



# Crash Course on Xometry Quality Clauses

# Xometry Quality Clauses: Table of Contents

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# Quality Clauses Defined: Certificate of Conformance


## C of C

**What is it?** A Certificate of Conformance is a document certified by a competent authority that the supplied good or service meets the required specifications. Also called Certificate of Conformity or Certificate of Compliance.

### What does it include?

- PO number
- PO line number
- Customer's actual part number
- Actual material and specs per the drawing
- Material Lot number
- Any special processes, material, hardware, or ink certs should be noted

### Important to remember:



## Certificate of Conformance

Xometry certifies that the part referenced below conforms to all requirements of the order. The part has been manufactured with the required material, specifications, instructions, or drawings agreed upon between the client and the manufacturer.

<b>Customer Name:</b>	NASA	
<b>Customer PO #:</b>	P000037412	<b>Customer Part Number:</b> 1739-25
<b>Customer PO Line #:</b>	1	<b>Customer Serial #:</b> N/A
<b>Xometry Order ID:</b>	12345-15001	<b>Customer Revision #:</b> 1
<b>Xometry Part ID:</b>	00D1B3B	<b>Material:</b> Aluminum 6061-T651 per AMS 4027
<b>Quantity:</b>	1	<b>Material Lot #:</b>
<b>Finish:</b>	Black Anodize per MIL-A-8625 Type II AMS 2472	
<b>Notes:</b>	N/A	

Signature

Date

## Assembled product C of C

### What does it include?

- Main Assembly as the part number with correct dash number
- In the notes all product from the BOM should be present
- Assembled product includes parts with inserts added



### Certificate of Conformance

Xometry certifies that the part referenced below conforms to all requirements of the order. The part has been manufactured with the required material, specifications, instructions, or drawings agreed upon between the client and the manufacturer.

Customer Name:	NASA		
Customer PO #:	P000037412	Customer Part Number:	1739-25
Customer PO Line #:	1	Customer Serial #:	N/A
Xometry Order ID:	12345-15001	Customer Revision #:	1
Xometry Part ID:	00D1B3B	Material:	Aluminum 6061-T651 per AMS 4027
Quantity:	1	Material Lot #:	
Finish:	Black Anodize per MIL-A-8625 Type II AMS 2472		
Notes:	Assembled from 1739-1, 2321-1, 4x 3/8 dowels per MS 16555-660		

Signature

Date



## Material Certifications - Mill Test Reports (MTR's)

**What is it?** Document provided by the Mill that created the material.

### What does it include?

- Includes chemical and physical analysis
- Includes heat lot numbers
- Always has an inspectors signature
- Must include exact Material specs called out on the print or PO

RT09544090

**KAISER ALUMINUM**  
FABRICATED PRODUCTS

*Best in Class*

**CERTIFIED TEST REPORT**  
<http://Online.KaiserAluminum.com>

Kaiser Aluminum  
Trentwood Works  
PO Box 15108 Spokane Valley WA 99215-5108  
15000 E Euclid  
Spokane Valley, WA 99216  
(800) 367-2586

LOT: 300070B0 CAST: 558 DROP: 20 INGOT: 3

Melted in USA  
(ASTM E8/B557)  
(EN 2002-1)

Tensile: Temper Dir/#Tests Ultimate KSI (MPa) Yield KSI (MPa) Elongation %  
T651 LT / 04 (Min:Max) 46.9 : 47.4 41.5 : 42.4 16.0 : 17.0  
(323 : 327) (286 : 292)

(ASTM E1251)

Chemistry:	SI	FE	CU	MN	MG	CR	ZN	TI	V	ZR	OTHER
Actual	0.70	0.5	0.31	0.10	1.0	0.17	0.15	0.02	0.01	0.00	0.02

Chemistry:	SI	FE	CU	MN	MG	CR	ZN	TI	V	ZR	OTHER
6061	MIN	0.40	0.0	0.15	0.00	0.8	0.04	0.00	0.00	0.00	MAX 0.05
	MAX	0.8	0.7	0.40	0.15	1.2	0.35	0.25	0.15	0.05	TOT 0.15

Aluminum Remainder

**Miscellaneous Notes**  
6061 sheet or plate certified to AMS 4025, AMS 4026, or AMS 4027 also meets applicable requirements of AMS-QQ-A-250/11 Rev.A.

