

AMMANN

LEADING THE ENERGY TRANSITION

ENVIRONMENTAL SOLUTIONS



BURNERS: THE REAL ENGINE OF THE PLANT

Ammann burners are designed to perform with low impact on energy consumption and environmental impact.

Our mission is to empower businesses by expanding their capabilities to embrace unconventional and alternative fuels, offering sustainable and cost-effective energy solutions without compromising performance.

Performance and sustainability

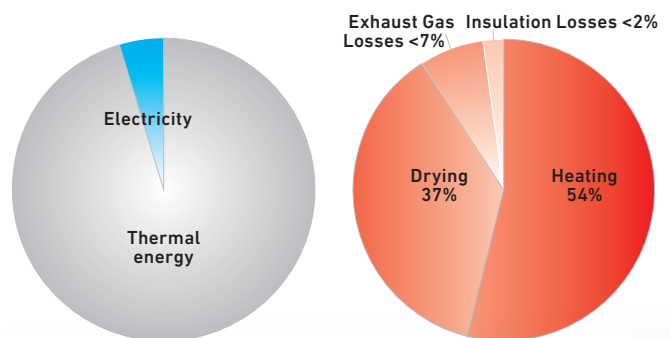
Our burners are meticulously designed to release the precise energy required for the asphalt production process.

Over 95% of the energy in the drying and heating phase is directly linked to the burner's efficiency. Our burner technology defines the new standards of innovation.

And technology is only one piece of the puzzle. Fuel choice is essential in achieving operational excellence and a responsible, sustainable solution.

Combining our advanced burner technology with the proper fuel strategy and asset means having a strategic advantage over your competitors in performance, innovation and sustainability.

Choosing Ammann also means choosing your experienced advisor.



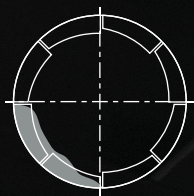
WORLD LEADER
OPERATING
4000+
BURNERS
WORLDWIDE
IN BURNERS TECHNOLOGY

EFFICIENCY OF AMMANN DRYERS

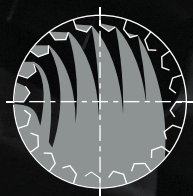
Ammann plants are designed to help customers perform their work efficiently and productively. With advanced technology and innovative features, these plants enable users to achieve maximum output with minimal effort.

Ammann dryers deliver exceptional efficiency, producing up to 64 tons of asphalt per hour (at 3% moisture content) per section per square meter. This efficiency represents a 22% increase in production compared to the existing industry standard.

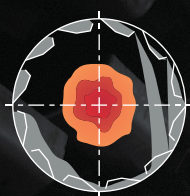
The high efficiency of Ammann dryers directly reduces energy consumption, which not only lowers fuel costs but also significantly cuts CO₂ emissions, providing economic and environmental benefits.



CONVEYING



CONVECTION



RADIATION

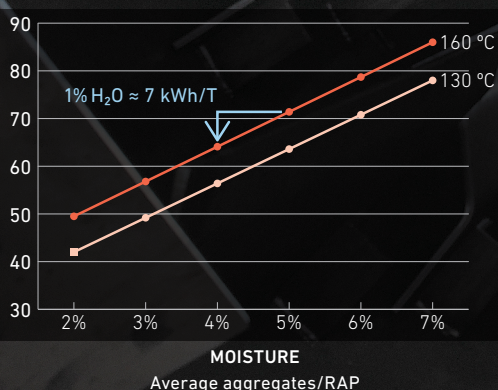


DISCHARGE

ENERGY SAVING

Moisture content is a critical factor that impacts production performance and overall costs. Ammann technology is engineered to manage moisture effectively, ensuring optimal performance and cost savings in every operation.

ENERGY
The energy necessary in the
drying and heating process
kWh/T



AMMANN BURNERS' PORTFOLIO

At Ammann, we have developed a complete range of burners, each with a broad offering in terms of energy potential.

Ammann is the partner that can offer the largest type of conventional fuels available in the market.

Our goal is to allow you to choose and expand the possibility for all our customers, to use unconventional and therefore alternative fuels.



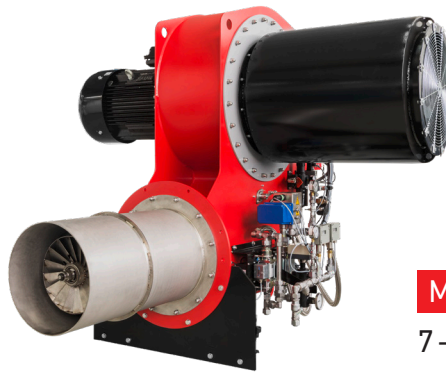
TYPE OF FUEL

- Light oil
- Heavy oil
- Waste oil
- Bio oil
- Kerosene
- LPG
- Coal dust
- Wood dust
- Natural gas
- LPG in a gas state



MIB

8 – 30 MW



MIBG

7 – 26 MW



MIBZ

6 – 30 MW

ADVANTAGES OVER ALL OTHERS

Core features

Precision Engineering for Enhanced Performance

Our advanced burner technology ensures precise flame control, producing a concentrated and narrower flame that delivers exceptional efficiency, especially in smaller dryers.

Innovative Design for Optimal Combustion

A newly engineered burner head, crafted with cutting-edge design software, optimizes air-fuel mixing, significantly boosting combustion efficiency for superior performance.

Reliable and Maintenance-Friendly

All electric and mechanical components have been thoughtfully redesigned to enhance reliability and simplify maintenance, ensuring long-term operational excellence.

Swiss Craftsmanship You Can Trust

Developed, manufactured, and rigorously tested in Switzerland, Ammann burners exemplify precision and quality.

Quiet Operation, Enhanced Experience

Integrated soundproofing technology minimizes noise levels, creating a more comfortable and efficient working environment.

Intuitive Burner Control with CMS

Our advanced control management system (CMS) offers seamless operation and monitoring for optimal performance.



LOW ENVIRONMENTAL IMPACT

- Low energy consumption Means low CO₂ emissions;
- Fully integrated with Ammann ADX (Ammann Drying Expert) for energy consumption optimization and reduction.



EFFICIENCY & ENERGY SAVING

- Simultaneous fire of 4 different fuels;
- Changing fuel on the flight;
- Features CMS Burner control;
- Low energy consumption and reduced operating costs.



TRANSPORT & INSTALLATION

Conceived for quick installation on any asphalt plant.



QUALITY & RELIABILITY

- Excellent value and life span in dryers, burners and filter bags;
- Spare parts are always available.



SUSTAINABLE SOLUTIONS

Optimized and modular products can be upgraded at any time.



AS1 CONTROL SYSTEM

- Fully connected with AS1 control system;
- Prepared for every possible future upgrade with Ammann SW modules like Ecoview and many others.

INSIGHT

Combustion Management System (CMS)

- **Mixed combustion**
of up to 4 different fuels;
- **Mix and burn of low caloric gases with standard fuels**
like biogas and oil;
- **Simultaneous combustion**
with dust, oil gas, LPG, etc;
- **Temperature compensation**
Optimal combustion at different outside temperatures guaranteed;
- **Worldwide permission**
CE/UL/SIL 3.

Burner experience: CMS & FMS

- **More than 10 years of experience in simultaneous combustion and wood dust**
First burner with Feuerungs-Management-System in 2013;
- **Burner with mixed combustion**
Over 80 units working World Wide;
- **Burner with CMS**
Over 400 units working World Wide.



