Pressure Transmitter Usage in Hydroforming with Metal Forming Machine Tools

Hydroforming Applications for Pressure Transmitters

Hydroforming

Hydroforming, also known as hydro-molding, is a technique, used in metalworking on malleable metal sheets and tubes as a means to form and stiffen complex shapes. Brass, copper and aluminum are common hydroforming materials though many stiffer, harder materials can be used in hydroforming. Materials that are hydroformed often have higher stiffness to weight ratios and smoother finishes when compared conventional die cast or stamped parts.

Hydroforming is performed through the use of pressure transmitter monitored hydraulic systems. Sheet hydroforming uses a negative mold of the part being formed. The sheet is placed inside a sealed chamber above the mold and has high pressure hydraulic fluids injected above the sheet to press the sheet down into the mold. Bending the sheet material used, pressures can reach in excess of 15,000 psi to properly hydroform sheet metal. Tube hydroforming is performed much the same way; however, the tube is pressurized from the inside and forced outward into a negative mold that extends the length of the tube. The high pressures involved in both sheet and tube hydroforming necessitates the use of accurate, high pressure transmitters for constant monitoring and control.

Advantages of Hydroforming

- Easy to produce complex concave and convex geometries
- Reduced metal thinning and work hardening compared to other metalwork processes
- Reduced need for additional metal heat treatment

Pressure Transmitter Use in Hydroforming Applications

Pressure transmitters are used for Hydroforming in the following metal forming machine tool applications:

- Hydraulic Pressure Monitoring
- Hydraulic Pressure Control
- Crack/Rupture/Detection
• Mold Chamber Sealing and Leak Detection
• Automated Process Control

Hydroforming metal sheets and tubes in metal forming machine tool applications calls for pressure transmitter material compatibility with high pressure petroleum and/or water based hydraulic fluids. Pressure transmitters are responsible for monitoring and controlling the pressure of the hydroforming hydraulic fluid, monitoring and controlling automated processes to close and seal the forming chamber, and to detect imperfections or failures during processing. The WIKA HP-2 high pressure transmitter has been designed for superior performance in high pressure applications like hydroforming up to 15,000 bar and with long term stability, high accuracy, and dynamic pressure curves in mind.

**Pressure Transmitter Selection Considerations**

• Absolute or Gauge Pressure Measurement
• Media Compatibility for Pressure Transmitters
• Moisture Resistance in Pressure Transmitters
• Pressure Transmitter Accuracy and Errors
• Radio Frequency (RFI) and Electromagnetic Interference (EMI) in Pressure Transmitters
• Vertical or Horizontal Pressure Transmitter Mounting
• Vibration Resistance in Pressure Transmitters

_Call us at (855) 737-4714 for more information, or to speak to one of our Sales Engineers._