**CERTIFICATION**  
Kaiser Aluminum, Trentwood Works, is ISO 9001, AS9100, and ISO 14001 certified, and hereby certifies that all material shipped under this order: \* has been inspected, tested, and found to be in conformance with the requirements of the specifications indicated herein. All test equipment and measuring devices are calibrated and certified in accordance applicable specifications. For material thicknesses outside specification limits, mechanical properties are as shown herein and chemical composition meets specification requirements. Reported elongation values have been measured as elongation at fracture. \* was melted in the United States of America or a qualifying country per DFARS 225.872-1(a), was manufactured in the United States of America, and meets the requirements of DFARS 252.225 for domestic content. \* has been thermally processed in compliance with AMS 2772, where applicable. \* is mercury free, within the limits of detection of ASTM E1215 (clipped). \* is in compliance with RoHS 2, European Union Directive 2011/65/EU. \* is in compliance with European Chemical Agency, ECHA, REACH regulations, (EC) No 1907/2006, and Kaiser regularly monitors these regulations for updates. \* is free of Conflict Minerals, as defined in Section 15.2 of the Dodd-Frank Act. \* is free of weld repair. \* meets the reporting requirements of ENIG204, Type 3.1. Any warranty is limited to that shown on Kaiser Aluminum's standard general terms and conditions of sale. Test reports are on file, subject to examination. Test reports shall not be reproduced except in full, without the written approval of the Kaiser Aluminum Laboratory. The recording of false, fictitious or fraudulent statements or entries on the certificate may be punished as a felony under federal law.

MICHAEL PESKE, PT LAB PROCESS ENGINEER

*Michael Peske*

## DFARS Material Certifications - Mill Test Reports (MTR's)

**What is it?** Document provided by the Mill that created the material.

### What does it include?

- Material is manufactured in a Country on the **DFARS list** →
- Includes chemical and physical analysis
- Includes heat lot numbers.
- Always has an inspectors signature.
- Must include exact Material specs called out on the print or PO

- |                               |  |
|-------------------------------|--|
| • Australia                   | • Japan  |
| • Belgium                     | • Latvia   |
| • Canada                      | • Luxembourg   |
| • Czech Republic              | • Netherlands  |
| • Denmark                     | • Norway   |
| • Egypt                       | • Poland   |
| • Estonia                     | • Portugal   |
| • Federal Republic of Germany | • Slovenia   |
| • Finland                     | • Spain  |
| • France                      | • Sweden   |
| • Greece                      | • Switzerland  |
| • Israel                      | • Turkey   |
| • Italy                       | • United Kingdom of Great Britain and Northern Ireland |

## Raw Material Traceability

**What is it?** Raw Material Traceability is being able to trace the material from the mill that produced the raw material to the manufacturer of the finished part and every hand off in between.

### What does it include?

- Paperwork must come from the raw material manufacturer and show sold to
- If not sold to parts maker directly, there must be paperwork from raw material maker to raw material supplier to machined part maker
- Includes chemical and physical analysis
- Includes heat lot numbers
- Always has an inspectors signature.
- Must include exact Material specs called out on the print or PO

RT09544090

**KAISER ALUMINUM**  
FABRICATED PRODUCTS

*Best in Class*

**CERTIFIED TEST REPORT**  
<http://Online.KaiserAluminum.com>

Kaiser Aluminum  
Trentwood Works  
PO Box 15108 Spokane Valley WA 99215-5108  
15000 E Euclid  
Spokane Valley, WA 99216  
(800) 367-2586

