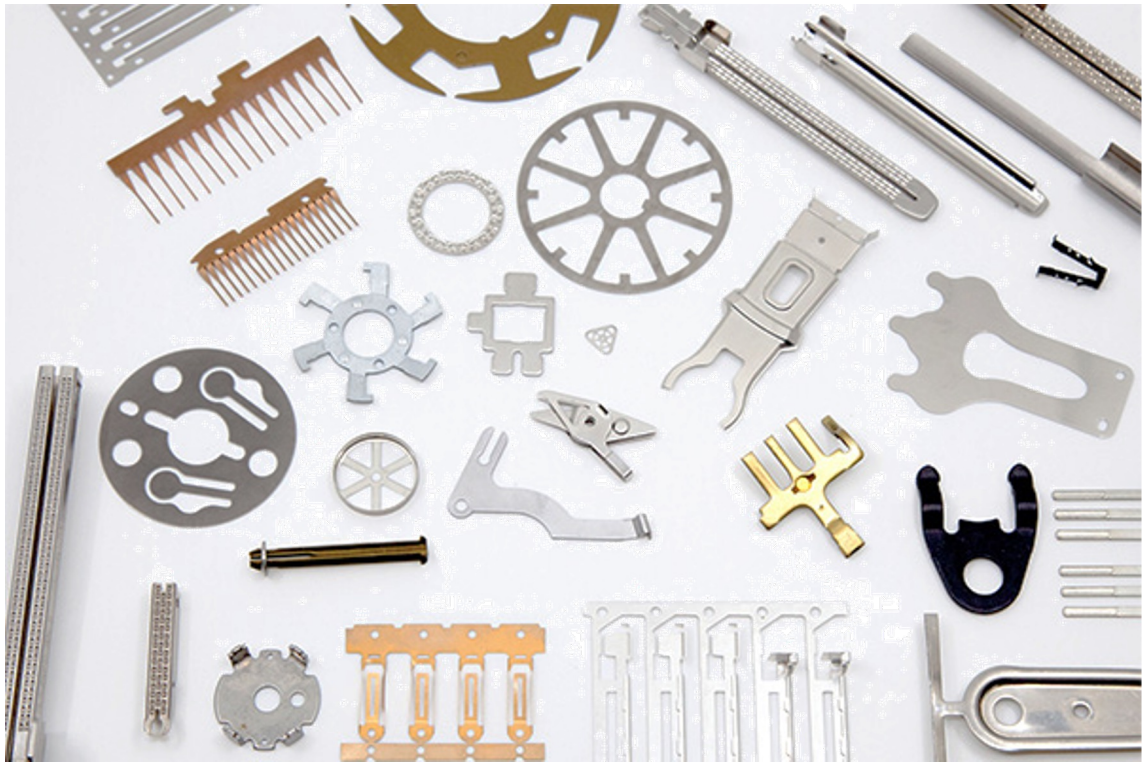
MetalForming LIVE

JULY 2023

The Precision Stamping Process

What is Precision?



