

# What kind of equipment should I choose to agglomerate the waste fines and dust from my process?

With any agglomeration project, it's important to identify the required final material characteristics and whether any waste will be used, further processed, or disposed of. You can select an agglomeration method based on your end use.

If the waste material will be disposed of, try to minimize the processing costs. For example, if dedusting is suitable, pin or paddle mixers provide an easy and effective means to mix the material with water or a binder solution. This produces wetted powders or small granules. The granules' integrity may be temporary but it's usually sufficient enough to allow dust-free transfer to a disposal point. If volume reduction is an issue, consider using high-pressure devices such as roll briquetters or pellet mills. These devices produce particles of good integrity that lend themselves to container filling or being used as part of a matrix, such as in building or paving materials.

If the material is of higher value, consider reclaiming it. If a powder form isn't acceptable, there are many agglomeration options available. Again, it's necessary to consider the requirements for the final particles. If larger particles are required, roll briquetters offer a good alternative. An added benefit of roll briquetters is that you can minimize or eliminate binders. If easily dispersible particles are preferred, a variety of wet agglomeration equipment is available, including pugmills, drum and pan granulators, and high-shear instant mixers. However, you may have to dry the agglomerated particles, which adds to the operational costs.

*Michael White, director of marketing, and Sara Gantner, applications engineer, Bepex International, 612-331-4370*

Waste by-products, including fines and dust, can create bulky, costly, or hazardous disposal problems. Agglomeration equipment can treat these by-products so they can be recycled back into your process or into a different process. If you're dealing with a low-moisture waste by-product, try using a roller press, which is a high-pressure agglomerator. A roller press compacts the waste materials into briquets, sheets, or granules that are easy to handle and recycle to your process.

For most applications, the roller press is

installed in a circuit located near your manufacturing process. In addition to the roller press, this circuit can include various types of conveyors, cleaning and drying equipment, a mixer, a size reducer, a screener, and other equipment. Which equipment you need depends on your waste material's characteristics. For example, waste fines can require a pneumatic or screw conveyor to transfer the material from your process to the roller press.

*Michael Schuelke, Koppert Germany, 704-357-3322*

An inclined rotating pan mixer is a good way to agglomerate the waste fines and dust from your process. You may need to add about 12 to 14 percent moisture to the waste material for agglomeration to occur. To achieve a uniform product, energy may also need to be introduced into the process, which can be done using a mixing tool or related component. Other methods of recycling waste fines and dust include mixing, homogenizing, vacuum drying, and pelletizing.

*Nick Semitka, sales manager, Eirich Machines, 547-406-1313*

Very often, what we call "waste" isn't a material without value; the material's characteristics just make it unsafe or too costly to handle or process for recycling or safe disposal. Size enlargement by agglomeration often can reduce or eliminate these handling and processing problems and give a particulate waste a new function. Agglomeration can be achieved by natural, growth-tumble, and pressure (low, medium, and high) methods. Which method and equipment is best for your application depends on the material's particle size.

Particles from about 1 to 500 microns are suitable for growth-tumble agglomeration. Typical equipment includes inclined discs or pans, pelletizing or rotating drums, powder (pin or pan) mixers, and fluidized beds. Material is tumbled or agitated as a liquid binder (often water) is added to the vessel to enhance the particle-to-particle adhesion. As the particles collide, they adhere to each other and agglomerate with the binder's aid.

Low- to medium-pressure agglomeration is suitable for fine particles and binders. For these types of waste fines, try using a pellet mill or pelleter. This type of equipment has holes or differently shaped screens or perforated dies where the material extrudes. High-pressure agglomeration typically doesn't require a binder and is suitable for particles larger than 1 millimeter. Try using open die (ram extruder), confined volume (punch-and-die press), or a converging die (roller press) equipment for this type of agglomeration.

*Wolfgang Pietsch, consultant, COMPACTCONSULT, 239-598-5422*

*Equipment suppliers are a valuable source of information about equipment and processes. In light of this, each month we ask suppliers a question of concern to our readers. Answers reflect the suppliers' general expertise and don't promote the suppliers' equipment. If you have a question you'd like suppliers to answer, send it to Alicia Tyznik, Associate Editor, Powder and Bulk Engineering, 1155 Northland Drive, St. Paul, MN 55120; fax 651-287-5650 (atyznik@cscpub.com).*