

# Biomass Alternative Fuel Solutions



# *Vecoplan*<sup>®</sup>



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Vecoplan solutions for converting and processing biomass feedstock for the production of alternative fuels.

# Vecoplan - Our History

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Vecoplan was founded in 1969 in Bad Marienberg, Germany as a manufacturer of high quality wood chippers.

In the early 1980's, Vecoplan's focus turned to manufacturing innovative machinery for recycling of various materials, inspiring the invention of the first single-shaft rotary shredder the world had ever seen. This innovation has revolutionized the size reduction industry.

In 1989, a European patent was awarded to Vecoplan for the single-shaft shredder and its unique "U-rotor". To this day, this rotor design continues to be the most advanced cutting geometry for the universal size reduction of a whole spectrum of waste materials.

In 1994, Vecoplan received its ISO 9001 certification. This is the highest standard set for quality systems and confirms its dedication to innovative product

development, design engineering, high quality manufacturing and quality control standards. Ensuring first rate customer service has been, and remains, a top priority.

In 2000, Vecoplan, the global leader in size reduction technologies, combined forces with ReTech Industries, the American leader in single-shaft rotary shredder technologies, to form Vecoplan, LLC - the undisputed global leader in size reduction systems.

Today, Vecoplan has a substantial presence on every continent (with the exception of Antarctica) and has evolved into the undisputed leader of state-of-the-art size reduction and recycling systems with over 75 models available and currently over 7,000 machines and systems operating around the world.

## From Kilowatt To Megawatt

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### Concepts To Suit Every Plant Size

Solutions tailored individually to the needs of your plant structure – implemented in outstanding quality for optimum cost-efficiency: VECOPLAN plants and individual machines make a crucial contribution to smooth

processes and therefore to your company's success. We deliver your fuel safe and sound and with maximum availability. With the right plant concept our specialists lay the foundations for an effective integrated plant.

