NGR® RECYCLING MACHINES

LARGE RECYCLING MACHINE SERIES

X:GRAN

145
165
185
205

IS DESIGNED FOR …

…all polymers

…all forms of scrap

…pelletizer output of 2,000 – 4,400 lbs/hr

X:GRAN 145 V One-Step Repelletizing Machine

12 | 08, US

PATENTED “ONE-STEP” TECHNOLOGY

3 steps combined into 1 machine

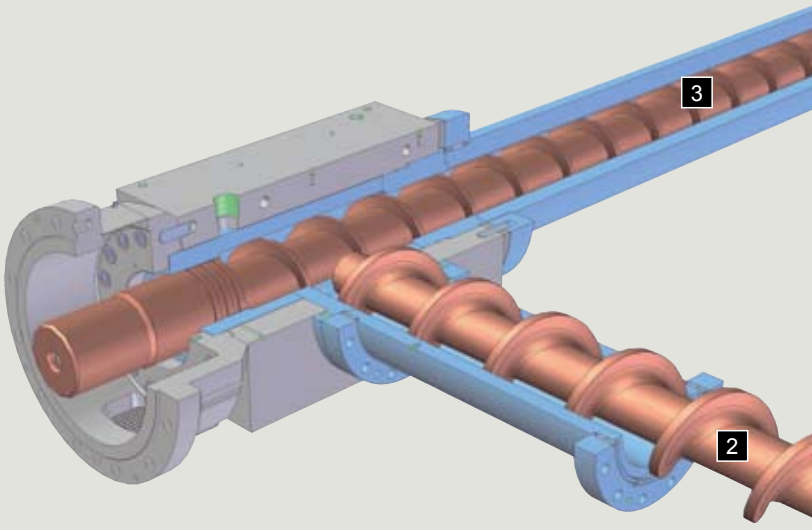
The key to the X:GRAN One-Step machine is the combination of a shredder designed to feed directly into an extruder. This design turns your scrap into valuable pellets easily and efficiently:

1 SHREDDER: Heavy duty shredder section cuts the plastic scrap, and feeds directly into extruder.

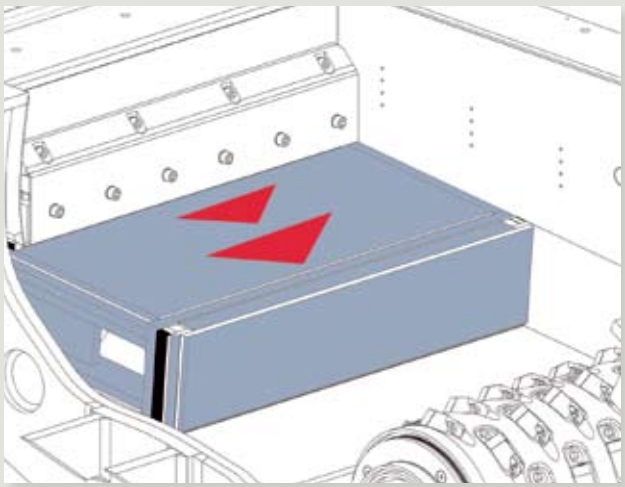
2 FEEDER SCREW: Heavy-duty feed screw controls feed of material from shredder to extruder.

3 EXTRUDER & PELLETIZER: The extruder melts the material and, if required, venting (degassing) is done. Then the material is filtered and pelletized into easy-to-use plastic pellets.

This all occurs without the material ever leaving the machine, which is why the process is known as **“NGR One-Step technology”**. One step processing, one-step responsibility.



The design of these very high performance X:GRAN machines incorporates a separate drive and e-motor for each of the three main components- the shredder, the feeder screw and the extruder. This gives the design the maximum flexibility and operating range over a wide variety of polymers and material forms.



The hydraulic ram pusher presses the material against the shredder.

* S:GRAN type

SUITABLE FOR A WIDE RANGE OF APPLICATIONS

NGR RECYCLING MACHINES

Polymers ...

Virtually all thermoplastic polymers, including PE, PP, PA, PS, PC, PET, ABS, EVA, PPS, biopolymers and other technical plastics, can be efficiently and cleanly recycled into pellets with minimal property loss. The X:GRAN control system provides complete recipe control and simplifies machine operation to make it easy for your operators.

