



Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
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Date: 8/21/2025

Return Request: 9/4/2025

Project: Hot Springs National Park – Rehabilitate Bathhouses – Buckstaff Bathhouse

Supplier: Comfort Systems USA (Arkansas), Inc.

Manufacturer: Varies

Submittal: Hydronic Piping

Submittal Number: 232113.001

Spec Section: 232113, 2.2 through 2.6

Drawing # and Installation Location: M3-1 through M3-4, and M4-1

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(402)391-2111

GENERAL CONTRACTOR

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(816)708-1110

ENGINEER

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MECHANICAL SUBCONTRACTOR

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Comments:

CSUSA PROJECT NO.

25-7065

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Spec Section 232113, 2.2, A.

Heating Water Piping Above-Grade (2-1/2" and Above)

Standard Steel Pipe

ASTM A53 TYPE E GRADE B PIPE Submittal Data Sheet



Scope

Covers ~~black and hot-dipped galvanized~~ electric-resistance welded Grade B pipe. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. Wheatland ASTM A53 is UL Listed and FM Approved, sizes **1" through 6" nominal**, for use in Fire Sprinkler Pipe Applications. Pipe is suitable for welding, threading and grooving. Produced to the latest revision of ASTM A53/53M, Federal Specification WW-P404 and ASME B36.10M.

Manufacture

The weld seam shall be heat treated after welding to a minimum of 1400°F or be otherwise processed in such a manner that no untempered martensite remains.

~~Hot-dipped galvanized~~

~~The average weight of zinc coating shall be not less than 1.8 oz. per sq. ft. of surface (inside and outside). When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit of elasticity, some flaking of the coating may occur.~~

Hydrostatic and Nondestructive Electric testing

Hydrostatic inspection test pressures for plain-end pipe are listed in Table X 2.2 of the A53/A53M specification. Test pressures shall be maintained for a minimum of five seconds. Nondestructive electric testing of the weld seam is required on each length of ERW pipe NPS 2 and larger.

Chemical Requirements

Composition, max. %

Carbon .30	Manganese 1.20	Phosphorus .05	Sulfur .045	
Copper .40	Nickel .40	Chromium .40	Molybdenum .15	Vanadium .08

*The combination of these five elements shall not exceed 1.00%.

Tensile Requirements

TENSILE STRENGTH, MIN.	YIELD STRENGTH, MIN.	ELONGATION IN 2"
60,000 psi	35,000 psi	Refer to A53 table x 4.1

Bending Test (Cold)

NPS	DEGREE OF BEND	DIAMETER OF MANDREL
2 and under	90°	12x pipe OD

Flattening Test

As a test for ductility of the weld for pipe 2½" NPS and larger, position the weld at 0° and alternately at 90° to the direction of force and flatten until the OD is ⅔ of the original outside diameter. No cracks shall occur along the inside or outside surface of the weld.

Frequency of Tests

Tensile tests are required on one length of pipe from each lot of 500 lengths or fraction thereof for each size. Refer to A53 specification for frequency of flattening tests.

End Finish

Plain End: NPS 2 and larger, STD and XS weights: ends beveled to angle of 30°, +5°, -0° with a root face of ⅛" ± ⅓₂"

Threaded: To ANSI Standard B 1.20.1

Couplings: To ASTM Standard A 865

Weights and Dimensions Charts

STANDARD (SCH. 40) BLACK PLAIN END

NOMINAL SIZE	OD	NOMINAL WALL	WT./FT.
	in.	in.	lbs.
2"	2.375	.154	3.66
2½"	2.875	.203	5.80
3"	3.500	.216	7.58
4"	4.500	.237	10.88
5"	5.563	.258	14.63
6"	6.625	.280	18.99
8"	8.625	.322	28.58

EXTRA STRONG (SCH. 80) BLACK PLAIN END

NOMINAL SIZE	OD	NOMINAL WALL	WT./FT.
	in.	in.	lbs.
2"	2.375	.218	5.03
2½"	2.875	.276	7.67
3"	3.500	.300	10.26
4"	4.500	.337	15.00
5"	5.563	.375	20.80

All information contained herein is accurate as known at the time of publication. Wheatland reserves the right to change product specifications without notice and without incurring obligations.

Permissible Variations in Wall Thickness

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

Permissible Variations in Outside Diameter

Pipe NPS 2 and larger shall not vary more than + 1% from the standard specified.

Permissible Variations in Weight per Foot

Pipe shall not vary more than + 10% from the standard specified.

