

Roto-Grind Becomes Grinder of Choice for Carolina Plastics Recycler *Ability to perform in demanding environment cited as reason for switch*

To hear Mark Askew tell it, the secret to becoming one of the more successful recyclers of polyester fiber in the Mid-Atlantic is really no secret at all. Keep abreast of changes in technology and, when necessary, replace existing processing machinery with newer, better performing equipment. It's a strategy that has served his company, Industrial Recovery & Recycling (IRR), well for 29 years and recently resulted in the purchase of four Roto-Grind 110H Grinders from Granutech-Saturn Systems.



Taking it All In

IRR, a plastics recycler serving the central South Carolina region, takes in a broad range of material, including film, non-woven, purgings, etc. According to Askew, the majority of material coming through his facility of late has been fiber and purge waste, received in every container imaginable.

"We get material from all over the world and it arrives in everything from luggers to bales to gaylord boxes to supersacks. In this business, we really can't be picky, so we take material in whatever form it comes, and simply dump it into the Roto-Grind for initial downsizing."

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Making the Old New Again

Roto-Grind doubles Western New York company's granulator performance, reduces downtime.

Like most plastics recyclers, MacNeil Polymers relies heavily upon its granulator performance to keep production levels up. And, like a growing number of plastics recyclers, the Western New York company has also come to realize that a combination of high wear and the risk of damage from metal contamination can be serious factors.

"Because our material comes primarily from outside sources, we have to be extremely careful what might be mixed in with the plastic," says Adrian Carless, the company's general manager. "That, and the fact that we were looking for a way

to reduce our reliance on hand cutting of some of the larger material steered us toward Granutech and its Roto-Grind processor. The results since installation have been impressive: at least a two to one improvement in our granulator performance and a marked savings in both time and labor."

Garbage In ...

Carless says the reason metal and other types of contamination are introduced in the first place is due in part to a perception problem.

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Roto-Grind Replaces Grinder and Shredder — and Still Ups Production.

Houston-area processor identifies problem area, sees dramatic upturn in hourly rates with new grinder.

Question: When is one greater than two? Answer: when it is the number of pieces of equipment needed to boost production throughputs in a processing operation. That was the situation which Textrude, Inc., found itself facing recently and the one unit in question — a Roto-Grind 110H — did, in fact, take the place of two other existing pieces of processing equipment.

For Charlie Nettles Jr., the need to make changes in his Channelview, Texas, operation didn't appear overnight. Rather, it made itself known over a long period of time. In business since 1952, his company, Textrude, Inc., was already successfully extruding PVC profiles, then expanded that operation to include polyethylene blown film. But, according to Nettles, the need for a more streamlined operation, combined with a desire to lower operational costs, prompted a look at alternative size reduction methods.

"We do between a sizeable volume of material annually, the majority of which is polyethylene purgings and chunks. In our operation — particularly in preparation for blown film processing — we encounter a good deal of larger chunks of polyethylene. Those are the result of both our own processing and purchases from outside. Because so much of that is oversized, it needs to be brought down to a manageable size before any pelletizing can be done. That's where we first identified an area that could be improved upon."

Until recently, Textrude's method for getting that oversized material down to size was rudimentary and labor-intensive. As a result, it was also inefficient, according to equipment manager John Griffin.

"Typically, on the larger chunks — and we often get chunks as large as 6-foot by 6-foot by

3-foot wide — we would first have a man quarter them using a manual saw. Once quartered, material would go into a guillotine shear or band saw, then into a grinder. Essentially it was a three-man operation just to get it ready."

Once material was sufficiently downsized, it was routed to a 200 hp hog grinder or a 100 hp shredder. To streamline that facet of the



operation, Textrude replaced the hog grinder and shredder with a Roto-Grind Model 110H. The result of doing so has been nothing short of amazing, says Nettles.

"The Roto-Grind has been an impressive performer for us," he says. "We have replaced several pieces of equipment with the single Roto-Grind and still upped production. With the old line configuration we were getting throughputs of about 1,000 to 1,500 pounds

per hour. The Roto-Grind is giving us steady rates in the 1,800 to 2,000 pph range. That's an upturn of about 500 to 1,000 pph — pretty impressive in my book."

The Roto-Grind is fairly indiscriminate in what it processes, says Textrude's Griffin, though material should be inspected for any metal contamination which can ultimately damage the rotor blades.

