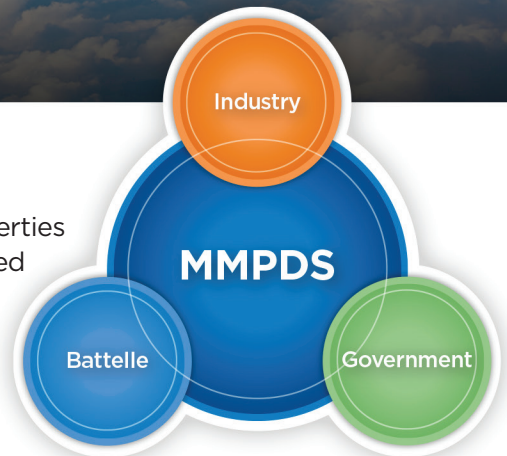


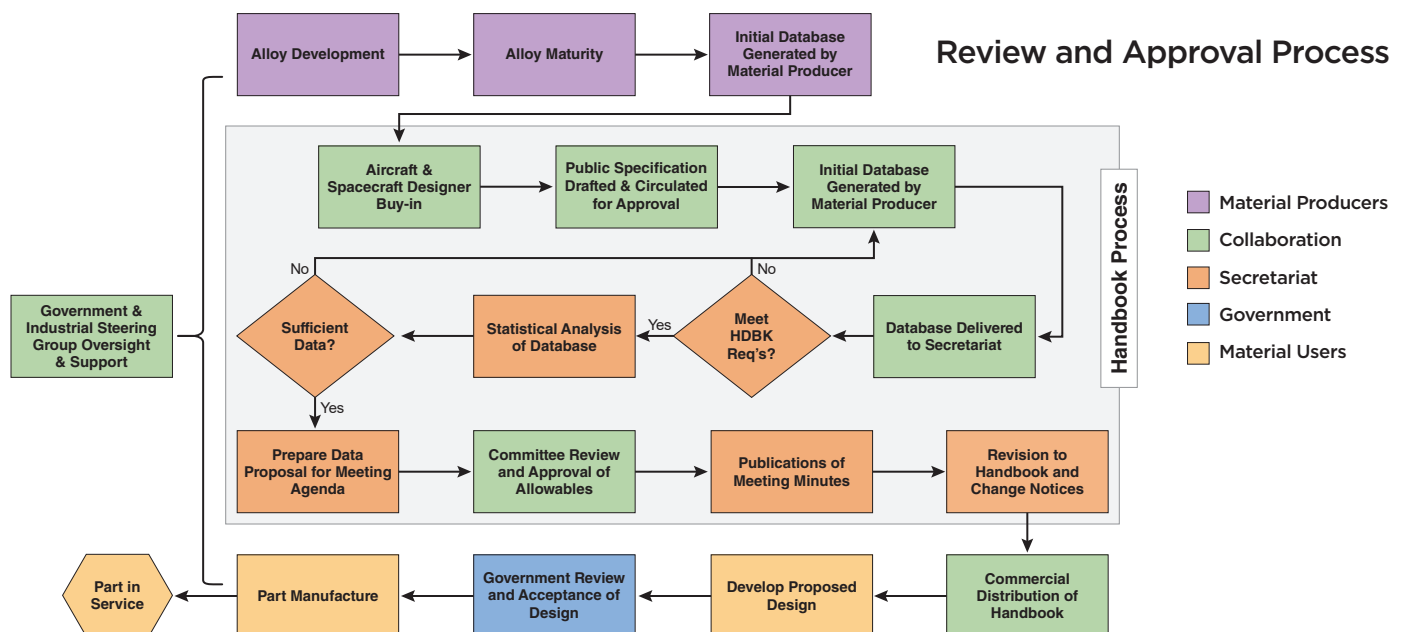
# Metallic Materials Properties Development and Standardization (MMPDS)

Since 1954, Battelle has played a central role in the Metallic Materials Properties Development and Standardization (MMPDS) project. The handbook created from this work is the primary source of statistically based material allowables for more than 400 material specifications and joint allowables for more than 100 fastener/material combinations used in many different commercial and military aerospace applications around the world.