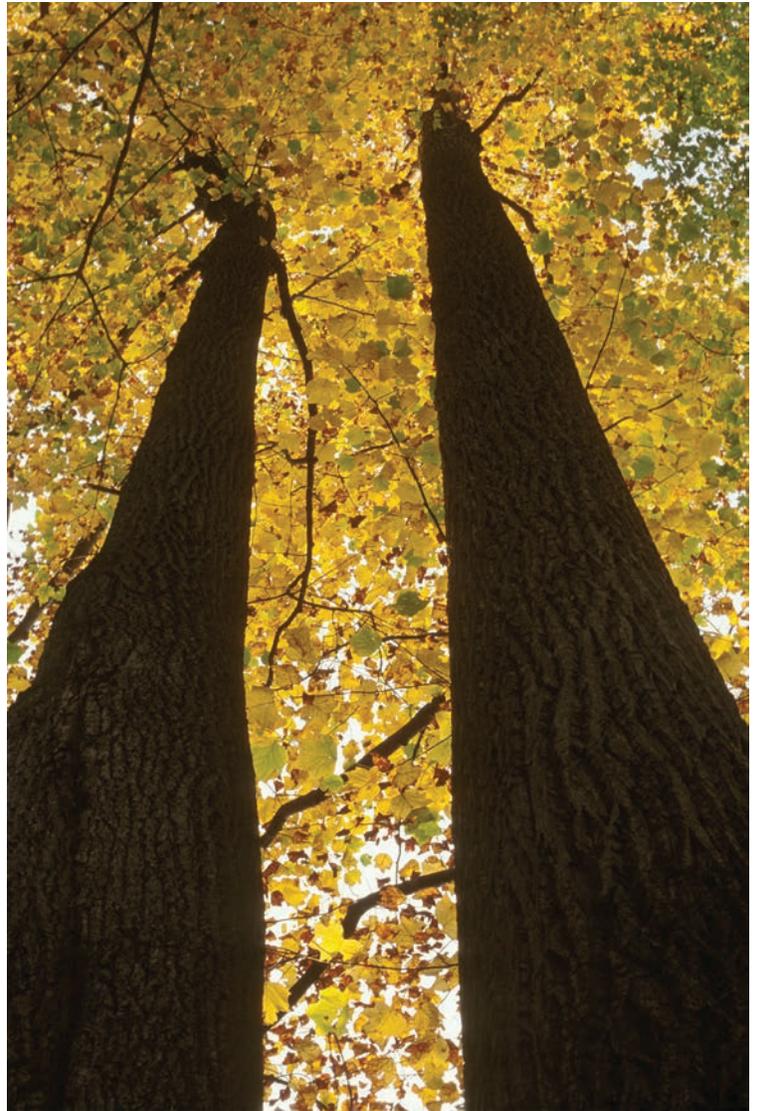


# Biomass Energy Resources

## The Future Of Alternative Fuel

Biomass — all plant and plant-derived materials including animal manure, not just starch, sugar, oil crops already used for food and energy — has great potential to provide renewable energy for America’s future. Biomass recently surpassed hydropower as the largest domestic source of renewable energy and currently provides over 3 percent of the total energy consumption in the United States. In addition to the many benefits common to renewable energy, biomass is particularly attractive because it is the only current renewable source of liquid transportation fuel. This, of course, makes it invaluable in reducing oil imports — one of our most pressing energy needs.

Looking at just forestland and agricultural land, the two largest potential biomass sources, a 2005 study conducted by the USDA (United States Department of Agriculture) and the DOE (Department Of Energy) found over 1.3 billion dry tons per year of biomass potential - enough to produce biofuels to meet more than one-third of the current demand for transportation fuels. About 368 million dry tons of sustainably removable biomass could be produced on forestlands, and about 998 million dry tons could come from agricultural lands. Forestlands in the contiguous United States can produce 368 million dry tons annually. This projection includes 52 million dry tons of fuelwood harvested from forests, 145 million dry tons of residues from wood processing mills and pulp and paper mills, 47 million dry tons of urban wood residues including construction and demolition debris, 64 million dry tons of residues from logging and site clearing operations, and 60 million dry tons of biomass from fuel treatment operations to reduce fire hazards. All of these forest resources are sustainably available on an annual basis and EXCLUDE environmentally sensitive areas and forestland not accessible by roads.

