RELIABLE AND EFFICIENT POWER GENERATION

Power boilers

ANDRITZ

ANDRITZ EcoFluid BOILER / Montes del Plata , Uruguay

Cover photo: Vattenfall, Uppsala, Sweden

Fluidized bed technology – Decades of experience

ANDRITZ is a leading supplier of plants based on Bubbling Fluidized Bed (BFB) and Circulating Fluidized Bed (CFB) technologies for boilers. The different technologies are distinguished by capacity, fuel, and application.

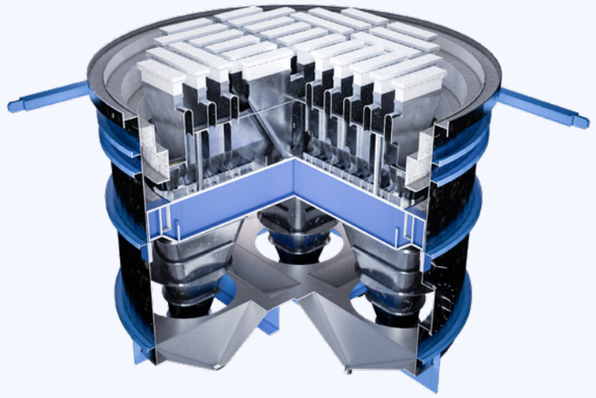
Excellent mixing and heat transfer make fluidized bed technology ideal for a wide range of applications. A variety of clean biomass fuels (bark, agricultural, forestry, and sawmill residuals) can be combusted, as well as many other fuels (demolition wood, refuse-derived fuels, peat, various sludges, etc.) and various types of waste.

BFB TECHNOLOGY

In a BFB unit, the fuels are fed in above the hot fluidized bed surface. BFB systems operate at a moderately low fluidization velocity and under controlled temperature conditions. Thanks to the large heat capacity of the fluidized bed material, which is mostly sand, the combustion conditions are ideal for biomass and recycled fuels with varying moisture contents. In many installations, various fuels are fired simultaneously.

CFB TECHNOLOGY

With CFB technology, the flue gas velocity in the furnace is higher and the bed is expanded and entrained with the flow. The bed material flows with the flue gas through the furnace, after which the material is separated by cyclones and returned to the lower furnace. CFB technology also allows an extremely wide range of fuels to be fired in the same unit. The efficient mixing and relatively low combustion temperatures contribute to low emissions of carbon monoxide, hydrocarbons, and nitric oxides.



ANDRITZ open nozzle grid

ANDRITZ PowerFluid waste boiler

ADVANTAGES OF ANDRITZ FLUIDIZED BED TECHNOLOGIES

- Fuel flexibility
- High burn-out and conversion rates
- Inherently low emissions
- Excellent availability with long, continuous operating periods
- Operational flexibility
- Minimal maintenance
- Proven design
- Readiness for oxygen-enriched combustion

INSTALLING EcoFluid BUBBLING FLUIDIZED BED (BFB) BOILER / Aschaffenburg, Germany

EcoFluid BFB boilers

Generating power from renewable fuel sources – the fuel flexibility of an ANDRITZ EcoFluid boiler is an inherent feature.

FLEXIBLE SOLUTIONS

In addition to typical biomass fuels such as wood (chips, bark, forest residues, and sawdust), more recently short-rotation energy crops, sludges, rejects, agricultural wastes, and refuse-derived fuels (RDF) have been introduced as fuel sources. Common characteristics for these fuels are their high volatile matter content and substantially varying moisture content. These alternative fuels require certain considerations in design as well as in the steam output parameters. ANDRITZ has technical solutions for a broad range of fuels that can be burned in an EcoFluid boiler.

SCALABLE AND RELIABLE

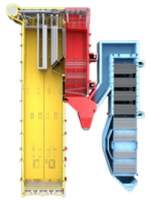
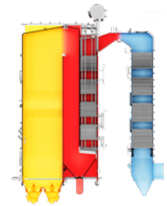
EcoFluid boilers can be either top- or bottom-supported, depending on the desired capacity and site conditions. Scalability and ease of construction are enhanced because the main boiler components are designed as modules. The arrangement of all heating surfaces is tailored to the customer's requirements. The boilers are conservatively designed with regard to the materials of construction, and the location and spacing of heat surfaces, to ensure high plant availability and low maintenance requirements.

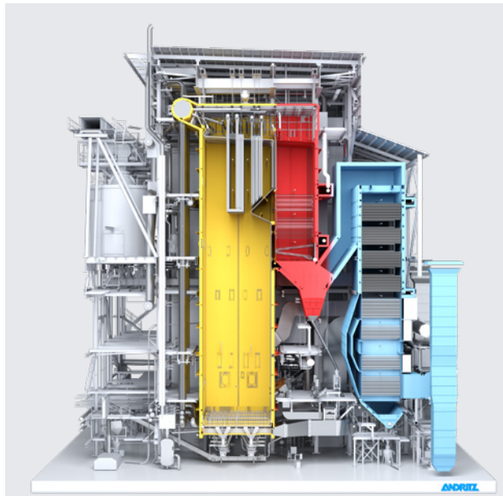
An important feature of the boiler is the design of the fluidizing nozzle grid, which distributes the primary air and drains inert, coarse material such as rocks and other impurities. These materials can cause disturbances in bed fluidization if not removed from the furnace. The ANDRITZ fluidizing grid can be designed with a unique water-cooled or air-cooled structure, providing reliable and efficient removal of coarse material from the fluidized bed.

FORTUM TERMEST A.S. PÄRNU, ESTONIA

Fuels	Wood, peat, and natural gas
Steam output	94 t/h
Steam temperature	525 °C
Steam pressure	117 bar
Features	SNCR and bag filter combined with sorbent injection

APPLICATIONS

	EcoFluid Bio	EcoFluid Waste
Type		
Size range	35 – 450 t/h 30 – 350 MW (fuel heat input)	15 – 140 t/h 10 – 100 MW (fuel heat input)
Main fuels	Biomass fuels, peat Secondary fuels: Sludge, agricultural residues, RDF, rejects, coal	RDF, rejects, sludge, wood waste, etc. Secondary fuels: Biomass fuels, wood, agricultural residues, coal
Steam parameters	150 bar(a) and 550 °C max. for clean biomass	65 bar(a) and 425 °C max.