"The unit really performs and the push ram keeps outputs up — a luxury we never had with the previous grinder. That hog grinder had a tendency to just let material tumble. We have blocks that measure 18-inches by 18-inches by 8-inches, which in the past was extremely problematic; the Roto-Grind just eats them up."

Nettles adds that the upturn in production comes with a number of added pluses as well.

"You have to keep in mind that the Roto-Grind is a 100 hp machine. Because it replaced a 100 hp shredder and a 200 hp hog grinder, we are seeing a pretty nice savings in energy costs. And, from a safety standpoint, the combination of not having workers hand cut material and not having material tumbling in the hog grinder are simply

invaluable benefits."

Adds Griffin: "In the past, we were doing a good deal of preprocessing before we could even start pelletizing. Today, better than 80% of the purgings and chunks we get through here can go right into the Roto-Grind. And because we've turned a three man operation into a single person job, the payback on our investment will be fast. We certainly can't argue with any of that." **SSS**

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Smart CHOICES

Consultant offers insight into advantages of single-rotor shredders in plastics recycling.

Since their introduction, single rotor grinders, such as Granutech-Saturn's own Roto-Grind, have proven far more efficient and productive than their shear-type, low-speed counterparts in many primary shredding or grinding applications. The depth of those advantages can be best related by someone who has spent a good part of his professional career in operations in which plastics recycling was integral to the overall process. Richard "Dick" Rosin, for years plant manager for Carlisle Plastics' Minneapolis plant and today an independent consultant to the plastics industry, says the advantage that is immediately obvious is the output.

"The Roto-Grind, by nature of its design, allows for a continuous feeding operation," he says. "The unit's onboard computer controls the cycle time as well as the load on the ram. Since the ram pressure and cycle timing are easily adjusted, a broader range of infeed materials can be accommodated. And, since the Roto-Grind is better suited to taking a wide range of material and processing it without interruption, throughputs are better."

Models of Efficiency

"Other machines — shear shredders in particular — are designed to reverse when they encounter a material that is difficult to process," says Rosin. "A good example of this is any tacky, low-density material such as stretch film which has a tendency to cling to the cutting blades. A Roto-Grind is designed to grind a broad range of material regardless of density, so the likelihood of an interruption in the processing cycle is almost nonexistent. Simply put, there is no lost motion; the unit is always cutting and producing. This results in a reduction in power consumption — a critical factor given the steadily-increasing occurrence of rolling blackouts in California and the threat of similar scenarios elsewhere in the country — is also positively impacted through use of a Roto-Grind."

Keeping it Up

Maintenance is yet another area in which Rosin sees the single-rotor unit excelling in the plastics processing arena

"Granutech makes a hydraulic drive Roto-Grind which is particularly more durable and less costly to operate," he says. "Because it is hydraulic, it has fewer moving parts and no gear box to maintain. In fact, the only maintenance needed is the regular rotation or replacement of the cutters and adjustment of the bed knives. Without damage caused by any metal contamination, that can be a simple two- to four-hour job once a month — a minimal downtime."

Rosin adds that, by comparison, as blade surfaces of a shear shredder become worn, the

unit will lose efficiency causing production rates to fall, resulting in days, not hours of lost time due to maintenance to bring it back up to full production. This, in turn, leads to a large dollar loss not only in downtime and maintenance costs but in replacement parts that are also more costly.

Proper Feeding Counts

According to Rosin, while grinders like the Roto-Grind offer a wealth of advantages, there are also certain precautions that have to be taken to ensure optimum performance.

"Metal contamination can be a real thorn in the side of any plastics reprocessing operation. To alleviate this risk, a conveyor equipped with a good metal-detection and removal system should be used. This will improve the performance of the grinder but, more importantly, will eliminate the risk of damage to any downstream equipment."

The manner in which material can be fed to the rotor of a unit like the Roto-Grind affords yet another benefit of this type of processing equipment: in-hopper blending of material. Rosin says gaylords of different types of material can be simultaneously dumped into the hopper and will blend as a result of the ram action of the grinder. "This is a nice advantage to have," he adds.

