

PLASTICS PRODUCT REVIEW

Note from PPR- This report is designed to be concise and to the point. It does not contain data you can find elsewhere. This report is the only spot where you can find this information. Everything we state in this report is backed up by data and hours of testing. We believe in quality reports with hard hitting facts as opposed to piles of information with little meaning. The testing conducted for this report took 25 hours to complete. You have made a wise choice, which will make your purchasing decisions easier.

Granulators

Granulators need to do several things well. First and foremost, they must produce consistent granulate without fines. Throughput is also an important consideration when figuring out how much bang you get for the buck. Indirect items such as energy consumption and decibel levels are also of concern. Our report provides data on each of these important points.

This report will cover the advantages and disadvantages of granulators based on the test results. At the completion of the main body of the report we will present our recommendations. The separate How and What We Test section describes exactly what variables are evaluated. This section also goes on to describe how and why variables are examined. The data itself is presented in a chart format at the conclusion of the report.

Test Results



Companies with this emblem next to their name have earned the Plastics Product Review Seal of Approval based on their upper echelon test results.

Auxiliary Process Equipment



This is our low cost granulator of choice. It is sold by a relatively new company, but it offers the price and performance of a seasoned veteran. Areas of strength include the important quality of granulate (lowest level of fines) and throughput categories. The granulator was also quiet with above average energy efficiency. Overall, this granulator earned a composite score of 2.80 (1 being the best, 7 the worst).

Battenfeld Gloucester

Another relatively unknown granulator that is making a charge into the industry. This granulators chief advantage is cost effectiveness followed by energy efficiency. However, Battenfeld's granulator did not fare well in the throughput and quality of granulate portion of this test. The composite score for this granulator is 4.60.

Conair



We like this granulator, particularly for heavy-duty applications. It is a bit on the pricey side, but it offers energy efficiency, a quality regrind, and above average throughput and decibel level ratings. Overall, this granulator scored a 2.80.

Polymer Systems

Polymer Systems chief advantage is its low noise level. The granulator comes completely enclosed and sound insulated. Disadvantages include slightly below average granulate quality, energy efficiency and throughput. As a whole this granulator came in with a composite rating of 4.20.

Rapid Granulator

Overall, this granulator did not test well. Its throughput and noise level were only slightly below average, but the granulator had problems with the energy efficiency and granulate quality portions of the test. The composite score for Rapid's granulator is 5.80.

Rotogran

The granulator had an average ranking in our test, which improves when you calculate in its relatively low cost. The throughput of this granulator is its chief advantage, but it also offers above average regrind quality as well. This granulator faltered in the intangibles, as its decibel level and energy ratings were at or near the bottom. Overall the composite score of this granulator is 5.40.

Wittmann



This granulator tested well in all areas and came out with the best composite score of the group. The Wittmann granulator was solid in all areas, but excelled in the quality of cut portion of our testing. It produced the highest concentration of particles at any one level, while producing the lowest percentage of fines. The unit was also quite energy efficient in comparison to its high throughput. The only drawback to the Wittmann granulator is its price, which is offset to some degree by the offering of several features as standard, such as additional limit switches, emergency stop disconnect, and a pre-adjustment feature for the knives. As a whole the composite score for this granulator is 2.20.

Conclusions

We first suggest a purchase of the Wittmann granulator based on its superior test results. However, for those who find the higher price tough to chew we suggest looking at Auxiliary Plastic Equipment or Conair as an alternative.

Subscription Information

If you wish to purchase a yearly subscription to PPR note that it is \$249.00. A subscription gives you access to all on-line reports, as well as all report updates and new test results published throughout the course of the one year subscription. Best of all, the amount you spent on this report will be credited

towards the purchase of your subscription if you subscribe within seven days. Call us now at 800-267-1065, or sign up on-line, to start receiving additional reports today!

How and What We Test

What We Test

PPR looks at four key variables when evaluating a granulator.

Sound level- The noise level is measured in decibels. This is important because of OSHA regulations and employee retention. The more stress free the environment the easier it is to keep employees.

Throughput- This is a test of how many pounds of material per hour can be processed through the granulator. Throughput is important for those granulating large amounts of material. Larger throughput granulators will also require less operator time at the granulator.

Cutting Consistency- The particle size of the granulate is analyzed. Fines and long strands can be hard to process and should be avoided. Generally speaking, the more uniform the particle size the better.

Energy Consumption- Energy consumption is measured in kWh. Every kWh equals money given to the electric company.