ADVANTAGES OF EcoFluid TECHNOLOGY

- Wide fuel flexibility
- High combustion efficiency
- Low emissions
- Low maintenance costs
- High availability
- Good turndown ratio
- Fast load change rate
- Readiness for oxygen-enriched combustion

EFFICIENT AIR POLLUTION CONTROL

Fluidization air (primary air) supplies part of the total combustion air and creates gasification conditions in the lower furnace. The balance of the air (secondary and tertiary air) is injected higher up in the furnace to complete the combustion process. In combination with a suitable reaction time, this reduces CO emissions to low levels, while the gradual addition of oxygen also ensures minimal formation of NOx. Further NOx reduction can be achieved by injecting ammonia into the furnace. This system can also be combined with ChlorOut, a patented process (license from Vattenfall) that reduces corrosive alkali chlorides as well as NOx in flue gases, effectively reducing fouling and corrosion of the superheaters. These measures provide enhanced steam parameters and boiler reliability using more challenging fuels, while keeping operating costs to a minimum. Particulates are removed from the flue gases in an electrostatic precipitator or fabric filter, depending on customer preference and environmental requirements. Additional emissions control can be achieved via sorbent injection to reduce gaseous emissions (SO_2 , HCl, Hg, and dioxin/furans) or other ANDRITZ flue gas cleaning technologies.

EcoFluid BFB boilers for sewage sludge mono-incineration

Cutting-edge technology for a circular economy - utilization of sewage sludge with ANDRITZ EcoFluid boilers has a proven track record. From municipalities to megacities, ANDRITZ offers the ultimate solution for each sewage sludge mono-incineration plant.

MEETING AND SURPASSING LATEST REGULATIONS

In the context of a sustainable circular economy, mono-incineration of municipal sewage sludge is becoming increasingly important. Among its various environmental benefits – such as avoiding contamination with PFAS (Per- and Polyfluoroalkyl Substances), microplastics, heavy metals, and bacteria during agricultural use – one particularly significant advantage is the recovery of phosphorus. Phosphorus is a vital, limited, and non-renewable resource, and it can be reclaimed from the ash produced during sewage sludge mono-incineration.

With an adiabatic and an integrated design, ANDRITZ, as a pioneer in bubbling fluidized bed technology, offers with the EcoFluid Sludge technology two proven combustion concepts that can be ideally deployed based on customer needs and project-specific conditions. While the adiabatic furnace with a downstream waste heat steam generator is mainly prevalent in smaller plants with a lower fuel heat input, the design that incorporates the combustion chamber directly into the steam generator offers special advantages, particularly beneficial for large-scale plants.

HIGHLY STANDARDIZED

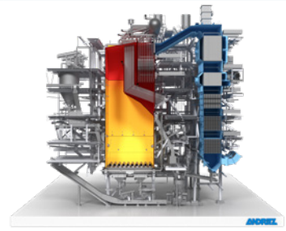
A major advantage of the EcoFluid Sludge technology is its modular sizing, which is adaptive to the specific needs of our customers and fits not only with the current project landscape on the market, but also flexibly responds to future market requirements. This standardization fosters positive investment decisions from an economic perspective and ensures that every customer benefits equally from ANDRITZ's decade-long experience in bubbling fluidized bed technology.

The high degree of standardization, combined with ANDRITZ's comprehensive value chain depth, maximizes cost efficiency in all project phases. Already during the engineering phase, the possibility to rely on in-house steam generator manufacturing leads to an optimized prefabrication degree, thereby minimizing lead times for erection. Together with the strong project management competencies of our ANDRITZ experts, minimal project durations can thus be realized.

T-PARK, TUEN MUN, HONG KONG

Fuels	Sewage sludge
Steam output	31.5 t/h per line
Steam temperature	383 °C
Steam pressure	42 bar
Features	World's largest energetic utilization of sewage sludge in mono-incineration plant

APPLICATIONS

	EcoFluid Sludge, adiabatic	EcoFluid Sludge, integrated
Type		
Size range	10,000–60,000 tDS/a	50,000–120,000 tDS/a
Lower heating value range:	3–5.5 MJ/kg	3.5–14 MJ/kg
Main fuels	Dewatered, partially dried, fully dried sewage sludges	
Steam parameters	Up to 65 bar(a) and 450 °C	

EFFICIENT AND ENVIRONMENTALLY FRIENDLY

The EcoFluid Sludge technology itself is based on the principle of a staged combustion, whose operation can be individually tailored to the specific requirements of our customers. Besides efficient and complete combustion with primary and secondary air, the use of recirculation gas ensures constant fluidization of the fluidized bed, thus providing maximum operational safety. The demonstrated lowest emission limits in numerous reference plants, which characterize the EcoFluid Sludge combustion, not only significantly undercut current emission regulations (e.g., regarding NOx, TCO, or CO emissions) but also provide our customers with a future-proof plant technology, optimized for potentially stricter emission limits in the future (e.g., regarding residence time and N_2O emissions).

FULL-SCOPE CAPABILITY

In addition to the combustion with EcoFluid Sludge, ANDRITZ also offers all other technologies necessary to cover every process step of a sewage sludge mono-incineration plant, including automation and digitalization, and is thus able to provide our customers with optimized turnkey solutions. In-house technologies for dewatering and drying of sewage sludge, subsequent flue gas cleaning, and close cooperation with external sub-suppliers for key components ensure not only maximum sewage sludge disposal security for our customers but also the realization of economically advantageous plants that meet the strictest environmental standards.

ADVANTAGES OF EcoFluid SLUDGE TECHNOLOGY

- Suitable for all sewage sludge qualities
- High combustion efficiency
- Low emissions
- Very compact standard design
- Short erection lead times
- Low maintenance costs
- High availability

Summarizing all these aspects, the EcoFluid Sludge technology enables a technically and economically optimized sewage sludge mono-incineration, which, despite its highest degree of standardization, can be individually tailored to the specific needs of each customer. Follow the example of numerous customers, such as municipalities in Germany or the megacity of Shanghai, and trust the EcoFluid Sludge technology from ANDRITZ for optimal thermal and energetic sewage sludge utilization.