... in any form

NGR X:GRAN series machines are engineered in extruder sizes from 145 - 205 mm and include separate e-drives for the shredder-feeder and the extruder. This makes the X:GRAN especially suitable for any form of plastic, including the most difficult to shred materials, including complete bales in many cases.

PP netting

Printed LPDE film

Nonwoven fabric

PP synthetic grass

Start-up lumps/purgings

Heavily printed LDPE film

- All types of film waste (on rolls, bales, loose, slabbed or bundled)
- Start-up lumps and purgings
- Pipes & Profiles
- Injection and blow molded parts
- Fibers
- Slit Tapes
- Nonwovens and woven fabrics
- Yarns and ropes
- Carpet and carpet waste
- Foamed plastics

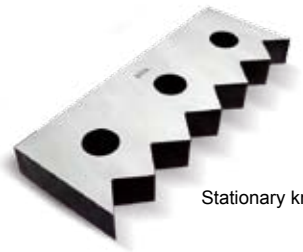
On average, the industrial manufacture of plastic products results in 2 - 20 % scrap material. This can include start-up scrap, which results until the required product specifications (such as thickness, color, shape and properties) are being attained, and change-over waste resulting from production changes. There is also sometimes normal process waste, such as film edge/bleed trims, sprues, or stamping waste. This scrap often represents a large percentage of potential profit margin and NGR X:Gran systems can quickly, easily and cost-effectively recover this profit.

X:GRAN 145 V One-Step Repelletizing Machine

QUALITY

Designed and built for long-term profitability

Robust design, high-grade materials and top quality manufacturing in combination with the finest possible controls and proven electronics, guarantee a long service life that extends far beyond the short payback period. It is then that NGR machines pay for themselves over and over again, as hundreds of operators on every continent can confirm.



Stationary knife

Feed screw

The transfer of material from the feed screw to the extruder takes place in the intake housing.

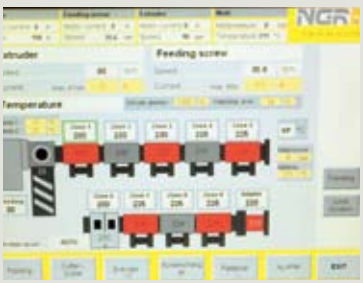
Reliability through robust design

The solid shredder shaft has bearings on both sides, which prevents bending under extreme loads. As a consequence, long service life is ensured even at full performance and with the processing of hard-to-handle materials such as PA fibers. In addition, low shredder shaft speeds give excellent cutting performance combined with long blade life.

X:GRAN 165 shredder shaft

Simplicity through Automation

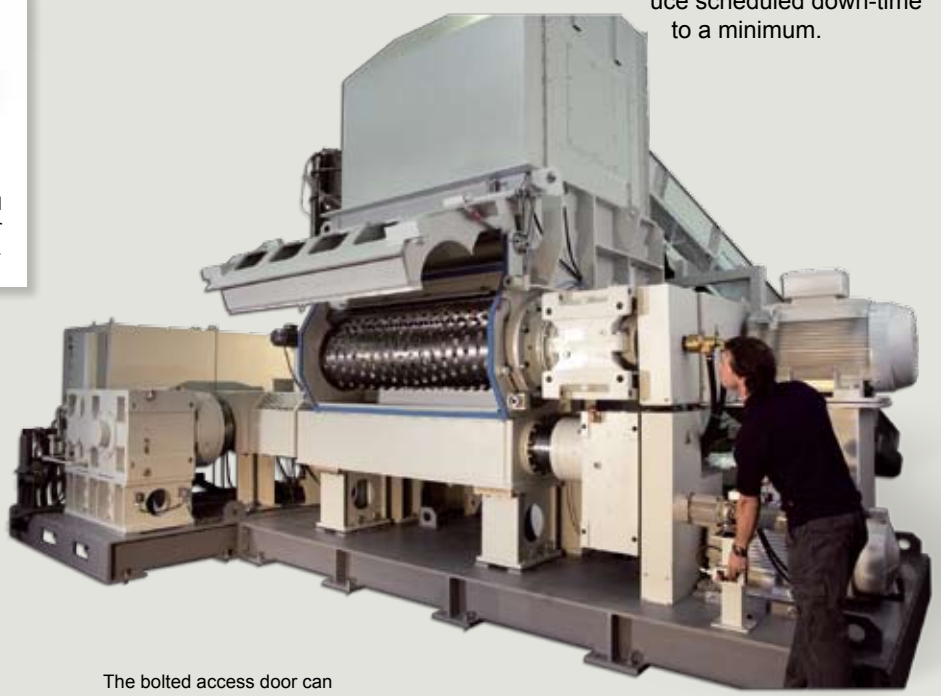
Operation of the machine has been largely automated through recipes accessed on the easy-to-read NGR display. Most machine operating functions are automatically controlled (conveyor belt start/stop, shredder pusher ram movement, feed screw, extruder temperatures, pelletizer controls) which reduces labor and frees the operator for more important tasks. This automation yields consistent high output in combination with optimum product quality and any deviations will generate alarms.