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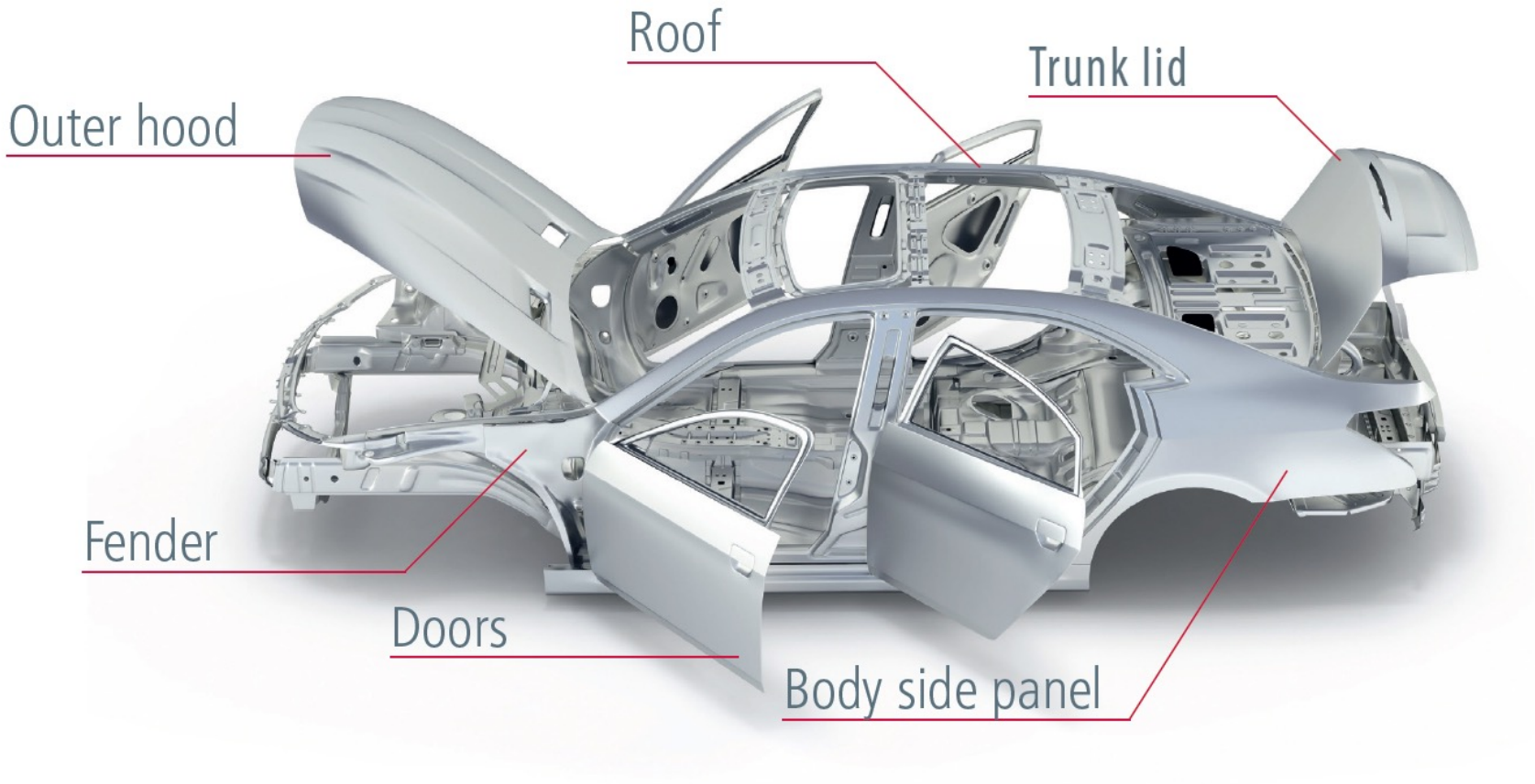


The Precision Stamping Process

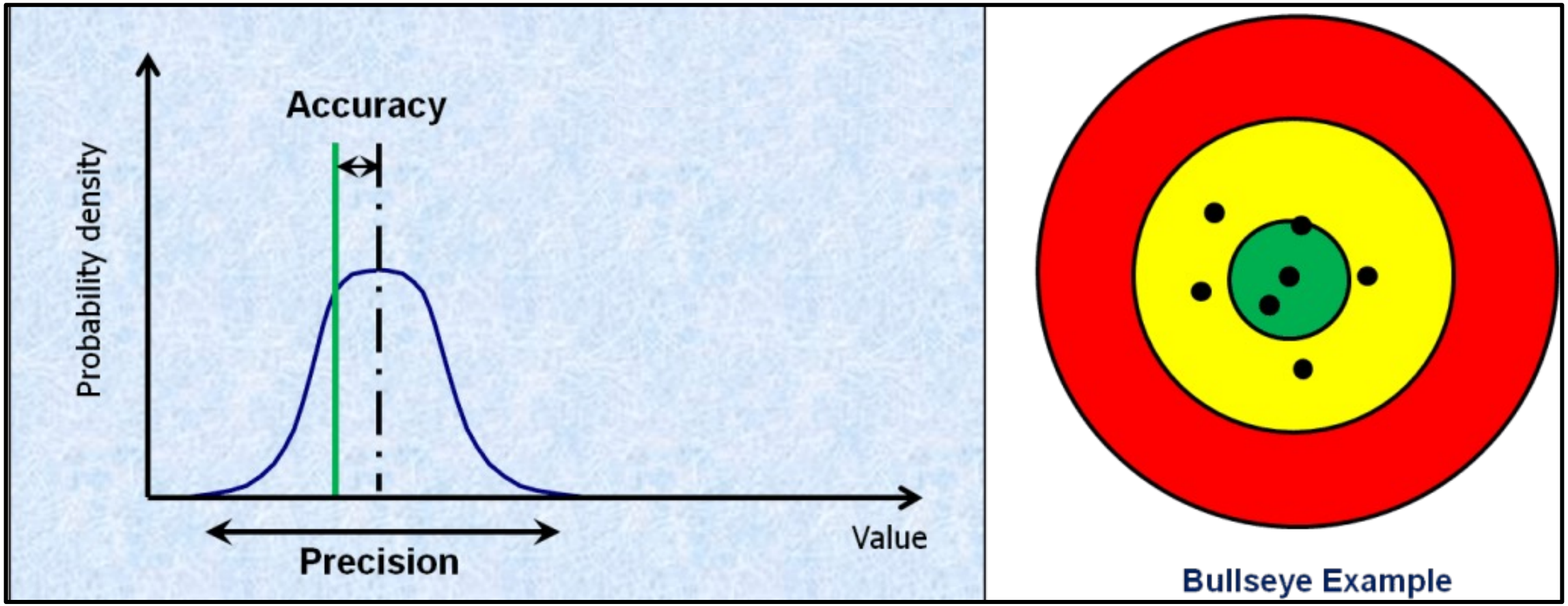
What is Precision?

