



# 118<sup>th</sup> IMOG Measurement Technology Subgroup Meeting

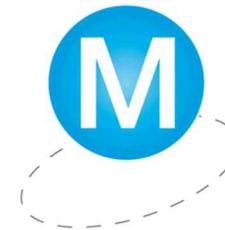
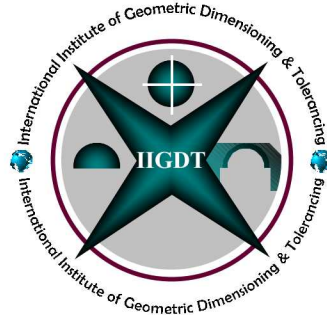
## ROUND ROBIN UPDATE May 2018

Presented by: Margie Baca

## Round Robin Update

- IMOG Round Robin Inspection Gage
- Motivation for Round Robin
- IMOG Round Robin “Specification Requirements”
- IMOG Round Robin Supplementary Information
- IMOG Round Robin Gage Presently
- Measurement Information Request Reminder
- Report IMOG Round Robin Inspection Gage data timeline

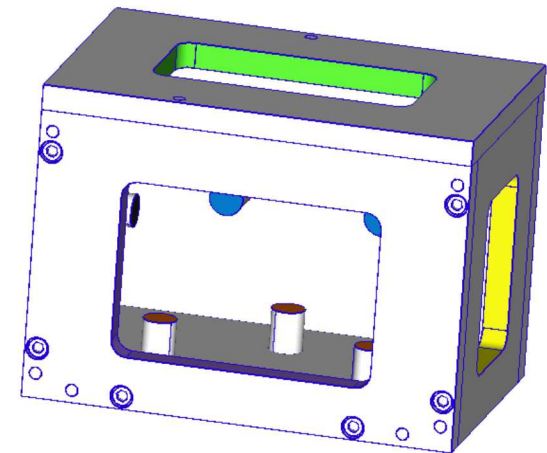
# IMOG- Round Robin Inspection Gage



**Marten  
Machining**  
inc.  
Multi-Axis Quality

## Developers

- Margie Baca – SNL/NM Mechanical Calibration
- Tony Bryce – SNL/NM Mechanical Calibration
- Monico Lucero – SNL/NM Manufacturing Liaison
- Dr. Greg Hetland – IIGDT
- Ryan Wierzba – Marten Machining
- Al Marten – Marten Machining