HOW THE CARBON CYCLE TAKES PLACE

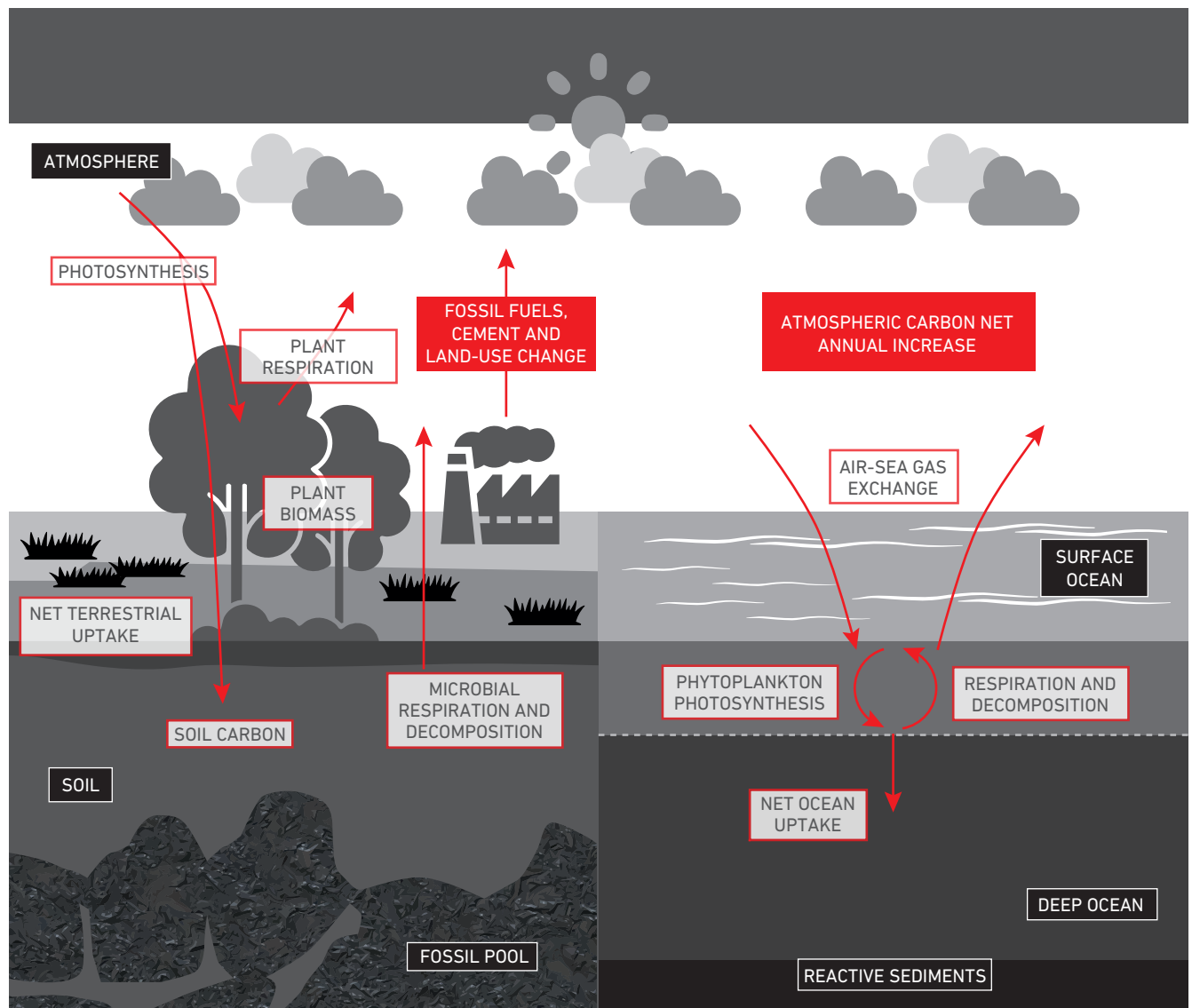
Most of Earth's carbon, around 65,500 billion metric tons, is found in rocks. The rest is in the soil, plants, fossil fuels, oceans, and the atmosphere. They're the reservoirs or sinks through which carbon cycles.

The carbon cycle is the exchange through which carbon flows between each sink. Any change in the cycle that lets carbon flow out of one sink creates more carbon in the other sinks.

Today, carbon escapes the sinks and reaches the atmosphere. Humans have a significant role in the carbon cycle through too much logging, burning of fossil fuels, excessive fishing, and land development. As a result, the amount of CO₂ in the air has been rising so fast.

Human activities disturb the natural carbon cycle significantly. Burning coal, oil, and natural gas quickens the carbon cycle process, releasing large amounts of carbon into the air each year.

The choice of the fuel type for the burner (solid, liquid or gas) is crucial to reduce CO₂ emissions.

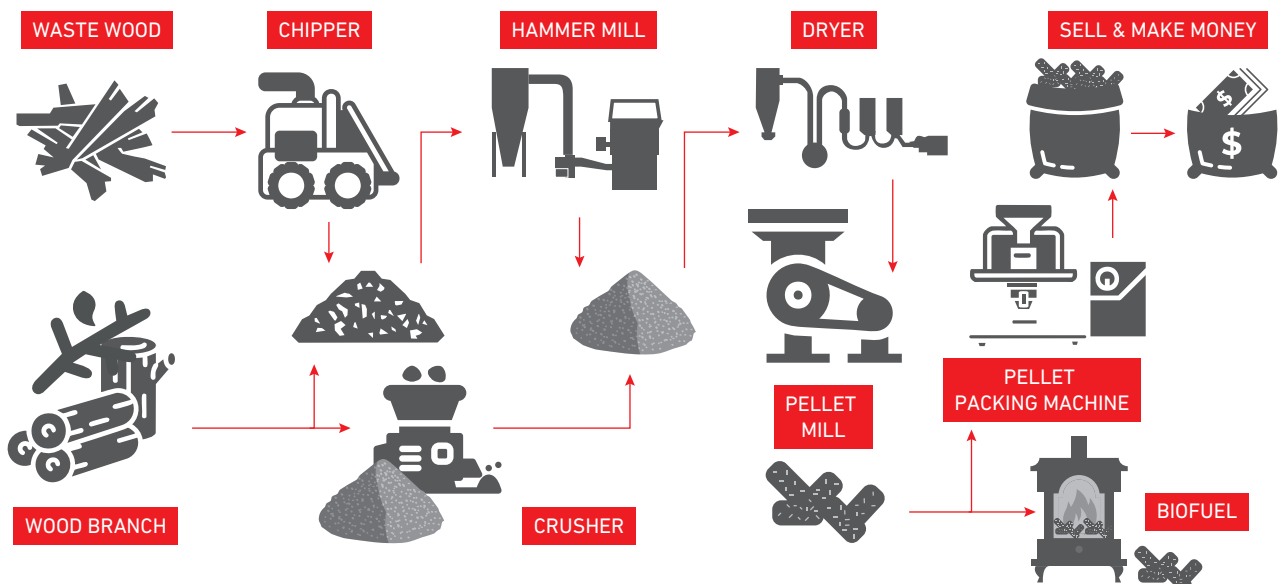
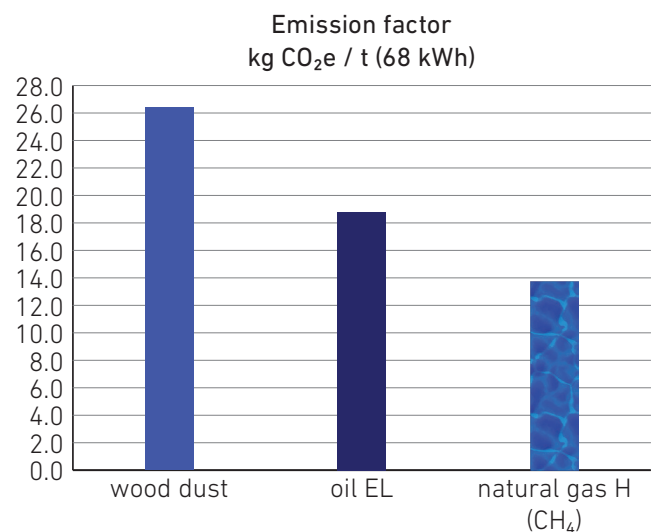
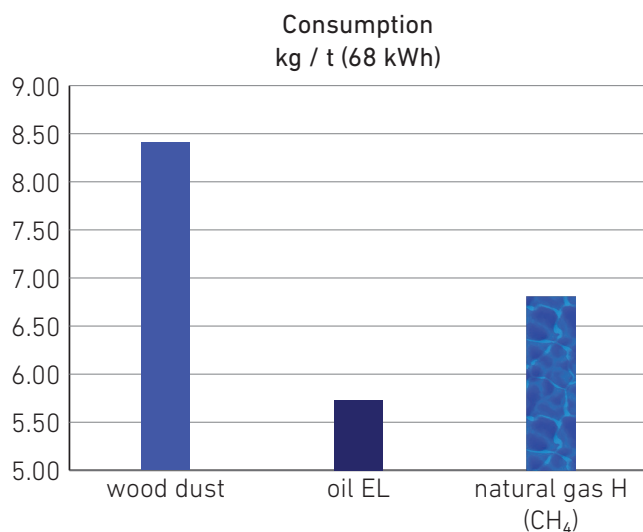


WOOD DUST



Available for
MIBZ

Wood dust, a byproduct of wood processing, can be a renewable and eco-friendly fuel source. It is often compacted into pellets or briquettes for efficient combustion. When burned, wood dust releases energy through heat, making it suitable for heating systems, industrial boilers, and power generation. Utilizing wood dust as fuel helps reduce waste, lower total carbon emissions (related to the entire life cycle), and provide an alternative to fossil fuels. However, proper handling is essential to avoid dust explosions, which can occur in environments with high dust concentrations.



AMMANN'S

WOOD DUST BURNER

Ammann is the leading wood dust burner manufacturer in Europe.

Over 36 Ammann wood dust burners are in daily use in Europe.



Reliable, low-maintenance and proven design with a long service interval;

Turn-Key solution with grinding process, dosing unit and wood dust burner;

Integration into the AS1 control system with on-the-fly fuel changeover;

Available for new plants as well as a retrofit solution to plants of all manufacturers.