Product Marking

Each length of pipe is continuously stenciled to show the manufacturer, the grade of pipe (ASTM A53), the kind of pipe E for Electric Resistance Welded, B for Grade B, the size, XS for extra strong, and length. Stencil markings indicate UL Listing and FM Approval for sizes 1" through 6" nominal for use in Fire Sprinkler Pipe Applications. Bar coding is acceptable as a supplementary identification method.

SUBMITTAL INFORMATION

PROJECT:

Buckstaff Bathhouse

ENGINEER:

IMEG Corp

LOCATIONS:

Heating Water Piping Above Grade (2-1/2" and Above)

CONTRACTOR:

Comfort Systems USA (Arkansas), Inc.

SPECIFICATION REFERENCE:

232113, 2.2, A

COMMENTS:

DATE:

9/8/2025

SYSTEM TYPE:

Heating Water



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Wheatland Tube
A ZEKELMAN COMPANY

WST-050625



Even with all the advances in technology today, the wholly welded piping system has for decades remained the best choice for use in high pressure and high temperature application. Many piping jobs in schools, industrial plants, refineries and factories have benefited from the inherent advantages of a completely welded system. It becomes a closed container joining pipes, valves, fittings, and flanges. A welded joint actually becomes part of the pipe, minimizing leak potential. This provides greater margins of safety, especially under conditions of high internal pressures. Additionally, welding fittings form a continuous metal structure with the pipe, adding forged-in strength to any piping system. Furthermore, smooth forged fittings simplify insulation and take up less space.

ASTM A 234

Scope

This standard covers wrought carbon steel fittings of seamless and welded construction which are manufactured to the dimensional specifications of ASME B16.9 and B16.28. These fittings are primarily for use in pressure piping and in pressure vessel fabrication for service at moderate and elevated temperatures.

Materials

The starting material for fittings shall consist of killed steel, forgings, bars, plates, seamless or fusion-welded tubular products with filler metal added and shall conform to the the chemical requirements of ASTM A 234. Unless otherwise specified, carbon steel plates may be either coarse grain or fine grain practice.

Manufacture

Forging or shaping operations are performed by hammering, pressing, piercing, extruding, upsetting, rolling, bending, machining, or by a combination of two or more of these operations. The forming process shall be applied so that it will not produce injurious imperfections in the fittings.

Heat Treatment

Hot-formed WPB fittings, upon which the final forming operation is completed at a temperature above 1150°F and below 1800°F, need not be heat treated.

Cold-Formed WPB fittings, upon which the final forming operation is completed at a temperature below 1150°F, shall be normalized, or shall be stress relieved at 1100°F to 1275°F.

Fitting Summary Data Sheet

Chemical requirements (in %):

Carbon	Manganese	Phosphorus (max)	Sulfur (max)
.30 max	.29-1.06	.050	.058

Silicon	Chromium	Molybdenum	Nickel	Copper
.10 min	.40 max	.15 max	.40 max	.40 max

Vanadium	Columbium
.08 max	.02 max

Mechanical requirements:

Tensile Strength	60,000-85,000 psi
Yield Strength (min)	35,000 psi
Elongation	- Longitudinal: 22%
	- Transverse: 14%

Dimensions

Butt-welding fittings and butt-welding short radius elbows and returns purchased in accordance with this specification shall conform to the dimensions and tolerances given in the latest revision of ANSI B16.9 and B16.28, respectively.

Certification

When requested by the purchaser, the manufacturer shall provide a certificate of compliance to this specification.

If requested to provide test reports, the manufacturer shall also provide the following where applicable:

- * Chemical analysis results. When the amount of an element is less than .02%, the analysis for that element is reported as "<0.02%."
- * Tensile property results, report the yield strength and ultimate strength in ksi [or MPa] and elongation in percent,
- * Hardness acceptable in accordance with Section 10 of ASTM A-234,
- * Seamless or Welded,
- * Type of Heat Treatment, if any,
- * Starting material, specifically pipe, plate, etc.,
- * Statement regarding radiographic or ultrasonic examination.
- * Any supplemental testing required by the purchase order.

Product Marking

All fittings shall have the prescribed information stamped or otherwise suitable marked on each fitting in accordance with ASTM A 234/MSS SP-25. A Weldbend fitting is marked as follows:
Weldbend's Name, Nominal Pipe Size, Pipe Wall Thickness Designation, Material Grade (WPB/WPC) and Heat Identification Number.

Note: All information contained in this document, and for a complete description of all requirements, refer to ASTM A 105. Sheets are subject to change without notice.



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Spec Section 232113, 2.2, B.

Heating Water Piping Above-Grade (2" and Below)

COPPER TUBE FOR PLUMBING AND MECHANICAL APPLICATIONS

Job Name Buckstaff Bathhouse

Contractor Comfort Systems USA (Arkansas), inc.

