

MINUTES

of the

14th MMPDS Coordination Meeting

Held in:

Palm Beach Gardens, FL

October 20-23, 2008

To Be Incorporated Into:

MMPDS-04, CN-1

Compiled by:

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I. Introduction of Attendees

Included in Attachments is a Distribution List for the Minutes of the 14th MMPDS Coordination Meeting. Additionally, a list of Coordination Meeting attendees, indicating the meetings they attended, has been incorporated.

II. Chairman's Remarks – FAA

Many thanks to all who attended the 14th MMPDS General Coordination Committee (GCC) Meeting. In spite of the state of the global economy, attendance was on par with past meetings with just under 70 attendees. For me, this serves to reinforce the relevance and importance of the MMPDS.

Together, we continue to be successful in maintaining the high standards and integrity originally established for the MIL-HDBK-5. Consequently the MMPDS, like its predecessor, remains the benchmark for static strength properties standardization. However, we do have a number of challenges to deal with. Adequate and dependable funding for the core activities continues to be an issue, and this put our 08-09 spring GCC meeting in jeopardy. Fortunately, thanks to the constructive inputs from our members, it looks like we have a way forward and will have a spring meeting in Columbus. Other immediate challenges include transitioning the Fastener Task Group to a more inclusive body, addressing properties for materials that receive significant user processing, and addressing properties for metallurgical joining processes.

Thanks again for your dedication and continued support. I hope to see you in Columbus.

III. Approval of the 13th MMPDS Meeting Minutes

Approval was given, without corrections, on the 13th MMPDS meeting minutes. Since no changes or additions were proposed, the draft minutes have been approved as initially distributed.

14th MMPDS Meeting Minutes

14th MMPDS Coordination Meeting Minutes Summary of Agenda Items

STEERING, WORKING, AND TASK GROUPS

ASG **Airframer Steering Group.** Lori Flansburg, Lockheed, led discussions at the ASG meeting on Monday. Topics of discussion included; **Item 07-22** Proposed Inclusion of Guidelines for Development and Presentation of Allowables-Based Flow Curves for Nonlinear Analysis in MMPDS, and GSG **Item 07-24** Review of Elemental Property Sections; **Item 07-39** Derived Properties for Legacy Alloy 2124-T851 Plate, and **Item 08-29** Revisions to Chapter 1 Analysis Methods.

Summary given by JT. Amin, Lockheed.

- 1) Item 08-29 ASG approved the agenda item proposal
- 2) Item 07-24 ASG will continue to review.
- 3) Item 08-02 (steels, tensile and hardness comparison) – B. Vogel, Cessna, gave a presentation on their testing of hardness and tensile properties on 4130 steel.

Action:

- 1) Review elemental property sections under Item 07-24.
- 2) Propose wording for Section 1.4.7 paragraph in GSG NIN (assigned 08-48) on “Revision of Chapter 1 Bearing Section 1.4.7”
- 3) Propose action for Item 07-39 Derived Properties for Legacy Alloy 2124-T851 Plate,

FTG **Fastener Task Group.** M. James, FAA, N. Ontko, AFRL, and M. Tefend, Battelle, led technical discussions at the Wednesday FTG meeting.

GSG **Government Steering Group.** J. Bakuckas and R. Eastin, FAA, led discussion at the GSG members-only meeting on Monday.

GTG **Guidelines Task Group.** R. Rice, Battelle, led technical discussions at the GTG meeting on Tuesday. He gave an overview of the status of all active GTG items at the GCC meeting on Thursday.

IHWG **International Harmonization Working Group.** R. Rice led discussion at the IHWG meeting on Tuesday.

ISG **Industrial Steering Group.** B. Thomas, Bombardier, ISG Chair and R. Rice led the discussions at the ISG members-only meeting on Monday. R. Rice led discussions at the ISG-members only financial meeting.

LAGWG **Legacy Alloy Guidelines Working Group.** No items were discussed.

MATSIG **Materials and Technical Services Interest Group.** Mike Niedzinski, Alcan, Chair and Ray Cribb, Brush Wellman, Vice-Chair led discussions on Monday.

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Items discussed included; **Item 07-36** Effect of Change in Strain Rate for Full Range Tensile Curves, and **Item 07-26** Determination of Specification Minimums for Fracture Toughness Properties. Other topics for discussion include common formats for data submission, naming orientations for bearing samples, and the inclusion of other suppliers such as suppliers of titanium and heat resistant alloys.

Action: A copy of the MATSIG meeting minutes is attached. New item was given to this group during the MTG meeting to discuss introductory sections of alloy systems. Teleconferences will be held prior to the next MMPDS meeting.

MTG **Materials Task Group.** J. Jackson led technical discussions at the Wednesday MTG meetings.

ETWG **Emerging Technologies Working Group.** The group encompasses Friction Stir Welding, Fiber-Materials Laminate, LAM, and other emerging materials and processes that may require new data collection, analysis, and presentation guidelines beyond those normally applied to metallic materials in MMPDS.

R. Reinmuller, Lockheed, led technical discussions on Friction Stir Welding Tuesday afternoon. See Item 07-17.

A presentation was given Thursday morning by R Bucci & D. Shrader, Alcoa on “Introduction to Advanced Hybrid Materials and Structures”. A copy of the presentation is attached.

SCCWG **Stress Corrosion Cracking Working Group.** M.Tefend opened the SCCWG meeting on Wednesday afternoon after conclusion of the MTG and FTG meetings. Planned topics of discussion were **GSG 07-25** Reconsideration of Applicable Thickness Ranges for SCC Data Tables and **GSG 07-34** Improved Guidelines for Definition of SCC Threshold Properties.