Accuracy and precision are both ways to measure results.

Accuracy measures how close results are to the desired value.

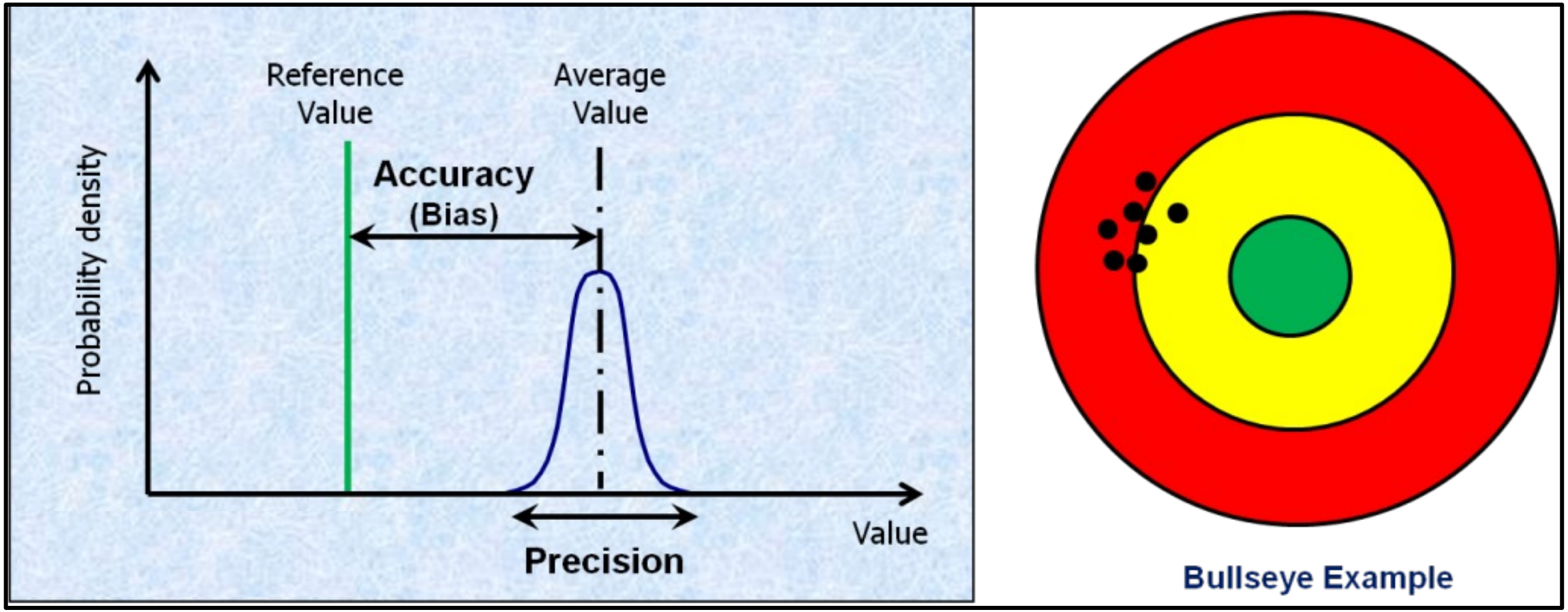
Precision measures how close results are to one another.

