Recycling Industry

The Number 1 Solution in Mixing for the Recycling Industry!

Date of Sale: 00/00/00

Describe your location by landmark or area of town.

Explore 100's of custom designed mixer applications for the Recycling Industry.

Marion Mixers, Inc.

3575 3rd Ave
PO Box 286
Marion, IA 52302
319-377-6371
www.marionmixers.com

Rubber Mulch Coloring & Drying

Case Study

Marion Mixers, Inc.

Mixing Recycled Tires Into Playground Mulch

Mix Recycled Tires Into Playground Mulch

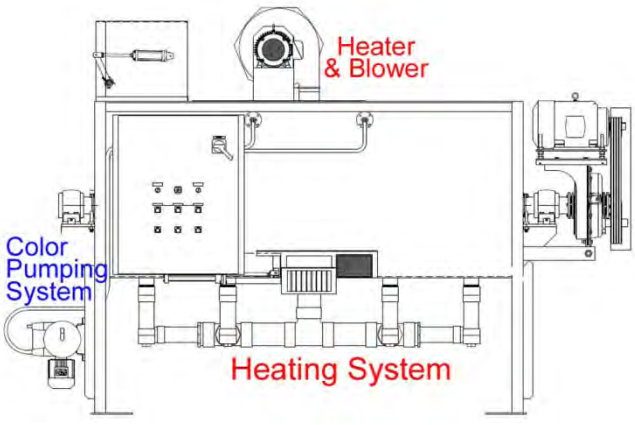
A Midwestern tire recycling company chose Marion Mixers to design and build a batch mixer that would coat ground chunks of car tire with a latex colorant. After applying the colorant, the mixer must then dry the materials so the colorant can't rub-off during the bagging process.

The company's goal was to turn 80,000 scrap car tires per year into upscale landscape mulch for use in playgrounds.

The customer brought samples of both the ground rubber (<1¼") and the colorant to our new test lab. Thoroughly coating the rubber chunks was relatively simple. Drying the rubber took a bit more resolve.

The equipment now in operation today includes a mixer, a batch sequencing control panel, a liquid metering system, a forced air drying system and two bulk material conveyors. Chunks of ground rubber are loaded into the mixer from pre-weighed super-sacks. Undiluted, latex paint is volumetrically metered into the mixer. The mixer evenly coats the rubber. A variable speed controller slows the speed of the mixer shaft to avoid scrubbing the latex off the rubber chunks during the drying cycle.

Air is then blown through the materials creating a fluidized bed of ingredients to prevent the materials from sticking together during the drying process. A pneumatically actuated slide gate then discharges the materials onto a conveyor, leading to the bagging line. Each 15 minute batch cycle produces 2000# of colored playground mulch that is dry to the touch.



Mixing Recycled Fly Ash

Case Study

Marion Mixers, Inc.

Mixing Recycled Fly Ash

Applications for Portland Cement

Fly Ash Use in Portland Cement

Electricity is the fuel of the “Information Age” and power plants that burn coal account for more than half of the electricity produced in the United States. Power plants also produce residual materials like fly ash (which is captured from the exhaust of the boiler) and bottom ash (which is heavier and falls to the bottom of the boiler). These “coal combustion products” were originally treated as waste and disposed of in landfills.

The use of recycled fly ash in cement improves concrete performance, making it stronger, more durable, and more resistant to chemical attack. Fly ash particles are smaller and almost totally spherical in shape, allowing them to fill voids, flow easily, and blend freely in mixtures. Additionally, when water is added to Portland cement, it creates two products: a durable binder that glues concrete aggregates together and free lime. Fly ash reacts with this free lime to create more of the desirable binder. The reuse of fly ash also creates significant benefits for our environment. Over the past decade Marion Mixers has partnered significantly with this industry.

*Heavy duty industrial machines involving continuous mixing operations **require** durability, because of sustained long-term production cycle.*

Marion Mixer is the correct choice when production cycles require the “ultimate durability” in continuous mixing operations. Our equipment is designed to handle the rough, abrasive world of mineral processing.

