Proper Blank Washing is Fundamental to Quality

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Automotive manufacturers can better form the component panels of an automobile when a blank has been properly washed. It saves time, money and parts rework in the process. In fact, I'd go so far as to say that properly washed blanks can lead to quieter passenger cabins and better paint finishes.

Read on. . .

An improperly washed blank can lead to quality problems down the line. For example, an improperly washed blank can create poorly stamped parts. That creates assembly problems as parts don't fit together properly, and gaps have to be closed with sealants or mastics. Excess oil that hasn't been washed away can lead to painting problems.

With that being said, let's talks about the critical success factors for automotive blank washing and what happens when blanks aren't properly washed.

Blank washing occurs at the start of a stamping line at an automotive assembly plant, at a Tier One supplier to an assembly plant, or when a blanking line supplies a stamping line.

To ensure proper washing, the following five elements need to work in sync:

- The line's processing speed
- The temperature of the fluids being used
- The chemistry of the lubricant being used
- Brushes that are properly engaged and have sufficient bristle to clean
- A good filtration system keeping the lubricating fluids clean

Brushes are used in the washing phases to provide the agitation or wiping action before the metal coil moves on to wringer rolls. NCCM® nonwoven rolls handle the job with great efficiency and productivity. They're fabricated from 3M's nonwoven coated fabrics compressed together to create a roll with a unique combination of characteristics. NCCM® nonwoven rolls are an ideal choice as a wringer roll and entry nip roller. The rolls are engineered based on temperature and pressures within the application.

NCCM® Premier Yellow nonwoven rolls are considered the premium roll covering for primary metal and automotive stamping operations. The major benefits of switching to a NCCM® nonwoven mill roll include:

- Consistent Oil Application
- Reduced Line Downtime
- Reduced Environmental Footprint
- Improved Quality and Plant Safety
- Cost Savings

NCCM® Premier Yellow Nonwoven Roll

It's All about Controlling Oil

A consistent oil flow rate—generally recommended at the rate of one gallon per minute/per inch of roll face—is critical to the proper cleaning of blanks. Film thicknessing rolls must be engineered for oil viscosity, pressure, hardness, finish, roll diameter, velocity and material topography. When these factors aren't controlled, the film thicknessing roll isn't capable of fluid control.

Production lines that have switched to NCCM® nonwoven mill rolls have experienced the following benefits:

- NCCM® nonwoven rolls provide superior fluid control. In wringing applications, fluid control is the removal of any liquids used in de-oiling or cleaning applications. In oiling applications, fluid control refers to applying oil to the surface of a strip in a controlled method while maintaining consistent film thickness for one or more years.

- NCCM® nonwoven rolls apply lubricants consistently. Ultimately, this means film thickness can be lowered, thereby eliminating or reducing defects from excessive oil.

- NCCM® nonwoven rolls reduce defects from excessive oil or oil marking, increase first-time-through quality and increase press output. You save the time and labor costs associated with parts rework.

- NCCM® nonwoven rolls reduce oil consumption. When oil film levels are maintained at a consistently low level, oil consumption can be significantly reduced. Performing a simple calculation will help you see the savings. Try comparing the costs of applying two g/m^2 compared to one g/m^2. One automotive manufacturer saved $80,000 in annual oil consumption costs after switching to NCCM® mill rolls.

Reduced Line Downtime

NCCM® nonwoven rolls produce a thin, predictable and evenly-applied oil film thickness. When this occurs day in and day out, the dies can be tuned in and require very little deviation in setup. In pressroom environments, NCCM® rolls have delivered consistent results for years. When it is time to change out a set of dies, reliable and predictable lubrication standards make it much

easier to reestablish the parameters to restart the line. Process stabilization makes springback forming far more predictable, and that's important for the forming of an ideal net shape part.

Improved Quality and Safety

When oil film thickness levels are less than 1.5 g/m^2, there is very little oil that drips off the parts onto the plant floor. This reduces slip and fall injuries and cleanup costs while simultaneously improving safety in the work environment.

The weld assembly of parts with low oil film levels produces less smoke and contributes to a cleaner work environment. Weld integrity is also better when there is less oil in the weld zone.

Keeping the oil film levels low can reduce the cost for gloves while improving the health and safety of employees, some of whom may have problems with dermatitis.

Low oil film levels also play an important role in improving safety and productivity. It reduces slippage when parts are transferred from one die to the next without disorienting the part. This is critical due to the transfer speeds of today's high output presses.

Improved Quality

Today's automobiles require high "N-value" steel (strain-hardened steel). Strain hardening refers to the ratio of elasticity in a solid material. This "N-Value" steel has a high elasticity value, meaning it has been properly elongated to create the hardening characteristics that provide passenger compartment integrity. When lubrication is set to a constant, pre-determined level, binder ring pressure and friction can be set to allow material flow that creates the optimum net elongation. This yields the design strength and shape.

The consistency of the net shapes of the inner and outer automotive panels is critical to quality when the panels are assembled. The stabilization of the forming process contributes to the

quality of the finished assembled part. If all the panels that make up an automotive body are formed to their design shape, the gaps between the mounted components should never be larger than the gaps for the seal. This creates a better seal and a quieter passenger compartment free from noise caused by air leaks. A quieter passenger compartment contributes to customer satisfaction.

When automotive panels are consistently stamped, the use of sealants and mastics that close gaps is reduced. Properly washed blanks don't have burrs, and the resulting stamped parts don't have defects that occur when paint is applied over residual oil.

Blank washing may seem like a simple process compared to the other process steps required to build an automobile. However, as you've seen, it's a fundamental first step that can prevent problems, save time and money and ultimately enhance the automotive manufacturer's reputation and a driver's experience of his or her new vehicle.