



Don't throw it away – use it: SIPAPER^{CIS} Reject Power and Reject To Fuel

Waste recycling that's both economical and good for the environment

Pulp and Paper Technologies

SIEMENS

Powering your success!

SIPAPER^{CIS}: Maximum performance through integration

The SIPAPER^{CIS} product family combines all our products and services into a single integrated package, known as Completely Integrated Solutions. What makes it special? Every solution for improving processes is also designed to be integrated into the company's own information structures, and to optimize the life cycle of the machinery and plant. SIPAPER^{CIS} Reject Power and SIPAPER^{CIS} Reject To Fuel are part of the SIPAPER^{CIS} product family that allow you to use residues from paper production ecologically and economically – to power your success!

Waste is just raw materials in the wrong place

The paper industry is facing major commercial and technical challenges. While paper prices are stagnating because of competitive pressure, the costs of oil, electricity and raw materials are continually rising, and the legal requirements for disposing of waste are becoming increasingly strict. And yet the paper industry moved from being a waste producing economy to a recycling economy long ago, and turned waste paper into a raw material. As one of the five largest energy consumers, the paper industry is constantly trying to use energy more efficiently.



Two sides of a good idea

Exploit hidden potential

SIPAPER^{clS} Reject Power

Rejects must be processed before their calorific content can be utilized. This involves separating the waste materials and fibers into their fractions and processing them by shredding and by precipitating iron or other metallic contents. This process homogenizes the fuel mixture, equalizing HCl spikes from PVC plastics, among other effects.

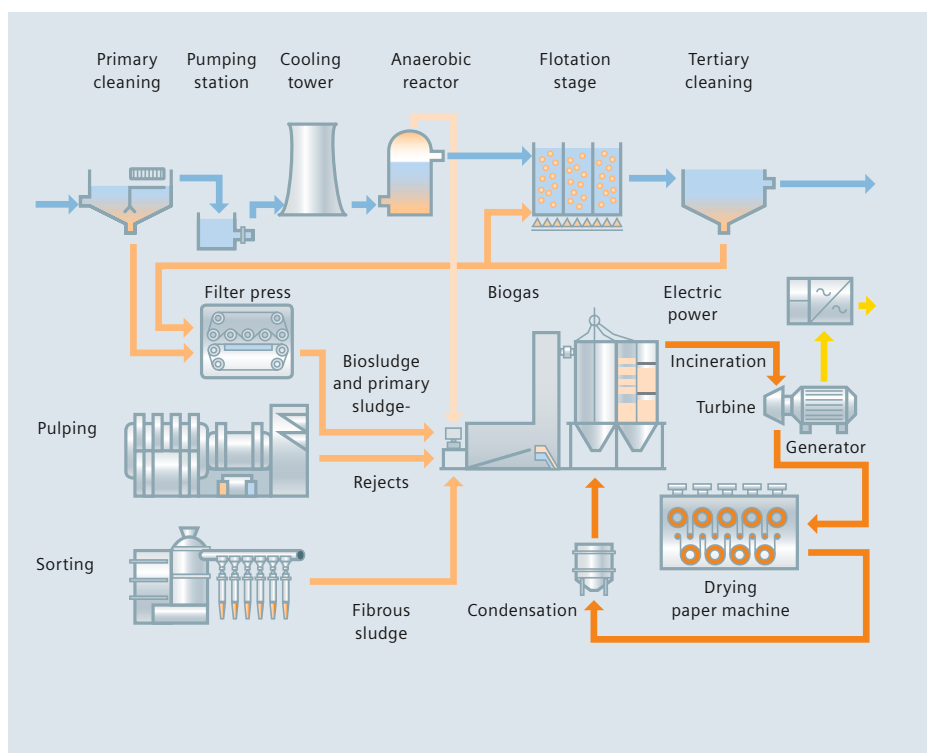
The metering of the fuel content is performed separately for each fraction. This makes it possible to consistently select the best combination of clear sludge, reject, and fibers in order to eliminate or minimize additional heating. However, an auxiliary source of oil or natural gas can be provided to aid in the combustion of especially moist waste and assure a continuous supply of energy at all times.

The combustible material is fed into the furnace by a directional throw conveyor, which limits the volume of the firebed and supports quick responses to load changes. Since the combustible material is evenly distributed over the firebed, CO and hydrocarbon emission levels can be kept extremely low. In the adjacent burn-out zone, NO_x emissions are reduced by injecting a spray of urea and water.