SYNTHETIC METHANE



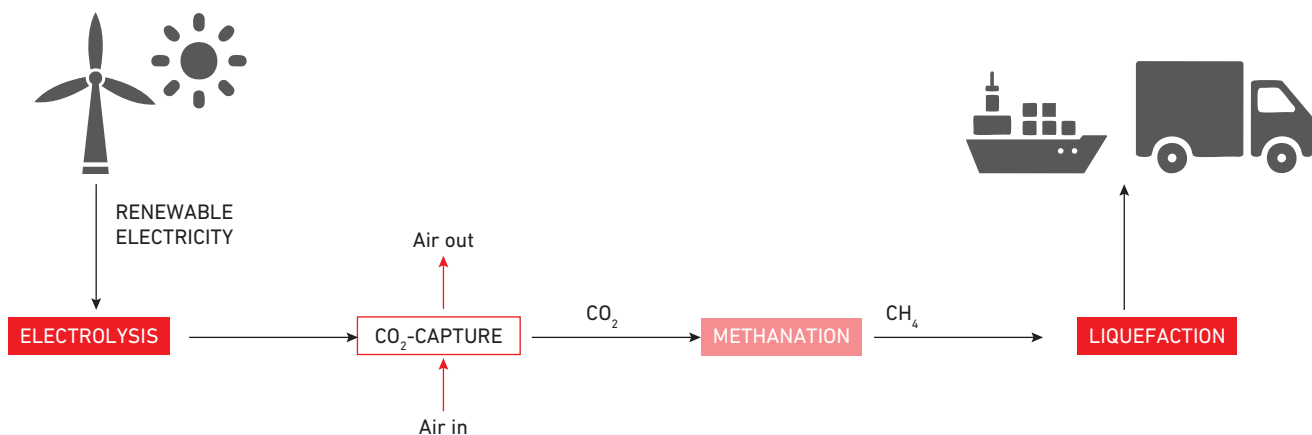
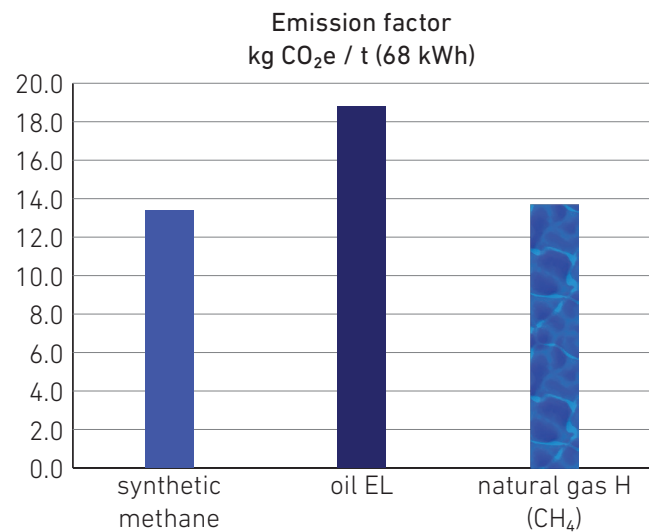
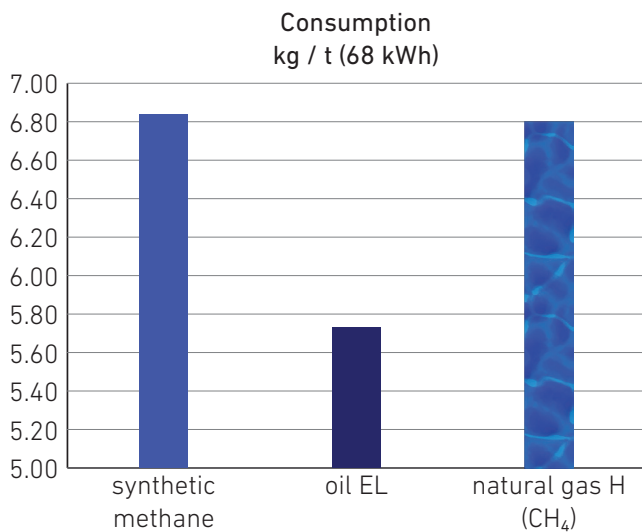
Available for
MIB, MIBG, MIBZ

Synthetic methane is an artificial form of methane gas produced through chemical processes. It's often seen as a cleaner alternative to natural gas, as it can be produced using renewable energy sources and potentially capture and

recycle CO_2 , reducing greenhouse gas emissions. Synthetic methane is used in similar ways to natural gas, such as in heating, electricity generation, and as a fuel for vehicles.

REQUIREMENTS

If equipped with the appropriate equipment, all Ammann burners are already ready for use up to 100% synthetic methane. No modifications or specific technical developments are necessary.



BIOETHANOL



Available for
MIB, MIBG, MIBZ

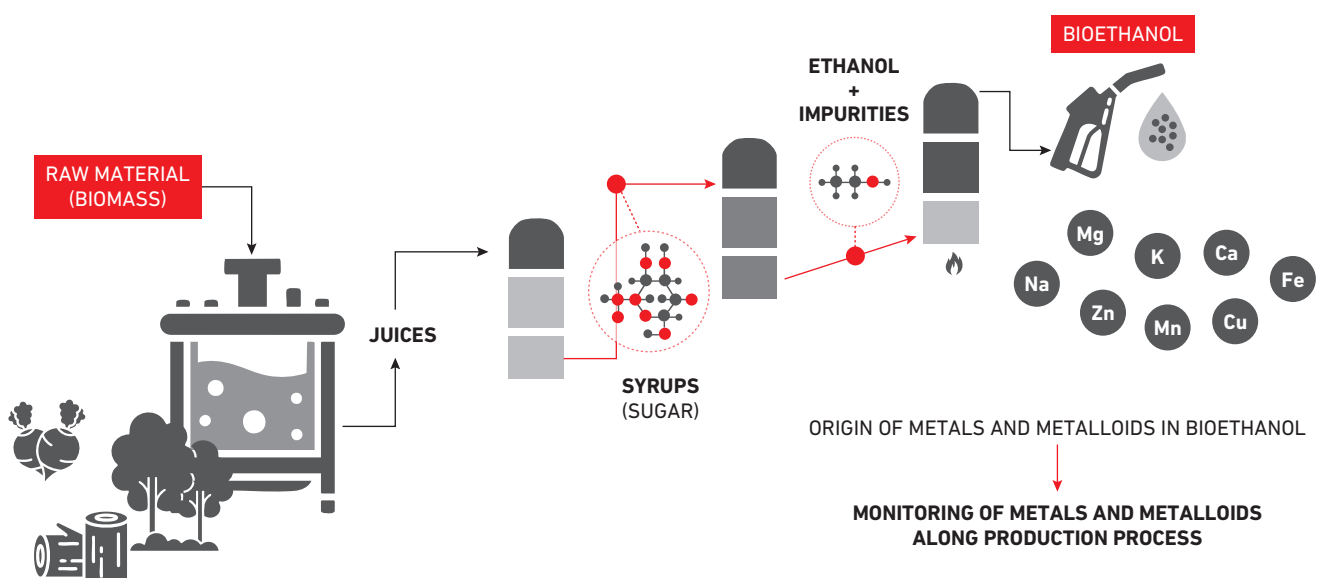
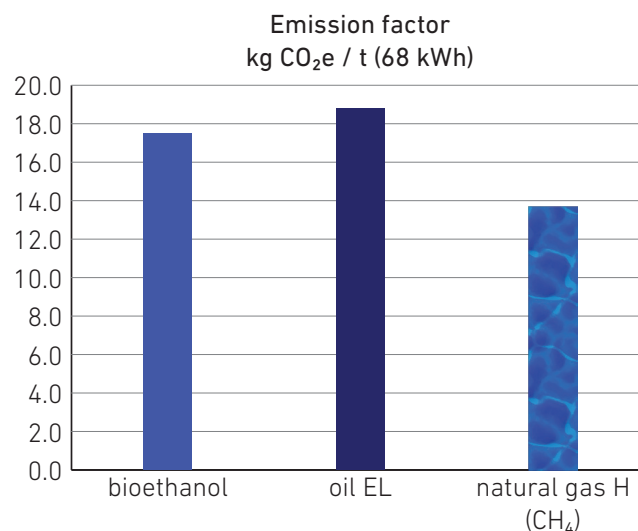
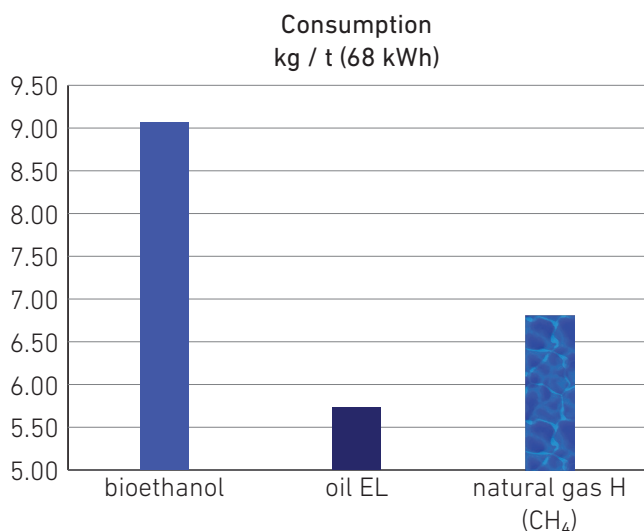
Bioethanol is a renewable fuel made from plant materials through fermentation. It is commonly used as an alternative to gasoline in internal combustion engines, either as a blend with gasoline (like E10 or E85) or pure ethanol. Bioethanol is considered

more environmentally friendly than traditional fossil fuels, as it produces fewer greenhouse gas emissions and reduces dependence on non-renewable resources. Bioethanol is a popular choice for promoting sustainable energy.

REQUIREMENTS

No modifications or specific technical developments are necessary at the Ammann burner to utilize up to 40% ethanol mixed with light oil.

Non-substantial technical changes must be made to the burner to utilize more than 40% ethanol mixed with light oil.



