

WORTHINGTON CYLINDERS- JEFFERSON, OH		Located at 863 State Route 307 East Jefferson, OH 44047 USA			
PRODUCT SPECIFICATION D.O.T. 4B 240 CERTIFICATION OF CONFORMANCE					
PURCHASE ORDER		CUSTOMER		QUANTITY	
FT21-0899		FIRETRACE USA, LLC		826	
CUSTOMER PART NO.	WC PART NO.	LOT NUMBERS	BURST TEST RESULT (PSIG)	1ST SERIAL NUMBER	LAST SERIAL NUMBER
100301	310434	CA 63 to CA 67	1,623	CA 012401	CA 013226
We certify the above referenced cylinders have been tested and certified as meeting the requirements of D.O.T. Spec. 4B 240. They were manufactured to the requirements of the cylinder drawings. The cylinders have been 100% proof tested at a minimum pressure of 480 psig. Minimum burst is 960 psig. The maximum working pressure of a DOT 4B 240 cylinder is 240 psig. These cylinders meet applicable UL2166 requirements.			ISSUED BY: (name, title, signature) Billy J. Vencill, CERTIFIED INSPECTOR <i>Billy J. Vencill</i>		DATE ISSUED: December 17, 2021

Certificate of Compliance and Test Report – Welded Cylinders**Manufactured under U.S. Department of Transportation (DOT) and/or Transport Canada (TC) regulations**

Cylinder Manufacturer:	Worthington Cylinders	Location:	863 State Route 307 East Jefferson, OH
Manufactured For:	Worthington Cylinders	Location:	Jefferson, OH
Consigned To:	N/A		

Cylinder Description and Design Criteria:

Nominal Cylinder Dimensions (Inches): 3.01 Outside Diameter by 12.427 Length

Specification:	DOT-4B	Service Pressure:	240 psi
Nominal Water Capacity:	2.6 / 75 CU IN	Test Pressure:	480 psi
Tare or Mass Weight Range:	See Attached	Minimum Wall Thickness:	0.042 in
Joint Efficiency:	N/A	Calculated Stress at Test Pressure:	14,635 psi

Manufacturing Process:

Construction: The general method of construction includes: cold forming the cylindrical heads; welding flange to the head; and circumferentially welding two heads to form the cylinder. Cylinders are pressure tested after welding. If valves are installed, an additional leak test is conducted.

Material and Heat Treatment:

The material used was identified and chemical analysis was verified. Record of such is contained in the Record of Chemical Analysis attached hereto. Heat treatment was conducted in accordance with the specification requirements.

Report/Marking Details:

Specification*:	DOT-4B240	Inspector's Mark*:	WORTHJ
Quantity:	826	Test Date*:	12-21
Serial Numbers*:	CA12401 through CA13226	Lot Numbers:	63 through 67
Identifying Symbol*:	M4543	Heat Number or Codes:	See Attached

*Physical markings on cylinder or attachments

Additional Markings*: Additional markings as identified on cylinder design drawings.

I hereby certify that I have determined that cylinders described on this report comply with the requirements of the Department of Transportation and/or Transport Canada specification DOT-4B240.

Remarks: N/A

Bill Vencill	Worthington Cylinders Jefferson, OH	December 17, 2021
Certifying Inspector	Company Name and Location	Date

Record of Chemical Analysis of Material for Cylinders

Serial Numbers:

CA12401 through CA13226

Cylinder Manufacturer:

Worthington Cylinders

Location:

863 State Route 307 East
Jefferson, OH

Nominal Cylinder Dimensions (inches):

3.01 Outside Diameter by 12.427 Length

Material Manufacturer: Cleveland-Cliffs Burns Harbor LLC

Heat and Code Number	Type of Analysis	Chemical Analysis
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Heat	Coil	(Check or Ladle)	C	P	S
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831K08310	Ladle	0.05	0.013	0.005	
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Material Manufacturer: Cleveland-Cliffs Steel LLC

Heat and Code Number	Type of Analysis	Chemical Analysis
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Heat	Coil	(Check or Ladle)	C	P	S
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4124480	Ladle	0.04	0.014	0.012	
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The previous analyses have been verified to comply with material authorized by the specification. Chemical analyses were made by: Material Manufacturer (Ladle) or Worthington Industries (Check).