There was negligible progress reported on both items. R. Rice questioned whether there was justification for continuation of this working group during tight budget times if there was insufficient interest or clarity in attainable goals of the SCC working group to make consistent progress. Subsequent discussion suggested that one of the biggest problems is the lack of testing standards for development of reliable, quantitative SCC resistance data.

Action: A decision was made to disband this working group until more progress is made on the associated SCC testing standards.

SWG **Statistics Working Group.** R. Rice led technical discussions at the SWG meeting on Tuesday. R. Rice gave an overview of the status of all active SWG items at the GCC meeting on Thursday.

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SPECIAL PRESENTATIONS

- MTG** **2195-T82 Aluminum Alloy Plate (0.50-2.00 inch thickness).** M. Niedzinski, Alcan gave a presentation on this new alloy. A copy of his presentation is attached.
- MTG** **Design Allowables for Castings.** J. Gegel, AFS, gave a status report. A copy of his presentation is attached.
- GCC** **Advanced Hybrid Materials and Structures.** R. Bucci and D. Shrader, Alcoa, gave a special presentation Thursday morning on this emerging technology. A copy of the presentation is attached.
- FTG** **Automated Testing for Assembled Joint Strength Determination.** B. Harris, UDRI gave a special presentation Wednesday morning at the FTG on the new software, LabView. A copy of the presentation is attached.
- FTG** **Analytical Prediction of Joint Load-Deflection Behavior.** John D. Pratt, Argos Engineering, gave a special presentation Wednesday afternoon at the FTG on numerical modeling of fasteners. A copy of the presentation is attached.

CHAPTER 1. GENERAL

- GSG NIN** **Meetings of Potential Interest to MMPDS Coordination Members (GCC).**
An updated list of upcoming technical meetings of potential interest to MMPDS coordination group members is included in the agenda.
- GSG NIN** **AMS Coordination (MTG).** J. Jackson attended the fall AMS meeting October 6th -9th in Colorado Springs and report on items of interest.
- Action:** An attachment is included with the new specifications and specifications which have been recently published or balloted. Discussions are on-going at SAE regarding the inclusion of HIP parameters in AMS specifications. HIP parameters are on the Export Control list even though these have been in public documents and on world-wide-web for years.
- GSG 03-14** **Review of Currency of Existing Database on Legacy Alloys (MTG).**
J. Jackson summarized current activities on this item including the status of 7075-T7351 plate (Item 08-11), 7075-T7351X extrusions (Item 07-35) and Ti-6-4 annealed extrusions (data still being requested).

Action: Continue

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GSG 07-22 Proposed Inclusion of Guidelines for Development and Presentation of Allowables-Based Flow Curves for Nonlinear Analysis in MMPDS (GTG). J. Pratt presented this agenda item.

Action: Continue. The proposal will be put in final formatted version for inclusion in Chapter 1 and final approval at the Spring meeting.

GSG 07-24 Review of Elemental Property Sections (GTG/ASG). The ASG has been asked to provide inputs and comments to the changes proposed by J. Baldwin. R. Rice and L. Flansburg led discussions on this agenda item with input from the ASG. (The changes in chapter 1 have been split off to new Item Number 08-29.)

Action: Continue. The FAA does not intend to pull sections out, but would like them to be correct. The ASG will continue to review these sections.

GSG 07-57 Definition of Acceptance Requirements for Material Specifications (IHWG). R. Rice led discussions on this item. At the previous meeting, R. Reinmuller provided an edited specification that could be used as an outline. M. Niedzinski provided a list of specifications that are universally recognized as reference and NADCAP audit specifications:

AMS 2750 -Pyrometry of furnaces used for thermal processing
AMS 2772- Heat treatment of Aluminum Raw Materials
AMS 2770- Heat Treatment of Aluminum Parts
AMS 2355- Quality Assurance Sampling and Testing of Aluminum and Magnesium

There may be similar specifications which cover steels, titanium and refractory/heat resistant metals.

Action: Continue. V. Leibov, Russia, will send information on the Russian methods and process to the IHWG. They will respond and send comment back to V. Leibov so he can prepare a presentation at the next Fall meeting showing how the Russian material specifications are equivalent to the AMS/ASTM specifications. J. Jackson to resurrect the 1163 data analysis and supporting specifications for inclusion in the next meeting agenda.

GSG 08-28 Revision to Section 1.1.2 Scope of Handbook (GTG). R. Rice led discussion of this agenda item.

Action: Closed. Effective in MMPDS-04

GSG 08-29 Revisions to Chapter 1 Analysis Methods (ASG/GTG). This item is a spin-off of Item 07-24. J. Baldwin provided proposed revisions/corrections to Chapter 1 sections 1.3 Commonly Used Formulas, 1.4 Basic Principles, 1.5 Types of

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Failure, and 1.6 Columns. The ASG has been asked to review these changes. R. Rice led discussion of this agenda item with input from the ASG.

Action: Continue. Prepare final agenda item. ASG has approved of this item.

GSG NIN **Definition of Design Allowables in MMPDS (GTG).** R.. Rice led this discussion.

Action: Closed with no action. It was determined that the term “design allowable” when referring to the properties in the handbook had been used for many years, thus no definition was required.

GSG NIN **Review of Differences in Guidelines between MMPDS-02 and ESDU 932 (IHWG).** A. Quilter, ESDU, was unable to attend. R. Rice showed several graphs that displayed significant differences in design minimums published in the two documents. The largest difference was seen in 7475-T7351. M. Niedzinski noted that there is a temper designation difference between US and UK for some tempers and this may be one of those cases.