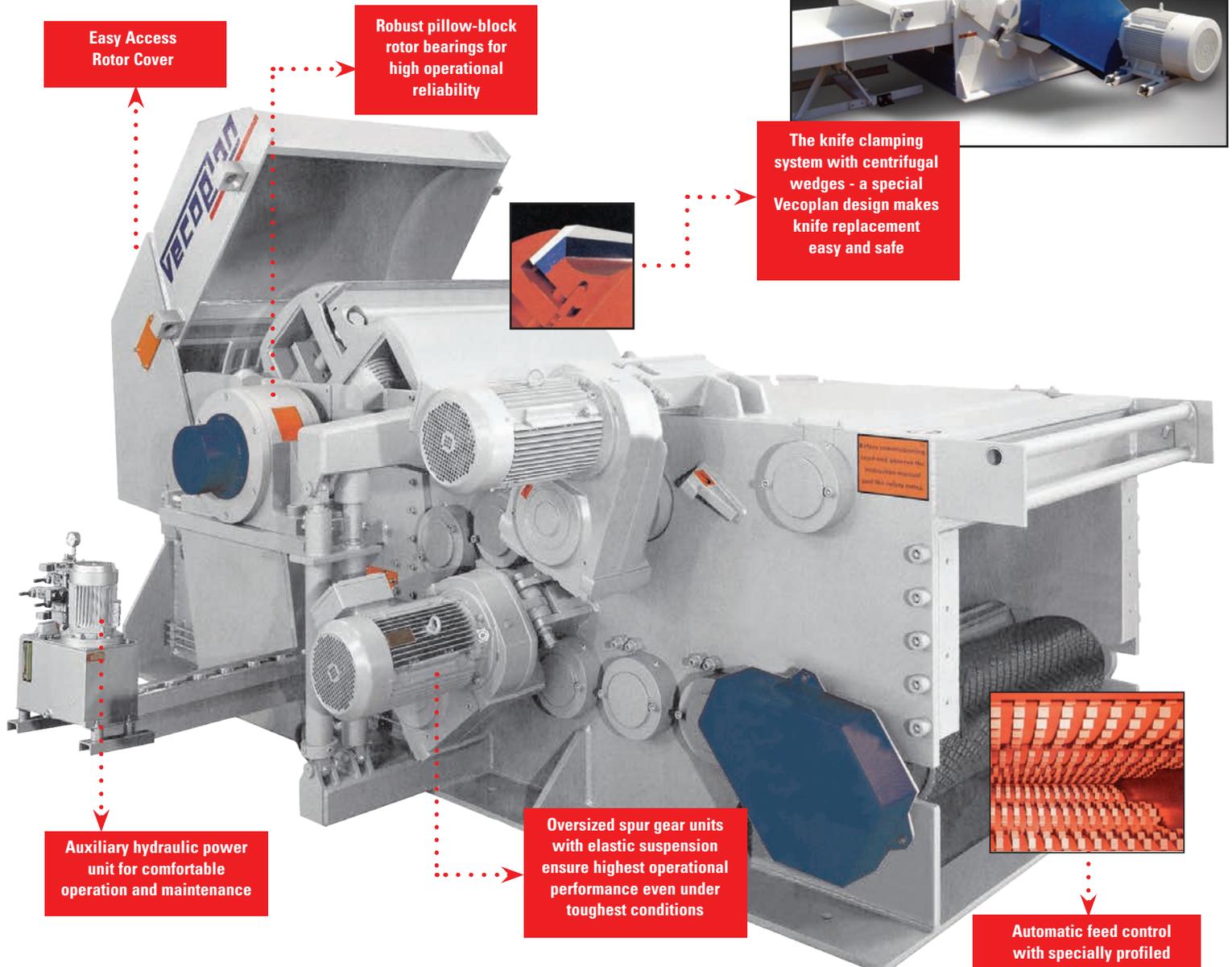


# Primary Chippers

## The First Step In An Efficient Alternative Fuel Production System

In order to begin processing the raw materials for an alternative fuel production system, valuable feed stock such as slabs, edgings, off-cuts and butt ends, a robust pre-shredding system is required. Vecoplan engineers and manufactures a wide range of primary chippers designed to process these raw materials reliably and cost effectively. Built to withstand the severe nature of heavy daily use and abuse, Vecoplan Chippers are designed with oversized components and with low maintenance features. Wear items are easy to access and can be changed quickly with minimal downtime.

Vecoplan chippers come standard with a 16' vibratory infeed conveyor (other lengths available) which provides a continuous stream of feedstock. These conveyors are interlocked with the chipper via a PLC (Power Logic Control) control panel programmed specifically for your requirements, which automatically meter-feeds material into the chipper guaranteeing the most efficient process available.



- High Quality Chip for the Pulp & Board Industries
- Throughputs of 1 - 80 Tons/Hr.
- ISO 9001 Certified, Highest Quality Standard
- Proven & Tested Since 1969

- Minimum "Overs"
- Optimized Chip Geometry
- Heavy, Rugged Construction
- Complete Systems - Screens, Discharge Systems, Conveyors

Automatic feed control with specially profiled and hardened feed rollers (16' vibration infeed conveyor included)

# Primary Shredders

## Ultimate Throughput

Vecoplan Hurricane Series feature a unique rotor design utilizing two solid (not segmented) rotor shafts which use inexpensive, replaceable cutting teeth. The cutting rotors interact with a shock-absorbing bedknife which provides protection from high tramp-metal content. The shafts are spaced further apart than those in conventional shredders, thus allowing large, bulky items to be processed more readily.