The heat from the incineration is utilized in the waste heat boiler for the production of hot water, low-pressure steam or high-pressure steam. The steam parameters are optimized for the usage requirements for process heat or for electric power production in a steam turbine. By combining this system with existing steam generation equipment, recycling of on-site waste materials helps reduce usage of primary energy sources. This is the case at the plant in Hirschwang, Austria, for example, when the required steam pressures and temperatures (e.g. 80 bars, 480 °C) cannot be achieved with the HCl- and SO₂-carrying waste gases from the rejects incineration due to high-temperature corrosion. When this happens, the plant generates saturated steam, which is then blended and additionally heated to enable optimized operation of the turbine.

An essential part of the plant is the final flue gas cleaner, which operates dry with sodium hydrogen carbonate and a mixture of activated coke and zeolites. This causes the acidic components, such as dioxins, furanes and mercury, to be precipitated.

Conceptual diagram of Reject Power



SIPAPER^{clS} Reject Power – benefits:

- Replacement of fossil fuels by largely biogenic CO₂-neutral fuels
- Substantial reduction in disposal volumes and costs
- Utilization of waste for energy-optimized, combined electric power-heat generation
- Avoidance of waste transport
- Fast amortization of the investment

Combustion, burn-out and steam generation at the waste incineration plant in Hirschwang/Austria





Drying the processed rejects in the drum dryer

SIPAPER^{CL5} Reject To Fuel

If the rejects cannot be recycled on site, or if this is not allowed because, for example, there's no room for a recycling plant, we offer SIPAPER^{CL5} Reject To Fuel as an attractive alternative for converting rejects from paper production into high-energy fuel for industrial incinerators.

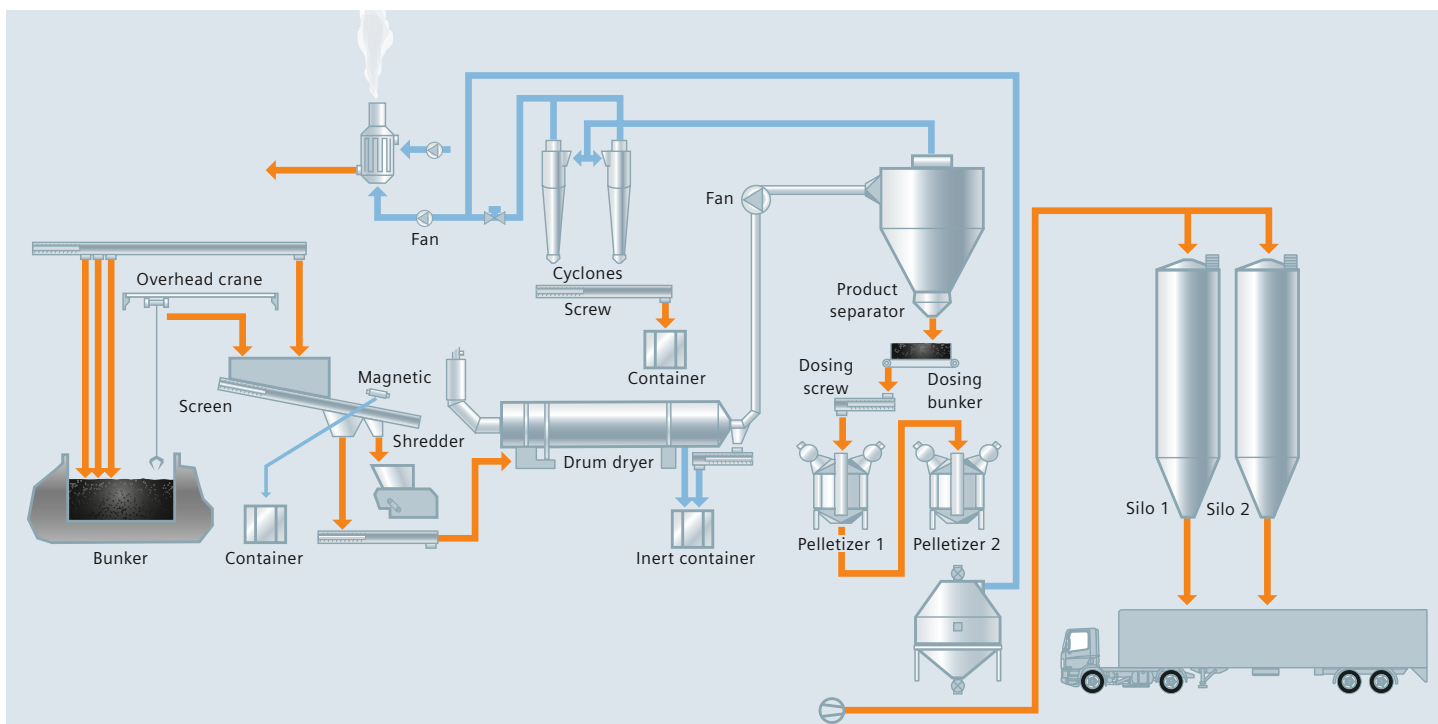
It is also possible to process not only rejects from paper production but also other production residues with a high specific calorific value, and thus to produce a standardized fuel with precisely defined properties. Firstly, these residues are separated in a complex process from the components that can be used in paper production. At the same time, unwanted inorganic components, such as sand, glass and metals, are removed.