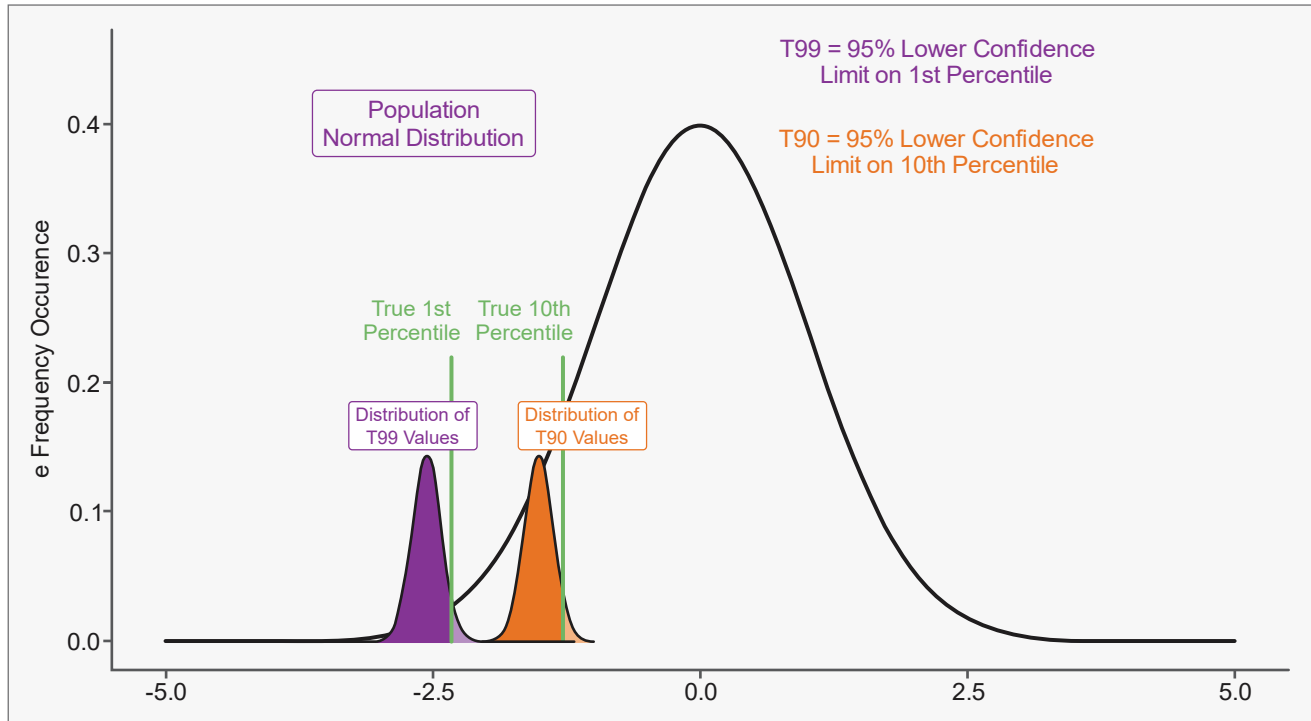


With millions of rivets and thousands of metal parts on an average commercial passenger jet, the information contained in the 2,700-page handbook is important to government regulators, aircraft and engine manufacturers, and metal producers. Government agencies rely on the handbook's standards to ensure the safety of the public during air travel. Battelle combines expertise in structural analysis, fatigue and fracture, statistics, and software development to create this resource. After Battelle receives data for a metal from an industry provider, researchers analyze the data using approved guidelines to determine statistical minimum strength.

New entries to the handbook are reviewed and approved annually by industry and government stakeholders. Trusted by industry to protect proprietary data and by government to consistently provide unbiased results, Battelle plays a critical role in facilitating effective collaboration between these diverse interests and making consistent information available to numerous users.



After publishing material allowables and guidelines for generating and analyzing data for conventional metals for more than eight decades, a second volume will be released in July 2024 documenting a similar framework for process intensive materials including additively manufactured alloys. Battelle will receive data generated per those guidelines and analyze that data to prepare for General Coordination Committee review and publication in future revisions of the handbook. Design organizations can use the published material allowables and appropriate application-specific influence factors to determine the design values needed to use these materials safely in aviation.



## Volume I: A-Basis, B-Basis, and S-Basis Material Allowables (Conventional Metals)

- $T_{99}$  and  $T_{90}$  are one-sided lower tolerance bounds, both calculated from data.
- *A-Basis* = the lower of the specification minimum or  $T_{99}$  value.
- *B-Basis* =  $T_{90}$  and is not related to the specification minimum.
- *S-Basis* =  $T_{99}$  that does not meet A-Basis requirements for sample size or distribution fit.

## Volume II: C-Basis, D-Basis, and S-Basis Material Allowables (Intensive Metals)

- $T_{99}$  and  $T_{90}$  are one-sided lower tolerance bounds, both calculated from data.
- *C-Basis* = the lower of the specification minimum or  $T_{99}$  value.
- *D-Basis* =  $T_{90}$  and is not related to the specification minimum.
- *S-Basis* =  $T_{99}$  that does not meet C-Basis requirements for sample size or distribution fit.
- \*Metallic C-/D-/S-Basis published in MMPDS Volume II require further showing that they are making good material with good parts and a larger sample is required.

Specific regulator guidance on acceptability of MMPDS published values is covered in the Foreword of each volume. Those guidelines differ between Volume I and Volume II. Further showing is required for all material allowables published in Volume II.