Action: Continue. W. Marsden, Granta, will generate a comparative report on materials which are in both MMPDS-04 & ESDU.

GSG 08-48 **Revision of Chapter 1 Bearing Section 1.4.7 (GTG).** J. Jackson presented this agenda item at the request of S. Fantle, Boeing.

Action: Continue. Assigned GSG Item No. 08-48. ASG will provide re-wording for the paragraph in Section 1.4.7. The revision for Section 1.4.7.1 was approved.

GSG NIN **Review of Alloy Comparisons in Introductory Sections (MATSIG).** New item.

Action: New item. MATSIG to discuss alloy comparisons in the introductory sections.

CHAPTER 2. STEEL ALLOYS

GSG 08-02 **Property Basis for Steel Tables 2.3.1.0(g1) and (g2) (MTG).** J. Jackson led discussion of this item. J. Jackson informed AMS Committee E (steels) on the possible removal of several specifications from the MMPDS handbook because they do not have minimum tensile requirements.

Action: Continue. Open new item for comparison of hardness and tensile properties (GSG Item 08-49). Various companies are gathering hardness and tensile data of select steel alloys. B. Vogel, Cessna, gave a presentation on 4130

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bar and sheet hardness vs tensile data gathered to date. B. Thomas, Bombardier is gathering data on 4340. S. Fantle, Boeing, and M. Ofthsun, Spirit Aerosystems, are also gathering data. It is requested that data be sent to R. Rice for analysis.

- GSG 08-13 Fatigue Analysis on Ferrium S53 Corrosion-Resistant Steel Bar (MTG).**
R. Rice presented this agenda item.

Action: Approved & closed with final graphs to be presented in the minutes with the correlative information.

- GSG 08-20 Effect of Grain Direction on Fatigue Properties of 300M Steel (MTG).**
R. Rice presented this agenda item. Data for unnotched fatigue in L & T orientations was requested. Since no data were received he proposed removal of Figure 2.3.1.4.8(a) from the Handbook.

Action: Continue. J.T. Amin, Lockheed, requested more time to collect data. If no data is received by the spring meeting, this figure will be removed and the item closed.

- GSG 08-38 Physical Properties and Modification to Introduction for Ferrium S53 (MTG).** J. Jackson presented this agenda item.

Action: Approved and closed with modifications to the Environmental Considerations paragraph as shown below. Open a new item to look at the wording in Environmental Considerations for similar alloys.

Original Proposal:

Environmental Considerations - ~~The general corrosion resistance of Ferrium S53 approaches that of 15-5PH.~~ While the alloy is corrosion resistant, users should consider the specific environment when determining surface preparation/treatment. The alloy is highly resistant to stress-corrosion cracking compared to other ultra high-strength steels.

Modified Proposal Approved and Closed (email to Jana 10/28/2008):

Environmental Considerations - While the alloy is corrosion resistant, users should consider the specific application and environment when determining surface coatings, preparation, or treatment. The alloy is more resistant to stress-corrosion cracking compared to other ultra high-strength steels such as 300M.

- GSG 08-49 Comparison of Hardness and Tensile Strength (MTG).** New item related to Item 08-02. It was agreed that recently developed hardness vs tensile property data should be sent to R. Rice for analysis.

Action: New item.

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GSG NIN **Wrought Steels S-Basis Summary (ASG/MTG).** J. Jackson gave a status report. She has requested data or data sources for 15-5PH plate in H1025 condition. At the June ISG teleconference the H1075 condition was requested as the next priority for 15-5PH bar.

Action: Continue

CHAPTER 3. ALUMINUM ALLOYS
(In alloy order following general chapter items)

GSG NIN **Wrought Aluminum Alloys with S-Basis Minimums (MTG).** J. Jackson gave a status report on the top priority alloys; 7050-T74511 extrusions, and 7075-T7351 plate (also covered as a legacy alloy in Item 08-11).

Action: Continue. Attendees indicated they were interested in 7075-bar and rod (Bret Vogel), 7050-T4 die forging, (Bruce Thomas), and 7050-T7452 hand forging (JT). A questionnaire will be submitted to confirm which alloys are of next importance.

GSG NIN **Ring Forging Allowables (MTG).** New item requested by J. Bennet, NASA, on allowables for 6061, 7050, 2219 aluminum alloy ring forgings. Currently MMPDS hand forging minimums for 2219 and 7050 as indicated in the table below. For both 2219 and 7050, ring forgings are being ordered to the hand forging acceptance test requirements and the hand forging design values are being used in design. In the case of the 2219 specification, the acceptance test properties for hand forgings and ring forgings are different. Since ring forgings of 7050 are not covered by AMS 4108, either the specification would have to be modified to include ring forgings, or a new AMS specification would have to be generated.

Proposed Ring Alloy and Temper	Existing Specification	Product Form in Specification	Tempers in Specification	MMPDS Hand Forgings
2219-T851	AMS 4144	Ring and Hand Forgings	2219-T851 2219-T852	S-basis, derived properties for 2-8 inches only
6061-T651	AMS 4312	Ring and Hand Forgings	6061-T651 6061-T652	None
7050-T7451	AMS 4108	Hand Forgings Only	7050-T7452	S-basis, A- & B-basis for 6-7 inch

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For 6061, the acceptance test properties for hand and rolled rings are identical, and the design values in MMPDS are being used for designs with ring forgings, even though the product form is not recognized in MMPDS.

Action: New item. Production data is requested on ring forgings and hand forgings of these alloys to first determine if they are combinable.