How We Test

Sound level- PPR tests the sound level according to SPI standards. The SPI standard dictates that sound be measured six feet off the ground, five seconds after the part is inserted. Sound level must be measured a minimum of three feet from the granulator. We standardized our testing at four feet from the granulator. Decibel levels are measure at four positions around the granulator. (0, 90, 180, and 270 degrees). The average of the four is taken as the decibel level that you can expect the granulator to produce. Six inch sections of schedule forty PVC piping are used to run the test according to the standard. An ANSI certified Simpson sound meter is used to measure the decibel level.

Throughput- This test is also run according to SPI standards. The procedure starts by feeding the previously mentioned PVC piping into the granulator at a set rate per minute. Meanwhile you measure the amps with an ammeter. The number of pieces per minute inserted into the granulator is increased until you reach the motor's nameplate amperage. At this time you start the test using that throughput. The test is run for ten minutes and at the end of the test the resulting granulate is weighed. This weight is multiplied by six to give the throughput in pounds per hour.

Cutting consistency- The particle size test consists of taking the material from the throughput test and running it through a series of sieves. The sieves are sized starting with the size of the screen, 0.3125". The following three sieves have holes in the following order: 0.2500", 0.1875", and 0.0937". Consequently, particles that make it through the last sieve are smaller than 0.0937" in diameter. These particles are considered to be fines. All sieves feature certificates of authenticity to ensure accuracy.

Energy Consumption- The energy consumption is taken during the ten minute throughput test.

Granulators

	APE	Battenfeld	Conair
Hopper Features			
Hopper Construction	Metal/Plastic/Metal	Ex. Soundproofing	Double Wall
Tilt Back Hopper	Yes	Yes	Yes
Hopper Feed	Manual	Manual	Manual
Soundproofing	Standard	Standard	Standard
Feed Tray	Metal	Metal	Metal
Removable Flap Tray	Yes	No	No
Cutting Features			
Rotor Configuration	6 Blade Delta	3 Blade Open	Staggered Helical
Drive Pulley	Solid Fly Wheel	Solid Fly Wheel	Fly Wheel Sheave
Extended Rotor Journal	Yes	Yes	No
Bed Knife configuration	2 Bed Knives	3 Scissor Cutting	Flat, 180o opposed
Knife Quality	D-2	D-3	D-2, Rotor M 42
Camber Construction	Cast Steel	Cast Meheenite	Cast
Bearing Type	External	External	Internal
Screen Size	5/16"	5/16"	5/16"
Screen Removal	Drop Down Cradle	Screen Rolls Out	Drop Down Cradle
Cutting Circle	10"	9.4"	6.4"
Cutting Chamber Size	10 x 12	10 x 12	8 x 14
Electrical Features			
Electrical Interlocks	Double Safeties	Double Safeties	Double Safeties
Electrical	480	480	480
Heater Reset	Internal	Internal	External
Horsepower	7.5	7.5	5
Miscellaneous Features			
Drive Mechanism	V-Belt	V-Belt	V-Belt
Belt Adjustment	Single Point	Single Point	Single Point
Rotor RPM	450	400	580
Fly wheel	Dual Solid	Solid	Solid
Casters	Yes	Yes	Yes
Footprint	29" x 42"	26" x 38"	27" x 30"
Weight	1,460 lbs.	970 lbs.	950 lbs.
Price	\$6,800	\$6,090	\$9,750
Performance Test Results			
Throughput	608 lbs./hr. (1)	364 lbs./hr. (7)	494 lbs./hr. (4)
Noise Level	77 dba (2)	87 dba (6)	83 dba (4)
Energy Consumption (kWh/hour)	3.381 (5)	1.998 (1)	2.454 (2)
Total kWh per lb.	0.0055 (4)	0.0054 (3)	0.0048 (1)
Sieve Analysis			
Larger Than 0.3125"	0.00%	0.00%	0.09%
Larger Than 0.2500"	1.35%	3.02%	2.09%
Larger Than 0.1870"	47.89%	22.30%	29.77%
Larger Than 0.0937"	41.92%	55.69%	56.11%

Smaller Than 0.0937"	8.81% (2)	18.99% (6)	11.94% (3)
Composite Average Ranking	2.80 (2)	4.60 (5)	2.80 (2)

