

How to Control Shim Tooling Costs

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Shim tooling costs are one of the quickest ways to drive a prototype or short-run production project over budget. **SPIROL** has several manufacturing methods that eliminate or greatly reduce tooling expenditures. Whether a project is for prototype, short run or long term requirements, **SPIROL** has a solution to minimize the installed component costs by controlling tooling costs. The following explains some of **SPIROL**'s production technologies that are used to manufacture Shims, and when each is most advantageous:

S.W.A.T. (Stamping Without A Tool)

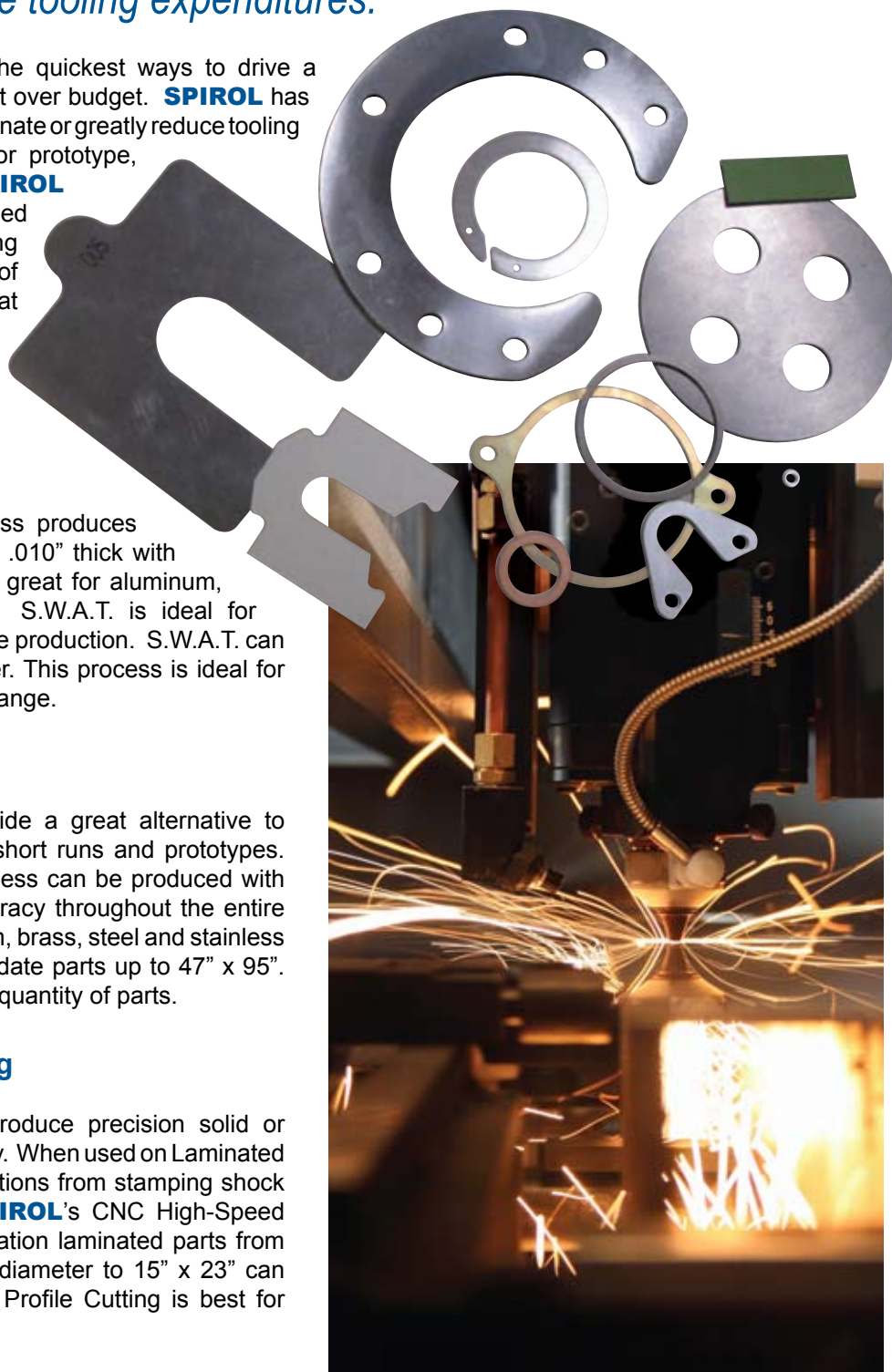
SPIROL's proprietary stamping process produces burr-free thin metal parts from .001" to .010" thick with simple or complex shapes. S.W.A.T. is great for aluminum, brass, steel or stainless steel parts. S.W.A.T. is ideal for dimensional repeatability and low volume production. S.W.A.T. can produce parts from 1" to 21" in diameter. This process is ideal for production runs in the 10 to 3,000 part range.

CNC Laser Cutting

SPIROL utilizes two lasers that provide a great alternative to tooling for unique configuration parts, short runs and prototypes. Thicker parts from .010" to .250" thickness can be produced with CNC controls that ensure precise accuracy throughout the entire lot. Laser cutting is suitable for aluminum, brass, steel and stainless steel. **SPIROL**'s lasers can accommodate parts up to 47" x 95". **SPIROL**'s laser cutting is good for any quantity of parts.

CNC High-Speed Profile Cutting

SPIROL's CNC machining centers produce precision solid or laminated parts with superior edge quality. When used on Laminated Shims, there is no separation of laminations from stamping shock and the layers are easy to peel. **SPIROL**'s CNC High-Speed Profile Cutting is ideal for odd configuration laminated parts from .012" to .250" thick. Parts from .500" diameter to 15" x 23" can be produced. **SPIROL**'s High-Speed Profile Cutting is best for production runs of 1 to 500 pieces.



Operational Setup and OD/ID Combo Tooling

SPIROL has accumulated thousands of common “free-float” and combo tooling, capable of producing one and two hit special-dimension washers and OD/ID parts. Operational setup utilizes standard tools to produce a two-hit washer or OD/ID part. OD/ID combo tooling produces a wide variety of special dimension washers with one-hit. OD/ID combo tooling is the preferred method when statistical capability is a criteria.

Compound Tooling

For products with a long life cycle, one-hit compound tooling will guarantee product quality and repeatability over the life of the tool. **SPIROL**'s die shop produces quality tools at competitive pricing utilizing the latest CNC and EDM production technology. Compound tooling is ideal for long run parts with complex configurations.

How does one know whether Tool-Less Technology or tooling is the best approach?

Tool-Less Technology is almost always the most cost effective solution for prototype and short run Shims. But, as quantities and project life expectancy increase, there is a point where tooling may be the preferred method.

Here is a simple formula to determine which method is best for each project. Remember to calculate the quantity of parts needed over the lifetime of the project.

Tool-less Technology part: $(\text{quantity} \times \text{piece price}) = \text{total cost}$
vs.

Tooled part: $(\text{quantity} \times \text{piece price}) + (\text{tooling cost}) = \text{total cost}$

Whichever results in the lower total cost will usually be the best choice.

SPIROL's cost estimating staff will analyze potential production methods to determine which is the best based on the life expectancy of parts and volume requirements.



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ISO/TS 16949:2002
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NADCAP AS7108 Chemical Processing
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