Rugged Cast Arms that are Mechanically Fastened to the Agitator Shaft

Solid Agitator Shafts with Machined Keyways

Dependable Hp Calculated Motors & Power Train

A multi-national building materials manufacturer chose Marion Mixers to supply commercial-grade cement mixing equipment throughout their plants involving continuous blending of cement, fly ash, ground slag and silica. Our rugged and dependable design coupled with our years of experience custom design mixing equipment for this type of application were some of the reasons this manufacture chose Marion. Our commercial, industrial mixers typically feature the following:

- Stainless, carbon or abrasion resistant steel construction
- Rugged cast arms and caps in stainless or carbon steel
- Solid agitator shafts with machined keyways
- Adjustable stainless, hardened carbon steel paddles
- Field replaceable, abrasion resistant trough liners
- Choppers with stainless steel or Ni-Hard cutter heads
- Machine steel or cast iron seal housings
- Side gate, butterfly or knife-gate discharge valves
- Plasma cut bearing plates, gussets and lifting lugs
- Bar grates with hinged doors and covers
- Stainless steel mixers are available to handle caustic, corrosive or alkaline ingredients

Contact Us and a Sales Engineer specializing in Recycling and Waste Product mixing will answer your questions and assist you on your project.

Mixing Cellulosic Waste Products

Case Study

Marion Mixers, Inc.

Mixing Cellulosic Waste Product

Into Renewable Energy Sources

Midwestern Lab Chooses Marion Mixers

Marion Mixers partnered with a Midwestern lab to custom design and manufacture mixing equipment used in testing and manufacture of biomass renewable energy sources.

The lab is working to reduce our independence on foreign oil, improve our air quality, and support rural economies. Marion Mixers provided this organization a free test mixer for 21 days to test the conversion of a biomass application into a renewable energy source. The test proved successful.

Marion Mixers then custom designed a production mixer to be used in a scaled up manufacturing process. The manufacturing process involved the batch blending of ground corn waste product consisting of corn stalks and husk (no larger than walnut-size composition). Acid was then added to the ground material via a controlled, liquid-spray manifold system designed for the mixer. This blended consistency of product is similar to lumpy mashed potatoes. The mixed application was then shaped into briquettes for a renewable energy source.

Marion Mixers is the "brand of choice" for horizontal mixing and blending, batch and continuous process equipment. Our globally-esteemed company is recognized as the innovation leader in custom-designed mixing applications.

Biomass Cellulosic Mixer features include interior product contact surfaces polished and ground to #4 DA sanitary finish, T316 stainless steel construction, 10 cu. ft. mixing capacity, 2-7/8" dia. solid main shaft with all welded double ribbon agitator, pillow block ball bearings, easy-clean split adjustable stuffing box shaft seals, 5" dia. butterfly discharge valve, liquid spray bar manifold with (2) spray nozzles, 10 Hp inverter duty motor, and a shaft-mounted torque arm reducer drive assembly. Also includes welded arms with adjustable paddle blade agitator and motor control panel with mixer start/stop and emergency stop suitable for 460 V service.

For nearly two decades Marion Mixers has been a leader in custom design horizontal mixing equipment for the waste conservation and recycling industries such as:

- Compost and Landfill Solutions
- Wood Scrap Recycling
- Recycled Rubber Products
- Mulch and Ground Cover
- Plastic Bottles – reground plastic
- Waste Sludge Reclamation
- Recycled Fly Ash Waste

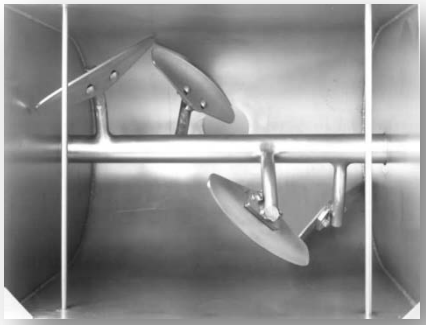
Features Gallery

10 cu. ft. U-Shaped Trough Mixer with 460 V Service Control Panel

5” dia. Butterfly Discharge Valve; Fast-Cleaning, Lever-Actuated Discharge

Welded Arm/Bolted Blade Field-Adjustable Paddle Style Agitator

Shaft-Mounted Torque Arm Variable Speed Reducer Drive Assembly



Dependable 10 Hp Inverter Duty Motor - “A True Workhorse”

