A common type of injection cooling system is the chiller, which utilizes a refrigeration cycle to achieve cooling.

Chiller Cooling Systems

A chiller typically consists of four main components:

- 1. Compressor: Compresses the refrigerant gas, increasing its temperature and pressure.
- 2. Condenser: Transfers heat from the high-pressure, high-temperature refrigerant to a cooling medium (often water or air).
- 3. Expansion Valve: Reduces the pressure of the refrigerant, causing it to flash into a cold, lowpressure liquid-vapor mixture.
- 4. **Evaporator:** Absorbs heat from the liquid or substance to be cooled, causing the refrigerant to evaporate.

Cooling Cycle:

- 1. Compression: The compressor increases the pressure and temperature of the refrigerant gas.
- 2. Condensation: The refrigerant releases heat to the cooling medium in the condenser, condensing into a liquid.
- 3. Expansion: The refrigerant's pressure is reduced, causing it to flash into a cold liquid-vapor mixture.
- 4. **Evaporation:** The refrigerant absorbs heat from the substance being cooled, evaporating back into a gas.



Air Cooling Chiller

Chiller cooling systems are grouped according to their different features. The biggest difference is the heat source. If the heat is released into the air, it is called an air-source cooling group, and if it is released into water, it is called a water-source cooling group. Air-cooled chiller systems work by transferring the energy gained by the refrigerant gas in the chiller through the evaporator and compressor onto air-cooled coils. The refrigerant, which is compressed and in high-temperature gas form in the compressor, is sent to the condenser. Heat transfer occurs by providing air flow on the coil surface with the help of fans. Cooling is completed by transferring the heat on the gas to the air.



Water Cooled Chiller

Water cooled chiller cooling systems, unlike the air cooled chiller working logic, cool the hot gas in the condenser circuit with water. Instead of air cooled coils, shell & tube or plate type heat exchangers that use water are used to cool the gas.

For those who ask how chillers work, it should be noted that there is a need for a water source during the supply of cooling water to be circulated in the condenser in water cooled chiller systems. Water sources can be streams, sea, cooling towers or standard water lines. Water cooled chiller systems are generally used in places where the area where the system will be placed is limited, energy costs are important but water costs are low. Since water cooled chiller models can also work indoors, they also provide an ideal solution when it is desired to be positioned as close as possible to the area where cooling is desired. Water cooled chiller systems can also be used for air conditioning of sea vehicles.



COOLING ROOM



- * Internationally verified certificate
- * Generator option
- * +50°C Outer condensator capasity
- * Easy clean condensor
- * Galvanized steel body, Individually sectioned service caps
- * Monitoring window, low and high pressure systems
- * Drainage system
- * Easy wall and ceiling mount

Cold Room Panels

Container Cooling Rooms

Container cooling rooms have the option to be relocated. With this advantage, it can be used to function in multiple places instead of one fixed placement, this is usually the ideal choice for Military and overaseas. $+4^{\circ}C -25^{\circ}C -35C/-45^{\circ}C$ working range can be adjusted and manufacted according to 3 different types of container series available. With the easy carry feature and the metal body that is not effected by outer agents, this is useable in all open spaces and fields, also it is optional to add a generator system which will give you an undistrupted usage performance.



Cold room panels are isolation systems which help cooling appliances work more efficiently. It consists of polyurethane injected between two 0.50 mm iron plates with a density of 40-42. Locked or no lock selections available. No matter how much it shows the structure as a whole, cold air warehouse panels has an isolation feature which reflects on the outcome of the work and gives its fruits. Even though the cooling appliances are selected in their largest capasity, there will always be energy loss as long as the isolation of parts are not performed appropriately. In the infiltration of the product, the selected panels have a moduler feature

If the company moves, needs more capasity or re alocates, the parts are designed to de mount and re assemble at the new location. In comparison with the cool regiment to the frozen regiment, the panels are isolated in a different way, and they are a very desirable solution to the isolational parts of the equipment . Anti rust, PVC, POLY POLY, caverned product range^[2]. The floor panels can also be manufactured in 3 different ways



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Sectional doors

Sectional doors help to ease the loading and unloading procedures. Polyurethane filled structure prevents the heat escaping. It runs without fault with up down featured motors. The control handle that is located inside and outside helps to control from both sides. It is generally used by industrial plants where loading is made. These are the doors which help investors transfer products and receive them into their stock easily. It reduces space loss to zero





Isometric Sliding Cold Room Doors

Sliding doors are widely used in Industrial Facilities such as cold air warehouses, meat entegration rooms, citrus fruits storages. They provide conveniences in places where loading and unloading are performed with forklifts and transpalates. Time saving and heat keeping levels at its best. The above mechanism helps the door to be easily opened and closed. 2 handles are placed inside and outside for an easer access. It is capable of being locked. It manufactured by injecting is polyurethane having 42kg/m3 density and and pressing. The base iron plate standardly have RALL 9002 colour, however Anti rust (CrNi) or PVC can be used depending on request. Dimensions of sliding doors show a change.



Cold Room Doors

Cold room doors are manufactured by injecting polyurethane having 42kg/m³ density and then pressed. The iron surface is made using the standard RALL 9002 coloured iron; on the consumer?s demand, nonrusting material or PVC is used. It is widly used in cold, frozen or shock rooms. The thickness of the doors vary according to the kind of the cold room and is also in the same ratio according to the panel thickness. The cold room doors can be locked from the outside, as well as having an emergency exit handle from the inside









FREEZE-DRYING



Freeze-drying is the world's most advanced drying technology. Freeze-drying technology uses the principle of sublimation, which allows water to pass directly from solid ice to gaseous water vapor under low temperature and low pressure without ever turning into liquid, thus removing water from the food.

The moisture content of products that start the drying process frozen is reduced to 2% by sublimation in the low pressure and low temperature environment created in the machine. In this process, no loss of shape such as wrinkling or melting is observed in products that do not pass into the liquid phase. The shapes of dried products are almost the same as their fresh forms.

Foods exposed to high temperatures lose a great deal of their nutritional and vitamin values, aroma, smell and color. Products dried under low temperature (~40°C) and low pressure (~0.5 mbar) with the freeze-drying method preserve their nutritional and vitamin values, aroma, smell, color and shape.



Nutrient Retention Freeze-drying preserves a high percentage of vitamins, minerals, and antioxidants, making it a healthier option compared to other preservation methods.



99 Flavor Preservation The delicate flavors and aromas of fresh fruits are retained during the freeze-drying process.



Extended Shelf Life Freeze-dried fruits have a significantly longer shelf life compared to fresh or canned fruits, making them ideal for long-term storage.



22 Lightweight and Portable: Freeze-dried fruits are lightweight and compact, making them convenient for travel, camping, or snacking on-the-go.

Systems with loading capacities ranging from 10 kg to 2,000 kg are available.

Long Shelf Life Lasts longer than baked and canned foods High Nutritional Value Since it is not exposed to high temperatures, it preserves its nutritional properties up to 97% Non-deteriorating Structure No shrinkage, darkening of color, hardening and odor change



HYGIENIC DESIGN & PLC CONTROL IN SPECIAL STAINLESS STEEL BODY

In which foods is it used?

- Fruit and fruit juice
- Vegetables
- Meat
- Fish and seafood
- Eggs
- Dairy products
- Coffee



HOMOGENEOUS HEATING AT LOW TEMPERATURE UNDER VACUUM