TABLET COMPRESSION RESOURCE
a division of Natoli Engineering Company, Inc.

WHITEPAPER

HOW LONG DOES A SET OF TOOLS LAST?

HOW TO RECEIVE THE LARGEST RETURN FROM A TOOLING INVESTMENT

One of the most common questions we are asked is "How long should a set of tools last?" The answer is dependent on many factors, including tablet configuration, the characteristics of the material being compressed, and the steel type of the tooling. These are just a few of the issues that should be considered when evaluating the life of your punches and dies. There are multiple ways to prolong the life of your tooling and protect your investment.

MAINTAINING YOUR TABLET COMPRESSION TOOLING

Tooling is a significant investment for your company. While individual punches and dies may represent a small portion of production cost in relation to the purchase and maintenance of machines such as fluid bed dryers and tablet presses, over the life of a product many sets of tooling will be necessary – a sizable expenditure. Excessively worn or improperly maintained tools could create a tremendous liability to the production team by creating a perception of poor quality to the consumer. Tablet manufacturers will receive the most use and highest quality tablets from their tooling if tools are properly maintained.

COMMON WAYS FOR MAINTAINING TOOLING TO ENSURE MAXIMUM RETURN INVESTMENT:

1. PROPER HANDLING

Proper handling of tooling can be as simple as keeping the tools in a recommended storage bin and separate from each other to protect them from coming into contact with one another. It's surprising just how many tools need to be replaced each year due to mishandling. "Accidents" add up. In some cases, tablet compression technicians simply lack a systematic handling procedure. Damage such as nicks and dings on and around the punch tip are commonly known to cause black specs and product discoloration as well as capping and lamination.

2. PROPER CLEANING

A cleaning procedure with minimum human interaction is ideal to ensure that tools are cleaned consistently, reducing potential for damage. Ultrasonic cleaning with an automatic dryer is the optimum solution as it provides the tool with increased exposure to cleaning solution and hard to reach portions of the punch, including keys and embossing, are cleaned without the risk of damage. The advantage of using a dryer in conjunction with an ultrasonic cleaner eliminates the potential for surface discoloration and corrosion.

3. PROPER STORAGE

Tooling storage containers should allow punches, dies or segments to be stored securely without bumping into other pieces. There are many solutions available, from storage boxes, to racks and cabinets that provide adequate protection during storage and transport. The use of a desiccant pack inside the sealed tooling storage box or drawer is recommended as well.

4. PROPER MAINTENANCE

Polishing tools refurbish the punch cups and restores land, and allows for minor repairs of punch heads, back angles and barrels. Unlike the polishing process of drag finishing, manufacturers using the cotton wheel method often double the usable life of the tool – increasing the life of your investment. On the contrary, polishing done by an inexperienced technician could destroy a set of tools. Great care should be taken that only a small amount of material is removed during this process. Therefore, a well-trained and experienced tooling technician should complete this maintenance procedure.

5. PROPER LUBRICATION

Automatic lubrication systems can provide false assurance that appropriate lubrication is being supplied to all the necessary areas of the punches. By simply applying a food grade barrel lubricant to the punch barrel

and applying a food grade grease to the head of the punch with a proper brush prior to operation you will ensure proper lubrication on tablet press start-up. Some auto lubrication systems require the lubricant to migrate to lubrication channels requiring centrifugal force for lubrication. Automatic lubrication may not have reached critical lubrication points at press start-up, which can lead to damage on mating parts of the punch, including guides, keyways, cams, and pressure rollers as well as premature wear to the tools themselves. If a tool is not properly lubricated, it will cause excessive friction which will increase the operating temperature of the punch resulting in thermal expansion of the punch barrel, which reduces the space allowed for lubrication, potentially leading to tool binding, turret damage, and emergency stop.

HOW TO EXTEND TOOL LIFE BEYOND PROACTIVE MEASURES

RESIZING TOOL LENGTHS

The working length of the tool is critical in production as it ensures consistent tablet parameters are met throughout the set. Punches should be visually inspected and measured before being transferred into storage. Working lengths of the set should be within the tolerance range determined by internal SOPs.

In most cases, tools that are out of specification with working length, can be lightly machined and put back into specification. If working length is out of specification, contact your tooling supplier to learn what your options are.

Management constantly evaluates cost reduction strategies, and those decisions reverberate through the business. It's the responsibility of the production team and procurement department to reduce variable costs while maintaining or increasing output and efficiency. It's the responsibility of all those involved, including suppliers, to ensure that costs are minimal and outputs are maximized. Protecting the company's investment by properly maintaining tooling can be a part of cost reduction.

By maintaining the integrity of your tools through proper lubrication, handling, storage and maintenance, production can ensure consistent and efficient tablet manufacture while prolonging tool life and tablet quality.