BIOMETHANOL



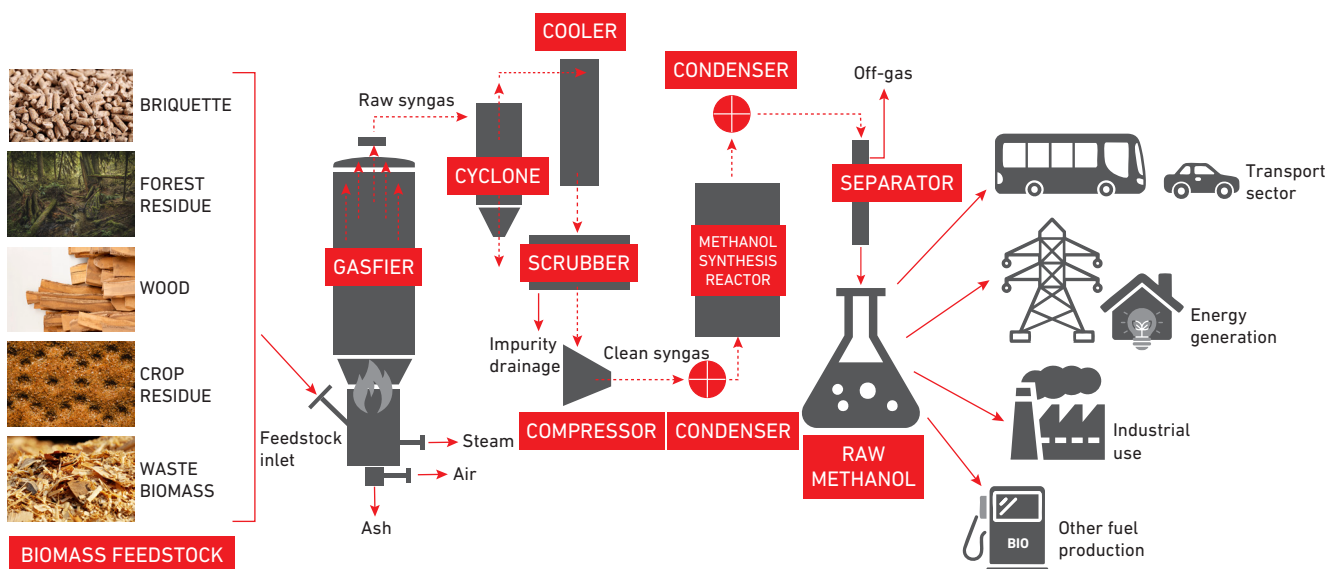
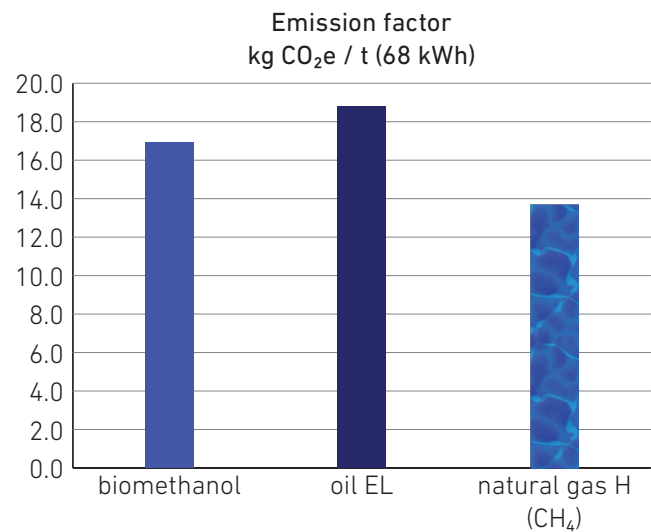
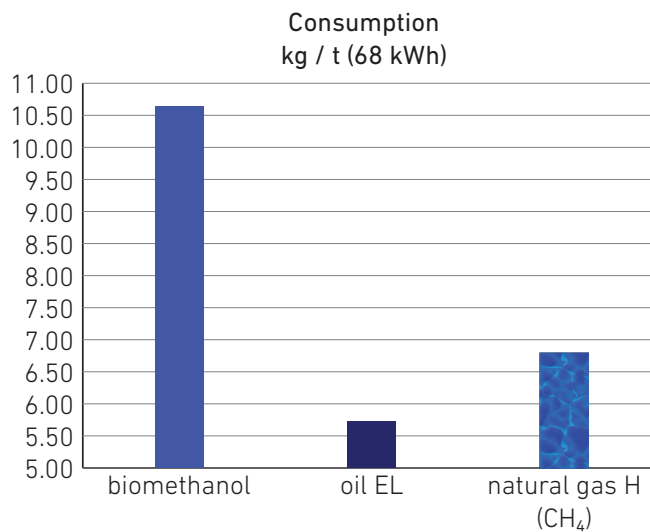
Available for
MIB, MIBG, MIBZ

Biomethanol is a renewable and eco-friendly alternative to traditional fossil fuels, produced by converting organic materials like agricultural waste, biomass, or even CO₂ emissions. It is created via a process known as gasification, where biomass is heated in the presence of oxygen to produce syngas, which is then converted into

methanol. As a fuel, biomethanol can be used in internal combustion engines, fuel cells, or blended with gasoline. Its carbon-neutral nature, as it recycles carbon from organic materials, makes it an attractive solution for reducing greenhouse gas emissions and supporting sustainable energy practices.

REQUIREMENTS

A few components need to be checked to utilize biomethanol, such as convenient seals, pump, valves corresponding to DIN32725 and flame sensors.



GLYCERIN



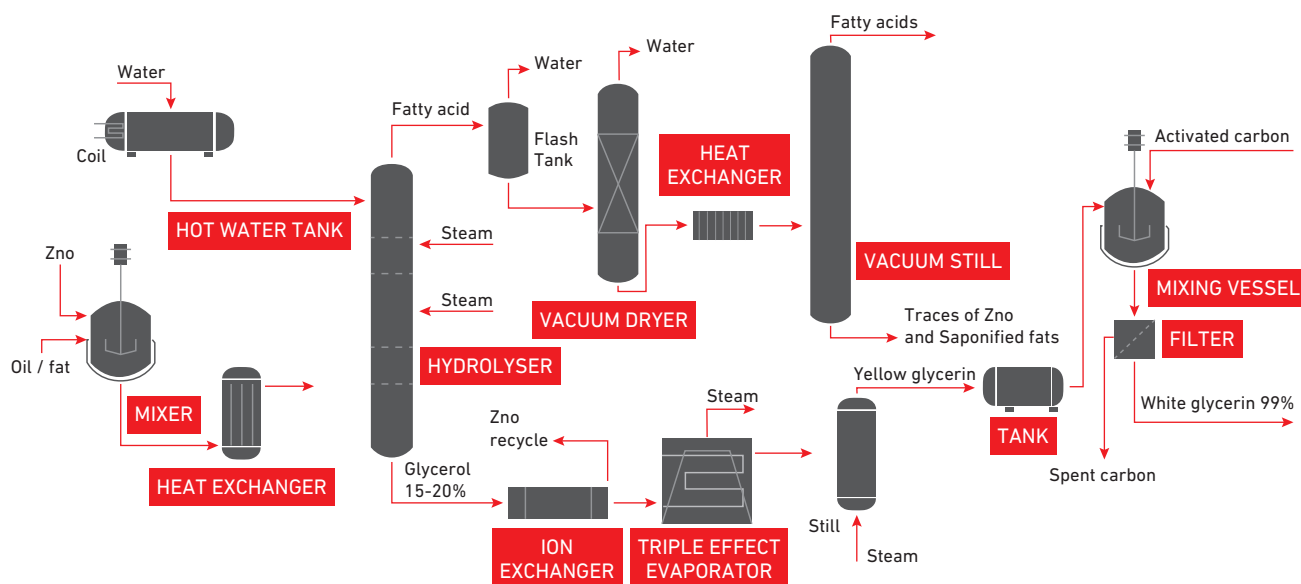
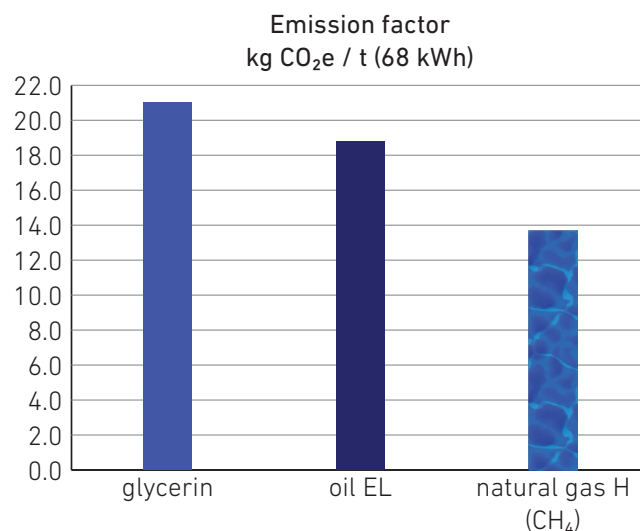
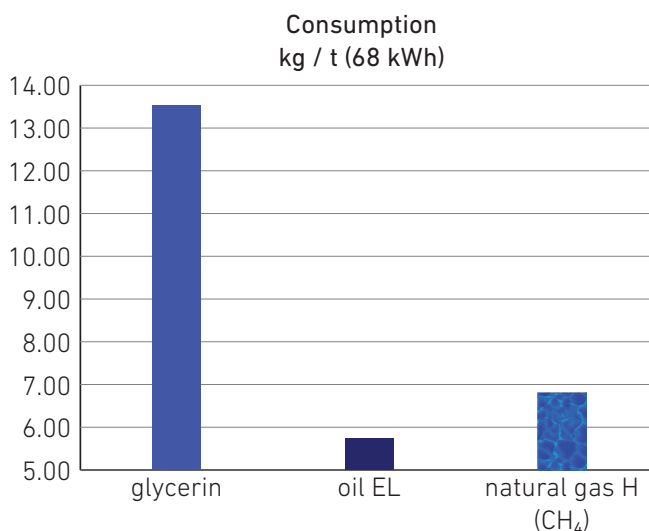
Available for
MIB, MIBG, MIBZ

Glycerin, a byproduct of biodiesel production, has gained attention as a potential alternative fuel source due to its high energy density and renewable nature. When processed, glycerin can be converted into glycerol-based fuels through processes like transesterification or pyrolysis. These

glycerin-derived fuels can be used in engines, providing a sustainable option for reducing reliance on traditional fossil fuels. However, challenges such as high production costs, engine compatibility, and combustion efficiency must be addressed before glycerin can be widely adopted as a mainstream fuel.