Bill Vencill

Worthington Cylinders
Jefferson, OH

December 17, 2021

Certifying Inspector

Company Name and Location

Date

Record of Hydrostatic and Physical Tests

Serial Numbers:
Cylinder Manufacturer:

CA12401 through CA13226
Worthington Cylinders

Location:

863 State Route 307 East
Jefferson, OH

Nominal Cylinder Dimensions (inches):

3.01 Outside Diameter by 12.427 Length

Lot Number 63

Hydrostatic

Serial Number CA12406

Total Expansion	1.58 cc	Permanent Expansion Ratio	1.27 %	Permanent Expansion	0.02 cc
Water Capacity	2.70 lbs				

Tensile

Serial Number CA12406

Top Yield Strength	32.48 ksi	Top Tensile Strength	47.08 ksi	Top Thickness	0.046 in
Bottom Tensile Strength	48.46 ksi	Bottom Thickness	0.046 in	Top Elongation 2.0 G.L.	49.0 %
Top Reduction of Area	67.5 %	Bottom Elongation 2.0 G.L.	50.5 %	Bottom Yield Strength	35.80 ksi
				Bottom Reduction of Area	67.3 %

Mechanical

Serial Number CA12407

Flattening Test	Pass	Macro Etch Test	Pass
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Burst

Serial Number CA12423

Burst Test 1623 psi

Lot Number 64

Hydrostatic

Serial Number CA12601

Permanent Expansion	0.08 cc	Total Expansion	1.60 cc	Permanent Expansion Ratio	5.00 %
		Water Capacity	2.70 lbs		

Tensile

Serial Number CA12601

Top Thickness	0.045 in	Top Yield Strength	33.48 ksi	Top Tensile Strength	47.61 ksi
Top Elongation 2.0 G.L.	55.0 %	Bottom Tensile Strength	47.40 ksi	Bottom Thickness	0.044 in
Bottom Yield Strength	35.48 ksi	Top Reduction of Area	65.6 %	Bottom Elongation 2.0 G.L.	48.5 %
Bottom Reduction of Area	57.8 %				

Mechanical

Serial Number CA12602

Flattening Test	Pass	Macro Etch Test	Pass
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Lot Number 65

Hydrostatic

Serial Number CA12801

Total Expansion	1.50 cc	Permanent Expansion Ratio	1.33 %	Permanent Expansion	0.02 cc
Water Capacity	2.70 lbs				

Tensile

Serial Number CA12801

Top Yield Strength	33.12 ksi	Top Tensile Strength	44.82 ksi	Top Thickness	0.046 in
Bottom Tensile Strength	47.25 ksi	Bottom Thickness	0.046 in	Top Elongation 2.0 G.L.	47.0 %
Top Reduction of Area	68.4 %	Bottom Elongation 2.0 G.L.	49.0 %	Bottom Yield Strength	45.91 ksi
				Bottom Reduction of Area	60.4 %

Mechanical

Serial Number CA12802

Flattening Test	Pass	Macro Etch Test	Pass
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Record of Hydrostatic and Physical Tests

Serial Numbers:
Cylinder Manufacturer:

CA12401 through CA13226
Worthington Cylinders

Location: 863 State Route 307 East
Jefferson, OH

Nominal Cylinder Dimensions (inches):

3.01 Outside Diameter by 12.427 Length

Lot Number 66

Hydrostatic

Serial Number CA13002

Permanent Expansion Ratio	1.39 %	Permanent Expansion	0.02 cc	Total Expansion	1.44 cc
				Water Capacity	2.70 lbs

Tensile

Serial Number CA13002

Top Tensile Strength	45.13 ksi	Top Thickness	0.047 in	Top Yield Strength	30.04 ksi
Bottom Thickness	0.047 in	Top Elongation 2.0 G.L.	46.5 %	Bottom Tensile Strength	44.69 ksi
Bottom Elongation 2.0 G.L.	49.0 %	Bottom Yield Strength	32.61 ksi	Top Reduction of Area	62.2 %
		Bottom Reduction of Area	69.5 %		

Mechanical

Serial Number CA13004

Macro Etch Test	Pass	Flattening Test	Pass
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Lot Number 67

Hydrostatic

Serial Number CA13202

Permanent Expansion	0.04 cc	Total Expansion	1.60 cc	Permanent Expansion Ratio	2.50 %
		Water Capacity	2.70 lbs		

Tensile

Serial Number CA13202

Top Thickness	0.047 in	Top Yield Strength	34.48 ksi	Top Tensile Strength	46.29 ksi
Top Elongation 2.0 G.L.	47.5 %	Bottom Tensile Strength	44.52 ksi	Bottom Thickness	0.046 in
Bottom Yield Strength	32.53 ksi	Top Reduction of Area	62.1 %	Bottom Elongation 2.0 G.L.	51.0 %
Bottom Reduction of Area	66.1 %				

Mechanical

Serial Number CA13203

Flattening Test	Pass	Macro Etch Test	Pass
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The previous results represent sample cylinders selected from each lot. All other cylinders in the lot were subjected to the required test pressure stated on the Certificate of Compliance and Test Report and show no defect.

Bill Vencill	Worthington Cylinders Jefferson, OH	December 17, 2021
Certifying Inspector	Company Name and Location	Date