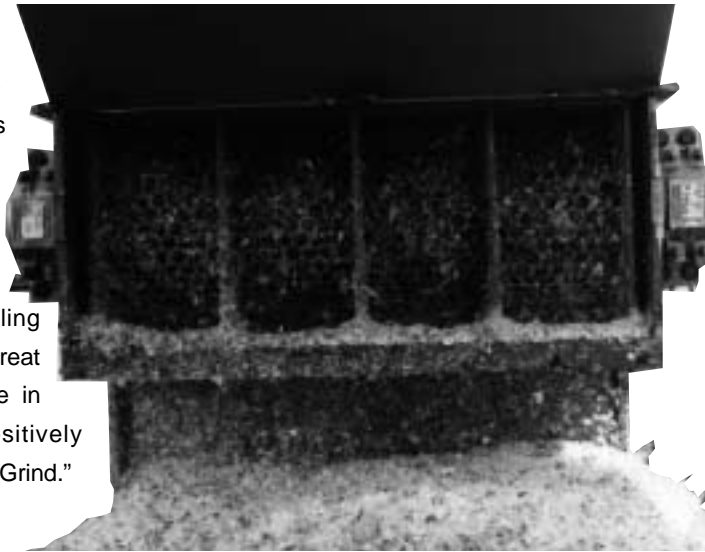
Fewer Steps Needed

Rosin echoes the sentiments of other Roto-Grind users in saying that the grinder, by nature of creating a more uniformly-sized product, can do more than simply enhancing performance of downstream processing equipment.

"In most cases, once a Roto-Grind is installed and configured properly, it will allow material to go directly into an extruder for pelletization. No additional grinding or sizing is needed at all."

Shear-type shredders have been used — and used successfully — in a number of plastics-based applications. But, as Rosin adds, the Roto-Grind is a much better fit.

"It is simply a case of better overall performance and much more versatility." **ESS**



Plastics Giant Finds Way to Reclaim “Unrecoverables.”

Toray Plastics America benefits from Roto-Grind’s ability to handle both thin film and more rigid material.

For years, Toray Plastics America, a division of worldwide giant Toray Plastics, dealt with trim rolls and cast rolls from its Rhode Island-based thin film operation in the most basic manner possible: it sold the scrap material back to other processors. While doing so was not a losing proposition, it was an obvious area in which improvement needed to be made. The company looked into a number of grinders and shredders in varied styles but found none that could satisfactorily handle the range of material the company generated — until it discovered Roto-Grind.

Thin is In

Part of the challenge of recovering the material, according to Jim Danielson, Toray Plastics’ mechanical engineer, was finding a unit that could handle one type of material that bordered on rigid scrap and trim rolls from another material that, in production, could be as thin as 60 mm.

“We get trim rolls from our slitting operation and the much thicker cast rolls from the initial step in our process — right after extrusion,” he says. “These rolls can range in size from 50 pounds to some in excess of 800 pounds. And that was what presented the challenge. We found grinders that we felt would be effective with either type of the scrap we are generating here but none that could handle it all. And since we generate almost equal parts thin film to rigid material, we needed that overall capability. We have that now with the Roto-Grind.”

Designs on Production

Much of the credit for Toray Plastics’ success with the full range of its scrap can be traced to

the Roto-Grind’s design characteristics which use a single, ram-fed rotor to process material. According to Damon Dedo, Granutech’s Director of Sales, that, and a number of other features, separate Roto-Grind from so many other pieces of processing equipment on the



market today.

“Toray Plastics chose a Roto-Grind 160E which is a 150 hp electric drive unit capable of generating the kinds of torques and production numbers they needed,” he says. “The Roto-Grind is actually very indiscriminate in what it will process. So going from, say, a hopper full of rigid scrap to a load of more challenging thin film is really no challenge for it at all. The unit

is designed to process the broadest range of material possible and, in the plastics environment, that can include PE, HDPE, PC/ABS, LDPE, PPL, Nylon 6 (6/6), LLDPE, PVC, stretch wrap, shrink wrap, and a host of engineered plastics. Toray Plastics’ material was actually a perfect fit for what Roto-Grind has to offer.”

Toray on the Inside

According to Toray’s Danielson, scrap material from the plant’s various processes is batch-separated in advance, then passed along for downsizing in the Roto-Grind.