REQUIREMENTS

A few components need to be checked to utilize glycerin, such as convenient pump and valves corresponding to DIN 32725.



BIO-OIL



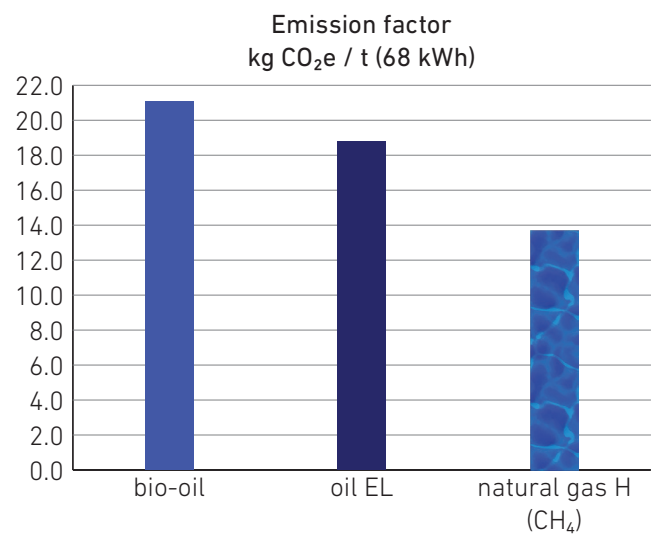
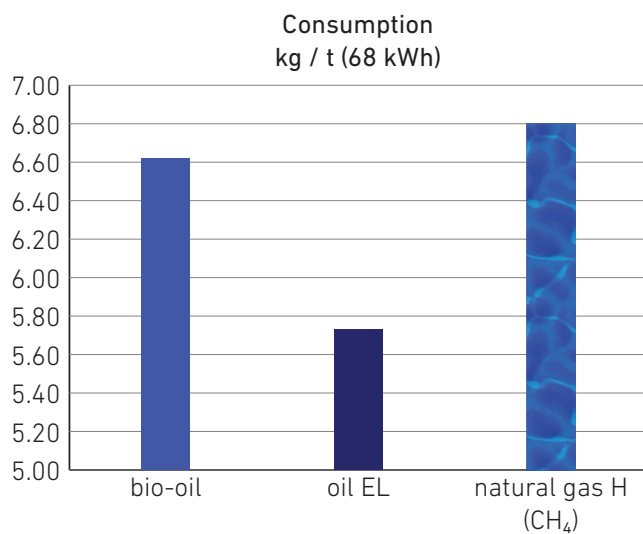
Available for
MIB, MIBG, MIBZ

Bio-oil is a renewable fuel from organic materials like plant biomass, wood, or agricultural waste through pyrolysis. In this process, the biomass is heated in the absence of oxygen, producing a liquid fuel that can be used for energy. Bio-oil is an alternative to traditional fossil fuels, offering environmental benefits such as lower greenhouse gas emissions

(related to the entire life cycle). It can be used for electricity generation, heating, and even as a potential replacement for petroleum-based products in specific applications. However, bio-oil requires further refinement and technological development to become a viable commercial fuel.

REQUIREMENTS

A few components need to be checked to utilize bio-oil, such as convenient seals, pump, valves corresponding to DIN 32725 and low pressure system.



FISH OIL



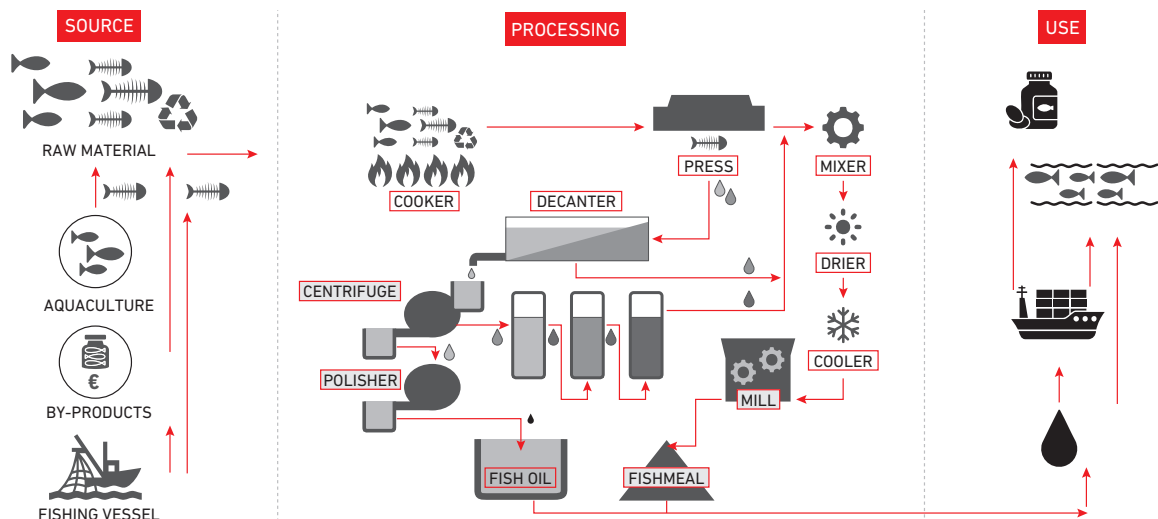
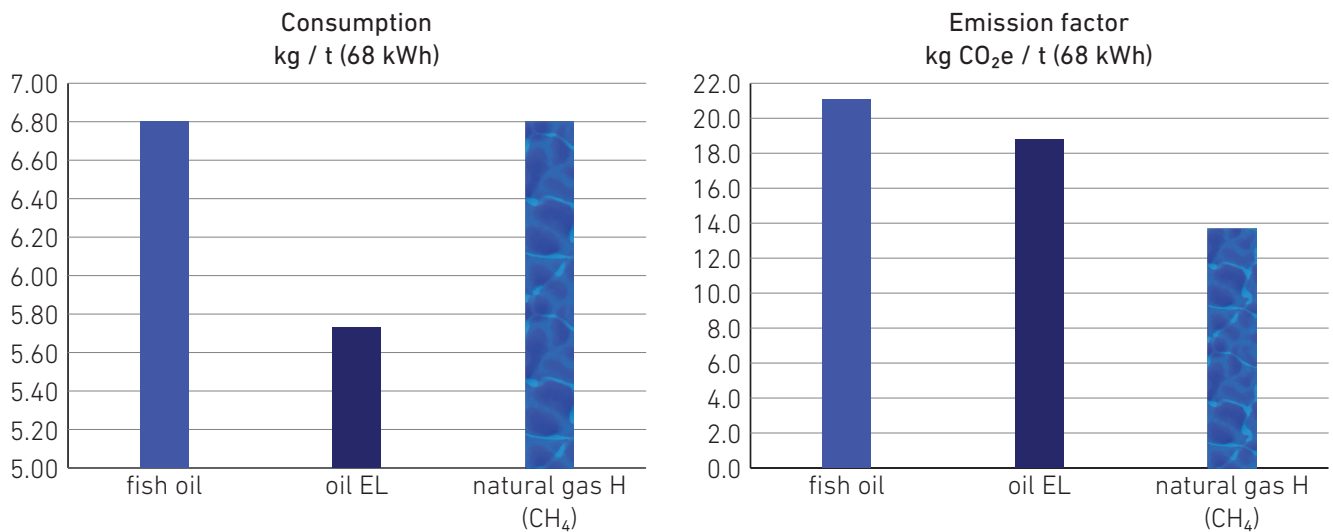
Available for
MIB, MIBG, MIBZ

Fish oil as fuel is an emerging alternative energy source derived from the oil extracted from fish, particularly from species like menhaden. This oil can be processed into biodiesel, a renewable substitute for traditional fossil fuels. The process involves refining fish oil to remove impurities and then converting it through a chemical reaction known as transesterification to create biodiesel.

Fish oil-based biodiesel is considered more sustainable because it reduces reliance on petroleum, produces fewer emissions (related to the entire life cycle), and utilizes waste products from the fishing industry. However, its widespread use is still limited due to concerns about the cost, availability, and environmental impact of fish sourcing.

REQUIREMENTS

No modifications or specific technical developments are necessary at the Ammann burner to utilize fish oil.