PowerFluid CFB boilers

Unmatched fuel flexibility – from biomass to alternative fuels and waste products. CFB technology is the state-of-the art technology for multi-fuel combustion.

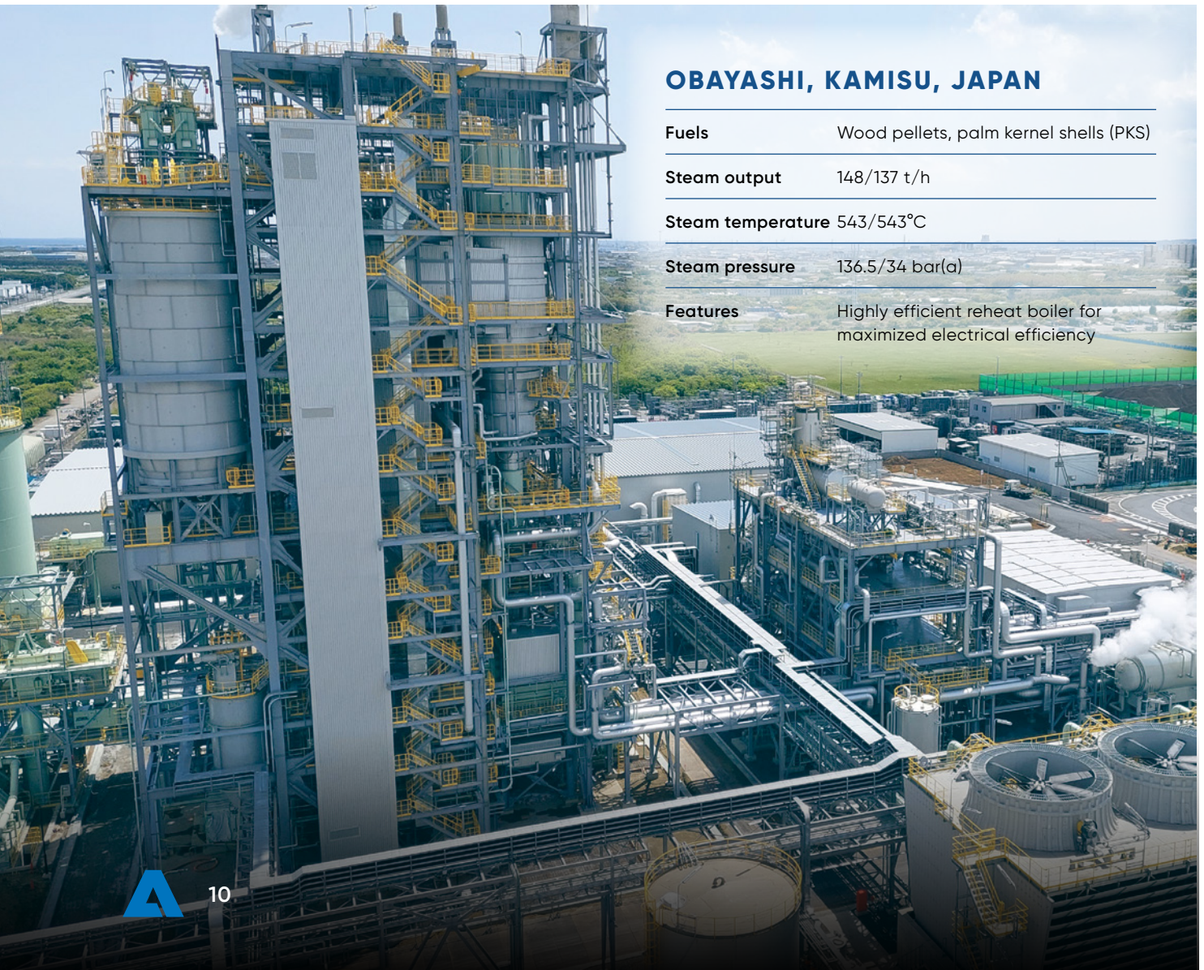
FREEDOM OF CHOICE: MULTI-FUEL DESIGN

The PowerFluid boiler's multi-fuel design enables it to utilize fuels of varying quality from diverse sources. This flexibility gives plant operators the freedom to adapt to changing market conditions and fuel availability.

The modular CFB design of an ANDRITZ PowerFluid boiler enables the boiler to utilize conventional and alternative fuels. The core components are standardized to deliver efficient, reliable performance.

Many features can be custom-tailored for optimal performance in each installation. In addition to firing conventional fuels (coal, lignite, and biomass), PowerFluid boilers have proven reliable in firing such fuels as biogenic residues, sludge, and rejects or waste fractions with high calorific value (RDF). These can be fired as the primary fuel or in combination with others.

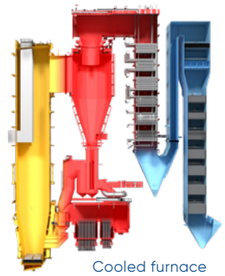
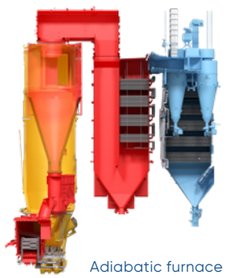
The large heating capacity and turbulent intermixing of the fluidized bed compensate for fluctuations in fuel variations and maintain full combustion, even using low-grade fuels with high moisture and ash contents.