Granulators				
	Polymer Systems	Rapid	Rotogran	Wittmann
Hopper Features				
Hopper Construction	Metal/Plastic/Metal	Double Wall	Double Wall	Double Wall
Tilt Back Hopper	Yes	Yes	Yes	Yes
Hopper Feed	Manual	Manual	Manual or Robotic	Manual
Soundproofing	Standard	Standard	Optional	Standard
Feed Tray	Metal	Metal	Metal	Metal
Removable Flap Tray	No	Yes	No	Yes
Cutting Features				
Rotor Configuration	2 Blade Open	3 Blade Open	3 Blade Open	3 Blade Open
Drive Pulley	Solid Fly Wheel	Solid Fly Wheel	Solid Fly Wheel	Solid Flywheel
Extended Rotor Journal	No	Yes	Yes	Yes
Bed Knife configuration	1 Bed Knife	2 Tangential	2 Scissor Cutting	2 Bed Knives
Knife Quality	D-2	D-2	D-2	D2
Camber Construction	Steel Weldment	Welded Steel	Steel Weldment	Welded Steel
Bearing Type	External	External	External	External
Screen Size	5/16"	5/16"	5/16"	8 mm (5/16")
Screen Removal	Screen Rolls Out	Drop Down Cradle	Drop Down Cradle	Drop Down Cradle
Cutting Circle	10.3"	9.8"	10.0"	10.3"
Cutting Chamber Size	9 x 12	10 x 12	10 x 12	14" x 12"
Electrical Features				
Electrical Interlocks	Double Safeties	Double Safeties	Double Safeties	Five Safeties
Electrical	480	480	480	480
Heater Reset	Internal	External	Internal	Internal
Horsepower	7.5	7.5	7.5	7.5
Miscellaneous Features				
Drive Mechanism	V-Belt	V-Belt	V-Belt	V-belt
Belt Adjustment	Single Point	Single Point	Single Point	Single point
Rotor RPM	566	715	480	315
Fly wheel	Solid	Solid	Solid	Yes
Casters	Yes	Yes	Yes	Yes
Footprint	27" x 37"	34" x35"	31" x 26"	33" x 45"
Weight	1,200 lbs.	1,516 lbs.	900 lbs.	1320 lbs.
Price	\$8,109	\$9,790	\$7,109	\$12,300
Performance Test Results				
Throughput	405 lbs./hr. (6)	408 lbs./hr. (5)	548 lbs./hr. (3)	582 lbs./hr. (2)
Noise Level	75 dba (1)	84 dba (5)	87 dba (6)	82 dba (3)
Energy Consumption (kWh/hour)	3.312 (4)	3.462 (6)	4.788 (7)	3.087 (3)
Total kWh per lb.	0.0081 (5)	0.0084(6)	0.0087 (7)	0.0053 (2)
Sieve Analysis				

Larger Than 0.3125"	0.27%	0.00%	0.00%	0.00%
Larger Than 0.2500"	2.39%	0.34%	1.01%	1.02%
Larger Than 0.1870"	27.09%	13.72%	40.43%	48.62%
Larger Than 0.0937"	55.35%	62.71%	45.62%	44.17%
Smaller Than 0.0937"	14.90% (5)	23.23% (7)	12.94% (4)	6.19% (1)
Composite Average Ranking	4.20 (4)	5.80 (7)	5.40 (6)	2.20 (1)

Explanation of Granulator Chart and Data

The numbers in parenthesis represent each products ranking in that category in comparison to the other machines. A product ranked (2) in a six product test was the second best out of the six in that category. The “Composite Average Ranking” is the average of the rankings in each category. A product with a “Composite Average Ranking” of 3.25 averaged a little worse than third best as a whole.

The first four sections deal with specifications and features. We will explain the test results starting with the section titled Performance Test Results.

Throughput- This is a measure of the amount of material processed by the granulator in one hour.

Noise Level- The average decibel level of the granulator during the Throughput test.

Energy Consumption (kWh/hour)- The amount of energy used during the Throughput test.

Total kWh per lb.- This number takes into account the throughput of the granulator. The Energy Consumption is divided by the total throughput of material traveling through the granulator during the throughput test.

Sieve Analysis- The granulate is collected from the Throughput test and run through a series of sieves with the aid of a sieve shaker. The heading Larger Than .3125” refers to the percentage of granulate that would not fall through a sieve with holes of this diameter. Likewise for all other headings, except for Smaller Than 0.0937” which refers to the amount of material that fell through this bottom sieve and constitutes a fine. Ideally, all granulate would be in three sieves- Larger Than 0.2500”, Larger Than 0.1870, and Larger Than 0.0937. The perfect granulator would have 100% consistency at one level, but it’s not a perfect world.

Directory

Auxiliary Plastics Equipment
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 Website: www.conairnet.com

Battenfeld Gloucester Engineering Co.
 Phone: 603-863-1270
 Website: www.beg.battenfeld.com

Polymer Systems Inc.
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 Website: www.polysys.com

Conair

Rapid Granulator Inc.
Phone: 815-933-4605
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Rotogran International Inc.
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