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Harold V Johnson

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Metal spinning, also known as spin forming or spinning, is a metalworking process by which a disc or tube of metal is rotated at high speed and formed into an axially symmetric part. Spinning can be performed by hand or by a CNC lathe. It is from an artisan's specialty to the most advantageous way to form round metal parts for commercial applications. Artisans use the process to produce architectural detail, specialty lighting, decorative household goods and urns. Commercial applications include rocket nose cones, cookware, gas cylinders, brass instrument bells, and public waste receptacles. Virtually any ductile metal may be formed, from aluminum or stainless steel, to high-strength, high-temperature alloys. The diameter and depth of formed parts are limited only by the size of the equipment available. The spinning process is fairly simple. A mandrel, also known as a form, is mounted in the drive section of a lathe. A pre-sized metal disk is then clamped against the mandrel by a pressure pad, which is attached to the tailstock. The mandrel and workpiece are then rotated together at high speeds. A localized force is then applied to the workpiece to cause it to flow over the mandrel. The force is usually applied via various levered tools. Simple workpieces are just removed from the mandrel, but more complex shapes may require a multi-piece mandrel. Extremely complex shapes can be spun over ice forms, which then melt away after spinning. Because the final diameter of the workpiece is always less than the starting diameter the workpiece must thicken, elongated radially, or

buckle circumferentially. A more involved process, known as reducing or necking, allows a spun workpiece to include reentrant geometries. If surface finish and form are not critical, then the workpiece is "spun on air"; no mandrel is used. If the finish or form are critical then an eccentrically mounted mandrel is used.