CIMCOOL®

Technical Report

Milacron Marketing Co. | Global Industrial Fluids | Cincinnati, Ohio 45209

Fluids for Burnishing, Tumbling & Deburring

Burnishing, deburring and tumbling are specific applications that fall under the broad term *mass finishing*. Mass finishing refers to a varied group of surface conditioning processes used in manufacturing operations. Cleaning and polishing are also examples of surface conditioning applications. Typically each mass finishing process requires a different media and compound or fluid.

Process Definitions

Burnishing is done to produce a highly reflective finish on the parts surface. The burnishing process involves smoothing the surface peaks into the valleys. Non-abrasive sintered bauxite or metal media are often used for this operation.

Deburring is the process of removing burrs. Burrs are the undesirable sharp edges or protrusions on a parts surface produced during the manufacturing process. Parts are deburred by tumbling the parts in a barrel or a vibratory bowl, along with finishing media. Deburring is categorized into the following three areas:

1. ***Light deburring*** removes small brittle burrs produced by preliminary grinding operations or flash resulting from powdered metal moldings. A long- wearing media (i.e. steel, ceramic) is used causing the burrs to break free from the part while smoothing the exposed edges.
2. ***Heavy deburring*** removes large, thick burrs caused by sawing, milling, drilling or turning operations. A fast-cutting media (i.e. ceramic, plastic) is used for this process.
3. ***Radiusing*** rounds sharp corners or edges of parts. This process uses an average to high range composition cutting media (i.e. ceramic, plastic).

Tumble finishing is a process, which utilizes vibratory friction that rubs the media against the parts to be finished. The choice of media is dependent on the surface finish requirements. This type of part finishing is often used for deburring, plating preparation, adhesion texturing, & parts polishing.

Media is the term used to describe the materials used to produce a modified or altered appearance to a part. It usually refers to an abrasive material, but applies to anything that will clean, burnish, abrade, or separate parts.

Most operations involve media along with a liquid compound. The success or failure of the operation is impacted appreciably by the proper selection of these two materials.

Compounds

Mass finishing processes usually utilize liquid compounds or fluids. These fluids are typically mixed at concentrations of 1% to 10% with tap water. Powder compounds are available, though, usually not the popular choice except for special applications. There are also hybrid compounds available in the form of thick liquids or pastes that are offered as carriers of special abrasives for cutting or polishing operations.

Fluid Functions for Mass Finishing

Fluid compounds used in mass finishing operations have many functions. One or all of the following may be a functional requirement of the fluid compound depending on the need of the specific operation and part finish requirements:

- Cleaning of parts & media
- Removal of solids & grease
- Media lubrication
- Reduction of loading & glazing
- Corrosion protection of parts & media
- Chemical removal of rust & scale on parts
- Metal brightening
- Microbial control

The fluid compounds are usually applied by one of three methods.

1. Batch loading of the fluid mix – fluid is placed into a sealed process holder (often seen used with tumbling barrels)
2. Flow-through - fluid mix is passed through the machine and parts and out to fluid waste.
3. Recirculating system – looped process where fluid mix circulates through the machine to a filtration set-up and back to the machine.

Fluids for Mass Finishing Processes

The fluid compounds utilized will typically be alkaline based, non-oil containing products. They may be marketed as a cleaner, corrosion inhibitor, burnishing product or even a metalworking fluid. The fluid chosen needs to fill three key purposes: The ability to suspend solids being removed from the part surface, prevent corrosion of the part, and provide lubrication.

Examples of products that have been successful in tumbling, deburring & burnishing applications:

- CIMCLEAN® BC60 Burnishing Compound
- CIMGUARD®R560 Corrosion Inhibitor
- CIMTECH®95 Metalworking Fluid
- CIMCLEAN® MA359
- CIMCLEAN® MA338
- CIMCLEAN® 30

Consult with your regional CIMCOOL® Technical Service Engineer for specific recommendations, or call CIMCOOL® Technical Service at 1-513-458-8199