GSG 06-42 Plane Stress Fracture Toughness of 2013-T6511 Extrusions (GTG/MTG).

R. Rice reviewed this agenda item, which includes a compilation of the 2013 raw R-curve data for inclusion in the Handbook. The proposed methodology was discussed under the related guidelines item, GSG 07-33, which was approved.

Action: Approved and closed. Final curves will be included in the minutes.

GSG 08-33 Mechanical Properties for 2050-T84 Aluminum Alloy Plate (MTG).

J. Jackson presented this agenda item.

Action: Approved and closed with changes. A copy of the revised section and table is attached.

- 1) Revise introduction paragraph
- 2) Add a paragraph on cold working holes
- 3) Add 45 degree orientation to design allowable table with a footnote on the 45 stating that the 45 degree properties may be lower and are under evaluation.
- 4) Add a footnote to the tensile ST properties in the 0.5-1.5 inch range that these apply only to 1-1.5 inch.
- 5) Correction noted after the meeting that F_{cy} (ST) (Figure 39 of agenda) and F_{su} (S-L) (Figure 36 of agenda) minimum properties begin at 1.5 inches. Allowables in the 0.500-1.500 inch range for these properties were deleted.

GSG 08-32 Mechanical Properties for 2098-T8 Aluminum Alloy Sheet (MTG). J. Jackson presented this agenda item.

Action: Approved and closed with changes. The revised introduction, which includes T8 sheet and AMS 4457 is included as an attachment to the minutes. Open new item for MATSIG to discuss alloy comparisons in the introductory section.

GSG 07-39 Derived Properties for Legacy Alloy 2124-T851 Plate (ASG/MTG). The ASG will discuss this item. In a previous item the reduced ratios for this alloy were questioned and the derived properties were shown as S-Basis. This item identified what data was available for reduced ratios and what data was still needed.

Action: Continue

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- GSG 08-41** **Analysis of 2198 R-Curve Data (MTG).** R. Rice reviewed this agenda item, which included a compilation of the 2198 raw R-curve data for inclusion in the Handbook. The proposed methodology was discussed under the related guidelines item, GSG 07-33, which was approved.
- Action:** Continue. Assign Item number 08-41. Hold item open until mechanical properties are approved for handbook.
- GSG 08-14** **Cancellation of AMS-QQ-A-250/7 for 5086 Aluminum Alloy Plate and Sheet (MTG).** J. Jackson presented this agenda item. This specification was superseded to ASTM B 209. It was requested that this specification remain in the MMPDS Handbook.
- Action:** Approved and closed
- GSG 08-37** **Cancellation of AMS-QQ-A-250/11 for 6061 Aluminum Alloy Plate and Sheet (MTG).** J. Jackson presented this agenda item.
- Action:** Approved and closed
- GSG 08-39** **Addition of AMS 4083 to Table 3.6.2.0(c) for 6061-T6 Drawn Tubing (MTG).** J. Jackson presented this brief agenda item.
- Action:** Approved and closed with correction to footnote “a”, specification should be WW-T-700/6 instead of MIL-QQ-T-700/6.
- GSG 07-38** **Mechanical Properties for 6056-T6511 Aluminum Alloy Extruded Profiles (MTG).** J. Jackson presented a status report on this item. Additional testing is being done.
- Action:** Continue
- GSG 08-30** **Compression Stress Strain Curves for 7056-T7651 Aluminum Alloy Plate (MTG).** J. Jackson presented this agenda item.
- Action:** Approved and closed
- GSG 08-11** **Re-Analysis of Legacy Alloy 7075-T7351 Aluminum Alloy Plate (MTG).** J. Jackson presented this agenda item.
- Action:** Approved and closed with changes. Use current production minimums to upgrade table (upgrade B-basis). Show shear and bearing allowables in all orientations. The confirmation footnote was reworded as follows: “Properties for plate product were last confirmed in Item 08-11 and updated based on current

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production and included in MMPDS-04CN1.” An attachment includes the revised table.

GSG 04-08 7075-T73511 Thin Extrusions AMS-QQ-A-200/11 (MTG). J. Jackson presented a status report. Data for this alloy is also being analyzed to confirm design allowables in thick sections under Item 07-35.

Action: Continue

GSG 07-35 Re-Evaluate Design Allowables for Legacy 7075-T73510, T73511 Extrusions (MTG). J. Jackson presented a handout. The B-Basis properties are in question. Typically strength decreases with increasing thickness for this alloy. Thin property data (below 0.062 inch) has also been requested for Item 04-08.

Action: Continue. It was noted that data above the specification minimum of 4.50 inches should not be included in the analysis as this alloy is quench sensitive and thick sections are prone to cracking. If sufficient information exists, analysis should also be done to determine effect of area on properties.

GSG 08-12 Fatigue Crack Growth of 7140-T7651 Aluminum Alloy Plate (MTG). R. Rice presented this agenda item.

Action: Approved and closed. Final graphs with correlative information will be included in the minutes.

GSG NIN Specification Allowables for Centrifugally Cast 709.0 (Similar to Wrought 7075-T6) (MTG). This item will be dropped until additional data are available.

Action: Closed with no action.

CHAPTER 4. MAGNESIUM ALLOY

No Chapter 4 agenda items were discussed.

CHAPTER 5. TITANIUM ALLOYS

No Chapter 5 agenda items were discussed.

CHAPTER 6. HEAT RESISTANT ALLOYS

GSG 07-03 A- and B-Basis Properties for Inconel 718 Bar (MTG). J. Jackson gave a status report; no additional data were provided since the last meeting. Data have

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been supplied by M. Katcher, Haynes International, and T. Bayha, Allvac, to upgrade Inconel 718 bar per AMS 5662 from S-Basis to A- and B-Basis. Additional data have not yet been received from SPS Technologies, Carpenter, or Aubert & Duval.