Job Location Hot Springs, Arkansas

Wholesaler

Engineer IMEG Corp

Streamline[®] Rep

Product Description:

Streamline[®] CopperTube for use in plumbing and mechanical applications. Available sizes (Type **K**, L, M, & DWV) ranging from ¼" to 8" in diameter. All tube shall be manufactured in the United States.

Material:

Streamline[®] CopperTube is manufactured from UNS C12200 grade of copper.

Key Specifications:

Streamline[®] CopperTube (Type **K**, L, M) shall conform to the **NSF/ANSI/CAN 61** Annex G requirements and is manufactured to meet ASTM B88. Copper drainage tube (DWV) is made to meet ASTM B306. Copper refrigeration coils, ACR/Nitrogenized straight lengths and line sets are made to meet the chemical, mechanical, cleanliness and eddy current testing requirements of the applicable specifications of ASTM B280. Coils are manufactured to 060 temper, and straight lengths are manufactured to H58 temper.

Installation:

Installations shall comply with the latest applicable building codes for the local jurisdiction. For detailed installation instructions, consult the Copper Development Association at copper.org.

References:

C12200	99.9% Pure Copper (can be used for potable water)
NSF/ANSI/CAN 61 Annex G	Safe Drinking Water Act (third party certification)
ASTM B88	Seamless Copper Water and Gas Tube (Type K , L, M)
ASTM B280	Seamless Copper Tube for Air Conditioning and Refrigerants
ASTM B306	Seamless Drainage Tube Code (DWV)
NSF/ANSI 372	Safe Drinking Water (Lead Content)

Copper [tube or fitting] UNS C12000 has been evaluated by NSF International to NSF/ANSI/CAN 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.



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COPPER FITTINGS FOR PLUMBING AND MECHANICAL APPLICATIONS

Job Name	Buckstaff Bathhouse	Contractor	Comfort Systems USA (Arkansas), Inc.
Job Location	Hot Springs, Arkansas	Wholesaler	
Engineer	IMEG Corp	Streamline® Rep	

Product Description:

Streamline® Wrot Copper Pressure and DWV fittings for use in plumbing or mechanical applications. Available sizes ranging from 1/4" to 8" in diameter. Product is designed to join ASTM B88 and ASTM B280 Seamless Copper Tube.

Material:

Streamline® Wrot Copper fittings shall be made from material in compliance with UNS C12200 grade of copper.

Key Specifications:

Streamline® Wrot Copper; solder joint, pressure fittings shall conform to the NSF/ANSI 61 Annex G requirements. Wrot copper pressure fittings shall be manufactured to meet ASME B1.6.22 and MSS SP104. Wrot DWV copper fittings shall be made to meet ASME B1.6.29. All threaded fittings conform to ASME B1.20.1.

Installation:

Installations shall comply with the latest applicable building codes for the local jurisdiction. For detailed installation instructions, consult the Copper Development Association at copper.org.

References:

NSF/ANSI 61 Annex G	Safe Drinking Water Act (third party certification)
C12200	99.9% pure copper
ASME B1.6.22	Wrot Copper and Copper Alloy Solder Joint Pressure Fittings
MSS SP104	Wrot Copper Solder and Joint Pressure Fittings
ASME B1.6.29	Drain, Waste and Vent (DWV) Fittings
ASME B1.20.1	Threaded Fittings

Other Applicable Standards:

ASTM B88	Seamless Copper Water and Gas Tube (Types K, L, M)
ASTM B280	Seamless Copper Tube for Air Conditioning and Refrigeration

Copper [tube or fitting] UNS C122000 has been evaluated by NSF International to NSF/ANSI 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.



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Spec Section 232113, 2.3, A.

**Chilled Water Piping Above-Grade (2-1/2"
and Above)**

Standard Steel Pipe

ASTM A53 TYPE E GRADE B PIPE Submittal Data Sheet



Scope

Covers ~~black and hot-dipped galvanized~~ electric-resistance welded Grade B pipe. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. Wheatland ASTM A53 is UL Listed and FM Approved, sizes 1" through 6" nominal, for use in Fire Sprinkler Pipe Applications. Pipe is suitable for welding, threading and grooving. Produced to the latest revision of ASTM A53/53M, Federal Specification WW-P404 and ASME B36.10M.

Manufacture

The weld seam shall be heat treated after welding to a minimum of 1400°F or be otherwise processed in such a manner that no untempered martensite remains.