Easy-to-use Operator controls

Simple maintenance and long operating periods

A high degree of process stability minimizes the influence of the operating personnel on pellet quality. NGR designed the X:GRAN with simple access to wear parts to reduce scheduled down-time to a minimum.



The bolted access door can be opened and closed hydraulically.

MACHINE OPERATING PRINCIPLES

Simultaneous processing of material in diverse forms

The size and quantity of the incoming scrap material is only restricted by the hopper opening and not the process. Therefore, several differing material feeding systems can be employed simultaneously.

Reduced Labor Costs

The NGR recycling process is very simple and requires only a sufficient inflow of material. In order to operate, NGR machines normally need just one person to handle this feeding task. This feeding can be accomplished intermittently depending on the amount of material loaded on the conveyor. For example, following the loading of two or three 1.000 pound bales onto the belt, the X:GRAN 165 can run for about an hour without further attention. This often creates significant labor cost savings and eliminates messy multiple handling of the same material.

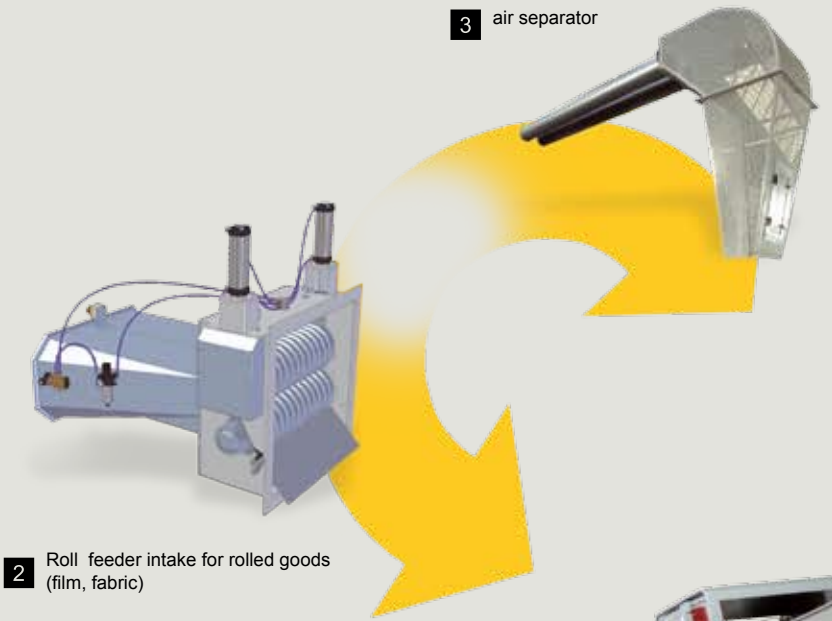
Problem-free restarts after emergency stops

Following sudden plant stops (e.g. power loss, emergency stops), the machine can be immediately restarted without any problem with filled hopper and extruder screw. The NGR recycling process is fully automatic and merely requires a sufficient inflow of material. This is because the screen changer and degassing only require cleaning in line with the degree of contamination in the material to be recycled. This creates enormous personnel savings and turns interim material handling into a thing of the past.