Easy-Clean Split Adjustable Stuffing Box Seals

Biomass Energy Basics

Sources of Biomass

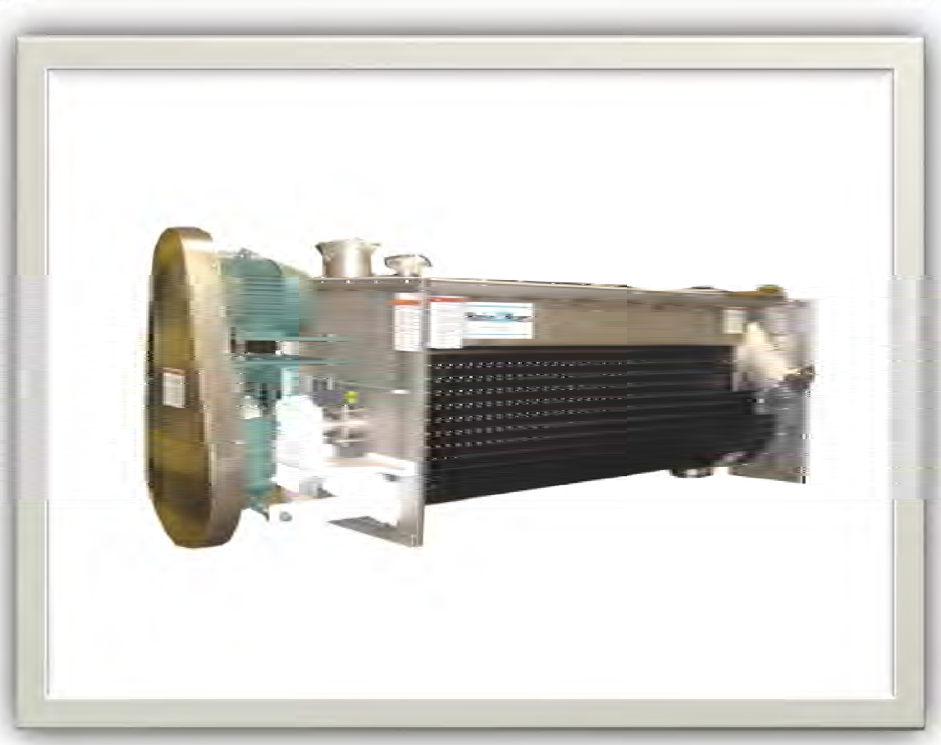
We have used biomass energy or "bioenergy"—the energy from plants and plant-derived materials—since people began burning wood to cook food and keep warm. Wood is still the largest biomass energy resource today, but other sources of biomass can also be used. These include food crops, grassy and woody plants, residues from agriculture or forestry, and the organic component of municipal and industrial wastes. Even the fumes from landfills (which are methane, a natural gas) can be used as a biomass energy source.

- The use of biomass energy has the potential to greatly reduce greenhouse gas emissions. Burning biomass releases about the same amount of carbon dioxide as burning fossil fuels. However, fossil fuels release carbon dioxide captured by photosynthesis millions of years ago—an essentially "new" greenhouse gas. Biomass, on the other hand, releases carbon dioxide that is largely balanced by the carbon dioxide captured in its own growth (depending how much energy was used to grow, harvest, and process the fuel).
- Biomass energy supports U.S. agricultural and forest-product industries. The main biomass feedstocks for power are paper mill residue, lumber mill scrap, and municipal waste. For biomass fuels, the feedstocks are corn (for ethanol) and soybeans (for biodiesel), both surplus crops. In the near future agricultural residues such as corn stover (the stalks, leaves, and husks of the plant) and wheat straw will also be used. Long-term plans include growing and using dedicated energy crops, such as fast-growing trees and grasses that can grow sustainably on land that will not support intensive food crops.

- The use of biomass can reduce dependence on foreign oil because biofuels are the only renewable liquid transportation fuels available.

  Contact Us and a Sales Engineer specializing in Recycling and Waste Product mixing will answer your questions and assist you on your project.

Reground PET Plastic for Bottles



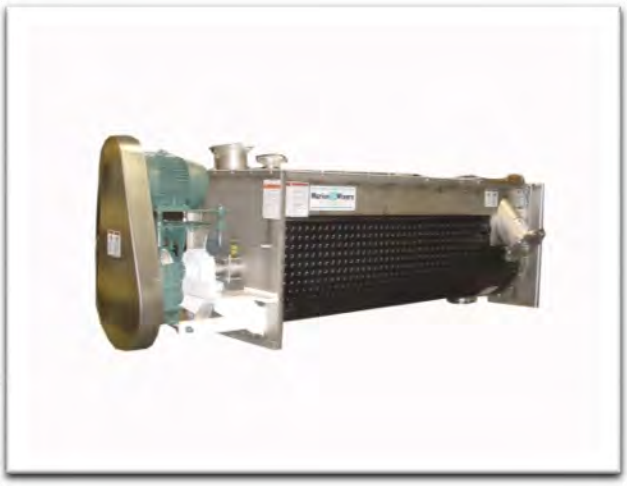
Case Study

Marion Mixers, Inc.