“We fill up skids with scrap material and bring it into the processing area and place it on the infeed mechanism which dumps the material — either thin film or the more rigid cast material — into the hopper. The Roto-Grind takes it down to sizes ranging from 1/8-inch to 1/2-inch and passes it along via conveyor to the granulator. There, it is processed down to the size needed for reuse and then conveyed out to storage silos.”

Danielson adds that all the material housed in the storage silo area is material that, since the addition of the Roto-Grind, no longer has to be purchased.

“There’s no doubt this approach has made us a more efficient operation,” he says. “The incentive was definitely there for us to keep this material in-house rather than selling it to other processors. We now have a decent supply of material on hand at all times to generate new product. That’s material that, in the past, would have been literally given away. The Roto-Grind has helped us make better use of what we have and that’s paying off every day.” **ESS**

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Safety, Improved Production By-Products of Roto-Grind Installation

Detroit's All Plastics Recycling cites grinder as big addition, sees opportunities down the line.

As the name implies, All Plastics Recycling specializes in the recycling of, well, all plastics. The Detroit-based company takes in industrial scrap from throughout Detroit and the surrounding area and processes it down to a size suitable for resale to its customers. Doing so used to be a matter of band-sawing the larger pieces prior to feeding material into a granulator. As volumes increased, the company identified sawing as both a potential safety risk and a bottleneck in the process, according to company president, Steve Silberschein.

"We take in all sorts of products

from our accounts, including drainage tiles, high molecular weight dunnage trays used by the automotive industry, pallet boxes, auto trim scrap, and pipe, to name just a few. That's roughly 70,000 pounds per day of polyethylene, polypropylene, ABS, polycarbonate, and polystyrene. We added the Roto-Grind 160E to eliminate the need for hand-cutting material — a method on which we had relied in the past. Now we simply load material onto a conveyor, feed it into the Roto-Grind and the unit takes it down to nice uniform 4-inch pieces in preparation for the granulator."

While safety is, obviously, the key factor at work here, Silberschein adds that production has gone up considerably since the Roto-Grind was added.

"We used to do 3,000 to 3,500 pounds per hour when we were hand-cutting material and now we're doing between 6,000 and 9,000 pounds per hour. That's an impressive upturn by anyone's standards. In addition, by preprocessing the material to smaller pieces, the blade life in the granulator has been greatly extended. We used to have to change granulator blades weekly — now we only have to do so monthly. At a cost of \$225 per blade

change, that's over \$8,000 I'm not spending on blades each year."

Silberschein says he did a great deal of research into grinders before choosing the Roto-Grind. While he found units that offered some promise with regard to performance, availability of parts and service made him leery.

"Before going with the Roto-Grind, I went all over the country looking at almost every system

out there. I was seriously considering the purchase of a European-made unit but, knowing what I know now, I'm awfully glad I didn't. I have a friend who is doing work similar to what we do and owns a unit made in Europe. A while

back, one of the gears went out on it and it took 16 weeks to get it replaced. I get my parts overnight. In fact, for the very few times we've had work done on either the mechanical or the

electronic components, Mike Hinsey and Chip Dillard from Granutech-Saturn have been out here in a heartbeat, the parts were here the next day and we were back up and running."

All Plastics Recycling is currently

a six day a week operation and is considering adding another shift. Says Silberschein: "There is an unlimited supply of material out there. We are looking into a deal that will get us 70,000 pounds of bumpers a day coming out of eight different plants in the US and Canada. Obviously that means we will have to add equipment to keep pace with that upturn in volume. When we do, rest assured Granutech and its Roto-Grind will be included in that expansion." **ESS**



MacNeil Polymers — Continued from front page

"Many of the companies with whom we deal have the mindset that the material they are sending us is trash. And that's due partly to the fact that when they started out, that's what it was — a barrel of mixed plastic scrap and other debris. Now we are working with the customer to help alleviate that situation. Boxes are being more clearly labeled and we will eventually get to the point where our material stream is much cleaner. But, for those instances when contamination does come into play, the Roto-Grind handles it without any problem and virtually eliminates the risk of granulator damage."

Handling the Big Stuff

Carless says MacNeil Polymers takes in material in any number of forms, including extrusions, purgings and finished parts. Materials are equally diverse, covering everything from polyethylene to nylon to polypropylene to polycarbonate.

