Specialist Article

menzerna polishing compounds

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Using Waste-Optimized Polishing Compounds Cuts Costs and Helps Protect the Environment

Polishing waste is bad for the environment. It's difficult - and increasingly expensive – to dispose of. Therefore, anyone looking to optimize polishing processes has to give some thought to the amount of waste generated. It is possible to measure and analyze the amount of waste produced by polishing compounds, rings, and processes using the "polishing waste indicator" (PWI). As a result, disposal-related and environmental considerations can be factored into future purchasing decisions.

Key Insights at a Glance:

- Polishing waste is environmentally harmful hazardous waste. It is becoming increasingly expensive to dispose of.
- The expenses associated with the storage, transportation, and disposal of polishing waste are often not included in calculations of process costs.
- Waste generation can be minimized by optimizing compounds and processes.
- There are measuring techniques that can pinpoint the amount of waste produced by each polishing process.

A New Perspective on the Costs of Polishing Processes

According to conventional wisdom, 90% of the total cost associated with an automated grinding and polishing system is attributable to personnel, depreciation, maintenance, and energy, with only 10% of the costs caused by process inputs (compounds and rings). The disposal costs for polishing waste are often not attributed to the process. When they are factored in, it becomes apparent that the process costs are significantly higher and that polishing waste accounts for between 5% and 20% of the overall cost.

Reducing Polishing Waste Cuts Process Costs and Helps Protect the Environment

Polishing waste includes animal or vegetable fats, polishing ring material, and metal particles. This mixture is problematic in several respects. On account of its high combustibility and large surface area, polishing waste is classed as a fire accelerant and, in certain circumstances, can even catch fire itself. Indeed, light metal scrap usually has to be declared as “hazardous waste” pursuant to the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). This explains why the storage, transportation, and incineration of such waste is costly. Therefore, companies that generate significant quantities of waste have – for environmental and cost reasons – an interest in including polishing waste in any analysis of process technology.

Methodology for Determining the Amount of Waste

Polishing waste comprises polishing residue (30–95%), workpiece material (<2%), and fiber residue from the polishing tool (5–60%). The proportions by weight are determined by means of the so-called “input method.” As a general insight, the amount of waste – measured in grams of waste/cut – can increase by up to 200% if the polishing process is not executed optimally. The amount of waste hinges on the type and quantity of compound, the quality of the buff, and process parameters such as downforce and cutting speed. If the process and inputs are optimized, significant reductions in the amount of waste can be achieved. As the polishing compound accounts for the largest proportion by weight of the waste, one powerful lever in terms of minimizing waste is to select more economical yet effective compounds and to fine-tune the process parameters. The PWI (polishing waste index) of two polishing compounds can, under otherwise identical conditions, vary by 50%. For a company that consumes 100 metric tons of polishing emulsion per annum, this difference can result in 50 metric tons less waste per year.

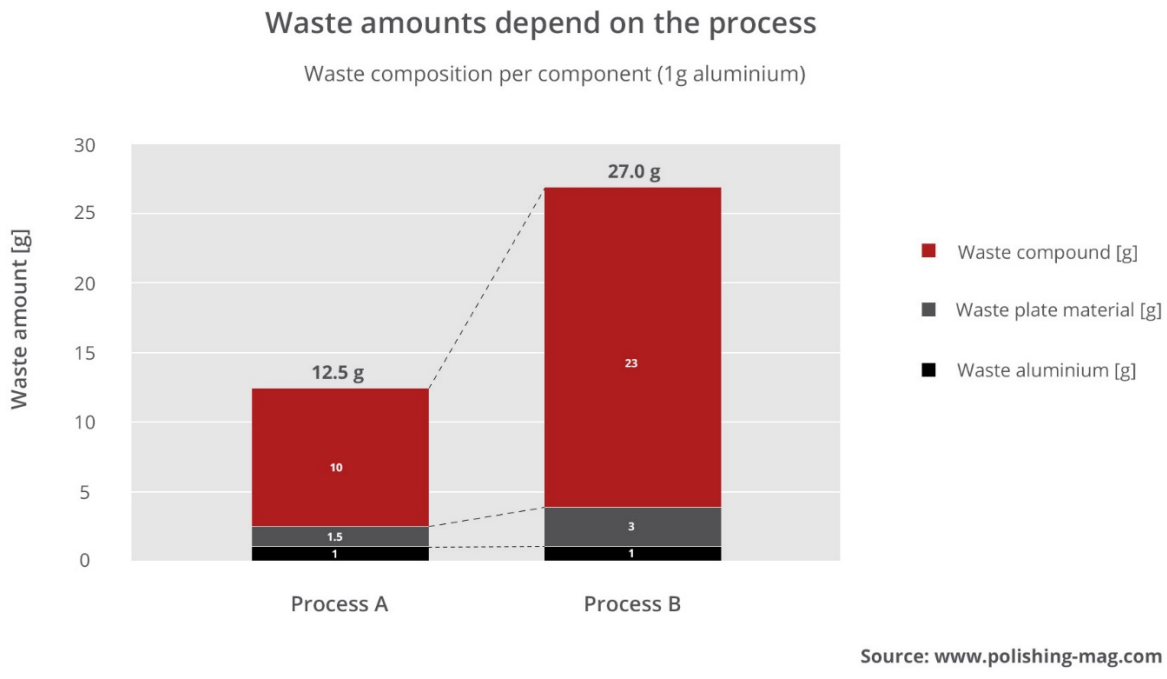

Figure 1: “Orange peel” applied to an aluminum plate using a die stamp

Waste-Optimized Compounds and Processes: Good for the Planet, Good for Profit

Compounds that seem to offer good value at first can generate significant amounts of waste. Companies that focus solely on output figures and the price of a compound end up paying twice: once for the compound itself and then for the expensive disposal of large quantities of polishing waste. Firms who know the PWI of their processes – and who factor this metric into their purchasing decisions – have a clear advantage. This not only benefits the company's bottom line, but the environment too.

Conclusion

Polishing waste often has to be disposed of as "hazardous waste" pursuant to ADR regulations. It is environmentally problematic and associated with high disposal costs. Polishing compounds make up a large share of polishing waste. It is therefore possible to help protect the environment and cut costs with waste-optimized compounds. The PWI indicates how much waste a compound generates by unit of material weight. This end-to-end analysis of the polishing process improves cost transparency and reveals starting points for ecological cost optimization.

About the Author

Menzerna has developed a measuring method that makes it possible to calculate the amount of polishing waste in relation to selected parameters. As a specialist in the optimization of polishing processes, Menzerna is therefore making its customers aware of further potential optimizations. Using data-based methods, Menzerna is able to demonstrate that the most powerful cost levers lie within the process itself. The sharp rises in the costs associated with the disposal of critical polishing waste also need to be considered. Therefore, choosing a Menzerna process or compound not only means choosing more cost-effectiveness, but also helping the environment.

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