ATRITOR

Installation, Operating and Maintenance Manual

Atritor Turbo Separator

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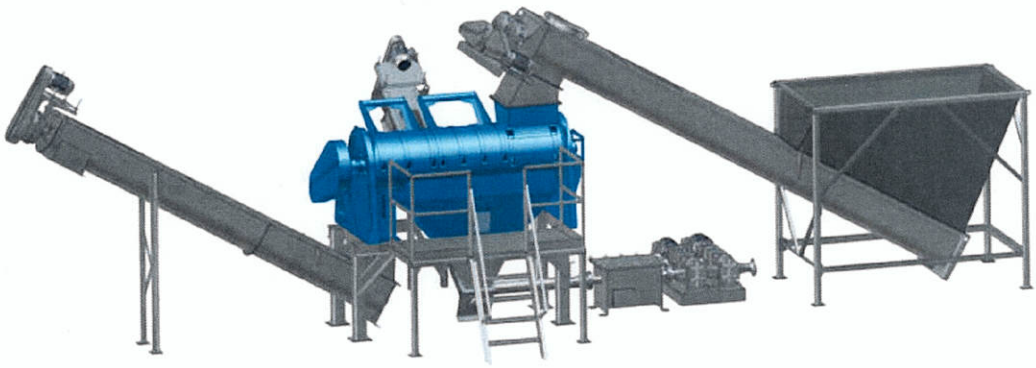

3 Operational Theory

The Atritor Turbo Separator removes products from their packaging, releasing them for recycling or disposal. Through a combination of centrifugal forces, self-generated air flow and mechanical action. Up to 99% of dry or liquid materials can be removed from their packaging.

The product is introduced by the client's loader into the hopper of the raw material conveyor. This feeds the Turbo Separator via a flanged inlet where the product is cycled through the Turbo Separator by the agitator paddles. The design features of the agitator paddles and breaker bars as well as the variable speed of the motor separate the product from its packaging. The product is routed through a centre discharge where screens filter the products. Denser material falls through the screens with lighter material being removed at the discharge end of the separator.

The Turbo Separator is intended to separate waste into 2 streams

- Low Density Materials – generally plastics, aluminium, and paper
- High Density Material – generally solid waste and liquids

Figure 1 Turbo Separator Plant

The table below shows typical separator applications.

Packaging Type	General Products	Food Products	Dairy Products
Cans (including labels, cartons & fittings)	Shaving Foam Gel Deodorants Household Products Pet Food Cigarettes Beverages & Drinks Oil Filters	Beans Soups Drinks Beverages Custard Vegetables Gravy Granules	Liquid Cheese Creamed Rice Milk Puddings Condensed Milk Evaporated Milk
Plastic Pots	Pet Foods Household Products Cosmetics Drinks	Processed Meats Non-Dairy Dessert Convenience Meals Margarine Coleslaw Pasta	Yogurt Cream Desserts Creamed Rice
Loose Products & Dry Sacks/Sachets	Plaster Board Biscuits Diapers Individual Sachets	Biscuits Tea Cereals Instant Drinks Sugar Potato Chips Coffee Gravy Cubes	Powdered Milk Chocolate Drinks
Plastic Bottles	Pharmaceuticals	Drinks Beverages Sauces Baby Foods	Milk Cream Milk Shakes
Cartons	Detergents (Liquids & Solids)	Drinks Custard Sauces Breakfast Cereal	Milk Cream Milk Shakes

Table 3 Turbo Separator Applications

Note: This is intended for reference only. This is not an exhaustive list. The compatibility does not factor in the desired throughput, just material compatibility. Please contact your sales representative for more detailed information regarding individual applications and fit based on throughput requirements.

5.2.2 Paddle Angle

The paddle angle can be adjusted to alter separation characteristics. Altering paddle angle affects the residence time of the material in the Turbo Separator. A longer residence time results in material being broken down more extensively than a shorter time period.

The paddle angle is determined by the position of the long side of the paddle in relation to the horizontal paddle support shaft. As shown in the figure below where a paddle is rotated from 0 to 90 degrees.

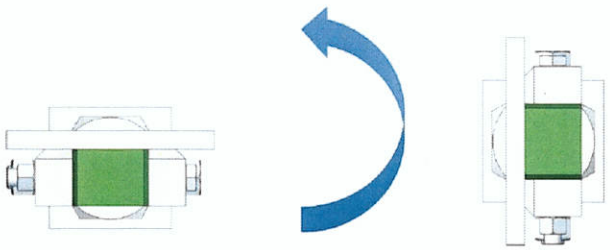

Figure 7 Paddle Angle Adjustment

Paddles are usually set in 15-degree angles as shown in Figure 8 Paddle Angles below. Angling the paddles towards the discharge end results in a shorter residence time and less break up and increased airflow through the separator. Paddles angled towards the inlet result in less airflow and a larger residence time. These increases break up of material.

