RECYCLING
RECOVER RAW MATERIALS AND MAINTAIN VALUES
Future-oriented recycling solutions

- Electrical/Electronic Equipment, Refrigerators
- Rejects from the Pulp and Paper Industry
- Waste-to-Value
- Metals and Specials
- Organic Waste
- Wood Waste
- End-of-Life Vehicles
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Recover raw materials and maintain values

A major goal in any industry is to produce more and waste less. More product, with fewer waste streams, translates into higher margins. This same goal applies to communities and consumers as well. As a manufacturer of high-quality recycling technology, we take it as a responsibility and commitment to future generations to conserve resources and create a cleaner world. We are proud of the considerable economic, environmental, and social impact of what we do.

Our machinery, processes, and technologies recover so-called “waste” and convert it into valuable materials or energy sources. The fact that our technology works so dependably and with such high recovery rates sets us apart in the global market.

Our technology not only reduces the extraction of primary raw materials, but also frees up landfills and disposal sites to protect the environment. By separating and treating many different waste flows, we make raw materials usable again, either as a source of additional revenue or by reusing the materials within the production cycle.

We are more than equipment suppliers. We develop recycling solutions that pay off for our customers. Our knowledge and expertise are available to help customers truly optimize their operations. By fully understanding customer needs and future trends, we work as partners to arrive at future-oriented solutions to deal with new kinds of waste streams.

Our R&D programs focus on sustainability: conserving resources, improving the quality and yield of the secondary raw materials, and maximizing customer benefit. Our machinery and technologies contribute to reduced environmental impact on the planet. Each of our employees is fully committed to continuing the ANDRITZ success story in recycling.

ANDRITZ supports its customers in creating a cleaner world for future generations
ANDRITZ: Your strong partner in recycling

ANDRITZ Recycling is a strong part of the ANDRITZ GROUP dedicated to converting waste streams into usable, valuable resources. Our rapid rise in the recycling world is the result of many strengths: 160+ years of industrial and engineering experience, adding the well-known capabilities of MeWa and Franssons to the Group, in-depth process knowledge, a well-established global network, financial strength, innovative people, and a comprehensive range of recycling solutions.

ANDRITZ Recycling combines the resources and capabilities of several key players in the industrial recycling arena.

The ANDRITZ GROUP has more than 26,000 employees and over 250 production sites, service centers, and sales companies around the world. ANDRITZ has core competencies in environmental processes and energy generation. Certain segments of our business, such as reject treatment and solid/liquid separation technologies, were involved in recycling long before it became a global social focus.

When ANDRITZ acquired MeWa in 2013, it greatly enhanced its capabilities for treating materials from different industrial processes and products, which helped it enter markets outside its traditional paper-making and wastewater treatment markets. MeWa began as a sales office for shredders to recycle E-scrap as well as household and industrial waste. Since then, the company has developed its unique processing technologies, particularly for electrical/electronic scrap and refrigerator recycling, which have won international environmental awards.

The Franssons product line was added in 2017 to further extend our capabilities. Franssons began as a supplier to Sweden’s timber industry. Its well-proven shredders with unique cutting technologies have been expanded beyond wood waste to include household/industrial waste, municipal solid waste, and plastics.

With these combined capabilities, ANDRITZ Recycling offers a global service and sales network with access to state-of-the-art manufacturing centers. The synergy between recycling products and other equipment in our product portfolio allows for integration into more complex plant concepts.
Manufacturing network ensures high quality

The ANDRITZ machinery is designed in a robust engineering process and then built according to the highest quality standards within our global manufacturing network. Material selection, manufacturing techniques, machine tools, and quality procedures are all state-of-the-art. Product enhancements are a normal part of the production process.

ANDRITZ’s global manufacturing network primarily focuses on producing key components or proprietary technologies. The extensive in-house capabilities are supplemented by a global network of certified sub-suppliers, each of which is a specialist and proficient in supplying to ANDRITZ’s exacting quality and delivery requirements. With a proven and tested make-or-buy strategy, the company maintains high levels of capacity utilization to ensure optimum use of own manufacturing capacities.