Continuous Washing of Re-Ground Polyethylene Plastic for Recycled Bottles

World plastic consumption is expected to increase by 43% during the next two years with an estimated output of 258 million tons of plastic by the year 2010. Twenty years ago consumption of plastic in the US totaled 25 million tons.

Over the past 20 years Marion Mixers has provided the Recycling Industry with numerous mixing solutions for plastic recycling with custom designed processing equipment.



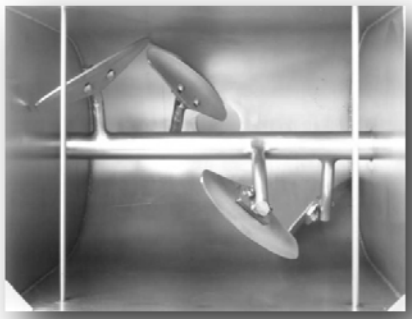
Recycled Polyethylene plastic (PET) commonly found in most plastic bottles and containers is reground and used as an ingredient in the processing of new plastic products. In order for these plastic particles to be used they must be thoroughly cleansed of pre-existing contaminants.

Marion's Continuous Washing Mixer
features a solid mainshaft with welded arm/bolted paddle agitator arranged in continuous flow, integral dimpled steam jacket, pillow block mainshaft ball bearings, adjustable stuffing box mainshaft seals, 8" dia. Overflow discharge port, 5" butterfly clean-out valve, 304 SS finish, and a 7-½ Hp shaft-mounted torque arm reducer arm assembly.

For nearly two decades Marion Mixers has also been a leader in custom design horizontal mixing equipment for these waste conservation and recycling industries:

- Compost and Landfill Solutions
- Wood Scrap Recycling
- Recycled Rubber Products
- Mulch and Ground Cover
- Plastic Bottles – reground plastic
- Waste Sludge Reclamation
- Recycled Fly Ash Waste

Features Gallery



Continuous Mixer with Overflow Outlet Stub for Process Washing of Plastic

Style E Split Seals for Frequent, Quick Disassembly & Clean Out

Welded Arm/Bolted Blade Field-Adjustable Paddle Style Agitator

Shaft-Mounted TXT-425 Torque Arm Variable Speed Reducer Drive Assembly

Flanged Custom Designed Product Inlets for Processing Requirements

U-Shaped Dimple Jacketed Insulated Trough for Regulating Temperature

The Future of Biopolymers

In addition to recycling, the plastics industry is also working to develop degradable products that would reduce disposal burdens. With Marion Mixer's extensive application library which spans 70 years of engineered applications we likewise are exploring custom designed solutions with mixing biopolymers for biodegradable products.

Plastics are expected to continue to replace traditional materials like steel, wood and glass. Experts in the field believe bio-plastics could capture up to 4.8% of the total plastics market by the end of 2010.

As petroleum-based products continue to diminish biopolymer-based products derived from renewable resources will continue to rise and provide alternatives for many industrial applications. Marion Mixers is poised for the future of biodegradable processing as an experienced mixing equipment vendor.

Contact Us and a Sales Engineer specializing in Recycling and Waste Product mixing will answer your questions and assist you on your project.

Incentives for Recycling

There are many federal, state and local incentives for recycling. The US Environmental Protection Agency publishes by state, the tax incentives for the purchase of certain types of equipment used in processing and manufacturing. Visit this site for details http://www.epa.gov/jtr/bizasst/rec-tax.htm

The US Government is making it cheaper to buy capital equipment in 2009

BUSINESS INCENTIVES

The Stimulus Act has *extended* the $250,000 amount for capital expenditures incurred for 2009 under the Section 179 tax code involving capital expenditures. Use our Section 179 calculator on the Marion Mixers website under (About Marion Mixers) to calculate your savings.

Bonus depreciation - The bonus depreciation provision allowing additional first-year depreciation of 50% of the asset cost has also been extended for 2009.