CUSTOMER PO NUMBER: PV13760092-1	WORK PACKAGE: 20810800	CUSTOMER PART NUMBER: 104492/28	SHIP RUNLOAD: 104492/28	GOVT CONTRACT NUMBER:	
KAISER ORDER NUMBER: 1280160-1	SHIP DATE: 12/27/2018	ALLOY: 6061	CLAD: BARE	TEMPER: T651	PRODUCT DESCRIPTION: Precision Plate
WEIGHT SHIPPED: 7318 LB	QUANTITY: 25 PCS EST.	TRUCK B/L #: 2078096	GAUGE: 0.6250 IN	DIAMTER/WIDTH: 48.500 IN	LENGTH: 96.500 IN
SHIP TO:  ALRO - POTTERVILLE 5859 ALRO PARK DRIVE POTTERVILLE, MI 48876 US			SOLD TO:  ALRO P O BOX 927 JACKSON, MI 49204 US		

MHU 2298113: LOT 300070B0: 16 pieces  
MHU 2298115: LOT 300070B0: 9 pieces

**Certified Specifications**  
AMS 4027/RevN~ASME SB 209/Rev2010~ASTM B 209/Rev14

Test Code: 1511

**Test Results:**


## Material Inspection Requirement

(Dyepen, MPI, Ultrasonic)

**What is it?** Non-destructive testing done at time of material creation or during the manufacturing process.

### What does it include?

- Dye Penetrant inspection
- Magnetic Particle Inspection
- Ultrasonic
- X-Ray inspection

  
**CERTIFIED TEST REPORT**  
4821

**CUSTOMER:** XOMETRY **Purchase Order:** W00022EE


**PROCESS:** ULTRASONIC CLEAN


ITEM #	DESCRIPTION	QUANTITY
1	PART ID: 00D9364 10481212-1-C.x_t ORDER ID: 0FECE-15004	2
2	PART ID: 00D935F 10481222-1-C.x_t ORDER ID: 0FECE-15004	3
3	PART ID: 00D9362 10461217-1_B.x_t ORDER ID: 0FECE-15004	12
4	PART ID: 00D935E 10481221-1-C.x_t ORDER ID: 0FECE-15004	3
5	PART ID: 00D9366 10481215-1-B_rev1 (2).STEP ORDER ID: 0FECE-15004	2
6	PART ID: 00D9361 10481224-1-C.x_t ORDER ID: 0FECE-15004	3
7	PART ID: 00D9363 10481211-1-C.x_t ORDER ID: 0FECE-15004	2

**Cleanliness Verification Method:** Visual Examination.  
**Visual Examination Criteria:** ≥ 50 foot candles of light illumination at 2 to 4 feet.  
**Result:** PASS

The above results have been reviewed and accepted to conform to the above stated specifications and criteria. Any evidence of tampering of the packaging or seals prior to final installation without specific approval nullifies this certification.

All process and final packaging materials meet or exceed the cleanliness level of the part(s) they come in contact with. Records on file for review.

  
\_\_\_\_\_  
QPC Quality

  
\_\_\_\_\_  
Date

04-04-2019

1735 Business Center Drive, Duarte, CA 91010  
TEL (626) 358-4500 : FAX (626) 358-4522 : WEB [www.qpc.com](http://www.qpc.com)

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## Approved Mill List Requirement

**What is it?** Customer requires material to be created by a list of approved Mills.

### **What does it include?**

- Parts can be bought from any supplier as long as the mill creating the material was on the list
- On the day of PO that list must be checked for allowable mills and changes
- If required, this will be provided by Xometry

# Quality Clauses Defined: Hardware C of C

## Hardware C of C

**What is it?** Hardware has a C of C from the hardware supplier.

### What does it include?

- The exact text of any specs on the drawing
- McMaster Carr **OK** if specs are correct
- Must include a signature