~~Hot-dipped galvanized~~

~~The average weight of zinc coating shall be not less than 1.8 oz. per sq. ft. of surface (inside and outside). When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit of elasticity, some flaking of the coating may occur.~~

Hydrostatic and Nondestructive Electric testing

Hydrostatic inspection test pressures for plain-end pipe are listed in Table X 2.2 of the A53/A53M specification. Test pressures shall be maintained for a minimum of five seconds. Nondestructive electric testing of the weld seam is required on each length of ERW pipe NPS 2 and larger.

Chemical Requirements

Composition, max. %

<u>Carbon</u> .30	<u>Manganese</u> 1.20	<u>Phosphorus</u> .05	<u>Sulfur</u> .045	
<u>Copper</u> .40	<u>Nickel</u> .40	<u>Chromium</u> .40	<u>Molybdenum</u> .15	<u>Vanadium</u> .08

*The combination of these five elements shall not exceed 1.00%.

Tensile Requirements

TENSILE STRENGTH, MIN.	YIELD STRENGTH, MIN.	ELONGATION IN 2"
60,000 psi	35,000 psi	Refer to A53 table x 4.1

Bending Test (Cold)

NPS	DEGREE OF BEND	DIAMETER OF MANDREL
2 and under	90°	12x pipe OD

Flattening Test

As a test for ductility of the weld for pipe 2½" NPS and larger, position the weld at 0° and alternately at 90° to the direction of force and flatten until the OD is ⅔ of the original outside diameter. No cracks shall occur along the inside or outside surface of the weld.

Frequency of Tests

Tensile tests are required on one length of pipe from each lot of 500 lengths or fraction thereof for each size. Refer to A53 specification for frequency of flattening tests.

End Finish

Plain End: NPS 2 and larger, STD and XS weights: ends beveled to angle of 30°, +5°, -0° with a root face of ⅛" ± ⅙"

Threaded: To ANSI Standard B 1.20.1

Couplings: To ASTM Standard A 865

Weights and Dimensions Charts

STANDARD (SCH. 40) BLACK PLAIN END

NOMINAL SIZE	OD	NOMINAL WALL	WT./FT.
	in.	in.	lbs.
2"	2.375	.154	3.66
2½"	2.875	.203	5.80
3"	3.500	.216	7.58
4"	4.500	.237	10.88
5"	5.563	.258	14.63
6"	6.625	.280	18.99
8"	8.625	.322	28.58

EXTRA STRONG (SCH. 80) BLACK PLAIN END

NOMINAL SIZE	OD	NOMINAL WALL	WT./FT.
	in.	in.	lbs.
2"	2.375	.218	5.03
2½"	2.875	.276	7.67
3"	3.500	.300	10.26
4"	4.500	.337	15.00
5"	5.563	.375	20.80

All information contained herein is accurate as known at the time of publication. Wheatland reserves the right to change product specifications without notice and without incurring obligations.

Permissible Variations in Wall Thickness

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

Permissible Variations in Outside Diameter

Pipe NPS 2 and larger shall not vary more than + 1% from the standard specified.

Permissible Variations in Weight per Foot

Pipe shall not vary more than + 10% from the standard specified.

Product Marking

Each length of pipe is continuously stenciled to show the manufacturer, the grade of pipe (ASTM A53), the kind of pipe E for Electric Resistance Welded, B for Grade B, the size, XS for extra strong, and length. Stencil markings indicate UL Listing and FM Approval for sizes 1" through 6" nominal for use in Fire Sprinkler Pipe Applications. Bar coding is acceptable as a supplementary identification method.

SUBMITTAL INFORMATION

PROJECT:

Buckstaff Bathhouse

ENGINEER:

IMEG Corp

LOCATIONS:

Chilled Water Piping Above Grade (2-1/2" and Above)

CONTRACTOR:

Comfort Systems USA (Arkansas), Inc.

SPECIFICATION REFERENCE:

232113, 2.3, A.

COMMENTS:

DATE:

9/8/2025

SYSTEM TYPE:

Chilled Water



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WST-050625



Even with all the advances in technology today, the wholly welded piping system has for decades remained the best choice for use in high pressure and high temperature application. Many piping jobs in schools, industrial plants, refineries and factories have benefited from the inherent advantages of a completely welded system. It becomes a closed container joining pipes, valves, fittings, and flanges. A welded joint actually becomes part of the pipe, minimizing leak potential. This provides greater margins of safety, especially under conditions of high internal pressures. Additionally, welding fittings form a continuous metal structure with the pipe, adding forged-in strength to any piping system. Furthermore, smooth forged fittings simplify insulation and take up less space.

