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## From The Director's Desk

India Inc. is showing signs of economic recovery after a slump last year. Manufacturing is picking up,



and that's good news for surface finishing industry. In sync with the spirit of revival, we are pleased to introduce a new initiative – Sparkle, a newsletter addressed to the industry: suppliers, customers, associates, and stakeholders.

Our aim is to open an informal channel of communication with you and share news, views, and technical issues on surface finishing. It will try to answer unsolved queries about machines, process, media, and result improvement relating to various industries.

As the pioneer manufacturers of surface finishing machines, we are pleased to create a connect between us through this communication channel. I will be glad to receive your views and comments to make further issues more interesting, richer in information and thus more interesting and useful to all of you.

Welcome aboard.....

**Anil Dalal**

## Mass Finishing – Importance of Media & Chemicals

### What is a Burr?

Need to shine the dull exterior of your product? To smoothen the rough surface? To soften sharp edges? Mass finishing helps you to do so. It is an economical way to remove or stabilize burrs to make a component more functional and contributes considerably in increasing its visual appeal.

Mass finishing works on the basic principle of friction of the component with finishing media in the presence of chemicals and water.

The mass finishing machine is essentially a vibrating machine – the constant movement of the entire mixture of components, media, and chemicals causes a scrubbing/rubbing action. Due to this action, the burrs of the components are removed, the rough surfaces smoothened, dull surfaces polished, and sharp edges softened.

Two very important aspects of a mass finishing operation are Media and Chemicals – A large variety of media, and chemicals available today makes it feasible to produce the desired finish on virtually

any part. Although the type of machine used is important, it is the media that is actually the finishing tool. Selection of the appropriate media is critical in deburring operations. To obtain an excellent result, size of the media and its' shape along with water and chemical compounds, and the type of desired finish have to be taken into account. A correct combination of these variables ensures the most efficient and economical finishing.

### Media

Media is any material that is used to produce different finishes for a component. It usually refers to an abrasive material that deburrs, polishes, cleans or separates parts.

A preformed media or abrasive is a rigid molded shape or cut extrusion that contains a bonding agent as well as a specific size of random abrasive particles that determine the amount of material removal from parts. One of the advantages of the preformed media is

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## ORIGINS OF SURFACE FINISHING

Some say that mass finishing began with the Romans shining their swords and marching to battle. The reflection of their perfectly finished swords was awe-inspiring to their barbarian counterparts armed with primitive clubs.

## Mass Finishing – Importance of Media & Chemicals

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that the bonding compound is formulated to continuously recede and expose new or more abrasive particles. These shapes are capable of maintaining a relatively consistent efficient material removal rate over at least half the life or size of the preformed media shape. The preformed media shape's size, particle size within the shape, and the mineral composition of the preformed shape determines the surface finish.

All media perform some basic functions:

- Cushions and supports parts to prevent damage
- Keeps parts separate
- Improves tumbling or vibratory action
- Supplies abrasive
- Performs work such as cleansing, polishing, and drying
- Burnishes surfaces
- Deburrs or forms radii
- Works on recesses
- Serves as a carrier for the compound

The main criteria for selection of media is that it must do the necessary work in conjunction with the proper chemical compound on the component and have access to all parts of the component where work is to be done.

Additionally the size of media should be such that it does not lodge in the component and there is adequate size difference between media and component size for easy separation..



## Chemicals

Water and chemicals have a significant effect on the performance of media and the action generated in any type of surface finishing equipment. Various chemicals can be used to provide an ideal environment in which the media can perform its best. Selection of the right chemical depends upon the material being finished. Operational requirement also governs whether a chemical should be acidic, alkaline, or neutral.

The selection of the correct chemical gives an accurate control over cutting, deburring, polishing, and descaling operations. Chemicals provide sufficient lubrication, keep the parts and media clean, prevent worn out and loose abrasive from depositing on media and thus glazing it.



## Are all Burrs Bad?

NO. Only those burrs that interfere with assembly, operator safety, or come loose and cause damage during the parts' service life are undesirable. Stabilized burr i.e. those burrs which by reason of location, durability or dullness do not cause the damage mentioned above need not be removed.

## Case Corner

One of the leading manufacturers of razor blades in India was using manual process to deburr razor blade holders. The company personnel were of the opinion that the most cost effective way to deburr razor blades was by manual process. Four workers were assigned the task of hand buffing of the blades. One inspector was assigned to inspect the quality of buffing and the production target of 5000 pieces per day. In case of poor buffing, the pieces were rebuffed and re-inspected.