OBAYASHI, KAMISU, JAPAN

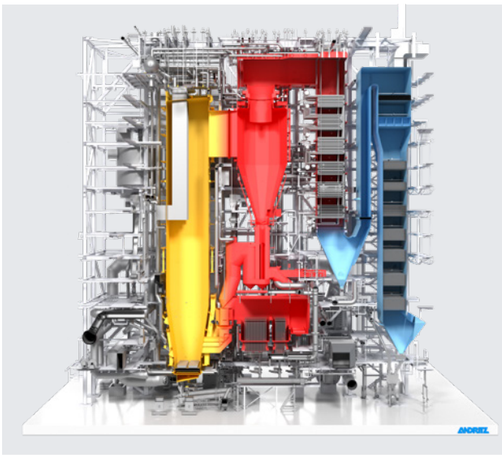
Fuels	Wood pellets, palm kernel shells (PKS)
Steam output	148/137 t/h
Steam temperature	543/543°C
Steam pressure	136.5/34 bar(a)
Features	Highly efficient reheat boiler for maximized electrical efficiency

CFB APPLICATIONS

	PowerFluid Bio	PowerFluid Waste
Type	 Cooled furnace	 Adiabatic furnace
Size range	100 – 750 t/h 80 – 550 MW (fuel heat)	50 – 200 t/h 40 – 150 MW (fuel heat)
Main fuels	Biomass, coal, RDF (refuse-derived fuel), SRF (solid recovered fuel), RPF (refuse plastic fuel) Secondary fuels: Sludge, peat, coke, TDF (tire-derived fuel)	Pre-treated municipal and industrial waste, RDF, SRF, RPF, rejects, sludge (co-firing), wood waste, etc. Secondary fuels: Biomass fuels, wood, agricultural residues, coal
Steam parameters	170 bar(a) and 570 °C max. for clean biomass	85 bar(a) and 500 °C max.

SUPERIOR ENVIRONMENTAL PERFORMANCE

The removal of nitric oxides (NOx) and sulfur oxides (SOx) is easily accomplished with CFB combustion. PowerFluid boilers can meet strict emission requirements without adding post-combustion cleaning equipment, such as flue gas desulfurization and selective catalytic reduction systems. The low temperatures and staged combustion in the furnace prevent thermal NOx formation and suppress the oxidation of fuel nitrogen – resulting in low NOx formation and high fuel burnout rates. Low cost limestone used as a sorbent in the furnace captures the fuel's sulfur components in a simple and efficient way during the combustion process.



ADVANTAGES OF PowerFluid TECHNOLOGY

- Exceptionally broad fuel flexibility
- High combustion efficiency
- Low emissions
- Low maintenance costs
- High availability
- Readiness for oxygen-enriched combustion

Grate-fired boiler technology

Available, reliable, energetic- and cost effective type of technology for the combustion of various types of fuel, such as: biomass, municipal solid waste (MSW), refuse-derived fuel (RDF) and solid recovered fuel (SRF).

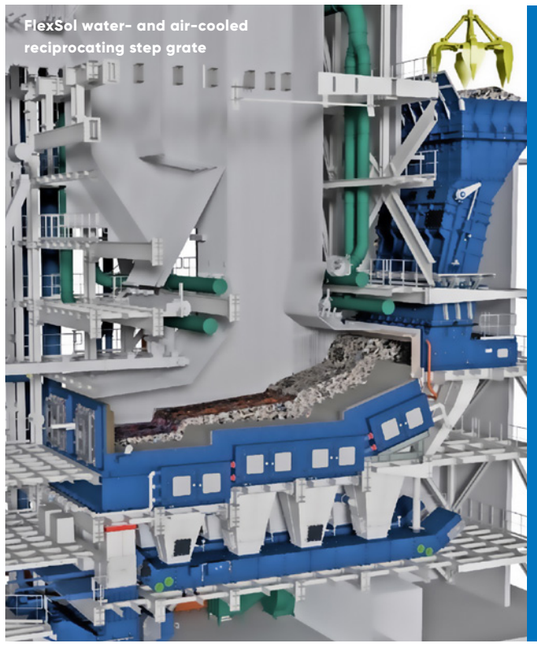
More than a century of experience in the design and production of boilers in one of the most modern production facilities in Europe, as well as extensive experience in design and production of boilers and design and construction of boiler islands and complete power plants, guarantees our customers a quick and efficient fulfilment of their specific energy needs, as evidenced by our numerous references.

VILLERS-SAINT-PAUL, FRANCE

Fuels	Municipal solid waste (MSW), Refuse-derived fuel (RDF)
Steam output	47.5 t/h
Steam temperature	400 °C
Steam pressure	45 bar(a)
Features	Boiler island with engineering, manufacturing, delivery, assembly, commissioning

FlexSol – WATER- AND AIR-COOLED RECIPROCATING STEP GRATE

In our boilers for fuel combustion with a high ash content, such as unsorted municipal solid waste (MSW), refuse-derived fuel (RDF) or solid recovered fuel (SRF) with a lower heating value (LHV) in the range of 8 to 30 MJ/kg, we use water- and air-cooled reciprocating step grate. Specially designed grate pads ensure efficient cooling, leading to a longer life, optimal combustion, and lower maintenance costs.



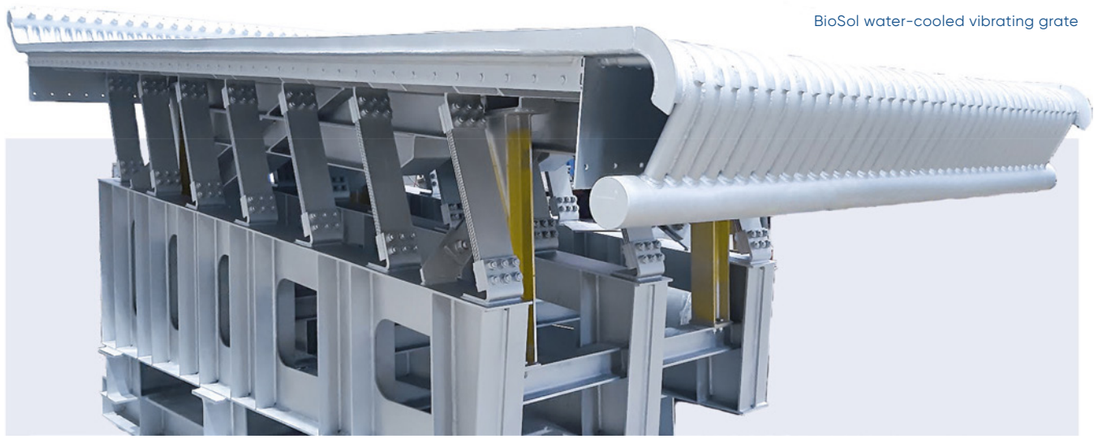
FlexSol water- and air-cooled reciprocating step grate