**HURRICANE**  
...the next generation in pre-shredding

## Replaceable Cutters

Unique in the industry, Vecoplan's replaceable cutter design minimizes downtime and maintenance costs. Cutters can be replaced or rotated by loosening two bolts. A complete cutting tool exchange can be performed in about two hours. Conventional shredders require extensive downtime, welding and maintenance expense just to maintain cutters.

## Counter Knife

Hurricane Shredders feature a counter knife positioned in-between the dual cutting rotors and bolted to the bed of the cutting chamber. The cutters on both rotors mesh precisely with the sharp serrated edges of the counter knife. This provides a smaller, much more consistent shredded particle size than traditional shredding. It also provides quick and easy replacement when they wear out, unlike shredding tables that require time consuming and costly resurfacing.

## Sizing Grates

Integrated sizing grates insure flexibility and control of shred size.



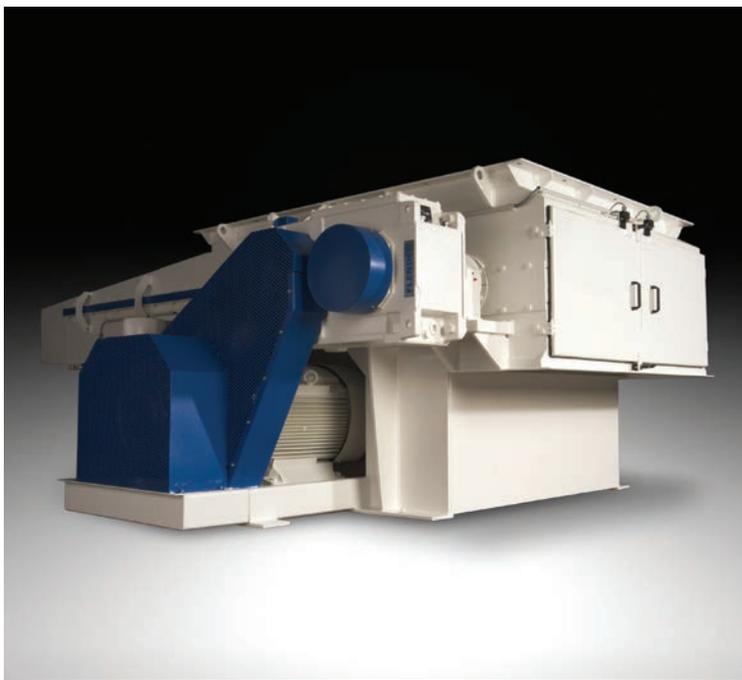
## Access Doors

Vecoplan's unique design allows for easy access to the cutting chamber for removal of foreign material via dual access doors, or shutters, which are hydraulically operated. Electrical and mechanical interlocks insure maximum safety. Foreign material can be removed with a full hopper, eliminating the need to empty the hopper to clear the foreign material. The doors also allow direct access to wear items, reducing downtime and maintenance costs.