All manufacturing locations participate in a continuous development program to offer customers the highest quality at a reasonable price. Internal investments are targeted to strategic expansion of manufacturing capacities in growth areas and to modernizing existing locations in established markets.

Depending on the country where a machine is to be installed, ANDRITZ Recycling relies on manufacturing facilities in Europe and Asia. Each workshop has a complement of modern machining centers, assembly bays, and testing operations. Every facility adheres to the same level of our manufacturing quality standards, ensuring each customer consistently high quality everywhere.

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Aerial photography of ANDRITZ headquarters and production site in Graz

ANDRITZ’s main manufacturing sites for the recycling industry

Final inspection of the ADuro QZ shredder in the workshop.
A technical innovation from ANDRITZ Recycling – the ADuro QZ shredder – has made a big impact on successful E-scrap recycling operations.

No cutting tools are employed in the shredder. The machine breaks down different composite materials quickly and gently using rotating chains so that the individual fractions (like iron, plastic, printed circuit boards, cables, and copper coils) are exposed and can be easily separated from one another in downstream processes.

Components that contain hazardous substances, such as batteries and capacitors, remain intact and can be disposed of without any negative impact on the environment.

**INPUT**
- Refrigerators (CFCs/pentane)
- White goods
- Electrical household appliances

**OUTPUT**
- Consumer electronics
- E-scrap

**BENEFITS:**
- Technology complies with WEEELABEX and CENELEC requirements
- Efficient single-stage process
- No sharp cutting of potentially hazardous components
- Reduced internal wear due to chain technology
- Easy access to the valuable component fractions
- Gentle liberation to avoid release of hazardous substances in components
- Compatible with manual or fully automatic sorting
- High recovery rates for valuable materials and CFCs/pentane
- Well-proven – excellent references

**WEEE and refrigerators**

With the proliferation of electrical and electronic devices, E-scrap has become the fastest growing (estimated 50 million tons per year) waste stream in the world. With the potentially hazardous materials found in electronics, it is a challenge to break down and safely recycle components. This is a challenge that ANDRITZ has successfully conquered.

**A LEADING-EDGE SOLUTION FOR RECYCLING REFRIGERATORS**

The fully encapsulated, single-stage system for processing refrigerators recovers environmentally harmful greenhouse gases from CFC and pentane appliances without any risk of fire.
Cable scrap and wires

Cable recycling not only preserves and conserves valuable resources, it also significantly reduces energy consumption. Recycling the metals in cables and wire requires only a fraction of the energy that must be expended to initially mine and extract ore.

There are many different types of cables with a variety of different material compounds: flexible wire cables, household cables, power cables, underground cables, copper and aluminum cables, and high-voltage cables with V-PE sheaths. Inherently, the strands in the core are valuable as a secondary raw material due to the high metal content. In most cases, the individual materials in the cable or flexible wire adhere very closely to one another. To expose and process these fractions requires recycling technology that produces small grain sizes for optimum separation.

ANDRITZ Recycling supplies complete processing lines for all types of cable and wire waste, and has many years of experience in doing this. Individual metal fractions are recovered with nearly 100% purity due to the technology employed for pre-shredding, granulating, sorting, and separating.
Metals recycling and special processing

There are hundreds of different metal compounds containing components and materials which require specific processing technologies and methods to maximize their value and minimize environmental impact. Attractive and valuable metal compounds include ferrous fraction, aluminum, copper, or zinc because these materials can be sold as secondary raw materials and recycled multiple times without loss of quality.

No matter if it is a battery, circuit board, solar panel, can, aerosol container, mattress, metal turnings, aluminum profile, slag, scrap metal sheet, textile bale, or wastepaper – ANDRITZ Recycling has successfully recycled it.

In the course of executing all these projects, ANDRITZ has often worked with customers collaboratively to arrive at tailored solutions: testing the incoming waste material at its test center and pilot plant, and then innovating or adapting its machinery to achieve the desired results.