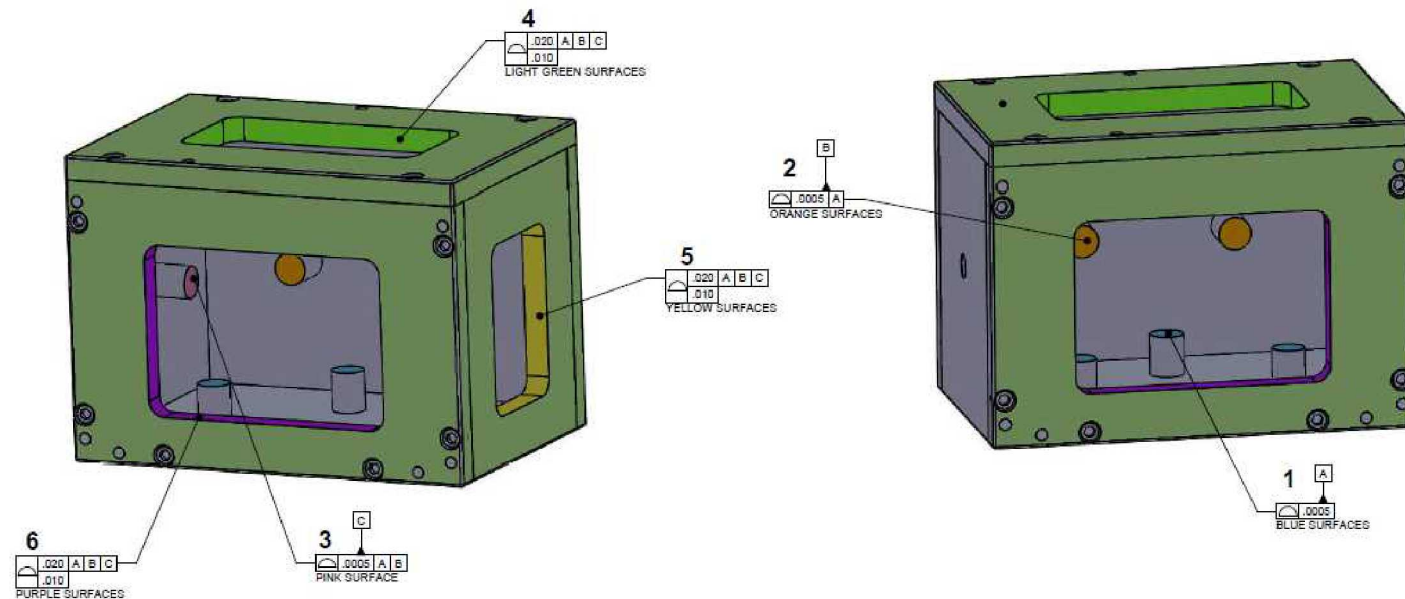
# Motivation For Round Robin

- To utilize a gage in a round-robin effort to evaluate measurement methods from various labs and determine potential biases between results and implications to each labs ability to optimally consider applicable error consideration when developing their uncertainty analysis.
- The magnitude of these measurement biases will determine each labs ability to have a high-degree of confidence in measuring parts for conformance to specification requirements with a known magnitude of measurement uncertainty.
- Failure to ensure confidence in these results could have a technical & business impact to IMOG participants as it will result in potentially rejecting parts that truly conform to specification requirements, or at a higher risk, accepting parts that truly do not conform to specification requirements.



# IMOG Round Robin “Specification Requirements”

\*Note that previously sent email regarding specifications did not represent the discrepancy found later on that should excluded datum A on the composite profiles



**DO NOT DISASSEMBLE GAGE**

UNLESS OTHERWISE SPECIFIED:  
1. ALL DIMENSIONS ARE BASIC, CONTROLLED BY THE CAD MODEL, AND CONTROLLED SIMULTANEOUSLY  
2. BREAK EDGES (.002-.010)  
3. SURFACE ROUGHNESS NOT TO EXCEED 63Ra OR 2% OF FORM REQUIREMENT



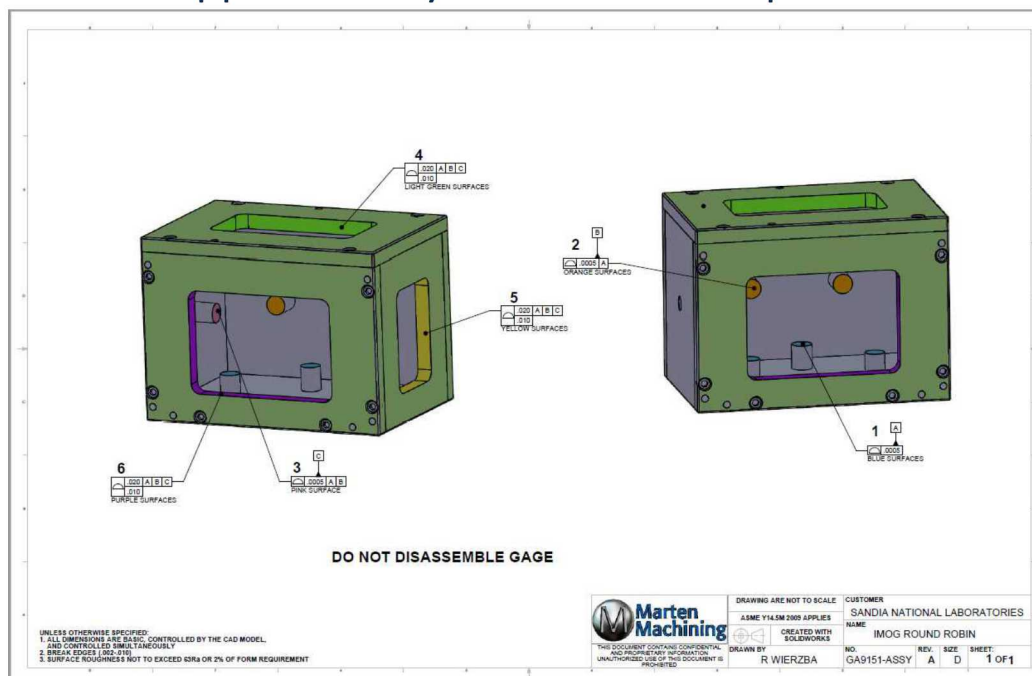
DRAWING ARE NOT TO SCALE		CUSTOMER		
ASME Y14.5M 2009 APPLIES		SANDIA NATIONAL LABORATORIES		
CREATED WITH SOLIDWORKS		NAME		
DRAWN BY		IMOG ROUND ROBIN		
R WIERZBA	NO.	REV.	SIZE	SHEET:
	GA9151-ASSY	A	D	1 OF 1