# Secondary Shredders

## Get More Value From Your Feedstock

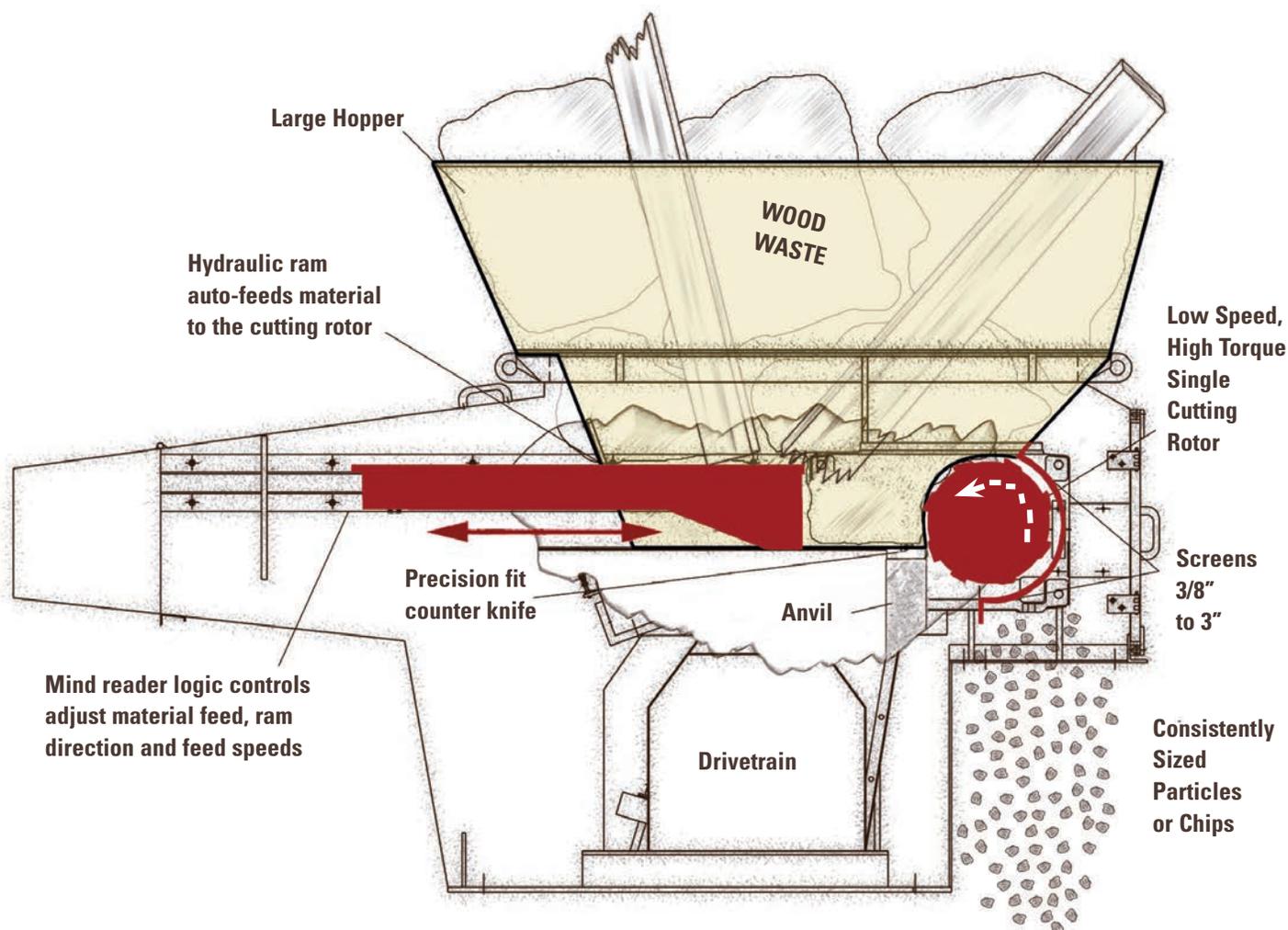


Vecoplan primary chippers produce a consistent chip suitable for most applications, however, additional processing of the raw material will maximize your profits by making the end product more consistent and uniform. Vecoplan re-shredders excel at producing the most homogenous end product possible.

Vecoplan designs and manufactures several models of shredders, including single-shaft and multiple shaft machines. Vecoplan shredders guarantee a consistent particle size by utilizing "quick change" screens in sizes from 3/8" to 4".

Vecoplan single-shaft machines use a hydraulic ram feeding system which controls the feed of material to the cutting rotor, insuring the most efficient process possible.

As with all Vecoplan equipment, these shredders are designed to withstand extreme duty usage and, of course, with easy of use and maintenance in mind.