**KATO Fastening Systems, Inc.** **PACKING TICKET**

---

Delivery	DELIVERY DATE	CUSTOMER PO NO.	PAGE
126241	08/28/18	87970	1 of 1


**DELIVERED SEP 04 2018**

**Bill To:** Aircraft Fasteners International, LLC  
PO Box 66249  
Los Angeles CA 90066-0249  
USA

**Ship To:** Aircraft Fasteners International, LLC  
13402 Beach Ave.  
Marina Del Rey CA 92092  
USA

Line #	Item No.	Description	Qty Shipped	UoM
0	2TLC-04C-0168	NAS1130-04L15, INSERT, TANGLESS, LOCKING, 4-40 X 1.5 D, BULK Line Notes:	50,000	Each

Lot Number(s)	Lot Qty	Chem/Phys Report:
C34635	50,000	Email Yes No

- 24066  **Certificate of Compliance**

KATO Fastening Systems certifies that all CollThread inserts supplied on the above purchase order have met all inspection requirements set forth by KATO Fastening Systems, and comply to all chemical and physical specifications.

CollThread inserts and tools conform with the following Military and Aerospace Standards: NASM122076-122115 Rev 2, NASM122116-122155 Rev 2, NASM122156-122195 Rev 2, NASM122196-122235 Rev 1, NASM122236-122275 Rev 2, NASM124651-124690 Rev 2, NASM124691-124730 Rev 2, NASM124731-124770 Rev 2, NASM124771-124810 Rev 2, NASM124811-124850 Rev 2 (formerly MS21208), NASM121209 Rev 3, NASM33337 Rev 2, NASM8846 Rev 1, A-A-59158 (Rev Jan 1998), MA3279 Rev B, MA3280 Rev B, MA3281 Rev B, MA3329 Rev C, MA3330 Rev C, MA3331 Rev C, MA1565 Rev B, MA1567 Rev B, AS7245 Rev A, ASME B18.29.1-2010 and ASME B18.29.1-2M.

Tangleless CollThread inserts conform with NAS1130 Rev 5, NA0276 Rev 3, and NASM8846. KATO Tangleless CollThread tools conform to all KATO design specifications.

Dry Film Lubricated inserts comply with Aerospace Standard AS5272 Rev E, Type I (formerly MIL-L-46010). Cadmium Plated inserts comply to AMS-QQ-P-416C (formerly QQ-P-416) Silver Plated inserts comply to Aerospace Specification AMS2411.

DFARS Compliance: All KATO CollThread inserts are DFARs compliant with the exception of M2 Tangleless inserts. KATO Tangleless and tanged CollThread inserts are manufactured in the UK. The UK is listed in sections 225.003, 252.225-7001, 252.225-7021, & 252.225-7036 as a "Qualifying country". Accordingly, KATO CollThread inserts are in compliance with sections 252.225.7008, 252.225.7009, & 252.225.7010.


RoHS Compliance: KATO Fastening Systems does not use lead, mercury, cadmium, hexavalent chromium, PBB or PBDE in the manufacturing of Tangleless and tanged CollThread inserts and tools. Cadmium plating is offered as an optional process in accordance to AMS-QQ-P-416B. Inserts with Cadmium plating are identified with a "Y" at the end of the KATO part number, a "P" at the end of the MS/NAS number, and the description will indicate Cadmium plating.

ODS Compliance: KATO Fastening Systems does not use Ozone Depleting Substances (ODS) in the manufacturing of Tangleless and tanged CollThread inserts and tools.

Country of Origin: KATO CollThread inserts are manufactured in the UK, with the exception of the new M2 Tangleless inserts which are manufactured in Japan. Inserts manufactured prior to 1995 were made in Japan or Singapore (tanged only). Hexatong Hinges are made in Japan. All KATO tanged tools are manufactured in the USA. All KATO Tangleless tools are manufactured in the USA with the exception of M6 and larger metric 2KRE and 2KHE series which are manufactured in Japan.