INPUT
- Batteries
- Printed circuit boards
- Solar panels
- Cans
- Aerosol cans

OUTPUT
- Iron
- Copper
- Aluminum
- Tin
- Plastics

BENEFITS:
METALS AND SPECIAL MATERIALS
- Decades of experience in developing tailored plants and solutions
- Flexibility to handle a wide range of materials
- Tailored processing and machinery depending on input/output requirements
- High throughput
- High purity levels
- High recovery rates
- Gentle, environmentally friendly handling of potentially harmful substances

SHOWREEL
See the plant in action!
Vehicle parts and tires

Even at the end of their useful life, many of the components in an automobile or other vehicle contain valuable raw materials. Whether it is the metal in oil filters and precious metals in catalytic converters, the aluminum in wheel rims and engine blocks, or the pure rubber in used tires – ANDRITZ has the process technology and expertise to extract and reuse it. More recently, recycling technology has been developed for the growing number of lithium-ion batteries in electric cars.

The main task in recycling end-of-life vehicles and tires is to break them down into their individual components in such a way that the valuable materials can be recovered and effectively processed.

For tires, this means breaking the used tire down into its main building blocks – rubber, steel wire, and textiles – so that these components can be recovered with highest purity in a three-stage process.

Used oil filters from vehicles are considered to be hazardous waste, yet their construction is about 60% metal, making recycling cost-effective. With its special tooling, the ADuro G shredder shreds the oil filter in a single-stage process. Then the individual fractions – ferrous fraction, aluminum, paper, rubber, and oil – can be separated easily.

INPUT
- Used tires
- Oil filters
- Catalytic converters
- Batteries
- Engine blocks
- Aluminum rims
- Shredder light fraction (SLF)
- Shredder heavy fraction (SHF)
- Auto shredder residues (ASR)
- Car parts

OUTPUT
1. VEHICLES
- Ferrous fraction
- Non-ferrous metal
- Paper
- Oil
- Plastics
2. TIRES
- Tire chips
- Rubber granulate
- Rubber powder
- Steel wire
- Textile fluff

BENEFITS:
1. VEHICLE PARTS
- Flexibility in handling a variety of input materials
- Cutting or chain technology tailored to the material
- Optimum separation of individual materials and fractions
- Very high purity levels
- Environmentally friendly, integrated solutions for draining oil from filters

2. TIRES
- Variable throughput depending on requirements
- Purity of rubber granulate > 99.9%
- Granulating, grinding, and powdering to <1 mm
- Processing line can be easily expanded due to modular design

SHOWREEL
See the plant in action!
ANDRITZ employs technologies that combine pre-shredding, post-shredding, sorting, and drying so that the entire flow of waste can be separated into organic and inorganic components.

Valuable fractions, such as metals, can be removed early in the process and appropriately recycled. The metal fraction, often with plastics or textiles still adhering to it, can be cleaned. Composite materials can be broken down with the ADuro QZ shredder. In the end, the steel scrap and non-ferrous metals can be recovered with a superior purity of 98% – perfect for use in the steel industry or re-processing in foundries.

With minor additional processing, the non-recyclable residual fractions often have a high caloric value, making them suitable as a fuel source for cement kilns, steel industry boilers, or for co-firing in power plants.

Substitute fuels and metal cleaning

Million of tons of waste are produced in the world every day. While the main sources are the industrialized nations, the amount of waste is increasing in emerging economies as well. ANDRITZ Recycling supplies ecologically and economically viable solutions for this deluge of waste.

INPUT
- Household waste
- Industrial waste
- Bulky waste
- Production residues

OUTPUT
- Plastics
- Textiles
- Paper
- PVC
- Ferrous fraction
- Non-ferrous fraction

BENEFITS:
- Substitute fuels and metal cleaning
- Powerful and reliable pre-shredding
- Fast removal of the metal fractions
- Granulating with the ADuro G shredder and tailored screen sizes
- Separation after each shredding stage
- High-quality substitute fuel fraction
- Metal fraction can be further cleaned with the ADuro QZ shredder

SHOWREEL
See the plant in action!
The ANDRITZ Recycling portfolio includes innovative technologies for the processing of paper mill sludges and rejects, materials separation and recovery, and the generation of alternative energy sources to reduce a mill’s dependency on landfills, fossil fuels, and purchased power.