# Material Conveying

## Getting The Material Where You Need It

In addition to engineering and manufacturing the finest shredding equipment available, Vecoplan applies the same philosophies to the design and manufacture of a comprehensive range of material handling equipment. Vecoplan's experience in a wide variety of applications means that the right material handling system for your needs will be designed and manufactured to your specifications. All of our conveyor systems are of heavy-duty construction to reduce maintenance and extend the life of the equipment.

### Standard Belt Conveyor Covers

In addition to our extensive standard selection, Vecoplan designs and manufactures belt conveyors to custom specifications for virtually every industry. We offer a full spectrum of styles, options and configurations, from individual belt conveyors to complete systems, as well as a variety of accessories that accompany them.

### Drag Chain Conveyors

Vecoplan drag-chain conveyors offer the ideal solution for difficult material conveying. The modular design allows for limitless adjustments in horizontal, vertical and diagonal installations.

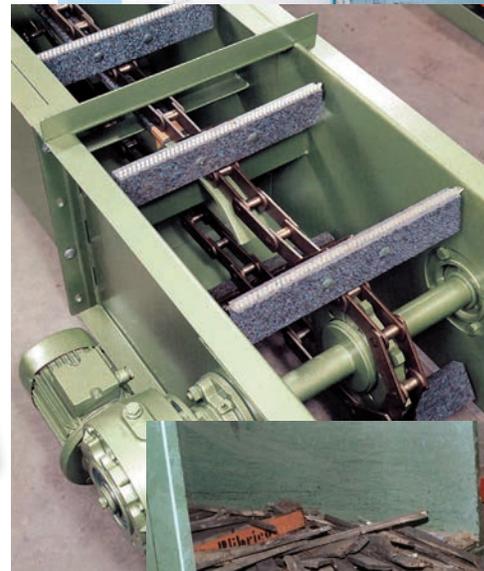
Motorized slides, outlets and funnels provide variable and accurate metering to different storage locations, balers, or other down stream equipment.

Offering the most flexibility in a durable, rugged package, Vecoplan Drag-Chain Conveyors offer made-to-order solutions for nearly every conveying problem.

### Vibratory Conveyors

Vecoplan's standard line of vibratory conveyors, combined with Vecoplan's custom design expertise, provides an infinite range of options and configurations to meet any application need. Precision engineered, and manufactured of heavy-duty components to the highest quality control standards, Vecoplan vibratory conveyors eliminate installation problems, operate flawlessly and minimize maintenance costs.

Vecoplan vibratory conveyors are constructed with extreme-duty components. Powerful motors are oversized to ensure optimal performance under heavy loads. Heavy-duty coil springs are designed with durability and long wear in mind.