ADVANTAGES OF ANDRITZ GRATE TECHNOLOGIES

- Fuel flexibility
- High combustion efficiency
- Lower emissions than required by European Union directives
- Excellent availability with long, continuous operating periods
- Operational flexibility
- Low cost of manufacturing, maintenance and operations
- Proven design

BioSol – WATER-COOLED VIBRATING GRATE BOILER

For all types of biomass, combustion on the BioSol water-cooled vibration grate is the optimal solution. Our vibrating grate boilers ensure high availability, lower construction and maintenance costs while meeting the permitted emission limit values. The grate is part of the circuit of the membrane wall of the boiler, in which its cooling is ensured, and this also enables the use of primary air up to 260 °C, which enables optimal combustion of very moist fuels (up to 60% humidity).



BioSol water-cooled vibrating grate

BioSol water-cooled vibrating grate boiler

Designed to deliver exceptional results while keeping maintenance costs to a minimum, this solution is perfect for a wide range of applications.

The design can be tailor-made and adapted to customer requirements and optimized for the specific fuel. Depending on the client's request the delivery scope is adjustable starting from the boiler plant to the entire power plant system (EPC) using a turnkey approach. All important boiler and boiler power plant components, such as the boiler and combustion system, are manufactured in our European production facilities. We pay special attention to the manufacturing quality and installation of the boiler power plant to ensure the high reliability and availability of the plant throughout its entire operating life. Commissioning and maintenance are also within our professional capacity, as well as contracting of short and long-term plant maintenance (O&M).

EXPERIENCE A SMOOTH WORKFLOW WITHOUT ANY COMPLICATIONS

Our water-cooled vibrating grate guarantees high availability, ensuring uninterrupted operation and requiring minimal maintenance, resulting in significant cost savings. The natural circulation boiler design incorporates the grate seamlessly into the evaporator system. This not only enhances convenience but also ensures hassle-free startups. The grate is made of panel walls with drilled holes in the fins for the primary combustion air. It is integrated as part of the boiler pressure water/steam cycle and connected to it by flexible connection pipes designed to accommodate vibrations.

The grate is inclined at a low angle, yet it can still be part of the evaporator system without the risk of steam stagnation and, consequently, overheating of the membrane.

The vibrating grate operates in a sequence depending on the fuel, ash and boiler load. The vibration ensures a mixing of fresh and already ignited fuel. In addition, the vibration generates transport down the grate from the reception/heating/drying zone to the area where the main combustion takes place, and finally to the cooling zone for the ashes before falling into the slag hopper.

The vibrating system is designed to operate continuously; it is important that it is reliable and has low maintenance costs. Compared to other types of grate firing systems, the vibrating system is generally simpler and has a reduced number of movable parts and cast iron elements. This results in a system that is straightforward and easier to maintain, with fewer wear parts that need to be replaced over time.

Great care is taken to ensure that the grates can expand freely and vibrating movements will be absorbed in well-designed connection tubes.

VIBRATING GRATE CHARACTERISTICS

- Low cost of manufacturing
- Multi-fuel (biomass) combustion
- Low cost of maintenance
- High availability – absence of cast iron elements
- Fuel with high percentage of moisture
- Better controlling of primary air input (supply) and burning process
- Simple maintenance and repairs – no need for special workshop and tools
- No consumption of electric energy to run cooling system pumps
- No need for sealing of grate between membrane wall headers (inclined wall headers)

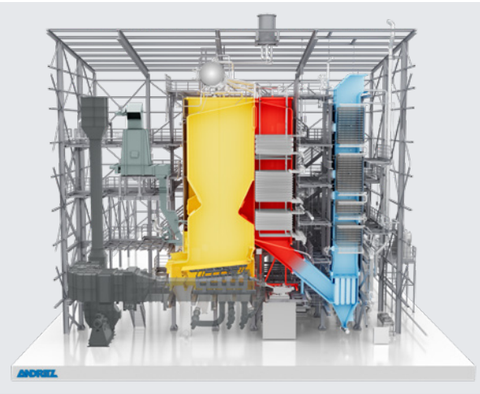
GOSPIĆ, CROATIA

Fuels	Wood chips
Steam output	26.6 t/h
Steam temperature	480 °C
Steam pressure	65 bar(a)

FUELS

Biomass:

- wood chips
- bark
- saw dust
- pellets
- straw
- energy cane
- bagasse
- agro-biomass
- forest residues



FlexSol water- and air-cooled reciprocating grate boiler

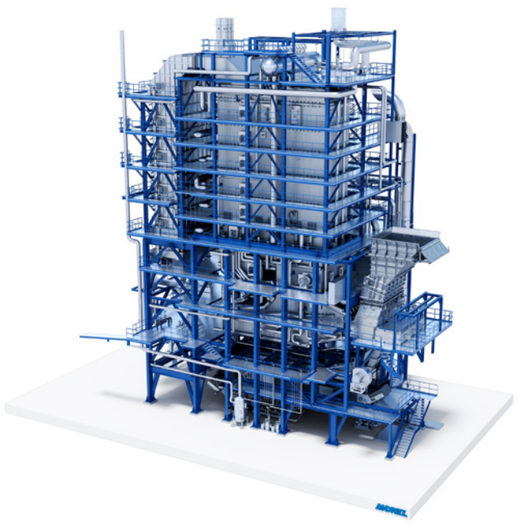
Most modern waste-to-energy (WtE) power plants utilize well-established thermal treatment technology for processing mixed municipal waste, refuse-derived fuel (RDF), and solid recovered fuel (SRF).

With more than 20 years of experience in waste incinerator boiler projects across Central, Western, and Northern Europe, we handle the entire process from design and material procurement to production, transportation, assembly, and commissioning.