Rejects mainly result from the pulping process of a waste paper recycling line and need to be handled carefully in terms of the individual pulping system applied. As an example, the so-called “pulper rags” are potentially a source of valuable raw material with their high proportion of steel wires. The ADuro P shredder processes the waste input material in only one step. In order to meet different requirements, a two-stage process can be applied: An ADuro C shredder pre-shreds the stringy material, and an ADuro G is used for post-shredding. The metal is then easily cleaned and recovered.

ANDRITZ develops complete processes and supplies equipment for waste-to-energy applications. Metals, inert materials, and other unwanted components (like PVC) are removed in clean fractions so that the light fraction with high calorific value can be used to replace fossil fuels.

With very high recovery rates, wastepaper has become a very important raw material to substitute virgin fiber in the paper industry. However, the contaminants it contains (inks, glues, plastics, etc.) as well as metals and tying wires in the bales themselves must be removed and processed.

Pulp and Paper mill rejects

The ANDRITZ Recycling portfolio includes innovative technologies for the processing of paper mill sludges and rejects, materials separation and recovery, and the generation of alternative energy sources to reduce a mill’s dependency on landfills, fossil fuels, and purchased power.
Wood waste

Potential wood waste markets include feedstock for composite materials, fuel for energy generation, animal bedding, and soil amendments. Due to the bulk, the recycled material is generally processed locally so that it does not have to be transported over long distances. The ADuro P and ADuro U shredders are superior multi-talents at work and handle bulky wood waste inputs easily.

Wood waste such as offcuts, veneers, boards from demolition projects, construction sites, and timber processing operations can be effectively processed with ANDRITZ shredding technology.

The slowly rotating ADuro P and ADuro U shredders can process large quantities of wood and even huge logs into manageable sizes (10 to 200 mm). The output size is determined by the screen choice.

A hydraulic pusher feeds the wood waste to a special knife geometry that is easily optimized for the type of input material. The rugged shredder technology provides perfect continuous cutting and high throughput up to 50 t/h.

The ADuro F shredder can be used to mill down the pre-cut wood further, to just a few millimeters in size.

BENEFITS:
WOOD WASTE
- Heavy-duty construction for reliability and availability
- High-capacity throughput (up to 50 t/h)
- Large inlet hopper
- Feed and pusher system avoids material extraction
- Dependable, innovative continuous cutting system
- Knife geometry easily adjusted for various input materials
- Quick and easy access for maintenance
- Reject hatch makes cleaning of the cutting area easy
- Automatic security lockout
- Insensitive to impurities and contaminants
- Optimized protection clutch

INPUT
- Offcuts
- Veneers
- Boards
- Panelboard
- Saw mill waste
- Demolition/construction wood

OUTPUT
- Wood particles of defined size (10 to 200 mm) for composites, fuels, etc.

Wood offcuts
Wood waste
Wood particles
Wood particles – substitute fuels

Picture ©AdobeStock

Drawing of the ADuro U shredder
The ADuro QZ shredder breaks down the cell structure of input waste materials (e.g., organic waste, corn and whole crop silage, grass silage, farmyard manure, restaurant and kitchen waste, and packaged foods) to maximize the contact surface area for fermentation bacteria to perform their magic. Biogas formation begins measurably faster and more intensely, which can reduce the duration of the fermentation process substantially. This, in combination with significant yield improvement, boosts the cost-effectiveness of a biogas plant.

A major advantage of the ADuro QZ is its ability to separate organic materials from food packaging by crushing and stirring the material in one process. The output is unwrapped organic waste, suitable for pumping. After the organic materials are removed, the packaging and other inorganic components can be easily separated out.

Organic waste

ANDRITZ has developed a special ADuro QZ system to prepare packaged foods, organic waste, and energy crops for optimum fermenting conditions in biogas plants.
Customers appreciate having an ANDRITZ Recycling expert on site to help them diagnose process or equipment problems and offer solutions to improve reliability and performance. That is why we maintain local service experts in key locations, backed by the global network of a leading technology supplier.