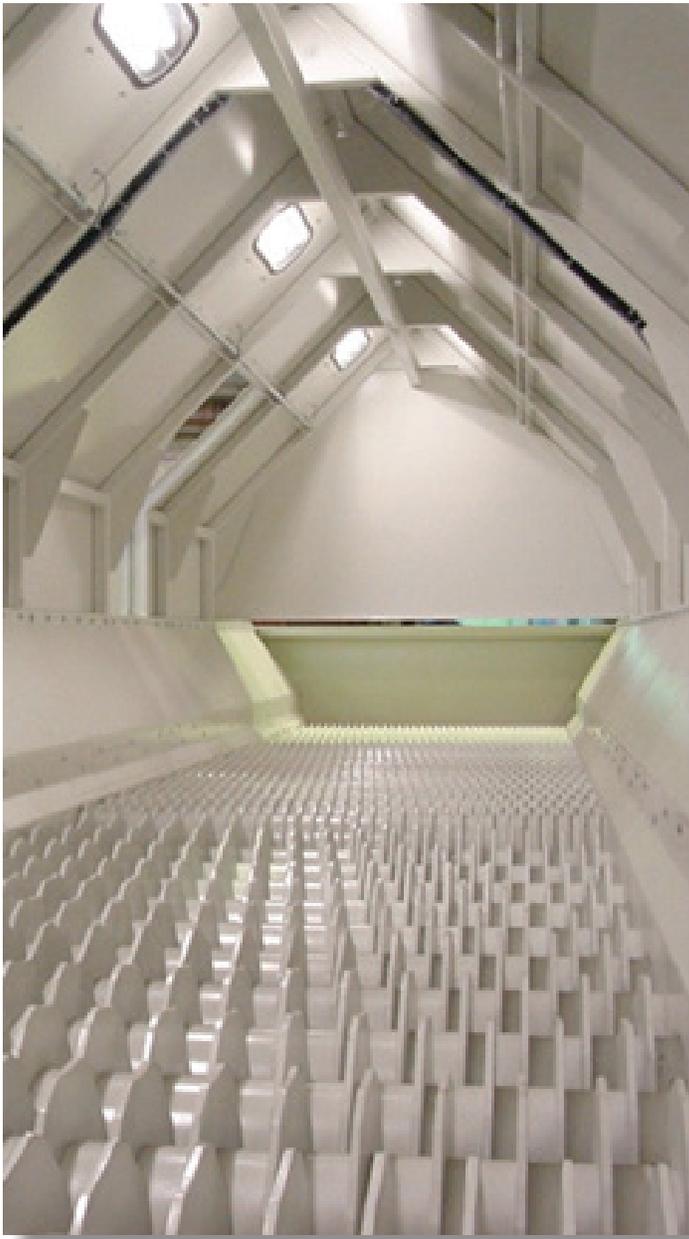


# Screening Technologies

## Insure Consistant And Uniform End Product

### Oscillating and Vibratory Screeners

Vecoplan offers a wide range of screening technologies for the screening of up to four different fractions within one aggregate. Our screening equipment allows removal of coarse pieces and integration in conveying sections, all with efficient screening on minimum surface.



### Disc and Star Screeners

For the efficient separation of fine particles.



### Trommel Screens

For medium capacities up to 100 cu. m. per hour. Installation above storage boxes is possible, with up to four fractions going directly into silos.

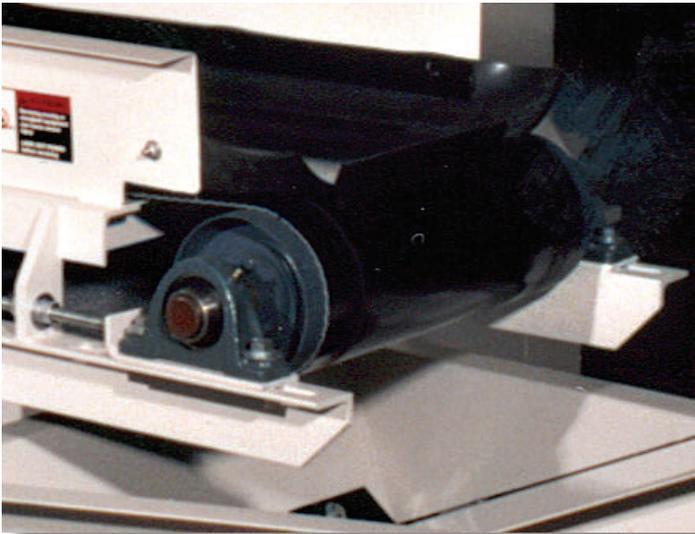


# Separation Equipment

## Guarantee Clean End Product

### Cross Belt Magnets

Vecoplan cross belt magnetic separators remove ferrous contaminants such as tramp metals, including nuts, bolts, wire and banding from material being processed. Cross conveyor magnets provide a large area of coverage delivering a continuous self cleaning operation. A durable cleated belt transports ferrous contaminants into a collection bin.



### Rotary Drum Magnets

Vecoplan Rotary Drum Magnets are used when a high volume of material needs to be separated, and when the separation process is too abrasive for cross belt magnetic separation. Drum separators provide a larger operating surface increasing the material throughput rate, and can have either an internal permanent or electro magnet system depending on the application.