"Some of the purgings can be fairly large — as much as 50 inches in diameter," he says. "On those, the Roto-Grind has completely eliminated our reliance on either a guillotine or a band saw for downsizing. That saves us both time and labor and improves the level of safety in the workplace. In addition, our workers benefit from an ergonomic standpoint as well. Putting material into the hopper of a Roto-Grind is easy — cutting that same material with a band saw is not."

Consistent Performance

MacNeil Polymers' workload is split between a steady monthly flow and material it takes in on what Carless calls a campaign basis. The degree to which the material gets processed is dependent upon the customer's demand.

"We have many customers who send us their material and want it reduced to granules and returned to them for reuse. Others will just ask us to take it off their hands. Whether or not we charge to take the material depends on how much effort will be needed to clean it up, whether or not we have markets for that material and so on. One thing that is consistent throughout the process is the performance we have gotten from the Roto-Grind. The granulators are now easily twice as productive and the downtime on them has been virtually eliminated by preprocessing and creating a cleaner, more consistently-sized product. It has really made the difference for us." **ESS**

Needing a Change

To meet its size reduction needs, IRR had been relying on several different types and manufacturers of processing equipment. While each unit initially performed to the company's satisfaction, issues of wear and durability, largely due to the contaminated state of the incoming material, became increasingly noticeable.

"As a rule, we assume that material we get in here will be contaminated in some way; that's just the nature of the business. We try to pull out any obvious cause of the contamination — cardboard and metal, for example — but it's often impossible to get it all. When contamination works its way into the processing equipment, the wear on that unit goes up dramatically."

Askew says IRR purchased their first Roto-Grind with production increases in mind but quickly became impressed with its ability to stand up under tough conditions.

"Their durability was really what won us over and, in later months, prompted our decision to replace the other manufacturers' units with additional Roto-Grinds. They are extremely heavy-duty and stand up to situations and materials that will damage other units — things you see in the day-to-day operation of a recycling facility."

Keeping Hands Off

Although IRR has contingencies for equipment breakdowns, that's a situation they'd

obviously like to avoid, says Askew.

"We are very diversified in our operation. In the past, if one of our grinders went down, we took material we had on hand that didn't need size reduction and hand-fed it to the downstream equipment. However, hand-feeding causes shock and can adversely affect downstream equipment performance and, obviously, production. We needed to avoid that and the Roto-Grinds have helped us do so. Because they are such steady performers for us, our efficiencies are far better and the wear and tear on our downstream equipment has dropped dramatically. Simply put, by staying up and running we are increasing productivity."

Ideally-Suited

IRR chose the 100 hp Roto-Grinds with hydraulic drive for its operation. Although the company chooses not to cite specific throughputs it gets through each Roto-Grind, other 100 hp units in similar situations have achieved steady rates up to 9,000 lbs./hr., according to Damon Dedo, Granutech-Saturn Systems' Director of Sales.

"The 110H is ideally suited to applications such as the one at IRR," he says. "Mark Askew is right in saying these units were designed to take a beating. In addition to this durability factor, however, we've also designed in a host of features to improve the processing capabilities of a recycler like IRR."

Ram-Tough

The features to which Dedo refers include the highest possible levels of torque to enhance

processing in even the most challenging materials; a broad range of cutter options, including size, shape, quantity and material, for process applicability and performance; one-step shredding and sizing for added versatility and efficiency; and "Intelli-Ram" technology to maximize production outputs during the automated feeding sequence of operation. Roto-Grind's push-ram feature in particular has proven beneficial in IRR's operation.

"The push-ram has been a valuable feature for us," says Askew. "While some of the material we run through here can be gravity-fed, we process huge amounts of fiber and purge waste and the ram keeps that material feeding to the rotor, thereby giving us the performance we need. It's a definite plus."

Valuable Asset

Today, IRR has four processing lines, each of which runs material through a Roto-Grind for initial size reduction, feeds it into a densifier where it is converted into small nuggets, then takes it into the extruder which creates the pellets used to create usable new raw material.

"Being in the recycling business, the profit structure is such that we work on tight margins," says Askew. "The only real way to ensure success in this business is by ensuring volumes stay at peak levels. The Roto-Grinds have played a major role in helping make that happen for us and, as a result, have helped make us a successful plant. We installed our first Roto-Grind more than two years ago and if we get the same performance out of the other three — and we see no reason we won't — they will continue to be a valuable asset to us." **SS**

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