# IMOG Round Robin Supplementary Information

DIMENSION	DESCRIPTION	ON CMM AS MEASURED	UNIT OF MEASURE	EFFECTIVE PROBE DIAMETER & MATERIAL	BALL CENTER or SURFACE POINTS	SCAN POINTS or SINGLE POINTS	MACHINE MODEL and SOFTWARE	CMM Specification	METROLOGIST/ FACILITY	EXPORTED POINTS
1	Profile Datum A	.0001	INCH	5mm / Silicone Nitrite	Surface	Scan	Zeiss Contura G2 Calypso	1.9 +L/300µm	Jesse Sanchez / SNL-NM	Metric & Inch
2	Profile Datum B	.0000	INCH	5mm / Silicon Nitrite	Surface	Scan				
3	Profile Datum C	.0005	INCH	5mm / Silicon Nitrite	Surface	Scan				
4	Composite Profile Top Window	-.0034	INCH	3mm / Ruby	Surface	Scan				
		.0050	INCH	3mm / Ruby	Surface	Scan				
		.0096	INCH	3mm / Ruby	Surface	Scan				
5	Composite Profile Right Window	-.0083	INCH	3mm / Ruby	Surface	Scan				
		.0083	INCH	3mm / Ruby	Surface	Scan				
		.0209	INCH	3mm / Ruby	Surface	Scan				
6	Composite Profile Front Window	-.0086	INCH	3mm / Ruby	Surface	Scan				
		.0083	INCH	3mm / Ruby	Surface	Scan				
		.0169	INCH	3mm / Ruby	Surface	Scan				

Please send all the point files for all the datums along with all the window features and include the units of the exported points. Please also include the stylus size diameter and if the exported points are surface or ball center data.

## Supplementary Information Requested



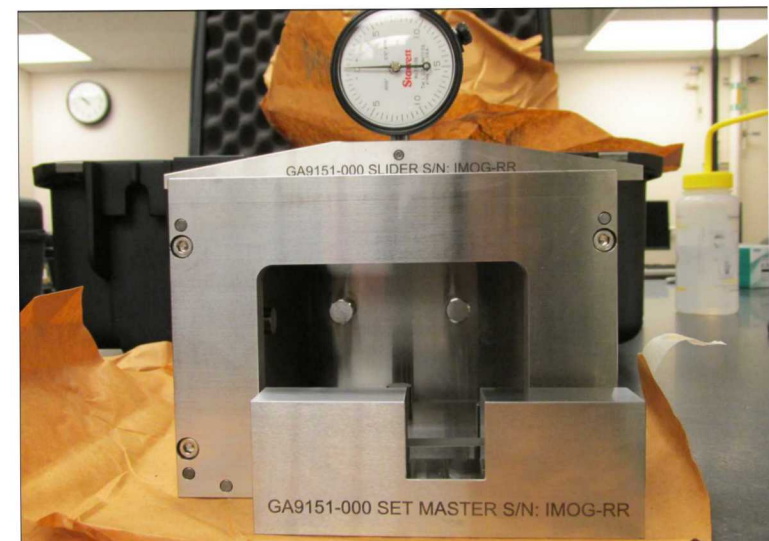
# Round Robin Gage Presently

- Three participants that have measured the Round Robin Gage so far:
  - Mechanical Calibration (SNL/NM)
  - Manufacturing Liaison (SNL/NM)
  - Mission Support and Test Services (NSTech)
- Sandia Livermore California is next in line to receive the Round Robin Gage
  - SNL/CA next participant John Friddle
- Just a reminder that there is no DOE funding for shipping the Round Robin Gage to and from each IMOG participant. It is understood that shipping cost will be on the IMOG participant.

- Report methodology per participant site's normal process
- Contact information for delivery of Round Robin gage
- Would like to receive from each participant if possible the following information-
  - X, Y, Z, i, j, k measured points (i.e. surface point data)
    - Measured surface points of all datums along with profile measurements
    - Follow participant's site process to provide information (e.g. E-mail, CD file transfer)
- Units of measure of the data
- Effective probe tip diameter
- Software (e.g. name and version) being used on CMM actual profile measurement value result
- Certified CMM specification or accuracy



# Round Robin Gage



# IMOG- Round Robin Inspection Gage

## Reporting Timeline

- Round Robin data reporting timeline
  - Anticipate having enough data to report on during the fall IMOG meeting this year
    - Would like to have the majority of the IMOG Round Robin Gage participants measure the gage before reporting any data.

# Questions?