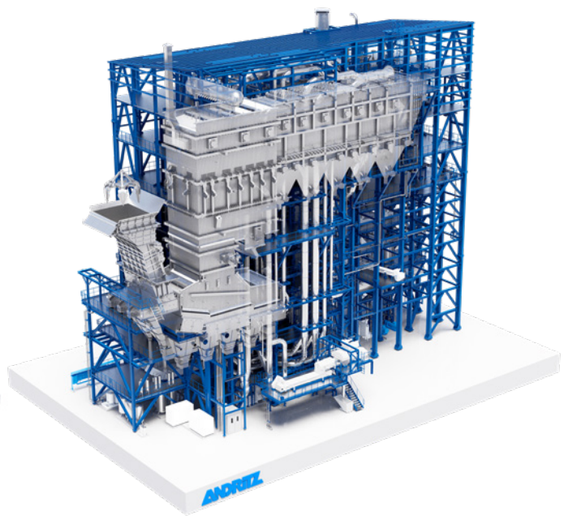
The primary components of these WtE plants typically include combustion grates equipped with air and/or water cooling systems, as well as custom-made boilers manufactured in our European facilities. Combustion grates, constructed with robust metal structures, can be built as horizontal or inclined reciprocating grates. One of our areas of expertise lies in the design of natural water/steam boiler circulation, which enhances boiler operation availability and lifespan while reducing maintenance requirements. Our designs are based on meticulous calculations, extensive experience, and engineering best practices.

Depending on the lower heating value of the fuel, the grate bars can be cooled using a water-cooling circuit, air cooling, or a combination of both. By selecting the appropriate cooling medium, the thermal and mechanical stress on the grate bars is significantly reduced. Consequently, this improves boiler availability and reduces maintenance costs.

Villers-Saint-Paul, vertical WtE boiler

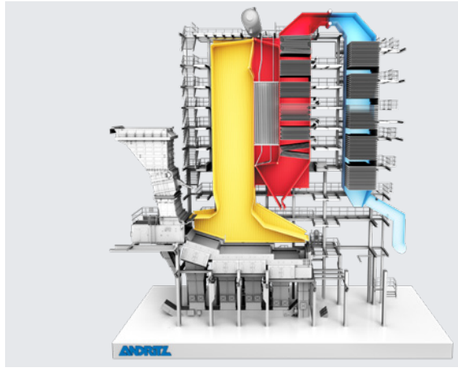


Réunion, horizontal WtE boiler



GRATE BOILER ADVANTAGES

Extreme fuel flexibility	• Multi-fuel combustion: Firing various fuels from biomass to different waste fuels • Large fuel moisture content variation • Large particle size variation
High combustion efficiency	• Low CO and TOC flue gas emissions • Low unburnt content in ash • high boiler efficiency
Low emissions	• Low NOx with air staging and • Low SO_2 with primary desulfurization • Low HCl and SO_2 in combination with sorbent injection and bag filter • Intense turbulence in combustion reaction zone: excellent destruction of organic and toxic components
Low maintenance costs	• Simple, reliable construction, low operation cost - quality components
High availability & long operating time	Proven innovative boiler design, efficient heating surface cleaning, high-quality components



FUELS

- Waste wood
- Household/municipal waste
- Refuse-derived fuels (RDF), solid recovered fuels (SRF)
- Chemical and hazardous waste
- Industrial waste

For fuels with a high Loher Heating Value (LHV), water cooling is used for the grate bars, and the heat from the cooling water can be utilized to preheat the combustion air. This enables the recovery of heat within the boiler, resulting in increased efficiency and reduced consumption of electric power and fuel.

Our ongoing efforts to improve boiler design focus on increasing steam parameters such as pressure and temperature. This results in higher overall efficiency for industrial processes in power plants, chemical plants, co-generation plants, and other industrial facilities.

In addition to improving efficiency, our boiler design also prioritizes safety. We incorporate advanced safety features and implement rigorous quality control measures to ensure the reliable operation of our boilers. Furthermore, we understand the importance of environmental sustainability. Our boiler design includes advanced emission control technologies that effectively reduce pollutants released into the atmosphere. By minimizing emissions and adhering to stringent environmental regulations, we contribute to a cleaner and greener future.

To ensure customer satisfaction, we provide comprehensive support throughout the entire project lifecycle. From initial design and engineering to installation, maintenance, and after-sales service, our dedicated team is committed to delivering reliable and efficient solutions tailored to our client's specific needs.

At our core, we strive for excellence in every aspect of our waste incinerator boiler projects. Through innovation, expertise, and a customer-centric approach, we continue to be a trusted leader in the field, providing cutting-edge solutions for energy production from waste.

One of Europe's largest boiler manufacturing facilities

Comprehensive engineering, production, and logistics—tailored for all fuels and the most demanding applications.

With a production area of 43,230 m³ located in Slavonski Brod, Croatia, ANDRITZ TermoEnergetska-Postrojenja d.o.o. (ANDRITZ TEP) ranks among the leading and largest manufacturing facilities in Europe for boilers, boiler equipment, as well as pressure and non-pressure parts. Backed by more than a century of expertise and experience, it is a trusted partner in delivering high-quality, custom-engineered solutions.

Croatian subsidiary within the ANDRITZ Group provides comprehensive engineering services, including the manufacturing, installation, commissioning, operation, and maintenance (O&M) of boilers of all sizes, together with all associated pressure and non-pressure parts. Solutions are tailored to meet the most demanding operational parameters and are compatible with all types of fuel. In addition to its proprietary BioSol and FlexSol grate combustion systems for biomass and waste, the company also manufactures gas- and oil-fired industrial boiler plants, as well as boiler systems designed to utilize residual heat (HRSG) from gas turbines and various industrial processes.

The engineering and manufacturing of boiler plants are performed in strict accordance with European standards, ASME regulations, as well as other applicable standards and regulatory frameworks within the energy sector. Special attention is given to manufacturing quality and installation, performed by the company's own experts, to ensure high reliability and availability throughout the plant's entire operating life.

The production facility is located near a port on the Sava River, enabling the efficient transport of large-scale units to nearly any destination without logistical constraints.

