



AMERICAN METALCASTING CONSORTIUM

Update on ICI-AFS Joint Research Project on MMPDS Inclusion of 17-4 PH and 15-5 PH Investment Cast Steels

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Current Cast 15-5PH and 17-4PH Data in MMPDS-07

The cast 15-5PH and 17-4PH Data (Section 2.6.7-2.6.9)

- **2.6.7 15-5PH**
 - **Table 2.6.7.0(a). Material Specifications for 15-5PH Stainless Steel**
 - AMS 5400 Investment casting (H935)*
- **2.6.9 17-4PH**
 - **Table 2.6.9.0(a). Material Specifications for 17-4PH Stainless Steel**
 - AMS 5342 Investment casting (H1100)*
 - AMS 5343 Investment casting (H1000)*
 - AMS 5344 Investment casting (H900)*
 - *Only have S-basis data.

Highlighted in red blocks
are the grades being
tested for the inclusion.

AMS Casting Material Specifications fpr 17-4PH & 15-5PH					
	180ksi (H900) ⁽¹⁾	180ksi (H925) ⁽²⁾	170ksi (H935) ⁽²⁾	150ksi (H1000) ⁽²⁾	130ksi (H1100) ⁽²⁾
17-4PH	AMS 5344 ⁽³⁾			AMS 5343 ⁽³⁾	AMS 5342 ⁽³⁾
15-5PH		AMS 5346	AMS 5400 ⁽³⁾	AMS 5347	AMS 5356
⁽¹⁾ Precipitation hardened at 900-925F					
⁽²⁾ Precipitation hardened at the designated H-Temperature					
⁽³⁾ S-Basis in MMPDS-07					

Test Plan - Properties being evaluated

1. Conduct MMPDS required tensile, compression, modulus and shear; Charpy and tensile (from both cast integral as-cast test bar – S basis as well as extracted off the test plate) for both the alloys and all three heat treat types for each - total 6 sets
2. MMPDS pin bearing and fatigue from as-cast specimens for both alloys and only one heat treat type, which is currently populated in the current MMPDS/MIL handbook – **17-4PH with H1000 and 15-5PH with H935.**

17-4/15-5 PH Project

List of Participating Foundries (14)

- Precision Propeller Industries / Yamaha-Motor
- Signicast, WI
- Carley Fdy, MN
- MCM Precision Castings Inc, OH
- MetalTek International, Wisconsin Investcast Div
- Tech Cast, Meyerstown, PA
- Kovatch Castings
- Aerotec Alloys
- DAFCO Aerospace (Damaeron)
- Intercast - Fansteel
- Wisconsin Precision Casting
- Eagle Precision Casting Co, NJ
- Aristocast, MI
- Bescast, Inc

Total 1600 tests from over 500 test plates and 600 cast test bars !

Project Completion Plans

17-4/15-5PH

Statistical Properties for MMPDS Standard (CHAMPS) (AFS)

Statistical Properties of 17-4/15-5PH for MMPDS



Complete modeling of rigging



Complete tooling and make test waxes



Complete making waxes, assembly trees and ship to foundries



Complete casting of MMPDS test plates & separately attached bars



Receive plates at AFS and spend for X-ray



Send plates for heat treat

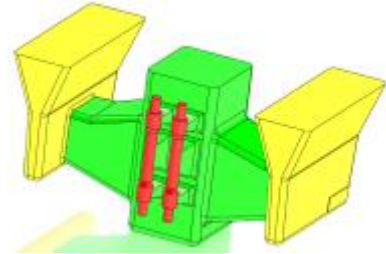
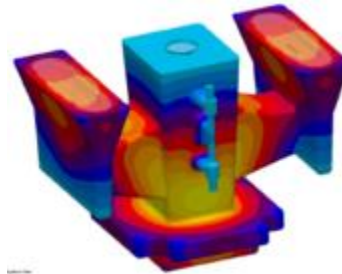
Complete MMPDS Mechanical Testing & Compile Results

Submit 17-4/15-5PH to MMPDS

Special Thanks & Acknowledgement

1. Project Sponsors:

- DLA-POC : Dean Hutchins
- AMC-AFS
- ICI



- ## 2. Project Management Team:
- Dr. Zayna Connor(AFS) - PI, Jiten Shah-Project Manager (PDA -Product Development & Analysis), Al Torok- Precision Propeller Industries, Inc. (AFS 4L and ICI Technical Committee Liason)
- ## 3. Suppliers
- (Wolf Aerospace) (MPI) (Paramelt), MIL (NDT), Applied Thermal Technologies (Heat Treater) and Metalcasters with in-kind support and efforts



Thank You !!

For more information:

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or

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