Action: Continue

CHAPTER 7. MISCELLANEOUS ALLOYS AND HYBRID MATERIALS

GSG 07-40 Mechanical Properties of ToughMet 3 Bar (MTG). This item was approved at the 13th meeting with changes pending publication of revision A. Physical properties were added at this meeting. J. Jackson presented this agenda item.

Action: Approved and closed. Revision A of the specification was published October 2008.

GSG 08-34 Mechanical Properties for Cold Worked ToughMet 3 (MTG). J. Jackson presented this item. The agenda item contained an error in the range used for determination of Poisson’s ratio. It should have been 4,000 to 40,000 psi.

Action: Approved and closed.

GSG 08-21 A- & B-Basis Properties for MP35N & MP159 Bar for Diameters Up to 0.800 Inches (MTG). J. Jackson presented this agenda item showing S-Basis for all diameters.

Action: Approved and closed.

CHAPTER 8. STRUCTURAL JOINTS

GSG 04-21 Fastener Tables of Sunset Review Interest (FTG). M. Tefend reviewed the following Sunset agenda items. The next set of recommended sunset tables was discussed.

Sunset Item No.	Table No.	Fastener Identification	Sunset Notice Date	Non-Confirmed	Supplier
GSG 05-36	8.1.2.2(i)	BRFS-D (MC)	6-Nov-06	14 th Meeting	Allfast Fastening Systems
GSG 05-37	8.1.2.2(j)	BRFS-AD (MC)	6-Nov-06	14 th Meeting	Allfast Fastening Systems
GSG 05-38	8.1.2.2(k)	BRFS-DD (MC)	6-Nov-06	14 th Meeting	Allfast Fastening Systems
GSG 05-39	8.1.2.2(l)	BRFS-T (MC)	6-Nov-06	14 th Meeting	Allfast Fastening Systems
GSG 05-40	8.1.3.1.1(b)	MS20600M	6-Nov-06	14 th Meeting	Allfast & Textron Fastening Systems
GSG 05-41	8.1.3.1.1(c)	MS20600M	6-Nov-06	14 th Meeting	Allfast & Textron Fastening Systems
GSG 05-45	8.1.3.2.1(b)	MS20601M (MC)	6-Nov-06	14 th Meeting	Allfast & Textron Fastening Systems

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GSG 05-46	8.1.3.2.1(c)	MS20601 (D)	6-Nov-06	14 th Meeting	Allfast & Textron Fastening Systems
GSG 05-42	8.1.3.1.1(d)	MS20600AD	14-May-07		Allfast & Textron Fastening Systems
GSG 05-43	8.1.3.1.1(e)	MS20600B	14-May-07		Allfast & Textron Fastening Systems
GSG 05-47	8.1.3.2.1(d1)	MS20601M (MC)	14-May-07		Allfast & Textron Fastening Systems
GSG 05-48	8.1.3.2.1(d2)	MS20601M (MC)	14-May-07		Allfast & Textron Fastening Systems
GSG 05-49	8.1.3.2.1(d3)	MS20601M (MC)	14-May-07		Allfast & Textron Fastening Systems
GSG 05-50	8.1.3.2.1(e)	MS20601M (MC)	14-May-07		Allfast & Textron Fastening Systems
GSG 05-51	8.1.3.2.1(f)	MS20601AD & MS20603AD (MC)	14-May-07		Allfast & Textron Fastening Systems
GSG 05-52	8.1.3.2.1(g)	MS20601B (MC)	14-May-07		Allfast & Textron Fastening Systems
GSG 05-56	8.1.5.2(a1)	AN 509 Screw (MC)	14-May-07		LFC Fasteners & Saturn Fasteners
GSG 05-59	8.1.5.2(a2)	AN 509 Screw (MC)	14-May-07		LFC Fasteners & Saturn Fasteners
GSG 07-50	8.1.2.2(c)	MS20426AD	9-Nov-07		Allfast Fastening System
GSG 07-51	8.1.2.2(d)	MS20426D	9-Nov-07		Allfast Fastening System
GSG 07-52	8.1.3.1.1(a)	CR6636	9-Nov-07		Cherry Aerospace
GSG 07-53	8.1.3.2.1(a)	CR6626	9-Nov-07		Cherry Aerospace
GSG 07-54	8.1.3.2.3(c)	FF200,FF260,FF312	9-Nov-07		Monogram Aerospace
GSG 07-55	8.1.4.2(a)	NAS1436-1442	9-Nov-07		Alcoa Fastening System
GSG 07-56	8.1.5.2(c)	TL-100	9-Nov-07		PB Fasteners
GSG 08-22	8.1.3.2.2(j)	NAS1399 B & NAS1739 B & E	30-Apr-08		Cherry Aerospace
GSG 08-23	8.1.3.2.2(c)	NAS1921C	30-Apr-08	To be Confirmed	Alcoa Fastening Systems
GSG 08-24	8.1.3.2.3(e)	SSHFA-200 & 260	30-Apr-08		Monogram Aerospace
GSG 08-25	8.1.5.2 (g)	HL61,HL70 Collar	30-Apr-08		Hi-Shear Corporation
GSG 08-26	8.1.5.2 (h)	HL719,HL79 Collar	30-Apr-08		Hi-Shear Corporation

Action: GSG Items 05-36 thru 05-41, 05-45 & 05-46 were approved and closed due to no confirmatory data supplied. This Item (GSG Item 04-21) is continued. The following tables are up for Sunset review.