TALL OIL



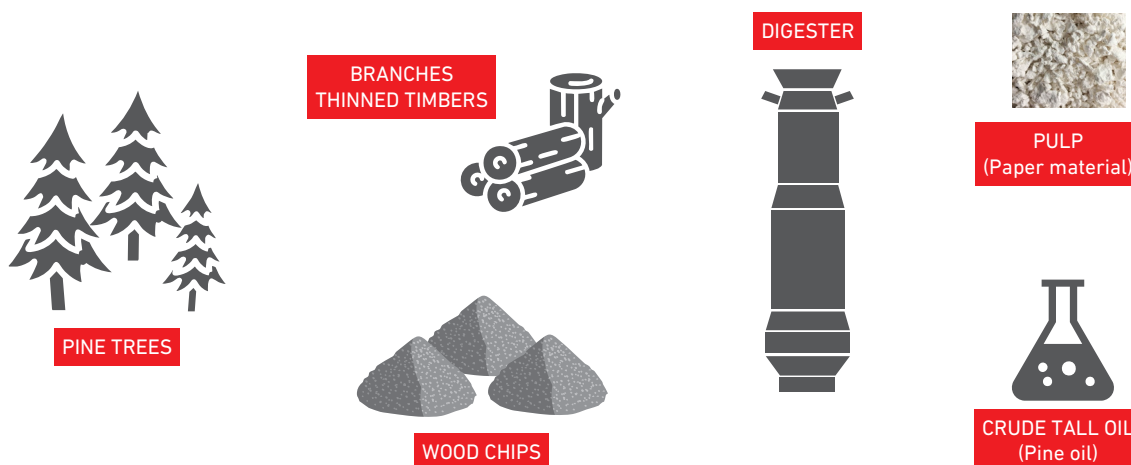
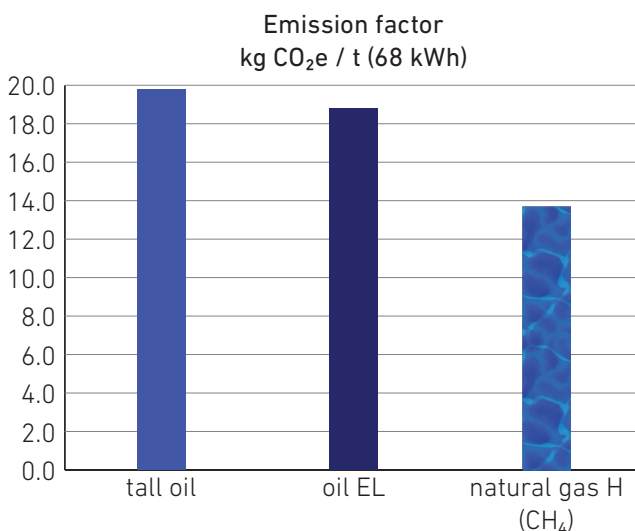
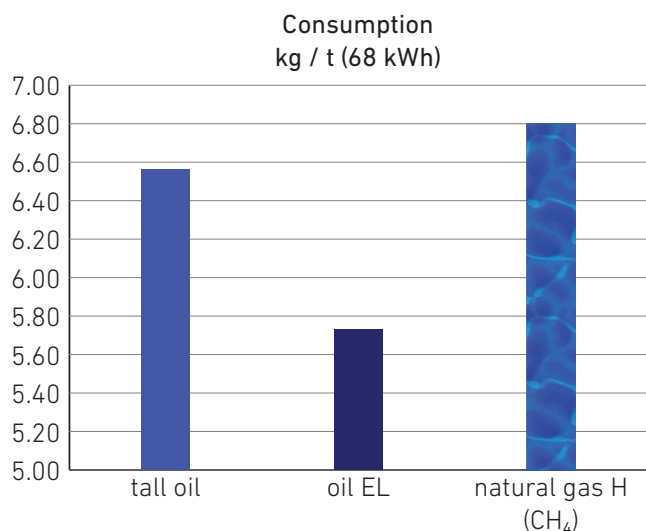
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MIB

Tall oil is a type of crude wood oil derived from processing pine trees in the paper industry. It consists of a mixture of fatty acids, rosin acids, and other organic compounds. Tall oil can be used as a fuel in various applications, such as boilers and power plants, or as a renewable biofuel in industrial processes. Its high

energy content and renewable nature make it an attractive alternative to fossil fuels, contributing to a more sustainable energy mix. Additionally, tall oil's use as a fuel helps to reduce waste from the paper industry, offering both environmental and economic benefits.

REQUIREMENTS

A few components need to be checked to utilize tall oil, such as convenient seals, pump, valves corresponding to DIN 32725, low-pressure system, and corrosion DIN 51603.



TYRE PYROLYSE OIL



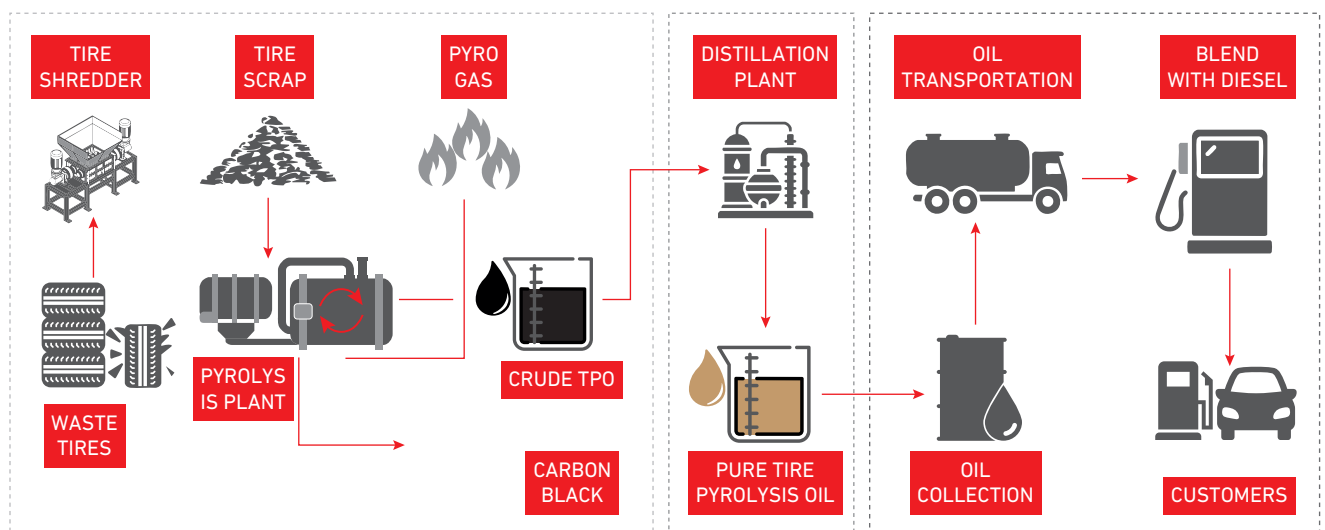
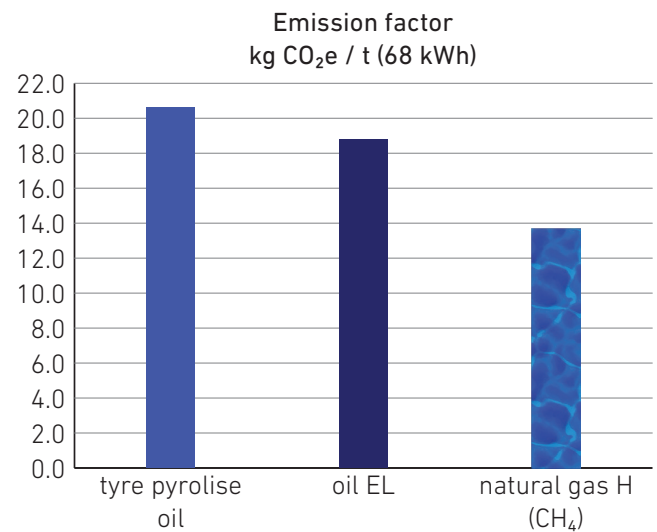
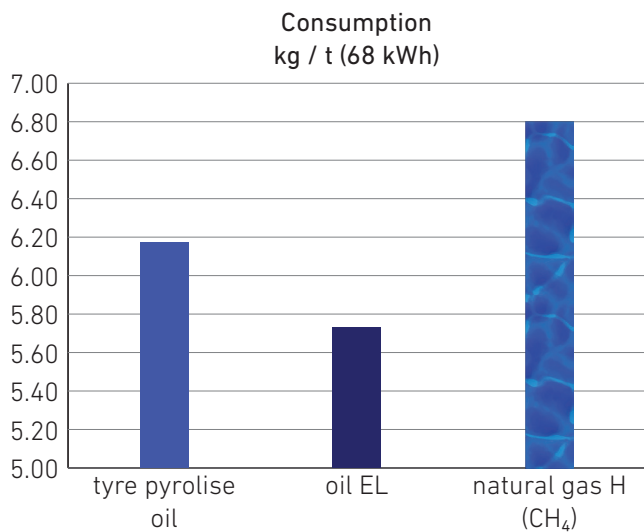
Available for
MIB, MIBG, MIBZ

Tyre pyrolysis oil is a liquid fuel derived from the thermal decomposition of waste tyres in the absence of oxygen, a process known as pyrolysis. During this process, tyres are heated to high temperatures, breaking the rubber into oil, gas, and solid carbon black. The resulting pyrolysis oil can be used as an

alternative fuel in various industries, particularly for power generation and industrial heating, and as a feedstock for refining. It offers an eco-friendly solution for managing waste tyres while providing a renewable energy source, although its quality may vary and require additional processing for optimal use.