1 The **conveyor belt** is the most common type of material feeding, handling everything from large bales to start-up lumps to slabbed film rolls. Due to its large hopper cross-section, the X:GRAN can also be fed with large and heavy pieces of material. A detector provides a warning if metal is detected in the scrap.

2 The **roll feeder** allows the processing of film in roll form.

3 The **air separator** allows the continuous recycling of film edge and/or bleed trims.



X:GRAN 165 V
with conveyor belt, dosing device and hot die pelletizing

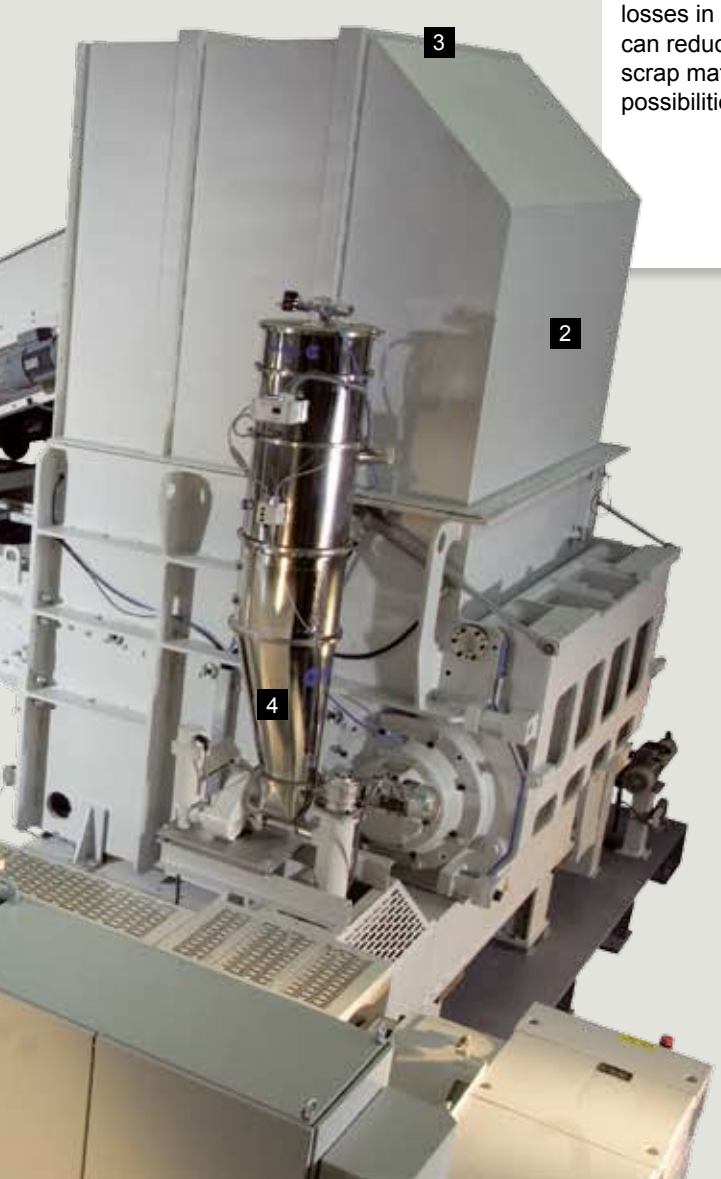
FAST PAYBACK TIME

High-quality pellets mean high-quality end products

The NGR design principle produces pellets with a minimum of property loss. This allows you to achieve the highest value end-use for your scrap and often allows you to use your repelletized scrap at full value to virgin resin in many products. The low speed drum shreds the material, which is then fed directly into the extruder without losing the frictional heat generated during the cutting process. The gently melted plastic produces high material quality with minimal loss of physical characteristics.

In addition to high quality, the uniform pellet size allows it to be mixed homogenously with original material. This gives you the highest value from your recovered scrap and ensures the quality and integrity of your end-products.

"Old technology" recycling systems can have a major negative effect on polymer quality. Undesirable deviations such as losses in viscosity or discoloring can reduce the value of the scrap material, and reduce the possibilities for its reuse.



Payback in 6 - 12 months!

Low labor, energy and maintenance costs

Due to their excellent output rates, low operating costs, and high uptime and process stability NGR One-Step machines typically offer extremely short payback periods.

