

PMMDA
GUIDE TO
GRANULATORS

Guide to

Granulators

Introduction

This document has been compiled by the PMMDA to provide plastics processors with a guide to recycling/granulating and against which Granulator specifications may be measured.

The Need for Granulators

Granulators are an essential element of plastics processing. The processor may make his operation profitable by re-using plastic waste, which would normally be disposed of

The benefits are: -

- Being able to re-use expensive raw materials by feeding processed waste material through the Granulator, thereby reducing production costs.
- Recycling post consumer waste, thereby ensuring compliance with the very latest regulations.
- Size reduction of the waste product, thus saving disposal costs.



Glossary Terms

Feed Hopper

Where material is fed into the Granulator.

Cutting Chamber/Rotor

Comprises of a chamber, fitted with a number of stationary knives and a rotor, which supports the rotating knives.

Screen Box

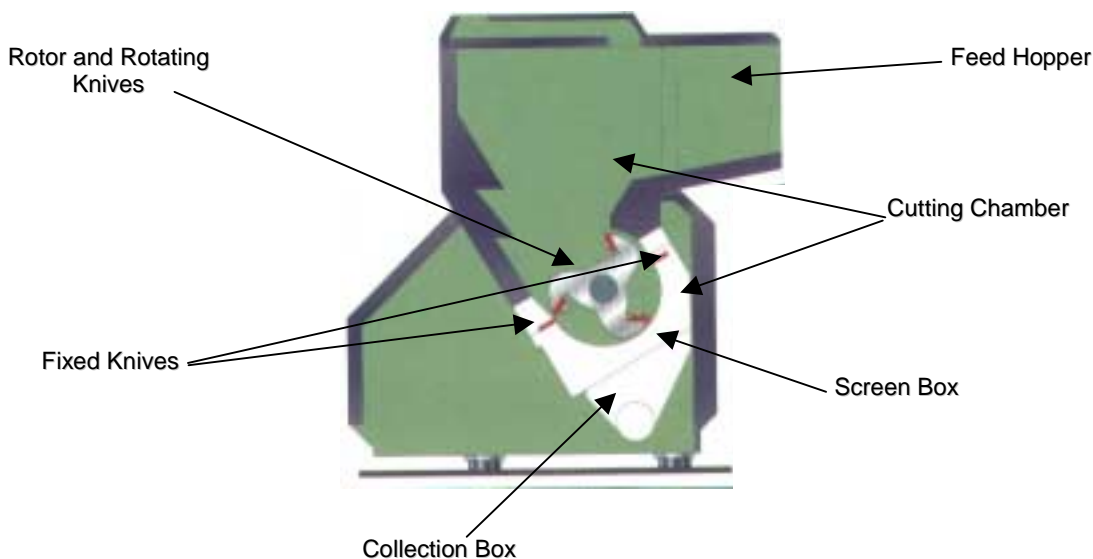
Situated below the Cutting Chamber supporting the Discharge Screen, which may have various size holes, depending on the size of granules required for re-processing.

Granulate

Material that has been reduced in size by the Granulator.

Collection Box

Situated below the screen, to collect the granulate which is then conveyed to storage silos.



Selection of Granulators

When selecting Granulators, the user has to decide on the size of Granulator required. This will depend on the dimensions and weight of the components, including wall thickness, the size of the finished granules and the quantity of material to be granulated per hour.

The design of Granulator required by the user will depend on the type of process.

These are: -

Injection Moulding

These are in the following categories: -

- a. Granulators for closed loop re-cycling sited next to the moulding machine.
- b. Central Granulators

Granulators sited next to the moulding machine are usually manually fed, although they can also be fed by a Sprue Picker/Robot or via a Conveyer/Sprue Separator.

Central Granulators can be fed manually or via a Conveyor. The Conveyor can include metal detection, if required.

Blow Moulding

Conveyers generally feed Granulators for Blow Moulding applications.

Again, the Conveyor can include metal detection, if required.

Extrusion of Profiles & Pipes

These Granulators are normally supplied with side or rear Hoppers to enable the processor to feed long lengths directly into the Granulator or Combination Hoppers to feed from the front and side.

Extrusion of Film & Sheet

These Granulators are available with manual front feed or rear feed hoppers. Automatic roll feeder units are available for sheet or edge trim recycling.

Thermoforming

These Granulators can operate in line with automatic thermoforming machines and serve to granulate skeletal waste produced after separating thermoformed components from continuous web of plastic sheet. They can also be used as central Granulators to accept complete rolls of skeletal waste.

Post Consumer Waste

These special granulators form part of a complete system which may include shredders, wasters, classifiers etc.

Rotor Designs

Closed Rotor – Numerous blades, with small cutting surface for tough materials or thick wall section parts.

Open Rotor – Blades, with large cutting surface for thin wall section and light parts such as blow moulded containers.

Semi-Closed Rotor - To accommodate both applications.

Discharge of Regrind

Regrind may be discharged using a variety of methods:

Vacuum take off using a suction box for evacuation via a hopper loader or proportional valve.

Blower evacuation via a through fan to a vented cyclone discharge, allowing dust removal and metal separation.

Venturi system using compressed air to evacuate Suction Box to simple cyclone discharge.

Bin base for manual emptying.

Noise Protection

The noise level specified by EC Regulations are 85dBA or below.

The noise is generally measured at least 1m above the discharge of the Granulators.

Beside the Press, small Granulators are usually operated at low cutting speeds and these may be supplied without soundproofing.

Medium sized Granulators are generally fitted with integral soundproofing.

Large Granulators can be either integrally soundproofed or a soundproof enclosure can be fitted over the Granulator.

Safety

It is important that there should be no access to any dangerous areas during the operation of the equipment.

Feed Hoppers have to be fitted with two sets of protective flaps and safety interlocking devices with time delay to prevent the operator opening the Granulator or Suction Box before the Cutting Rotor comes to a halt.

The Feed Hopper must be designed so it is impossible for an operator to reach any dangerous areas through the feed entry.

Medium and large Granulators must be designed, so that the feed entry has a minimum distance of 1.2m from floor level.

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