REQUIREMENTS

A few components need to be checked to utilize tyre pyrolyse oil, such as convenient seals, pump, valves corresponding to DIN 32725, low-pressure system, and corrosion DIN 51603.



WASTE RECYCLING OIL



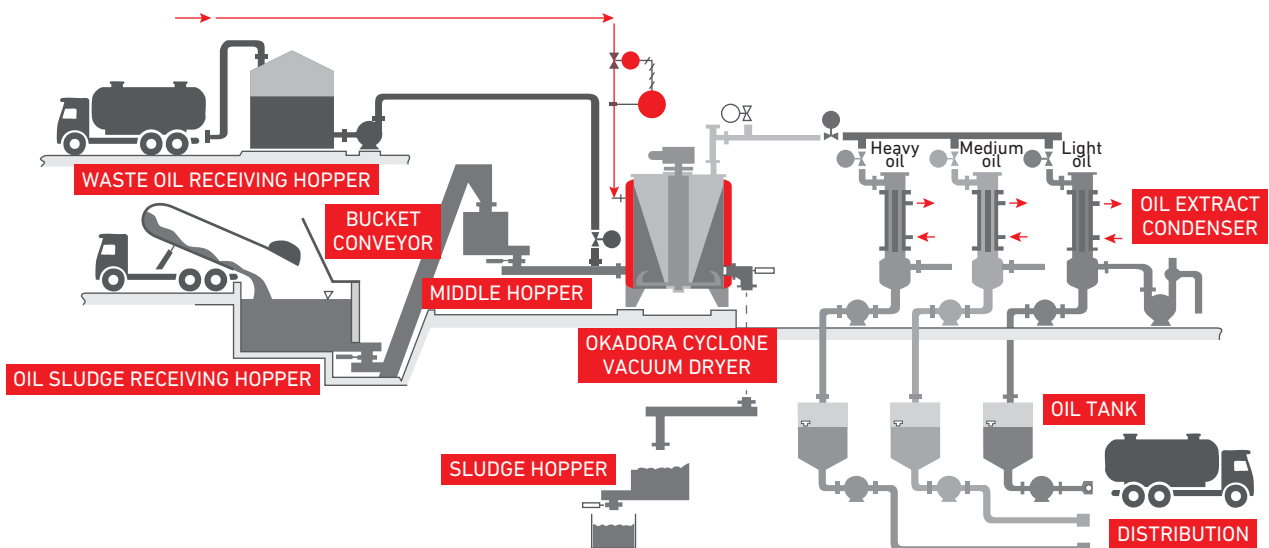
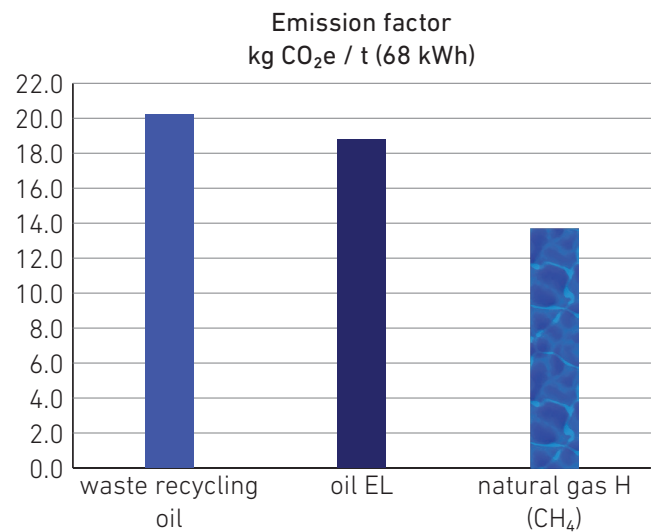
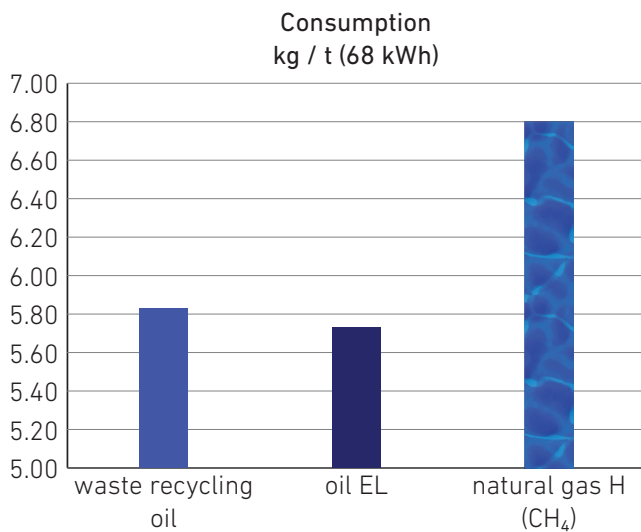
Available for
MIB, MIBG

Waste recycling oil as fuel is an eco-friendly solution that transforms used oils, such as motor or cooking oil, into a renewable energy source. Recycling waste oils can reduce the environmental impact of oil disposal, prevent pollution, and conserve natural resources. This oil can be refined and

repurposed for industrial applications, power generation, or as a substitute for diesel fuel in specific engines. Recycling waste oil helps reduce the need for virgin petroleum, lower greenhouse gas emissions, and promote sustainable energy practices.

REQUIREMENTS

A few components need to be checked to utilize tall oil, such as convenient seals, pump, valves corresponding to DIN 32725, low-pressure system, and corrosion DIN 51603.



SYNTHETIC OIL



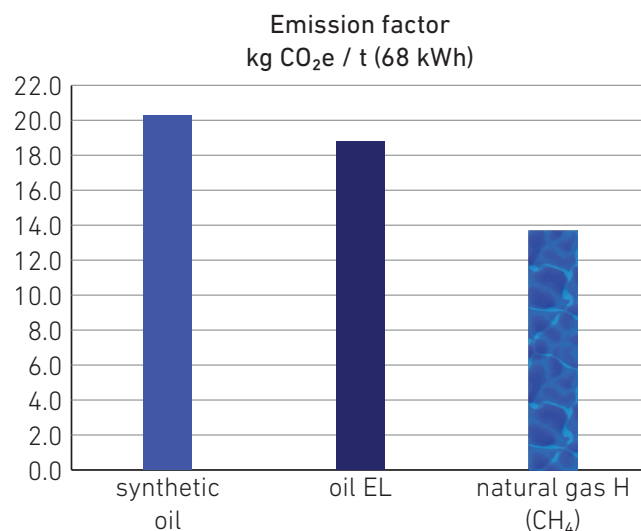
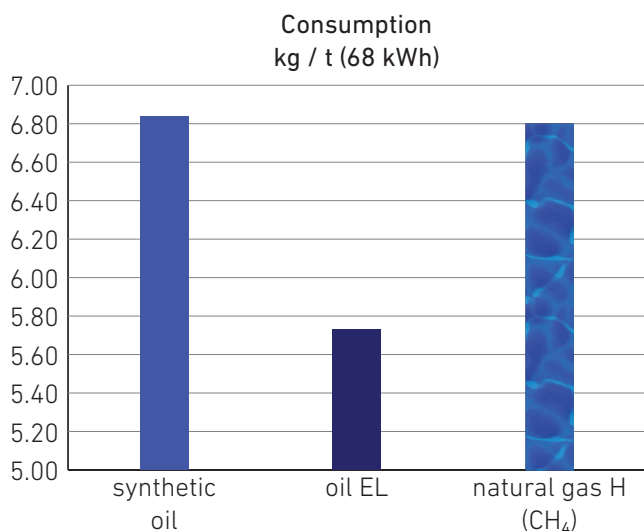
Available for
MIB, MIBG, MIBZ

Synthetic oil is an artificial lubricant designed to provide superior performance compared to conventional oils. It's made by chemically altering petroleum components to enhance their properties, such as improved stability, resistance to high temperatures, and better viscosity control. Synthetic oils

offer advantages like extended engine life, better fuel efficiency, and increased protection against wear and tear, especially in extreme conditions. While they tend to be more expensive than traditional oils, the benefits often justify the cost for those seeking optimal engine performance and longevity.