The fuels are sieved, taken through a magnetic separator, chopped in a shredder and homogenized. The fuels are then dried in a drying tunnel and temporarily stored in a silo. The residues can then be burned as fluff directly from the drying process or sold and used as secondary fuels. Alternatively, the fluff is pressed into pellets in a pelletizing machine to make handling easier. These pellets can then be incinerated in cement works, smelting works or coal-fired power stations. They are suitable for all applications in which combustion temperatures of over 800 °C are reached.

SIPAPER^{CL5} Reject To Fuel – the advantages

- Clear reduction in landfill volumes and costs
- Paper production becomes more efficient
- Fast amortization of investment from the sale of high-quality fuels
- The environment is protected since fossil fuels are replaced by largely biogenic CO₂-neutral fuels

Diagram of Reject To Fuel option with pelletization



Always the right solution



Reject To Fuel plant near Groningen in the Netherlands, with a capacity of 100,000 metric tonnes annually, for the production of high-calorific fuel from paper waste.



Reject Power plant in Hirschwang, Austria, for the on-site conversion of 10,000 metric tonnes of waste annually into steam and electric power. This plant can supply up to 30 percent of the power required for production.

SIPAPER^{CIS} Reject Recycling – Reject Power and Reject To Fuel – provides solutions that convert waste generated in paper production (such as rejects from recycled paper processing) in order to

- generate electric power and process steam for on-site use,
- produce fuel for recycling in industrial incinerators, and
- contribute to the long-term protection of the environment.

Since local conditions vary among paper mills, SIPAPER^{CIS} Reject Recycling doesn't provide a standard solution but rather an individual selection of modules, designed for perfect interoperability, which can be combined into a seamless overall solution. We design a system tailored to the specific requirements of your location based on the method of paper production as well as the type and amount of waste, local power and steam production, and any utilization of waste in cooperation with external partners. Be sure to take advantage of our comprehensive industry expertise – so you can focus on your core business of making paper.

We find the best way

Based on a comprehensive evaluation of conditions at your plant, we offer you the following alternatives:

- SIPAPER^{CIS} Reject Power (on-site utilization) or
- SIPAPER^{CIS} Reject To Fuel (utilization by external recycling) or
- a combination of both, tailored to your requirements, to ensure the optimum balance of local incineration and utilization as fuel in other plants.

Reuse in the same plant can be desirable for a variety of reasons. Substantial fuel costs are eliminated, and so are disposal costs for biological and fibrous sludge, rejects, screenings and tailings.

The environment benefits in two ways, since most of the waste products are biogenic and therefore CO₂-neutral, and since extensive transportation by truck in the recycling process is eliminated. If on-site recycling is impractical for spatial or economic reasons, a substantial and sustainable contribution to high efficiency and profitability of your production can be achieved through the sale of the processed material.

Flue gas cleaning system at the Reject Power plant in Hirschwang, Austria. This system is based on the dry flue gas cleaning process.



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The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

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SIPAPER^{CIS} Reject Power and Reject To Fuel pay for themselves – fast. Let us show you firsthand how much you can save with our solutions. We just need a little information about your plant. Complete this page and send it to us at the address on the reverse side. We'll get back in touch with you right away.


Fuel data

If you don't know the dry matter content and lower calorific value, you can enter standard values instead.


Rejects

	Quantity in t/a	Dry matter content in %	Lower calorific value in kJ/kg

Paper waste

	Quantity in t/a	Dry matter content in %	Lower calorific value in kJ/kg

Organic sludge

	Quantity in t/a	Dry matter content in %	Lower calorific value in kJ/kg

SIPAPER^{CIS} Reject Power and Reject To Fuel – do you want to know precisely?

Data needed for a cost effectiveness study

Disposal costs

Rejects in €/t	Paper waste in €/t	Organic sludge in €/t

Energy costs

Natural gas in €/m ³	Electricity in €/kWh

Company

Name

Street

Zip Code / City / Country

Phone / Fax

E-Mail

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