HIGH Accuracy and LOW Precision



https://techqualitypedia.com/accuracy-definition/

LOW Accuracy and HIGH Precision



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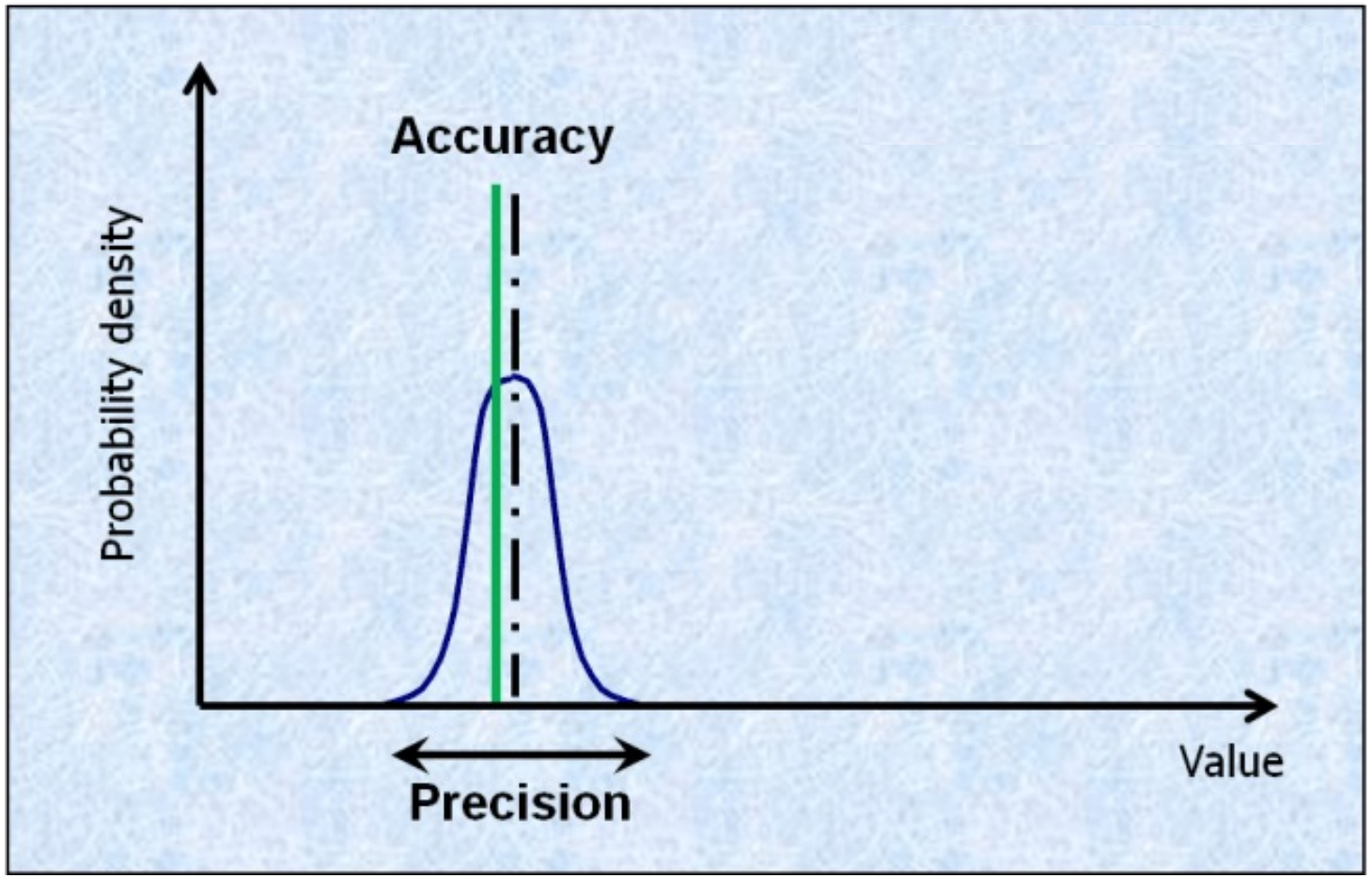
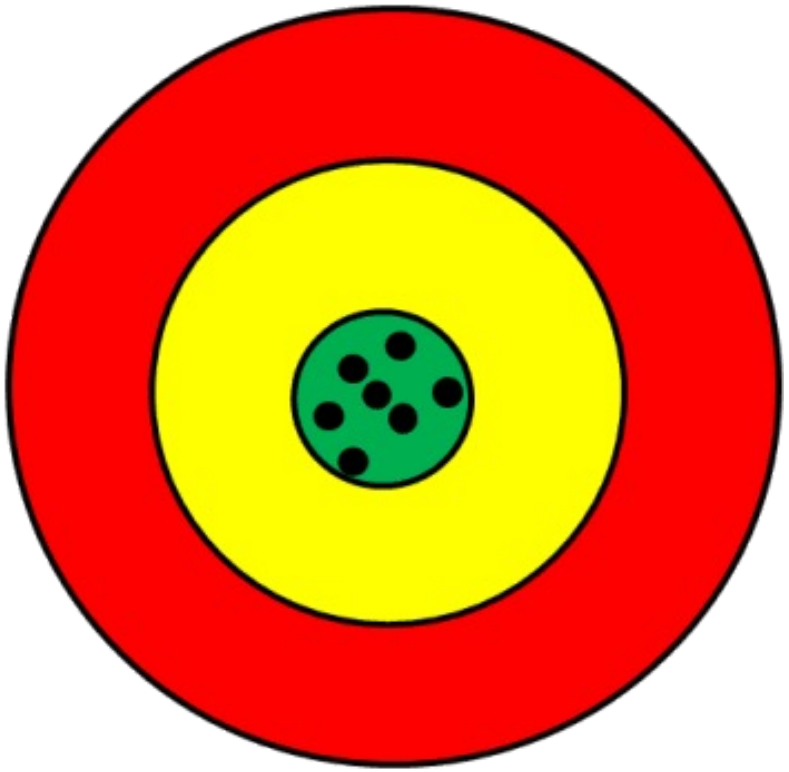
HIGH Accuracy and HIGH Precision