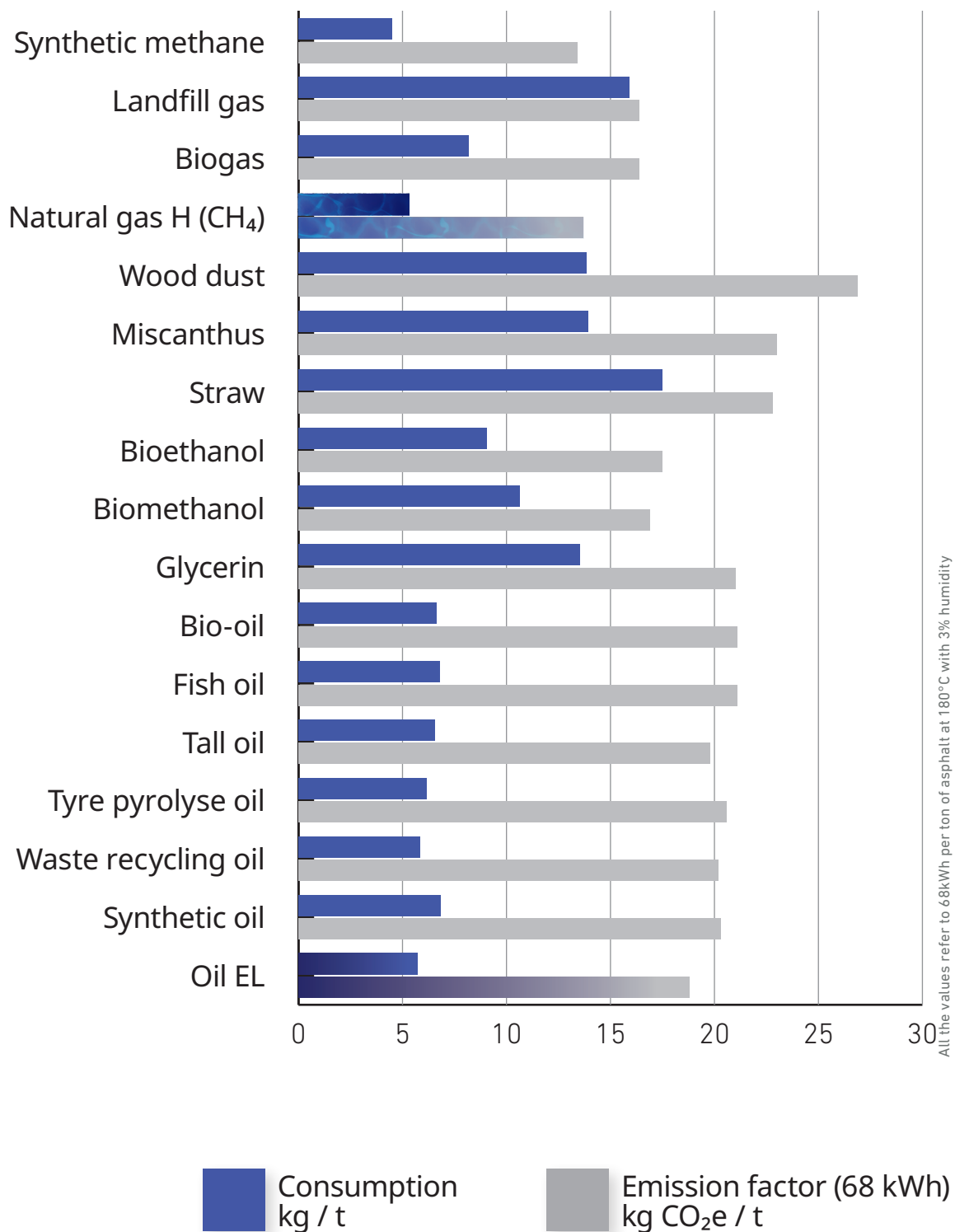
REQUIREMENTS

A few components need to be checked to utilize tyre pyrolyse oil, such as convenient pump, valves corresponding to DIN 32725, low-pressure system, and corrosion DIN 51603.

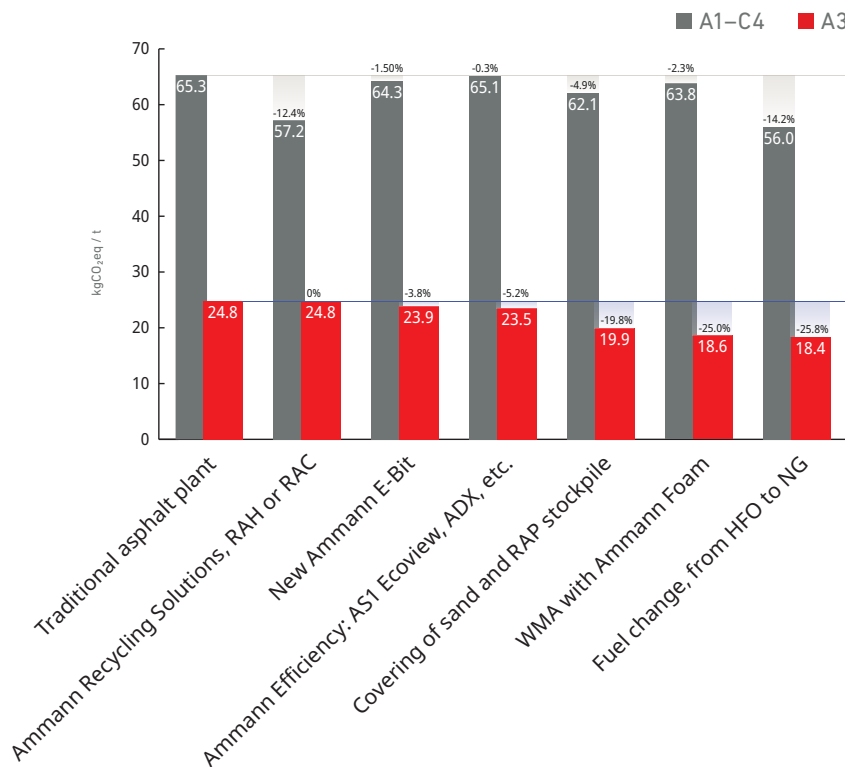
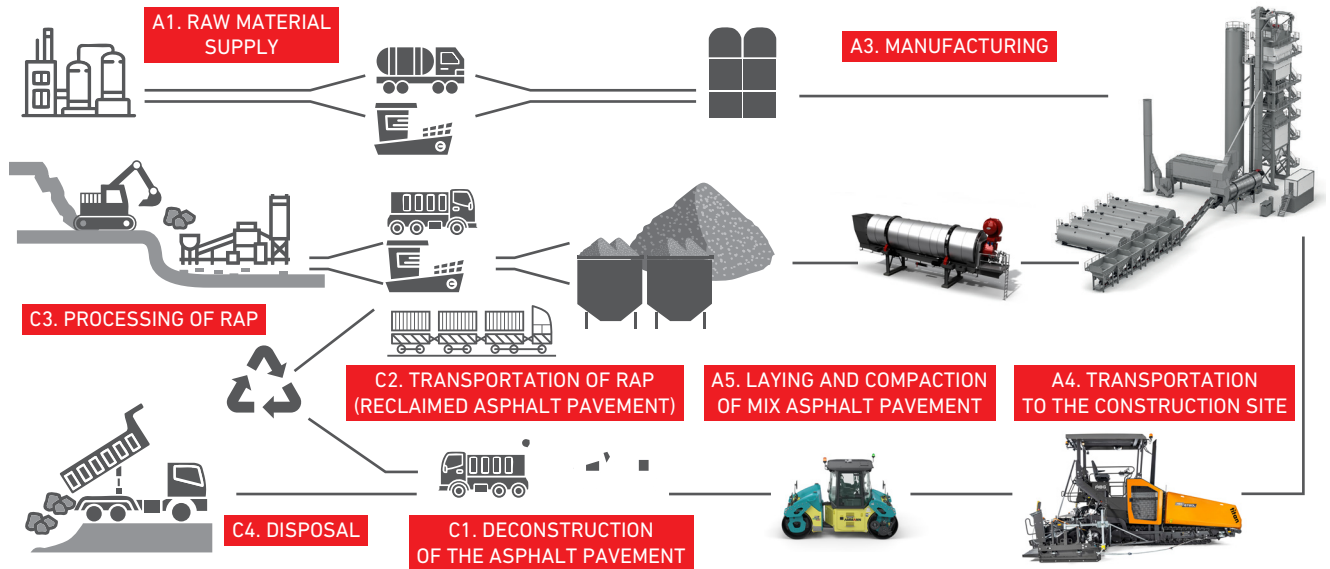


COMPARISON CHART

Average consumption per ton of asphalt produced and emission factor for different fuels



LCA & CO₂ REDUCTION



LCA (Life Cycle Assessment) is a comprehensive method used to evaluate the environmental impact of a product, process, or service from its inception to disposal. It considers every stage of the product's life, including raw material extraction, manufacturing, transportation, use, and end-of-life. By analyzing factors such as energy consumption, emissions, and waste production, LCA helps identify areas for improvement in sustainability and informs decision-making for businesses and consumers aiming to reduce their ecological footprint.

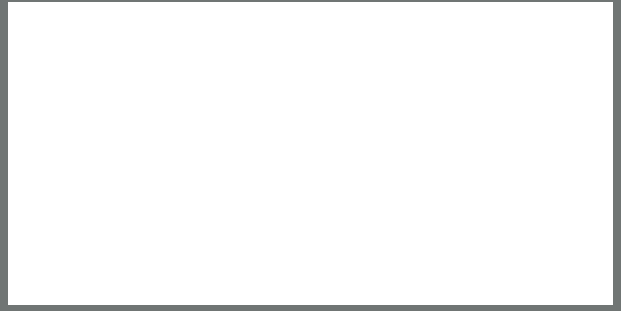
LATEST TECHNOLOGIES AND INNOVATIONS

How can we use less, and how can we make what we do use last longer? These questions are at the core of Ammann's sustainable efforts.

We pore over our existing plants, machines and processes in search of improvements, no matter how small they may seem. After all, incremental steps add up – a lesson we've learned over our more than 150 years in business.

What has this commitment brought? We've reduced emissions across all plants and machines, lessened fluid disposal needs and dramatically upgraded asphalt recycling capabilities – among other advances.





For additional product information
and services please visit:
www.ammann.com

