Sorting plastics: a new device for the recycling industry

There is a clear need to increase the amount of plastic that is recycled to conserve and recover resources and energy and to relieve pressure on landfill sites. However, recycling plastic waste is problematic as there are many types of plastics: each type has different physical and chemical properties. A recent study has assessed the effectiveness of a new separating technology which sorts different plastics according to their individual mass.

Traditional sorting, based on physical characteristics, such as specific mass (weight) or size and/or chemical properties is carried out on single types or mixtures of plastics after selective collection. Currently, methods such as automatic sorting, electrostatic separation, gravity separation or flotation, which are used in recycling plants, all have associated difficulties. The similar specific mass of most plastics and contaminants in the waste in particular makes sorting less efficient.

Italian researchers have developed an innovative device for use in the plastic recycling sector. The ‘Multidune’ separator is particularly sensitive to small differences in mass and so addresses the problem of sorting plastics that have a similar density. It is able to separate out plastics of a low specific mass (around 1 g/cm³).

Called the ‘Multidune’ separator because its shape resembles the undulation of sand dunes, a mixture of plastic particles and fluid is transported through a series of pipes in a similar manner to sand grains travelling in a wind flow. The configuration of the pipes is such that the flow dynamics act to separate the various plastics into different outlets according to their density.

By using tracer particles to track the progress of waste through the apparatus, the researchers tested the Multidune separator under a series of experimental conditions, which investigated the behaviour of different types of plastics flowing through the device. Three samples of plastic particles and two of resin, all about 1-1.5 mm in size, were individually evaluated in the separator, and optimum operating conditions were determined. The findings demonstrated that the Multidune separator is an effective means of differentiating plastic particles of similar density.


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