CAPACITY AND CAPABILITIES

ANDRITZ TEP employs over 500 blue-collar workers, including certified welders qualified in accordance with EN, ASME, and other relevant international standards. In addition, more than 100 experienced engineers support operations across modern workshop, featuring dedicated areas for cladding, headers manufacturing, membrane walls production, coil bending, and pre-assembly.

ANDRITZ TEP is located near a port on the Sava River / Slavonski Brod, Croatia

ANDRITZ TEP: CAPACITY AND CAPABILITIES

Qualified blue-collar workers	500+ (259 EN welders, 103 ASME)
Engineering experts	100+
Design capacity	155,000 hours/year
Production capacity	12,000 tons/year
Production norm hours	1,000,000 hours/year
Workshop area	43,230 m²
Cladding (membrane panels)	10 m²/day
Cladding (single tubes)	11 m²/day

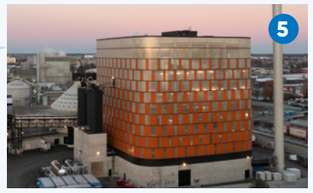
We supply the power worldwide

BE-TO KARLOVAC, CROATIA – BioSol VIBRATING GRATE BOILER
Steam conditions:
28.5 t/h, 480 °C, 71 bar(a)
Fuel: Wood chips
Start-up year: 2020

STORA ENSO OULU, FINLAND– EcoFluid BFB BOILER
Steam conditions:
216 t/h, 525 °C, 100 bar
Fuel: Bark, biomass, sludge, pellets
Start-up year: 2024

STOCKHOLM ENERGI, VÄRTAVERKET, SWEDEN – PowerFluid CFB BOILER
Steam conditions:
467 t/h, 562 °C, 143 bar
Fuel: Forestry wood, bark, peat, wood pellets, wood dust, bituminous coal
Start-up year: 2016

RIIKINVOIMA, FINLAND – PowerFluid CFB BOILER
Steam conditions:
71 t/h, 500 °C, 85 bar
Fuel: RDF, light fuel oil
Start-up year: 2016



VATTENFALL AB UPPSALA, SWEDEN – EcoFluid BFB BOILER
Steam conditions:
126 t/h, 470 °C, 80 bar(a)
Fuel: Woody biomass, bark, recycled wood
Start-up year: 2021

BIOMASSE ENERGIE DE MONTSINERY, FRENCH GUIANA – BioSol VIBRATING GRATE BOILER
Steam conditions:
23.6 t/h, 485 °C, 65 bar(a)
Fuel: Energy cane, wood chips
Start-up year: 2023

SUZANO, BRAZIL – EcoFluid BFB BOILER
Steam conditions:
120/140 t/h, 502 °C, 102 bar
Fuel: Eucalyptus bark, forest waste, sludge, debarking wood losses and screening rejects
Start-up year: 2024

ASCHAFFENBURG, GERMANY EcoFluid BFB BOILER
Steam conditions:
36 t/h, 420 °C, 40 bar(a)
Fuel: RDF, rejects, paper sludge, sewage sludge, bark
Start-up year: 2025

SZABADEGYHÁZA, HUNGARY – BioSol VIBRATING GRATE BOILER
Steam conditions:
32 t/h, 220°C, 12 bar(g)
Fuel: Wood chips
Start-up year: 2024

MES, ICHIHARA, JAPAN – PowerFluid CFB BOILER
Steam conditions:
149/134 t/h, 543 °C, 140/37 bar
Fuel: Palm kernel shells, wood pellets
Start-up year: 2020

Smart Power Boiler Monitoring and Analytics - Smart BOA

Explore the realm of digital transformation with our operator dashboard designed to analyze, optimize, and advise, using the Smart BOA system, where BOA stands for Big Data, Optimization, and Analyses.

In the dynamic world of power generation, efficiency is key. Introducing Smart BOA, previously known as Metris BOA, a SaaS product designed to analyze machine and process data in power plants, enhancing performance and awareness of critical components, and optimizing consumables.

REVOLUTIONIZING POWER PLANT OPERATIONS

Smart BOA uses Big Data, Optimization, and Analyses (BOA) to equip operators with tools for excellence. The platform integrates seamlessly with existing dashboards and on-site installations, leveraging DCS data and advanced smart sensors for precise insights.

OPTIMIZING PERFORMANCE

Smart BOA helps power plants boost boiler efficiency while minimizing costs. It provides real-time status gauges, indicators, and trend analyses, utilizing machine learning and AI for advanced diagnostics of boiler processes.

INCREASED AWARENESS OF CRITICAL COMPONENTS

Smart BOA offers clear guidance on operational improvements, allowing operators to examine time series data and correlations within an intuitive interface, ensuring proactive issue resolution and smooth operations.

IMPROVED USAGE OF CONSUMABLES

By analyzing data and offering recommendations, Smart BOA enables operators to optimize consumables, reducing waste and extending their lifespan, thus promoting sustainability and lowering costs.

FLEXIBLE SOFTWARE ARCHITECTURE

Built on a microservices architecture with standardized communication channels, Smart BOA offers flexibility and customization, meeting the unique needs of any power plant through various installation configurations.

TRANSFORM YOUR POWER PLANT

Smart BOA is a comprehensive solution for optimizing performance, increasing awareness, and improving consumable usage in power plants. Embrace digital transformation with Smart BOA and revolutionize your plant's efficiency and sustainability.

BENEFITS OF SMART POWER BOILER MONITORING AND ANALYTICS - SMART BOA

Optimizing performance:
Smart BOA provides tools like corrosion and combustion advisors to optimize fuel consumption and reduce wear and tear.

Reducing operating and maintenance costs:
It supports just-in-time delivery through consumable order tools and optimizes additive dosing.

Increasing operational availability:
Bed condition advisors minimize unplanned shutdowns and enhance smooth operations.

Improving sustainability:
By optimizing consumables usage, Smart BOA reduces waste and promotes sustainable generation practices.

Smart BOA

www.andritz.com/smart-boa

Power Plant Service

Full steam ahead – ANDRITZ expertise for your plant's entire lifetime

Turnkey installation of a plant is one thing – lifelong operation in a highly competitive industry with stringent and changing legal requirements is another.