Proposed Sunset Group			
Sunset Item No.	Table No.	Fastener Identification	Supplier
NIN	8.1.2.2(a)	NAS20427M	Unspecified
NIN	8.1.2.2(b)	NAS20427M	Unspecified
NIN	8.1.2.2(h)	NASM20427M	Unspecified
NIN	8.1.3.1.2(a)	NAS1398C, CR2643	Cherry Aerospace & Allfast Fastening Systems
NIN	8.1.3.1.2 (b)	NAS1398MS or MW	Cherry Aerospace & Allfast Fastening Systems
NIN	8.1.3.2.3 (a)	NASM21140	Alcoa Fastening Systems

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GSG 07-28 **General Announcement Letter (FTG).** M. Tefend gave a status report on this item. An updated and reformatted letter will be posted on MMPDS.org. A few remaining companies will be notified via this letter.

Action: Continue. This item is expected to be closed at the next meeting.

GSG 07-37 **Validation of FastenerCalc (FTG).** M. Tefend presented this handout item, which contained a re-analysis (T₉₀ validation) of all the fastener tables previously analyzed in item 99-27 was performed using FastenerCalc and compared to the plots contained in 99-27. A few differences were discussed and approved by the FTG. The FTG Validation of the ISG FastenerCalc software by the Fastener Task Group is required before release of the new software.

Action: Approved and closed. Further enhancements to FastenerCalc will be performed under item ISG 07-08.

GSG 07-48 **Referencing of Non-Confirmed Sunset Fastener Tables (FTG).** M. Tefend presented this agenda item which contains the proposed table format for the new Non-Confirmed Sunset Fastener Table. Sunset tables that were approved and closed in item 04-21 at this meeting will be added to this table.

Action: Approved and closed. Sunset updates to this table included in the minutes.

GSG 08-04 **Statistical Basis of Chapter 8 Tables (FTG).** M. Tefend presented this agenda item which consists of identifying each table's a) date of creation, b) date of last modification and c) the statistical basis of that table. L. Flansburg presented some background on these tables.

Action: Continued. A copy of a presentation given by L. Flansburg, Lockheed, is included.

GSG 08-18 **Chapter 8 Fastener Table Descriptions (FTG).** M. Tefend presented this agenda item which included some recommendations to improve the current fastener descriptions text. The opening paragraph in each section was decided to be removed.

Action: Approved and closed with changes. Corrections included in the minutes.

GSG 08-19 **Fastener Tension Allowables (FTG).** M. Tefend presented this agenda item which includes a draft of the footnote for inclusion into Table 8.1.5 (b1 and b2). This footnote will clarify how these tables are perceived.

Action: Approved and closed with changes. Table 8.1.5(b1) footnote was corrected and is included in the minutes.

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GSG 08-31 **Cancellation and Supersedure of MIL-W-6858 (FTG).** M. Tefend presented this agenda item.

Action: Continue. On hold until status of Section 8.2 is determined.

GSG 08-40 **Update of AMS-QQ-A-250/1, 2, 8, and 11 (FTG).** M. Tefend presented this agenda item.

Action: Continue. On hold until status of Section 8.2 is determined.

GSG 08-46 **Conversion of “MS” Fasteners Specification to “NAS” (FTG).** M. Tefend presented this editorial handout item. This item specification change affects only the table footnotes.

Action: Approved and closed. Assign Item number 08-46.

GSS 08-47 **Inactivation of MIL-B-8831/4, Table 8.1.6.2(a) and (b) (FTG).** M. Tefend presented this editorial handout item.

Action: Continue. J. McCarrick will review this item for the Spring meeting. Assigned Item number 08-47.

GSG NIN **Update of Chapter 8 Specifications (FTG).** M. Tefend presented this agenda item contains a list of chapter 8 specifications that need to be reviewed.

Action: Continue.

GSG NIN **Section 8.2 (FTG).** New item. Recommended removal of this section (welding) will be reviewed.

GSG NIN **Section 8.3 (FTG).** New item. Recommend removal of this section (wire rope, pulleys, etc) will be reviewed.

GSG NIN **Allfast Allowables Table (FTG).** New item. Testing and analysis efforts are underway for a new allowables table.

GSG NIN **Table 8.1.2.2(n) (FTG).** New item. Table title review of NAS1097-E is being reviewed.

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CHAPTER 9. GUIDELINES FOR THE PRESENTATION OF DATA

Fastener Task Group Items

GSG 06-45 MMPDS Fastener Guidelines Update (FTG). M. Tefend reviewed this agenda item. Sections 9.7.1.4 and 9.7.1.5 had minor changes. Section 9.9.5 is being re-worked to include combinability examples.

Action: Approved and closed Sections 9.7.1.4 and 9.7.1.5 with minor changes. Changes included in the minutes. Re-assign section 9.9.5 to new item number, GSG Item 08-50.

GSG 07-29 Input on FTG Portion of MMPDS By-Laws (FTG). M. James presented this handout item which is centered about a proposed change which will essentially dissolve the FIWG group and merge it with the FTG group.

Action: Continue. By-law text will be re-drafted. This item is expected to be closed at the Spring meeting.

GSG 07-49 Fastener Failure Codes (FTG). M. Tefend gave a status report on this item. H. Vuil presented some examples of load-displacement graphs and corresponding failure modes where “failure” doesn’t necessarily represent “failure” at peak load. The Ultimate Load definition will be reviewed.

Action: Continue. A copy of a presentation given by H. Vuil, Airbus, is included.