ENERGY INCENTIVES

The Stimulus Act has created a new 30 percent credit for the construction of manufacturing facilities for advanced energy property – renewable energy, energy storage, energy conservation, efficient electricity distribution/transmission, manufacturing facilities to refine/blend renewable fuels, production facilities for renewable energy, energy conservation technologies, plug-in electric drive motor vehicles, and carbon sequestration. This 30 percent tax credit is a significant tax incentive for manufacturers to develop and invest in facilities to manufacture the high technology equipment necessary to enable a wide array of energy efficient technologies and processes.

Marion Mixers has been designing and building mixers for the energy, recycling & waste management industries and poised for growth opportunities due the stimulus.

Recycling Fly Ash

Greater than 50% of the electricity produced in the United States is generated from coal. For every 10 tons of coal, 1 ton of coal combustion products or CCP's are produced. The American Coal Ash Association (ACAA) estimates 120 million tons of CCP are produced in the United States each year. Conditioning and recycling CCP products is a huge opportunity for Marion Mixers.

Fly ash is one of the by-products created during the coal burning process that has commercially redeeming value. An estimated 68 million tons of fly ash are generated each year. However, only 18 million tons are currently being recycled. 50 million tons of unprocessed ash are being deposited into landfills or storage lagoons each year.

Fly ash is classified under the ASTM standard C618 in two forms.

Class F fly ash is produced from anthracite or bituminous coal that is typically found in the Eastern United States. This ash has pozzolanic properties. In the presence of water and free lime, the ash will react into cementitious compounds.

Class C fly ash is created when burning lignite or sub bituminous coal that is typically found in the Western United States. In addition to having pozzolanic properties, this ash has some self-cementing properties. This ash can harden and gain strength in the presence of water alone.

Fly ash is a known carcinogen and is therefore a regulated substance. Processing and transporting fly ash must be accomplished without the release of fugitive dust. Marion Mixers has experience processing both Class F and Class C ash. Marion's batch and continuous style mixers are ideally suited for processing ash while containing fugitive dust.

Applications include:

- Portland cement production
- Additives for wetted concrete products
- Fertilizer from neutralized sewage sludge
- Gypsum from flue gas desulphurization systems
- Conditioned fly ash without fugitive dust for structural fills & embankments and stabilization of waste materials

Future Trends in Biodegradables

Biopolymers are a class of polymer produced by living organisms. Starch, protein and peptides are all examples of biopolymers, in which the basic building blocks are sugars, amino acids and nucleic acids. Unlike petroleum based polymers, biopolymers break-down and biodegrade over time.

Because biopolymers are biodegradable and are derived from renewable resources, they are strong candidates for many industrial applications. The major beneficiaries of biopolymers are industries such as: food-processing, cosmetics, pharmaceuticals, packaging, paper and textiles. Biopolymers can be used as stabilizers, thickeners, binders, dispersants, lubricants, adhesives and drug-delivery agents.

Trends & Applications

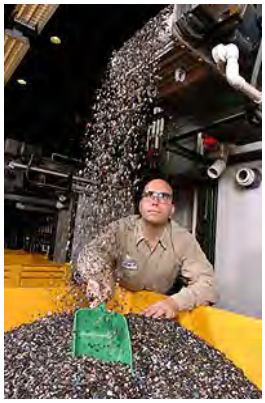
- World plastics consumption is expected to increase by 43% during the next two years (180 million tons currently to 258 million tons in 2010.)
- Plastics are expected to continue to replace traditional materials like steel, wood and glass.
- Experts in the field believe bio-plastics could capture up to 4.8% of the total plastics market by the end of 2010.
- Depending on oil prices, R&D funding and social pressure to reduce green house gases, the use of biopolymers could explode in the next two years to 12.4 million tons in the year 2010.
- Products capable of replacing 50 percent or more of the petroleum-based content of conventional plastic resins with renewable resources such as cornstarch, tapioca or other starches.
- Bio-Polymer drainage trench methods used in
    - Landfill leachate collection
    - Reactive barriers

The Recycled Products Explosion

The media is in a frenzy with the “green revolution”. This makes us think and act “green.” Hybrid cars are designed to “reduce our dependence on foreign oil” by providing greater fuel mileage. Investments in sources of renewable energy like ethanol and wind generation are supposed to “reduce our carbon footprint”. Eating less red meat will reduce the number of “methane-producing cattle that cause global warming”.