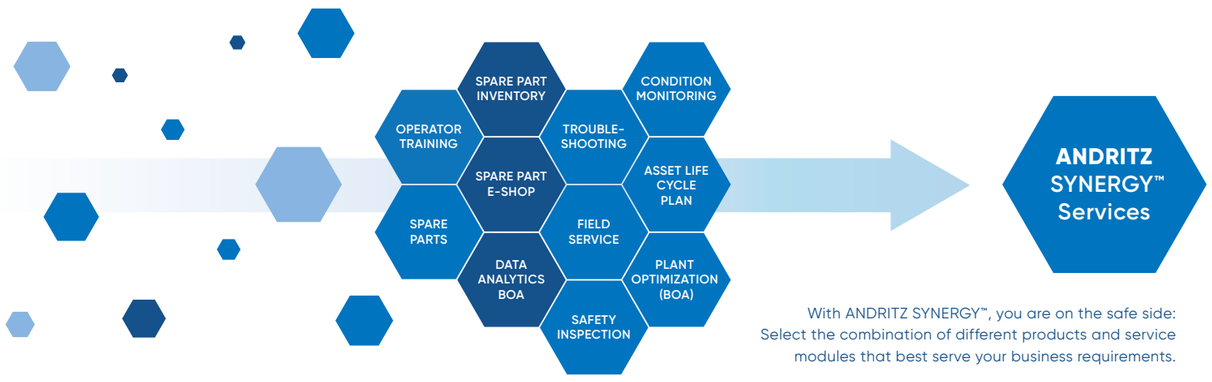
With ANDRITZ, you can ensure that your plant is still up and running at full power even decades after its initial start-up.

With its expert teams and holistic solutions, ANDRITZ knows how to apply state-of-the art technology – not only to build your plant, but also to maintain your assets' economic efficiency over their entire lifetime.

Extend asset life and reduce costs

Whether during or after your warranty period, we'll have your customized spare parts package ready for use. This reduces your plant downtimes and increases its efficiency.

Rely on ANDRITZ's tailor-made services, all-inclusive if you like. We can support you with preventive maintenance, personal consulting, and field service. Whether you need maintenance and repairs, equipment and process knowledge, or spare parts, we can tackle your challenges together and keep your plant up and running over its entire lifecycle with minimum downtimes.



With ANDRITZ SYNERGY™, you are on the safe side: Select the combination of different products and service modules that best serve your business requirements.

Retrofits and upgrades by ANDRITZ Power Plant Service

Put our in-depth knowledge of fluidized bed technologies and years of experience to work at your plant to get the maximum return out of your investment.

Your assets may require a technological upgrade if your business model changes or more stringent regulations are introduced. This is where our process specialists come into their own again. They are skilled in helping you to upgrade and renew the essential components of your boilers.

With a wide range of value-added services, enhancements and upgrades, ANDRITZ can improve your plant's performance and reliability so that it measures up to the constantly changing requirements and general conditions:

- Capacity increase planned
- More flexible part-load behavior required
- Fuel change imminent
- Further reduction of emissions prescribed

YOUR BENEFITS

- Increased availability
- Reduced total cost of ownership
- Shorter and more effective shutdowns
- Longer service intervals
- Increased energy efficiency
- Minimized emissions

WE CAN BE WITH YOU IN AN INSTANT, EITHER PHYSICALLY OR THROUGH REMOTE DIAGNOSTICS.

ANALYZE OPERATIONS → ASSESS CONDITION OF EQUIPMENT → ADVISE HOW TO IMPROVE EFFICIENCY/ PERFORMANCE → INSTALL EQUIPMENT (IF NEEDED)

Empowering the future of power and heat with ANDRITZ

At ANDRITZ, we deliver innovative, efficient, and sustainable power generation solutions. With advanced manufacturing capabilities and cutting-edge technologies, we're a trusted partner in the power and heat sector. Our comprehensive portfolio and complementary services enhance plant performance and reliability.

CLEAN AIR TECHNOLOGIES

Clean Air Technologies delivers customized solutions that prioritize emission reduction, enhanced performance, and improved efficiency. The offerings are designed to support evolving market demands and align with strategic asset management goals.

The offering covers an end-to-end solution for the entire flue gas line, ranging from particulate control, dry and wet scrubbers, to multi-pollutant equipment, volatile organic compounds abatement, as well as decarbonization for various industries such as pulp and paper, waste-to-energy, biomass, cement, iron and steel, metals, feed and agriculture, chemicals, and others.

With a focus on sustainability and operational reliability, we help industries transition toward cleaner, more efficient production processes.

ANDRITZ BURNER SOLUTIONS

ANDRITZ burner solutions are designed to utilize industrial side streams, biofuels and other sustainable fuels to generate green energy thus reducing the CO_2 footprint of the main process. Even streams previously considered as waste can be processed to produce valuable chemicals and raw materials instead of simply incinerating them.

ANDRITZ BIOMASS HANDLING

ANDRITZ offers complete solutions for biomass handling and processing. All types of biomass can be effectively processed, conveyed, stored, and fed to power generation systems using ANDRITZ technologies. We offer a comprehensive scope of process machinery from biomass receiving to boiler silo feeding.

ANDRITZ DRYERS

Our drying technologies are designed to optimize the drying process for various applications. Whether it's biomass, sludge, or other materials, our dryers deliver consistent and efficient results, contributing to overall energy efficiency.

ANDRITZ BOILER CLEANING SYSTEMS

ANDRITZ's advanced Diamond Power boiler cleaning technologies and services are widely used across the pulp and paper, utility, biomass, waste-to-energy, and industrial sectors around the globe. Our strong portfolio of boiler cleaning systems and process optimization tools include: sootblowers, replacement parts and upgrades, boiler cleaning controls, cameras and monitoring, port rodders and dampers, gauges and level indicators.

ANDRITZ EcoFluid BOILER / Vattenfall AB, Uppsala, Sweden

ANDRITZ POWER BOILERS ALL AROUND THE WORLD

From biomass handling to boiler technologies and flue gas cleaning systems – a worldwide network of ANDRITZ engineers and service experts will guide you through your entire project.

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