Skilled technicians and engineers have access to certified work-shops to provide quick response for repairs, rebuilds, and upgrades. While there are other local companies in the “service” business, none understand the machinery and processes as well as ANDRITZ. Each local organization is backed by ANDRITZ’s worldwide service organization, giving them access to experts in the recycling industry for those special problems or situations that cannot be handled locally.

From routine work during a scheduled shutdown to quick response during a disruption, ANDRITZ Service specialists work side-by-side with a customer’s team to diagnose, offer training or recommendations, provide replacement parts, or perform repair services as needed to keep operations running smoothly.

**BENEFITS:**
- Decades of experience with recycling machines and plants
- Global expertise, local contact
- Replacement parts
- Wear components
- Rebuilds and retrofits
- Field services, audits, inspections
- Shutdown and start-up assistance
- Service agreements/contracts
- Operator/maintenance training

As a part of the international ANDRITZ GROUP, ANDRITZ Recycling has the support and strength of an extensive global network of service specialists, machining centers, rebuild shops, and service locations. These centers are strategically located close to customers – around the globe.
Machinery portfolio for shredding, granulating, and dismantling

**ADuro QZ SHREDDER**
**DISMANTLING**
- Electrical and electronic scrap
- Refrigerators
- Printed circuit boards and LCD monitors
- Composite materials: metal/plastic, ferrous/non-ferrous metal, aluminum/plastic, wood/glass
- Scrap cans made of tinplate and aluminum
- Automotive parts (fittings, engine blocks, catalytic converters)
- Metal separator fraction from MBT and RDF plants
- Hazardous waste: paint tins, aerosol cans, batteries
- Production waste, e.g. steel/aluminum turnings
- Fiber-reinforced plastics (FRP)
- Packaged food
- Organic waste

**ADuro U SHREDDER**
**SINGLE-SHAFT SHREDDER**
- Industrial waste
- Refuse-derived fuels
- Solid recovered fuels
- Municipal solid waste
- Plastic waste

**ADuro P SHREDDER**
**SINGLE-SHAFT SHREDDER**
- Household/industrial waste
- Bulky waste
- Pulper rags, rejects
- Plastics
- Textiles
- Wood

**ADuro H SHREDDER**
**SHREDDING**
- Industrial waste
- Wood waste
- Municipal solid waste

**ADuro P SHREDDER**
**SHREDDING**
- Household/industrial waste
- Pulper rags
- Sheet metal
- Oil filters
- Underground cables
- Aluminum profiles
- PVC waste
- Mattresses

**ADuro S SHREDDER**
**SHREDDING**
- Industrial waste
- Refuse-derived fuels
- Solid recovered fuels
- Municipal solid waste
- Plastic waste
ADuro M SHREDDER
MILLING

- Aluminum cables
- Copper cables
- Tire granules
- PVC
- Plastics

ADuro G SHREDDER
POST-SHREDDING

- E-scrap
- Plastics
- Rejects
- Tires
- Cables
- Metal profiles
- Oil filters
- RDF

ADuro F SHREDDER
GRINDING

- Wood
- Dry wood
- Bark
- Paper
- Cardboard

Wear and spare parts

To achieve highest equipment availability and performance over the entire life-cycle, ANDRITZ offers a broad range of wear and spare parts. A global network of warehouses and intelligent logistics ensure quick deliveries all over the world. As an example – chains and knives with different alloys can be provided upon request to meet even more specific mill requirements.
GLOBAL TECHNOLOGY – LOCAL SERVICE

ANDRITZ Recycling is more than an equipment supplier. We develop recycling solutions that pay off for our customers. Our knowledge and expertise are available to help customers truly optimize their operations. As a part of the international ANDRITZ GROUP, we are backed by the strength of an extensive global network of service specialists, machining centers, rebuild shops, and service locations. From the supply of spare parts, routine work during a scheduled shutdown, to quick response during a disruption, we are available to keep operations running smoothly.

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