GSG 08-05 General FTG Data Requirements (FTG). M. Tefend presented this agenda item which includes a draft of the previously approved changes to Section 9.2.4.6.3 General Data Requirements. The number of fastener shear and tensile observations as well as tensile preload allowables was discussed.

Action: Approved and closed. A new item number to review the number of fastener shear and tensile observations was opened.

GSG 08-27 Fastener Combinability Example Section (FTG). M. Tefend presented this handout item that contains modifications to the combinability section in the current handbook. The new combinability fastener example was presented.

Action: Continue. This example will be merged with Problem III.

GSG 08-35 Fastener Testing Requirements Table (FTG). M. Tefend presented this agenda item of the proposed new table for section 9.2.4.6.3.

Action: Approved and closed with minor changes to title and footnotes. Corrections included in the minutes.

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GSG 08-36 **Table 9.2.4 Modification (FTG/GTG).** M. Tefend presented this agenda item that contains the proposed modifications to Table 9.2.4. Corrections included in the minutes.

Action: Approved and closed with changes to correct the basis value for the Tensile and Shear Strength.

GSG 08-50 **Update Section 9.9.5 Mechanically Fastened Joints (FTG).** New item created from GSG Item 06-45.

Action: Continue

GSG NIN **Historical Comparison (FTG).** M. Tefend gave a status report on this agenda item which centers on the differences between MMPDS-03 and MIL-HBK-5H.

Action: Continue. R. Goode will be asked to review.

GSG NIN **t/D Grouping Review (FTG).** It was agreed that a review of the user defined groupings should be completed.

Action: New item.

GSG NIN **Sunset Table Example (FTG).** M. Tefend proposed that an example “blanked” out Sunset table be placed in section 9.9.5 for reference purposes.

Action: New item.

GSG NIN **Sunset Criteria Flowchart (FTG).** M. Tefend proposed and presented a draft of new flowchart for the handbook.

Action: New item.

GSG NIN **Sunset Combinability (FTG).** New confirmatory observations that are merged with the original dataset, for Sunset purposes, will be evaluated.

Action: New item.

GSG NIN **Fastener Shear and Tensile Observations (FTG).** A review of the number of observations required will be completed.

Action: New item.

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GSG NIN Section 9.7 Update (FTG). The last paragraph in Section 9.7 must be reviewed.

Action: New item.

Guidelines and Materials Task and Working Group Items

GSG 01-01 Regression for Skewed Data (SWG). R. Rice presented this agenda item.

Action: Conditionally approved; the new procedure will be evaluated, as an adjunct to the currently approved procedure, for the next two years on data sets that have a minimum of 100 samples. The item will be held open for this period to report on similarities and differences in design allowables computed by the current and proposed regression analysis procedures.

GSG 05-27 Update for Bearing Strength Reduction for Edgewise Orientation (GTG). J. Jackson presented this agenda item. It was agreed that the reduction factor table should be in the alloy chapters and not moved to Chapter 9.

Action: Approved and closed with change to title of Table 3.1.2.1.1, “Reductions for Edgewise Orientation of 2000, Al-Li, and 7000 Series Alloys”. Open new item for other alloys. Add tables to other chapters as data becomes available.

GSG 07-05 Update of Guidelines for the Submission of Plane Strain Fracture Toughness Data (GTG). R. Rice presented this agenda item.

Action: Approved and closed. Open new item “Development of Plane Strain Fracture Toughness Data for Tough Alloys”.

GSG 07-08 Referencing of Obsolete Alloys Removed from MMPDS (GTG). R. Rice presented this agenda item.

Action: Continue.

GSG 07-17 Development of Design Properties for Friction Stir Welds (ETWG). R. Reinmuller led discussion on this agenda item at the ETWG meeting.

Action: Continue. Presentations were given by R. Reinmuller (Lockheed) and D. Buford and C. Widener from Wichita State U.

GSG 07-19 Proposed Guidelines on Transformation of Data (GTG). R. Rice presented this agenda item.

Action: Approved and closed. J. Goodman may have some editorial changes.

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GSG 07-25 Reconsideration of Applicable Thickness Ranges for SCC Data Tables (SCCWG/GTG). M. Tefend led in discussions on this item. No further efforts to review these thickness ranges could be agreed upon.

Action: Closed with no action.

GSG 07-26 Determination of Specification Minimums for Fracture Toughness Properties (GTG). J. Jackson presented this agenda item.

Action: Continue. It was requested that the wording be changed to, “Use the higher of the T99 or the minimum bound of the data.” Specify that this is related to plane strain. Include real examples in Spring agenda. MATSIG will further discuss this issue.

GSG 07-27 Proposed Modification of Guidelines for Development of Effect of Temperature Curves (GTG). R. Rice presented this agenda item. A presentation supplied by S. Fantle at Boeing was also presented.

Action: Continue. A formal presentation will be prepared for the Spring meeting.

GSG 07-31 Ramberg-Osgood Single Shape Factor vs 2 Shape Factors (GTG). R. Rice presented this agenda item. He also presented a presentation by S. Fantle, Boeing. Discussions were to include

Action: Approved and closed showing both shape factors on the same graph. Open new GSG Item 08-51 to revise current 2-shape factor figures. The following paragraph will be added to Section 9.8.4.1.3 and 9.8.4.2.:

In situations where a bi-log-linear relationship best characterizes the relationship between stress and plastic strain it is customary within the MMPDS to also show the best-approximation, traditional Ramberg Osgood fit, alongside of the bi-log-linear fit, and to report the best-fit parameters for both equations.

GSG 07-33 Guidelines for Plane Stress FT Data Analysis and Presentation (ISG/GTG). R. Rice led discussion of this item.