Bullseye Example

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The Precision Stamping Process

What is Precision?

Accuracy and precision are both ways to measured results.

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Precision measures how close results are to one another

The key to a precision process is the control of input variables

Precision Stamping Processes

Identifying and Controlling Input Variables

A Process is a System of Inputs and Outputs

Precision Stamping Processes

Identifying and Controlling Input Variables

A Process is a System of Inputs and Outputs

Where Does Mommy Keep the Extra Diapers?

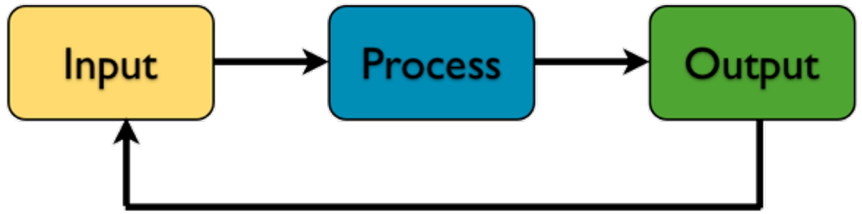
Precision Stamping Processes

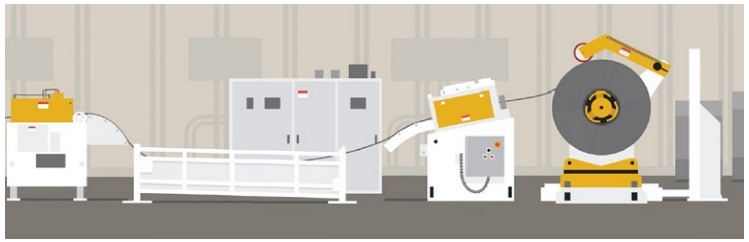
Identifying and Controlling Input Variables

A Process is a System of Inputs and Outputs

Precision Stamping Processes

Identifying and Controlling Input Variables





Precision Stamping Processes

Identifying and Controlling Input Variables

How Many Possible Combinations?