Making the world “green” is not new to Marion Mixers. For decades we have designed and built process equipment for use in recycling plastics, minerals, rubber, paper and bio-ingredients. Transforming recyclable materials into new, marketable products is not only “green” for the environment; it generates “green” for you. Converting a waste stream into a profitable end-use product often makes the decision to purchase capital equipment easy. Marion Mixers has been fortunate to participate in a large number of recycled projects through the years.

- De-dusting fly-ash for engineered sub-soil construction.
- Coating ground concrete for use as landscape materials.
- Blending lawn clippings and wood chips with sewage sludge for compost.
- Standardizing colored glass fragments for beer bottles.
- Washing shredded plastic soda bottles for re-molding.
- Heating recycled foam rubber for carpet backing.
- Coating ground rubber to turn car tires into railroad crossings.
- Coating recycled asphalt to create bagged, cold-patch asphalt
- Neutralizing sewage sludge with reactive fly-ash to create fertilizer.
- Blending paper fiber into insect and rodent bait.



Proof Positive

- Recycled products are usually processed in large volumes. This results in large mixers with big horsepower.
- Recycled products are often unique in nature requiring validation testing. Marion offers a three week test period with free use of one of our test mixers to validate your application.
- Recycling processes are often times continuous rather than batch. Marion’s bolted-arm / bolted-blade agitator designs offer the most flexible processing solutions of any of our competitors.

- Recycled products are typically abrasive in nature. This results in heavy-duty mixer designs with the opportunity for future replacement parts business.
- Processing of recycled products is often times heavily regulated for environmental agencies. This typically results in a willingness on the customer's part to pay for specialized equipment that is designed to meet their regulatory needs.

Incentives for Recycling

There are many federal, state and local incentives for recycling. The US Environmental Protection Agency publishes by state, the tax incentives for the purchase of certain types of equipment used in processing and manufacturing. Visit this site for details. http://www.epa.gov/jtr/bizasst/rec-tax.htm

The US Government is making it cheaper to buy capital equipment in 2008

The Economic Stimulus Package offered by the US Government is designed to instill a sense of urgency in our customers to buy capital equipment in 2008. The tax incentive package contains increased limits on the write-off of qualified capital equipment as well as accelerated depreciation for certain qualified property purchased in 2008. A Marion mixer is a qualifying capital purchase under both tax provisions.

- Section 179 expense of newly acquired qualifying assets would double. This would allow companies an immediate write-off of qualifying equipment up to $250,000 (up from $125,000). This benefit is phased out dollar for dollar by eligible asset purchases in excess of $800,000 during the 2008 tax year.

- 50% special depreciation allowance for certain qualified property purchased in 2008. This provision has no limit on the size of the company or the amount of capital expenditure.

Waste Management & Recycling

Decades of Experience

Helping to make the world a “greener place” isn’t new to Marion Mixers. For decades we have designed and built recycling process equipment for the Food, Plastics, Chemical, Minerals and Energy Industries. Transforming recyclable materials into new and marketable products is not only “green” for the environment; it generates “green $” for our customers. Converting a waste stream into a profitable end-use product often makes the decision to purchase capital equipment more justifiable.

Marion Mixers has participated in numerous applications for the Recycling Industry, including:

- Animal waste – rendering & animal reclamation
- Blending lawn clippings and wood chips with sewage sludge for compost
- Blending paper fiber into insect and rodent bait
- Cellulosic feedstock for heat source
- Coating ground concrete for use as landscape materials
- Coating ground rubber to turn car tires into railroad crossings
- Coating recycled asphalt to create bagged, cold-patch asphalt
- Compost
- Continuous mix of centrifuged spent mash, thick syrup, dryed recycle: following alcohol production
- De-dusting fly-ash for engineered sub-soil construction
- Fly ash and sewer sludge
- Fly ash with Portland cement
- Ground asphalt
- Ground cellulose material
- Heating recycled foam rubber for carpet backing
- Mixing paint sludge with sawdust for solid landfill disposal
- Mulch and ground cover
- Neutralizing sewage sludge with reactive fly-ash to create fertilizer
- Plastic bottles – reground plastic
- Processed sludge with lime
- Recycled rubber products
- Rubber pellets for fuel
- Sludge mixing tanks
- Standardizing colored glass fragments for beer bottles
- Washing shredded plastic soda bottles for re-molding
- Wood recycling – wood pulp and wood floor