- One-step design eliminates separate size reduction and interim storage equipment, greatly reducing the required floor space for a plant repelletizing operation.
- **NGR's one-step technology provide energy cost savings of up to 40 %*.**
  The shredded plastic is immediately fed to the extrusion process and is therefore already heated above ambient temperatures. This reduces the energy needed for material melting.
- The investment, operating and maintenance costs for a pre-shredding system are no longer required.
- The extremely short material process path facilitates quick cleaning and material switches, as well as reduced downtime.
- Low labor, utilities (power, water, compressed air) and spare part costs.

*Actual reduction depends on the material and your labor and utility rates

OPTIONS

1 Conveyor belt
Rugged design with high sidewalls and metal detector, e-drive, process controlled.

2 Roll Feeder intake for film
Feed hopper with electrically powered intake rolls, process controlled.

Hydraulic pressdown device
Foamed parts and other light waste can be processed with greater efficiency, process controlled.

3 Air separator feeding
Film edge trims can be carried to the X:GRAN using air. The air separator, which is mounted above the feed opening, separates the transport air from the edge trims.

4 Additive dosing device
In the section between the shredder and the extruder intake, additives equal to up to 20 % of the material flow can be fed in (e.g. for the improvement of flow characteristics or material coloring), process controlled.

Simple Venting/degassing (V)
Vacuum degassing consists of two openings, where melt degassing takes place using a water ring vacuum pump (drying).

5 Double Venting/degassing (VV)
Enhanced vacuum degassing suitable for extremely dirty, highly printed and damp plastics.

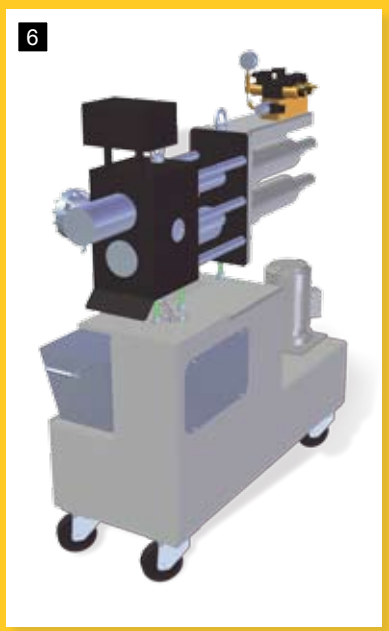
Combined venting (AV)
NGR offers combined venting consisting of both atmospheric and vacuum venting (AV type) for materials with a maximum of 10 % surface moisture. As it is possible that such moisture levels can occur in pre-cut and washed flakes, a special system configuration (without a cutter) can be supplied on request.

Screen Changer (Melt filter)
A high-quality, double-piston screen changer is offered as a standard feature, allowing "on-the-fly" screen changes without stopping the machine. Self-cleaning 6 **backflushing melt filters** are available and recommended for highly contaminated materials to maximize time between required screen changes.

7 PELLETIZING SYSTEMS
As a result of the modular design of the X:GRAN, various process controlled pelletizing systems can be used depending on the range of materials to be reprocessed.
Hot die-Water ring pelletizer (HD) is generally used for the majority of polyolefins (PE, low-mfi PP, etc).
Strand pelletizer (SP) or
Underwater pelletizing (UWP) are employed for PA (nylon), PET or other polymers and high-mfi PP.