- Set Up Accuracy
- Die Design/Construction
- Equipment Maintenance
- Die Maintenance

10,000 different combinations

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- Measurement Methods

100,000 combinations

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- Die Maintenance

10,000 different combinations

- Measurement Methods

100,000 combinations

- Documentation/Control

1,000,000 combinations

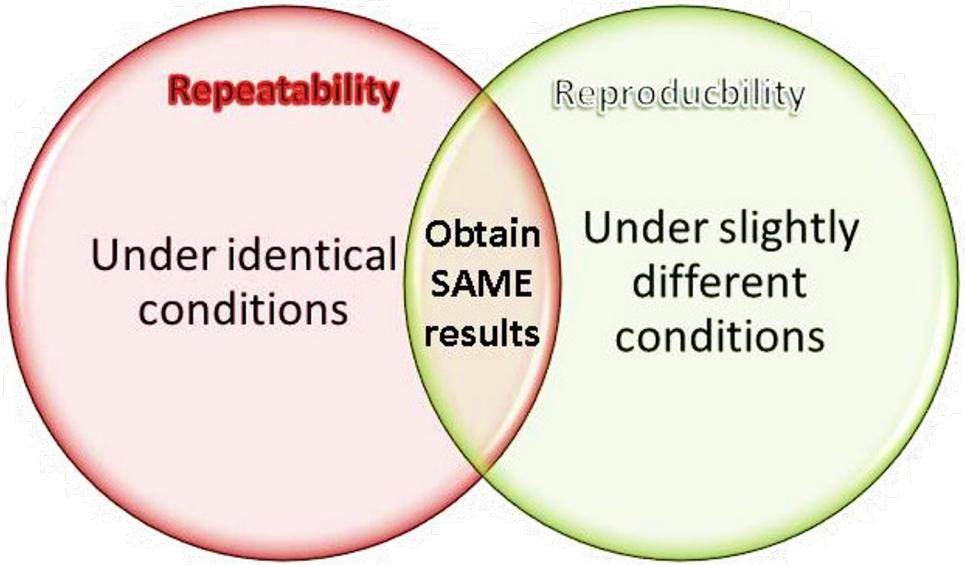
Not understanding and communicating accurately the variable parameters that produce the best outcome are usually the root cause for inconsistency!

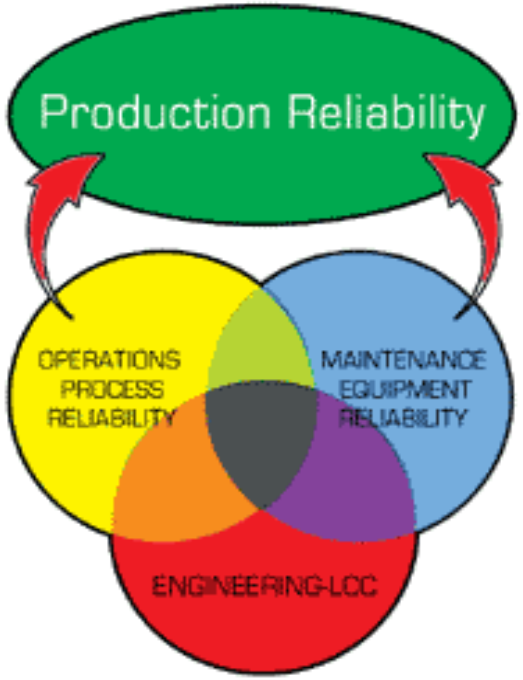
Precision Stamping Processes

Identifying and Controlling Input Variables

Die Manufacturing Objectives

Die components are designed and constructed in a manner that assures **reproducibility, reliability** and **repeatability**





Precision Stamping Processes

Identifying and Controlling Input Variables

Reproducibility means the tool or component can be replicated regardless who makes them

Reproducibility require$ extremely detailed component print$

All dimensions, tolerances, surface finish call outs, breaking corners, manufacturing processes (rough machine, stress relieve, finish machine; jig grind; WEDM), heat treat specifications, specific heat treaters.

Result: If the part is made to the print, it will be exactly the same every time - no matter who makes it

Precision Stamping Processes

Identifying and Controlling Input Variables

Reliability means every tool or component is designed and constructed in a manner that it will not flex, chip, break, deform, crack, etc.

Result: Maximize tool life and avoid catastrophic failures

Repeatability means all the tooling component can be serviced, changed over and replaced every time by any toolmaker and achieve the same manufacturing results

Result: Minimize machine downtime and maximize quality, without "tweaking" no matter who installs the component

Panel Discussion

Stephen DePinho, Engineering Manager, Weiss-Aug Company, Inc.

Paul Lightowler, Product Manager, APDIS Laser Radar (CMM), Nikon

Jeff Umlor, Director of Business Development, Walker Tool & Die, Inc.