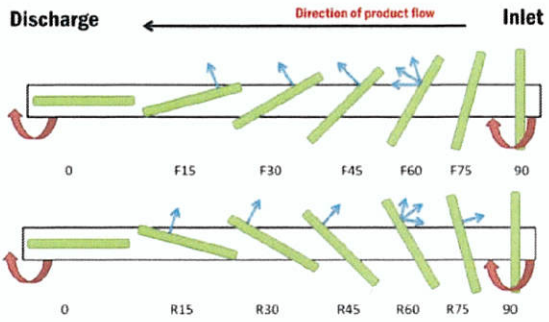

Figure 8 Paddle Angles

5.2.3 Paddle Length

The length of the paddles can be altered so that the distance from the tip of the paddle to the nut varies to achieve the desired separation. Paddles are adjusted in banks of 12 paddles known as zones. Counting from the inlet of the separator and counting clockwise around the shaft, the first 12 paddles make up zone 1. The next 12 make up zone 2 and the pattern continues for each zone after. Figure 10 shows the zones in a TS3096. Generally, the paddles at the inlet section of the separator (Zone 1) are set between 30-50mm whilst those in the mid-section (Zone 2) and the discharge section (Zone 3) are set between 10 – 30mm, depending upon the application.

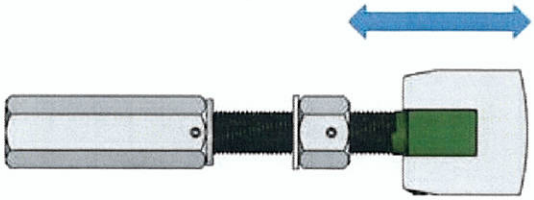

Figure 9 Nut to Tip Distance

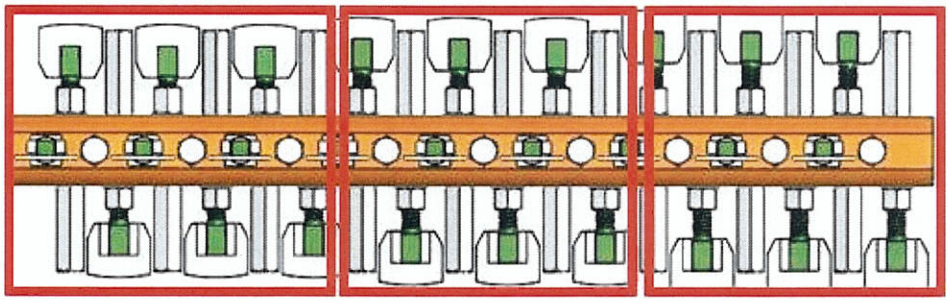

Figure 10 Paddle Zones

5.3 Screens

Screens can be supplied with apertures of various sizes. Generally, a larger aperture screen is positioned at the inlet end and smaller aperture screens at the discharge end. The size and positioning of these screens depends on the material to be processed and is generally finalised following initial material testing by Atritor or on-site engineers.

5.3.1 Changing Screens

The separator chamber is fitted with a number of screens. The screens are held in place with screen holding down bars. The configuration of screens and holding down bars can be one of 3 configurations which vary depending on separator type. The figures below show a TS42 and TS3096SD arrangement.

Figure 18 TS3096SD Screen Configuration

Figure 19 TS42 Screen Configuration

The screen holding down bars are held in place with 12mm countersunk hex headed bolts nuts and washers. These hold the bars to the internal surface of the separator and are fixed through the separator body, they are located by slots in the holding down bars.

The figures below show a typical 3 screen configuration in a TS3096. Usually a short screen is under the inlet (Figure 20 Short Screen (Screen 1)) and long screens (Figure 21 Long Screens (Screens 2 & 3 respectively)) fitted to the separation chamber.

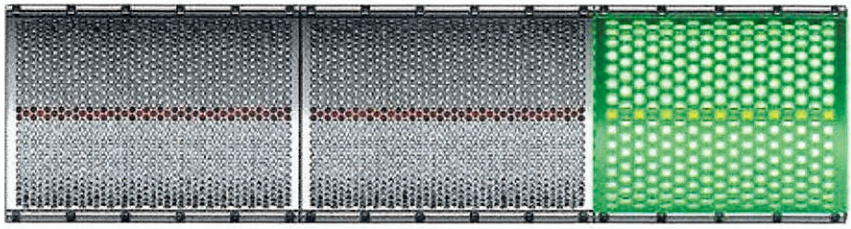

Figure 20 Short Screen (Screen 1)

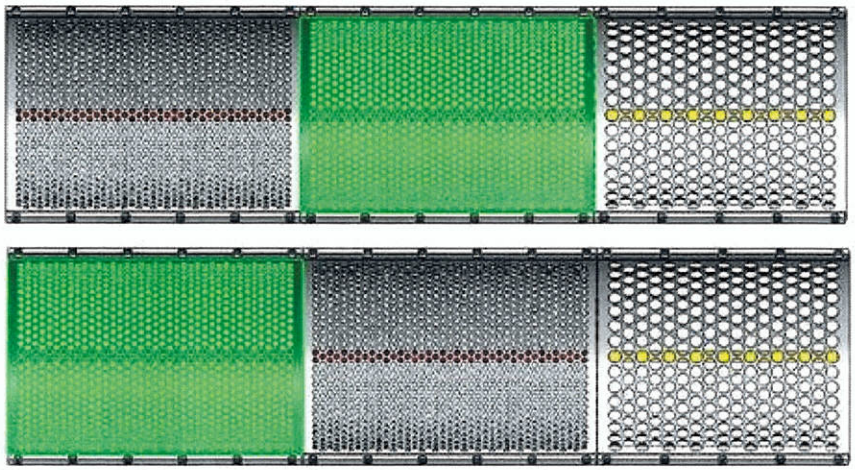

Figure 21 Long Screens (Screens 2 & 3 respectively)