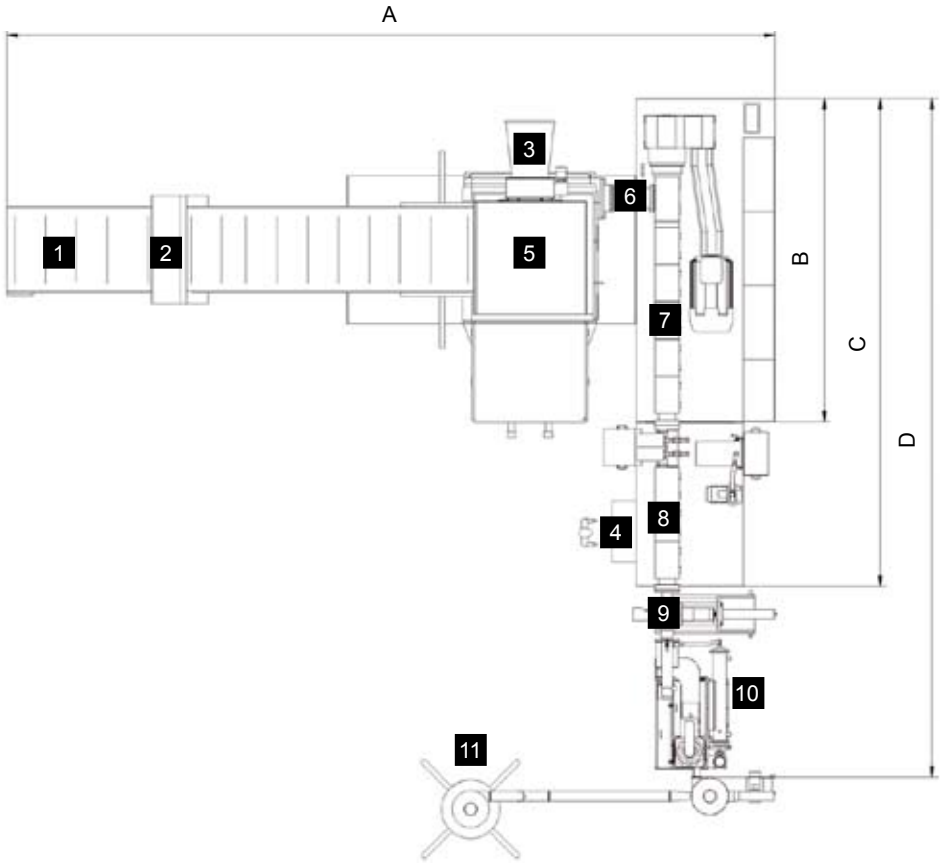
In addition, NGR typically supplies the entire finished pellet transport equipment such as blowers, piping, cyclones, etc.

Double venting/degassing



Melt filter

Hot die pelletizer



1 Conveyor belt
2 Metal detector
3 Roll Feeder intake
4 Operating terminal
5 Shredder
6 Feed Screw
7 Extruder
8 Venitng (degassing) device
9 Melt filter
10 Hot die pelletizer
11 Pellet hopper

www.marketing-tools.at

US t ... US tons, hp ... hp@60 Hz, rpm ... rpm@60 Hz
*) output for LDPE according to NGR standards, material and form. Values are ‚up to'
**) approx. value for transport; depending on chosen executions
standard execution:
Basic … short screw without venting
additional options:
• variable screw speed with frequency converter
• V … single vacuum venting
• VV … double vacuum venting
• AV … atmospheric venting plus vacuum venting

X:GRAN series

type			X:GRAN 145				X:GRAN 165				X:GRAN 185				X:GRAN 205			
venting option			Basic	V	VV	AV	Basic	V	VV	AV	Basic	V	VV	AV	Basic	V	VV	AV
output of pellets*)		**lbs/hr**	**2400**				**3100**				**3900**				**4400**			
cutter	**hopper volume**	**ft³**	78				138				138				138			
	cut width	**inch**	55				71				71				71			
	cutter motor	**hp**	141				211				211				211			
	feeder motor	**hp**	71				71				71				71			
extruder	**screw diameter**	**inch**	**5,71**				**6,50**				**7,28**				**8,07**			
	screw length	**L/D**	26	37	45	49	26	37	45	49	26	37	45	49	26	37	45	49
	motor standard	**hp**	392	392	392	392	503	503	503	503	625	625	625	625	704	704	704	704
	motor ‚power'	**hp**	-	-	-	-	-	557	557	557	-	-	-	-	-	-	-	-
	screw speed	**rpm**	132				102				90				82			
dimensions	**A**	**inch**	425				492				492				492			
	B	**inch**	236				209				224				240			
	C	**inch**	-	327	374	394	-	311	362	390	-	346	406	433	-	370	433	469
	D	**inch**	378	469	516	535	354	461	512	539	374	496	555	583	390	520	583	618
	E (height)	**inch**	173				189				189				189			
weight)**		**US t**	35				52				54				56			

WE TAKE CARE OF YOUR PLASTIC WASTE

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