Action: Approved and closed

GSG 07-34 Improved Guidelines for Definition of SCC Threshold Properties (SCCWG/GTG). M. Tefend led discussions of this agenda item. Due to the efforts involved with acquiring the necessary data to perform time to failure type

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analysis, and the lack of agreement on how to correlate laboratory SCC results with field performance, this effort was canceled.

Action: Closed with no action.

GSG 07-36 Effect of Change in Strain Rate for Full Range Tensile Curves (GTG).
R. Rice led discussion of this item.

Action: Continue. Agreement on this approach. Provide a formal proposal for the Spring meeting.

GSG 08-15 Revision of Guidelines on the Display of Full Range Stress-Strain Curves (GTG). R. Rice led discussion of this handout item. He argued that a better method is needed in MMPDS to represent variability between full-range stress-strain curves. Comments and suggestions to improve the proposed methodology are invited.

Action: Continue. Prepare proposal for the Spring meeting.

GSG 08-17 Estimation of Average Tensile Properties from A- and B-Basis Design Allowables (SWG). R. Rice presented this handout item.

Action: Continue. Rich will perform a supplemental analysis by alloy system.

GSG NIN Development of Allowable Ultimate Strain (GTG). R. Rice led discussion of this agenda item.

Action: Closed with no action. This topic will be picked up under Item 08-17.

GSG 08-42 Development of Look-Up Tables for Crack Growth Curves (GTG). R. Rice presented this item, which was originally distributed as a handout at the last meeting.

Action: Approved and closed. Assigned Item 08-42. Agreed upon rewording of Section 9.9.2 is included as an attachment to these minutes.

GSG 08-43 Revision of Footnote in Table 9.2.4 Regarding Number of Heats (GTG).
J. Jackson presented this agenda item.

Action: Approved and closed with change in word “thickness” to “dimensional”. Assigned GSG Item Number 08-43.

GSG 08-44 Adding Date Columns to Fracture Toughness Table (GTG). R. Rice presented this item.

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Action: Continue. Fill in columns. Add date when it was developed and when it is approved. Assign item number 08-44.

GSG 08-45 Effect of Temperature Curves for Under-Aged Alloys (GTG). R. Rice led discussion of this item.

Action: Continue. Assign item number 08-45. Add note in the graphs indicating this is an under-aged alloy as proposed by S. van der Veen, Airbus, as follows: “During the first stages of exposure to these temperatures, significant further age-hardening occurs. In compliance with current guidelines (paragraph 9.8.5.5), these have been truncated to 100%. The reader must be aware however, that material properties in general are subject to significant changes also during the first stages of exposure to these temperatures.”

GSG 08-46 Revised Text on K90 and K99 tables in MMPDS (SWG). R. Rice led discussion of this item, which was suggested by J. Goodman, Alcoa.

Action: Continue. Prepare agenda item. Assign item 08-46.

GSG 08-51 Revision of Figures with 2-shape Ramberg-Osgood Parameters (MTG). New item that derived from approval of Item 07-31.

Action: New item.

GSG NIN Inconsistencies in Double Shear Testing (GTG). S. Fantle provided information for this handout item. During a round-robin shear testing per ASTM B 769, it was found that some testing was performed using ASTM B 565 and NAS1312-13 which are not equivalent test specifications and even state that they are not equivalent to ASTM B 769. Companies should exercise care when specifying double shear testing, in order to ensure the proper test method is utilized, as results from the various methods are not comparable.

Action: Closed with no action

GSG NIN Naming the Orientations of Bearing Samples (MATSIG/GTG). J. Jackson presented this agenda item. This item is being expanded from just naming the ST orientations to naming the flatwise and edgewise orientations for bearing samples. Unlike the ASTM specification for shear testing, the ASTM specification for the bearing test does not include naming of the test orientations.

Action: Continue. Background information supplied by Jim Rossi, Westmoreland, is included in the minutes.

GSG NIN Guidelines for Derived Properties Lot Requirements (GTG). J. Jackson presented this agenda item to discuss requiring duplicate testing per lot or

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additional words for an increased number of lots which do not require duplicate testing per lot.

Action: Closed with no action.

GSG NIN **Validation of Design Properties (GTG).** R. Rice led discussion on this item with input from J. Layton.

Action: Continue. ASG to discuss.

GSG NIN **Statistical Analysis of Fatigue Data (GTG).** S. van der Veen, Airbus, and R. Rice led discussion of this agenda item.

Action: Continued. S. van der Veen, Airbus, to supply some of the analysis code to R. Rice for evaluation.

GSG NIN **Development of Plane Strain Fracture Toughness Data for Very Tough Alloys (GTG).** Concerns have been expressed for several years within MMPDS coordination meetings that ASTM E399 produces a very large percentage of invalid tests results with very tough steel and aluminum alloys; yet there is no other approved standard within MMPDS for documenting the plane strain fracture toughness of these alloys.

Action: New item.

Next Meeting Location And Times

The Spring meeting will be in Columbus, OH and will be reduced to 2 ½ days. Registration fees for this and future meetings will be increased until funding exceeds 150% of base funding, which is the level called out in the current FAA contract necessary for 2 traditional on-site meetings.

Possible Fall 2009 meeting locations:

- | | |
|-------------------|----------------------|
| - Seattle, WA | - Tucson, AZ |
| - Portland, OR | - San Antonio, TX |
| - Wichita, KS | - San Francisco, CA |
| - Lake Tahoe, NV | - Ft. Worth, TX |
| - Los Angeles, CA | - Salt Lake City, UT |
| - Phoenix, AZ | |