CollThread insert chemical and physical test reports, certifications, and other documents are on file and available for an additional charge.

CAGE CODE: 0YCA0 | ECCN: EAR99 | Export License: NLR | SIC: 3452 | NAICS: 33272 | Schedule B: 7318.19.0000 for CollThread Inserts, 8467.11.5090 for CollThread Air Tools, 8467.29.0095 for CollThread Electric Tools, 8467.89.5090 for CollThread Hand Tools, 8207.40.0000 for STI Taps, 9031.80.8060 for STI Gages, 8302.10.4090 for Hexatong Hinges | Harmonized Tariff Schedule (HTS): 7318.19.0000 for CollThread Inserts, 8467.29.0090 for CollThread Tools, 8302.10.9090 for Hexatong Hinges

  
Quality Assurance Representative

## Hardware Traceability

**What is it?** Customer is looking for traceability paperwork back to the mill of the hardware.

### **What's important to know?**

- McMaster Carr hardware is not acceptable
- At time of purchase these need to be requested
- Paperwork must match customer drawing specs
- Shows every handoff from the mill to the partner

## Finishing Certifications

**What is it?** Specialty Finishes added to the parts will need a C of C from the finisher.

### What does it include?

- This must contain the exact specs that the customer requested on the drawing or PO
- Must have a signature
- Finishes include any heat treatments or other specialty testing done
- Must have a Xometry part number or drawing part number

**MOMENTUM**  
METAL FINISHING

**Momentum Metal Finishing  
Certification**

Order No.: 66047  
Date: 05/08/2019  
Entry Date: 05/07/2019  
Page: 1 of 1

To:  
PT&R INC.  
1430 Attberry Ln  
San Jose CA 95131

Purchase Order No.: 2001395  
Packing List No.:

We are pleased to provide you with the following Certification

Quantity	Part Number / Part Name / Part Description	Pounds
1	00DF985 REV 0	
1	00DF986 REV 0	

CLEAR ANODIZE PER MIL-A-8625F, TYPE II, CLASS 1

MOMENTUM METAL FINISHING HEREBY CERTIFIES THAT THE PROCESS REQUIREMENTS OF THIS SPECIFICATION WERE STRICTLY OBSERVED AND MAINTAINED WITHIN ALL PRESCRIBED LIMITS. CALIBRATION OF ALL EQUIPMENT USED WAS CURRENT. RoHS COMPLIANT. THIS INFORMATION IS AVAILABLE FOR YOUR INSPECTION UPON REQUEST.

Bruce Nguyen  
General Manager  
Momentum Metal Finishing

1232 Memorex Drive Santa Clara CA 95050 Phone: (408) 988-4858 Fax: (408) 988-4856

# Approved Finisher List Requirement

### What is it?

- Xometry will have a list of finishers and what types of post-processing they are approved to do on a customer's part
- This list will be provided with the job to verify that intended finishers are still approved



## Thermal Processing Records

(Heat Cert and Oven Log)

**What is it?** When a heat treatment is done on a part this is a record of the times and temperatures a part went through on a particular oven cycle.

### What does it include?

- There will also be a C of C that should state exactly the same spec that is on the customer print
- Must have a signature



## Formal inspection report

**What is it?** Customer is looking for an Inspection report on the Xometry formal template.

### What does it include?

- Will include a bubbled drawing and corresponding report
- Will be downloaded from the partner portal.
- Must have proper sample size per the partner guide
- Use of manual calibrated measuring tools or CMM acceptable
- Must have measuring equipment identified on each line with calibration expiration date.
- Will be reviewed by Xometry VQC team prior to shipment for accuracy
- Must be included in the box at time of shipment

