Personal Protective Equipment

Automotive Metal Stamping; ANSI A7 to A9 Cut Resistant Gloves for Working

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Let's face it, many times working professionals get thrown to the wolves when it comes to the work performed in business, whether that's the safety professionals keeping others safe or the physical workers making things. That's why MCR Safety believes in keeping you informed about how their products fit into various industries, including metal stamping in the automotive industry.

So, what is metal stamping? It is the process by which metal is cut and formed into a desired shape or profile by a stamping die, whose cutting and forming parts are made of special types of steel. Within the automotive industry, metal stamping is the fastest method available for producing the vast numbers of parts that go into creating automotive vehicles.

This image shows metal after stamping occurs. Sharp metal is everywhere, meaning cut protection is essential.

Keeping with the theme of metal stamping, let's press on and examine where PPE plays its part in the overall process.

Stamping Processes

Stamping is a "cold-form" operation. Heat is not used during the process; however, friction generates heat as the metal is cut and formed, so metal often ends up being very hot when it exits the die.

There are different stamping processes, depending on what final product is desired:

- **Bending:** Metal is bent into specific shapes. Force is applied to create simple curved surfaces.

- **Blanking:** Cutting shapes from large pieces of metal.
- **Coining:** Letters, numbers, or images are imprinted on the metal's surface. (This is how coins are made, thus the name.)
- **Drawing:** Metal is forced against a die and is stretched into a three-dimensional object, most times a complex shape. It is the most common method for making auto body parts.
- **Piercing:** Indentations are made in the surface of the metal; the metal is not cut all the way through. Instead, a cavity is left in the metal's surface.
- **Punching:** The shape that is cut is discarded and the surrounding metal is used.

Both blanking and punching can be done at once.

Metal Stamping's Role in the Automotive Industry

Metal stamping is one of the first steps in the automobile production process. Stamping is essential to the fabrication of automobiles because of the large number of different-sized steel parts that are assembled into finished vehicles and the ability to stamp and replicate a high volume of identical parts. A car body may contain more than 1,500 stampings, in addition to large parts including the doors, floor, chassis, and roof.

As mentioned above, many automotive parts are made by a process known as drawing. In drawing, a flat piece of sheet metal is placed on the forming die. It is held in place via a compressive force exerted by a blank holder, which controls the sliding of the metal sheet during the drawing process.

A punching tool then moves down to the piece, causing it to deform. The metal flows into the die cavity to create the final shape, which is typically hollow and open on one side. The term "deep drawing" refers to the shapes produced by this method, as they often have depths that exceed their diameter.

A Visual Look at Automotive Stamping

The following are the steps taken when metal stamping in vehicle manufacturing plants (*for images of each step, please see the full article on **MCR Safety's blog***):

- **Metal blanks are made.** The steel is turned into metal blanks.
- **Tool-die makers get to work.** Workers prep the press and stamping begins.
- **Press machine stamps out metal components.** Workers have to handle stamped parts and feed the blanks into the machines to make different components. Examples include: rear frame, panels, bumpers, and floor and side panels.
- **Stamped metal is destacked.** Workers move the stamped metal parts to production, loading them onto welding robots.

MCR Safety highlights all 16 steps to manufacturing automobiles on their ***Automotive Industry*** page. Metal stamping absolutely requires cut protection, in both gloves and sleeves.

Cut-resistant gloves are essential PPE needing to be worn throughout all stages of working around metal. However, its importance can't be understated when workers must handle rough-edged stamped metal and move to other work stations where sharp metal is present.

Examples of Stamped Automotive Parts

There are thousands of ***stamped parts*** used in automobiles. Some of the parts that regularly get

stamped are bayonet sockets, caps, coupling joints, engine mounts, exhaust mufflers, fuel injectors, motor housings, seat latches, and thermostats.

Applications Performed by Stamping Workers

Workers perform a variety of tasks during the stamping process and when forming metal, including:

- Bending and forming metal sheets to desired shapes.
- Checking and inspecting parts.
- Cutting and separating metal.
- Handling metal panels and body structures.
- Grabbing and handling sharp metal parts formed from the presses.
- Lifting stamped parts into place on the welding line.
- Moving and transferring stamped parts to welding cells.
- Operating machine presses.

Metal Stamping Hazards and Injuries

Metal stamping is hazardous work. There are 4.5 million reported injuries in the metal manufacturing industry each year. In 2016, OSHA cited one metal stamping company for nine serious and two other-than-serious safety violations. Workers can get injured at every step of the stamping process.

When you examine injuries within the automotive industry, most of them occur around the stamped metal itself. Injuries typically occur when workers are taking stamped pieces off the machine, moving stamped parts, and then transferring them to welding cells for frame assembly.

Workers in metal stamping are at ***risk when***:

- **Material handling:** The edges of sheet metal may be abrasive and razor sharp, so even the most careful worker is at risk for cuts if they're not wearing the proper protection.
- **Sharp objects:** Sheet metal workers are in constant contact with some of the world's sharpest materials. Workers are punching, cutting, bending, and shaping metal.
- **Cuts and crush:** Workers can be cut by the edges of sharp metal and have their hands or arms crushed by objects.
- **Impaired vision:** Workers who handle sheet metal are potentially exposed to flying metal fragments, particles, and projectiles.
- **Puncture:** Metal splinters, small metal chips, and burrs are found all over sheet metal. They can easily puncture workers' skin.

PPE for Stamping Applications

Stamping requires that workers wear the best cut protection available. Here are two new products from MCR Safety.

The MCR Safety Cut Pro™ 92735N glove features a 15-gauge plaited black Hypermax™ and steel shell. The plaiting provides additional comfort from steel fibers that help reinforce the glove's strength. From a strength standpoint, the 92735N scores a "top of the chart" ***ANSI Cut A9 and ANSI Puncture 5***. The reinforced thumb crotch provides extended use in a high-stress area. The black color also hides dirt and grease to provide the user with a perceived desire to wear the gloves longer.

The Cut Pro™ 92743BP offers a seamless salt and pepper Hypermax™ shell that supplies cut, tear, and

abrasion resistance. It also offers good dexterity and is comfortable and easy to wear. The black foam nitrile/water-based PU-coated palm and fingertips provide a durable grip and hide dirt, grit, and grime. With high cut and abrasion scores, this glove keeps coming back for more.

You should also check out MCR Safety's ***Glove Cut Protection*** page. They explain the American National Standards Institute's ANSI/ISEA 105-2016 cut-resistance standard and provide an extremely helpful sorting tool for choosing different levels of cut-resistant gloves, from ANSI A2 to A9. All metal stamping workers should consider wearing at least A7 cut protection and above.

Previously Featured on MCR Safety's blog.