### Introduction

A leading manufacturer of razor blades in India was using manual process to deburr razor blade holders as they felt that this was the most cost effective method. Four workers were assigned the task of hand buffing of the blades, and one inspector checked the quality of buffing and the production target of 5000 pieces per day. In case of poor buffing, the pieces were rebuffed and re-inspected.

### The Problem

Dalal's business development engineer approached the head of production and suggested introducing vibratory finishing machines. Initially the production head expressed his fear that the capital cost of machine would make the entire operation more expensive, although there would be increase in production due to mass buffing of blades.

Dalal's engineer collected data, calculated current costs of operations (see Table 1) and compared with the mass production cost that would incur if a vibro finishing machine was used. (See Table 2).

### The Solution

The production head was amazed by the cost comparison of the manual and mass finishing processes. The economic benefit of mass finishing through Dalal's vibratory machine was astounding. Table 3 shows a comparison of cost benefit.

	Pieces finished per day	Working days/year	Production/year (piece)	Total cost/year (Rs.)	Buffing cost per 100 piece (Rs.)
Manual finishing	5,000	25 days x 12 months = 300 days	15,00,000	2,66,000=00	18
Mass finishing	5,000	25 days x 12 months = 300 days	15,00,000	1,18,983=00	08

Switching to Dalal's vibratory finishing machine was a clear winning solution for the company and the company has now installed two machines with the increase in their domestic and export orders.

Table 1. Manual Cost of Deburring Razor Blades

No.	Cost Head	Yearly Cost (Rs.)
<b>5,000 pcs/day</b>		
1	Hand buff labor (4 workers )	1,44,000=00
2	Inspection cost	48,000=00
3	Raw material, hand buffing, scrap, rebuffing	59,000=00
4	Floor space cost	15,000=00
<b>Section Total</b>		<b>2,66,000=00</b>

Table 2. Mass Finishing Cost of Deburring Razor Blades

No.	Cost Head	Yearly Cost (Rs.)
<b>5,000 pcs/day</b>		
1	Deburring machine operator (1 person)	36,000=00
2	Finishing machine depreciation	1,700=00
3	Machine maintenance	1,500=00
4	Water, Media + Chemical	45,806=00
5	Power cost	22,477=00
6	Floor space cost	10,000=00
7	Waste removal	1,500=00
<b>Section Total</b>		<b>1,18,983=00</b>

Total savings by installing a mass finishing machine will be Rs.1,50,000=00 per year

## Recent Developments

- » Wooden Items can now be smoothed and polished through a new specially developed process.
- » Reduce process time of deburring and polishing of ferrous components through special chemicals developed by us.
- » Check out the amazing results for yourself by sending your samples to our Thane factory.

## FAQs



The users of vibratory finishing machines do face some problems or dilemma in operations. We give below the answers to five frequently asked questions by the users.

### **Q.1] I find excessive impingement (denting) on my components.**

A.1] Let us first understand what are the causes of excessive impingement of the components' surfaces. Causes are: insufficient media used; too many components placed in the bowl with very little space to turn over along with media; media size being larger than required; and excessive vibrations of the machine. A prudent way would be to check on the above causes and in case one or more cause is present, remedy them and you have solved the problem!

### **Q.2] In my components which have small hole, the burrs get bent on the other side of the hole instead of getting removed.**

A.2] Such a problem can arise due to either of the reasons, such as: deburring action is too slow; wrong type

of media is used; water level in the bowl is not sufficient; or the vibrations of the machine are not correct for the given process. Please observe the process carefully and find what is the cause.

### **Q.3] We get poor surface finish on our components.**

A.3] Poor surface finish is largely caused due to an inadequate cutting process done before polishing. If the components are not cut properly before putting them in the vibro bowl, the outcome would be poor surface finish. Other reasons could be: incorrect selection of compound, or insufficient water flow or too aggressive media. By solving these problems, the surface finish of the components will improve drastically.

### **Q.4] In our parts, media gets lodged in the holes and in the recessed areas. How can we remove them?**

A.4] The most important reason would be the wrong size or the wrong shape of media. It may also happen that media gets fractured during the process

and gets lodged inside the holes or recesses. At times, the operator is not careful to remove worn out media. This is very important as worn out media may harm the process.

### **Q.5] We have an automatic vibro machine but even in that the components do not get unloaded. We have to manually unload them.**

A.5] There are several reasons for this problem. If the media is insufficient, the components do not get the thrust to come out during unloading, and also if media is oily, then there are high chances of components not getting unloaded. Another reason could be excessive water in the machine during unloading cycle. One check is important and that is the eccentric weight setting. If this setting is accurate as per the factory setting norms, then the components will rotate and come out automatically.



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