## CMM inspection report

**What is it?** Customer is looking for an Inspection report on the Xometry formal template completed using a CMM.

### What does it include?

- Will include a bubbled drawing and corresponding report
- Will be downloaded from the partner portal.
- Must have proper sample size per the partner guide
- Must have measuring equipment identified on each line with calibration expiration date.
- Will be reviewed by Xometry VQC team prior to shipment for accuracy
- Must be included in the box at time of shipment

# FAIR (First Article Inspection Reports)

## What does it include?

- [illegible]

[illegible]

## RoHS/REACH

### What is it?

**RoHS** stands for Restriction of Hazardous Substances. RoHS, also known as Directive 2002/95/EC, originated in the European Union and restricts the use of specific hazardous materials found in electrical and electronic products (known as EEE). All applicable products in the EU market after July 1, 2006 must pass RoHS compliance.

**REACH** stands for Registration, Evaluation, Authorisation and Restriction of Chemicals is a European Union regulation dating from December 18, 2006. REACH addresses the production and use of chemical substances, and their potential impacts on both human health and the environment.

### What does it include?

- A Material Test Reports stating RoHS/REACH Compliant
- A Finishing Certification stating RoHS/REACH Compliant
- Provide a CofC that states that Xometry confirms that the raw materials, components and finishes meet the RoHS, REACH requirements per the declaration on the applicable certifications and that Xometry has not added any other raw materials or substances in the processing of these parts



## NADCAP

(National Aerospace and Defense Contractors Accreditation Program)

**What is it?** NADCAP (National Aerospace and Defense Contractors Accreditation Program) is an industry-managed approach to conformity assessment of 'special processes' that brings together technical experts from prime contractors, suppliers and representatives from government to work together and establish requirements for approval of suppliers using a standardized approach.

### What does it include?

- When NADCAP finishers are required Notes will be added to the job and Xometry will have to review the finishers for NADCAP certification

## Process Control Plan

**What it it?** This can be a formal process control plan, or a shop routing or Traveler is typically acceptable. The goal is to document the order of the process used to produce the part.

### What does it include?

- Needs to show steps used to manufacture the parts

5/8/2012 **Job Traveler** Page 1 of 1  
Job No: M14734

Job Name 2010-0539 - 4 - 26 1-4 UNWIND CHAIN LINK - LIFT SI  
Customer Make Job

Outputs				
Item ID	Description	Qty	UM	Revision
2010-0539	26 1-4 UNWIND CHAIN LINK - LIFT SIDE	4.00	EA	DEFAULT

**Job Notes**  
Item ID: 2010-0539; Description : 26 1-4 UNWIND CHAIN LINK - LIFT SIDE

Output Drawing Number	
Item ID	Drawing No
2010-0539	STAND ALONE ROLL LIFT

Sequence	01-SAWCUT SAWCUT ITEMS	Process ID: DEFAULT Work Center: SAW	Machine ID: SAW
Cycle Time	Setup Hours Labor Hours Items/Process Processes/Hour Hours Type Days to Next	0.00 0.07 1.00 60.00 Actual	0.00
Labor Collection	Worker Date Start time End time Total hours Completions Finished?		
Notes			

Sequence	02-MILL MILL PARTS	Process ID: DEFAULT Work Center: MILL
Cycle Time	Setup Hours Labor Hours Items/Process Processes/Hour Hours Type Days to Next	0.00 4.00 1.00 1.00 Actual 0.00
Labor Collection	Worker Date Start time End time Total hours Completions Finished?	
Notes		

Sequence	03-OXIDE OXIDE PARTS	Process ID: DEFAULT Work Center: OXIDE
Cycle Time	Setup Hours Labor Hours Items/Process Processes/Hour Hours Type Days to Next	0.00 1.47 1.00 2.73 Actual 0.00
Labor Collection	Worker Date Start time End time Total hours Completions Finished?	
Notes		

# Xometry Quality Clauses Recap

1. Certificate of Conformance
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Questions?

Don't hesitate to reach out to us at [work@xometry.com](mailto:work@xometry.com)