### Magnetic Head Pulleys

Vecoplan magnetic head pulleys provide a convenient method of ferrous separation with virtually no footprint at all. Incorporated into the conveyors themselves, magnetic head pulleys separate ferrous materials as they travel along the end of the conveyor, and are then dropped into a separate container.



### Eddy Current Separation

Designed for the separation of non-ferrous metals, Vecoplan Eddy Current Separators efficiently separate aluminum, copper and magnesium from waste streams. Eddy Current Separators are increasingly used wherever separation of non ferrous metals from a product stream can give a more valuable product, whether the end use is in recycling, reduction of waste, raw material production or any other process where separation is beneficial.

# Loading and Unloading Systems

## Efficient Handling Of You End Product

With decades of experience across a gamut of industries and applications, Vecoplan is uniquely positioned to provide loading and unloading solutions for large volumes of bulk material on a continuous basis. Vecoplan systems deliver balanced loading of trucks and containers through lifting, sinking, and movable chain conveyors. Complete filling and emptying of storage containers is achieved easily, economically, and automatically.

Vecoplan loading and unloading conveyors can be combined with nearly every other material transportation system.



Whether round or square, Vecoplan chain discharge devices are the ideal solution for virtually every work load and every container.





# Vecoplan - Your Total System Solution

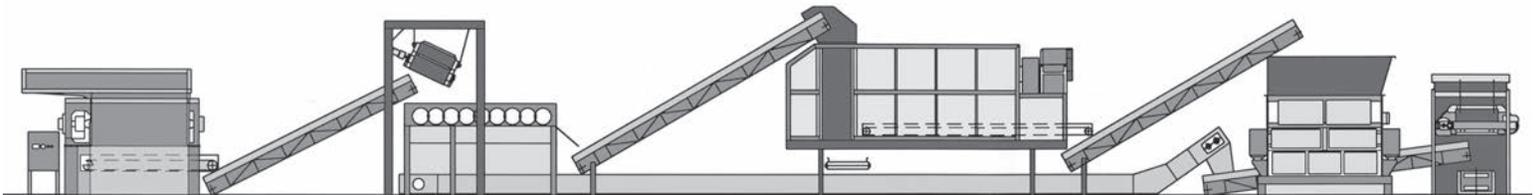
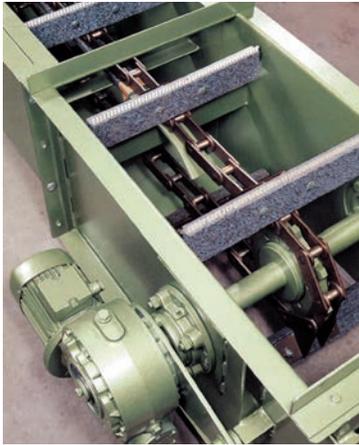
Vecoplan is known for providing complete turn-key solutions.

We provide complete material handling systems and design engineering including conveyors, pneumatics, metal detection and separation. American electrical control panels and components are available and may be fabricated to your specifications.

Vecoplan understands that installing new equipment can disrupt production operations. New equipment can create new demands on your present electrical system. That's why we include a review and analysis of your present electrical components.



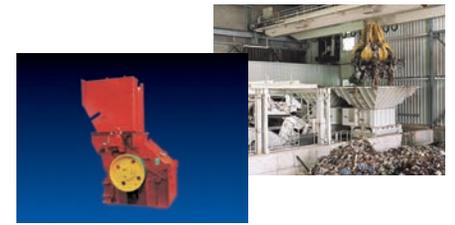
Vecoplan will help you plan for the additional equipment and prepare your present system to minimize any disruption to your operation.



## Our Complete Range of Products



- Single and Multiple Rotor Shredders
- Conveying Technologies • Air Classification Systems
- Refiners • Rotary Trommels • Vibratory Feeders
- Oscillating, Roller and Star Screeners
- Ferrous and Non-Ferrous Detection and Separation
- Bulk Material Handling, Metering and Loading
- Turn-key Recycling and Waste Processing Systems



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