ASTM A 234

Scope

This standard covers wrought carbon steel fittings of seamless and welded construction which are manufactured to the dimensional specifications of ASME B16.9 and B16.28. These fittings are primarily for use in pressure piping and in pressure vessel fabrication for service at moderate and elevated temperatures.

Materials

The starting material for fittings shall consist of killed steel, forgings, bars, plates, seamless or fusion-welded tubular products with filler metal added and shall conform to the chemical requirements of ASTM A 234. Unless otherwise specified, carbon steel plates may be either coarse grain or fine grain practice.

Manufacture

Forging or shaping operations are performed by hammering, pressing, piercing, extruding, upsetting, rolling, bending, machining, or by a combination of two or more of these operations. The forming process shall be applied so that it will not produce injurious imperfections in the fittings.

Heat Treatment

Hot-formed WPB fittings, upon which the final forming operation is completed at a temperature above 1150°F and below 1800°F, need not be heat treated.

Cold-Formed WPB fittings, upon which the final forming operation is completed at a temperature below 1150°F, shall be normalized, or shall be stress relieved at 1100°F to 1275°F.

Fitting Summary Data Sheet

Chemical requirements (in %):

Carbon	Manganese	Phosphorus (max)	Sulfur (max)
.30 max	.29-1.06	.050	.058

Silicon	Chromium	Molybdenum	Nickel	Copper
.10 min	.40 max	.15 max	.40 max	.40 max

Vanadium	Columbium
.08 max	.02 max

Mechanical requirements:

Tensile Strength	60,000-85,000 psi
Yield Strength (min)	35,000 psi
Elongation	- Longitudinal: 22%
	- Transverse: 14%

Dimensions

Butt-welding fittings and butt-welding short radius elbows and returns purchased in accordance with this specification shall conform to the dimensions and tolerances given in the latest revision of ANSI B16.9 and B16.28, respectively.

Certification

When requested by the purchaser, the manufacturer shall provide a certificate of compliance to this specification.

If requested to provide test reports, the manufacturer shall also provide the following where applicable:

- * Chemical analysis results. When the amount of an element is less than .02%, the analysis for that element is reported as "<0.02%."
- * Tensile property results, report the yield strength and ultimate strength in ksi [or MPa] and elongation in percent,
- * Hardness acceptable in accordance with Section 10 of ASTM A-234,
- * Seamless or Welded,
- * Type of Heat Treatment, if any,
- * Starting material, specifically pipe, plate, etc.,
- * Statement regarding radiographic or ultrasonic examination.
- * Any supplemental testing required by the purchase order.

Product Marking

All fittings shall have the prescribed information stamped or otherwise suitable marked on each fitting in accordance with ASTM A 234/MSS SP-25. A Weldbend fitting is marked as follows:
Weldbend's Name, Nominal Pipe Size, Pipe Wall Thickness Designation, Material Grade (WPB/WPC) and Heat Identification Number.

Note: All information contained in this document, and for a complete description of all requirements, refer to ASTM A 105. Sheets are subject to change without notice.



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Spec Section 232113, 2.3, B.

Chilled Water Piping Above-Grade (2" and Below)

COPPER TUBE FOR PLUMBING AND MECHANICAL APPLICATIONS

Job Name	Buckstaff Bathhouse	Contractor	Comfort Systems USA (Arkansas), Inc.
Job Location	Hot Springs, Arkansas	Wholesaler	
Engineer	IMEG Corp	Streamline® Rep	

Product Description:

Streamline® CopperTube for use in plumbing and mechanical applications. Available sizes (Type **K**, L, M, & DWV) ranging from ¼" to 8" in diameter. All tube shall be manufactured in the United States.

Material:

Streamline® CopperTube is manufactured from UNS C12200 grade of copper.

Key Specifications:

Streamline® CopperTube (Type **K**, L, M) shall conform to the **NSF/ANSI/CAN 61** Annex G requirements and is manufactured to meet ASTM B88. Copper drainage tube (DWV) is made to meet ASTM B306. Copper refrigeration coils, ACR/Nitrogenized straight lengths and line sets are made to meet the chemical, mechanical, cleanliness and eddy current testing requirements of the applicable specifications of ASTM B280. Coils are manufactured to 060 temper, and straight lengths are manufactured to H58 temper.

Installation:

Installations shall comply with the latest applicable building codes for the local jurisdiction. For detailed installation instructions, consult the Copper Development Association at copper.org.

References:

C12200	99.9% Pure Copper (can be used for potable water)
NSF/ANSI/CAN 61 Annex G	Safe Drinking Water Act (third party certification)
ASTM B88	Seamless Copper Water and Gas Tube (Type K , L, M)
ASTM B280	Seamless Copper Tube for Air Conditioning and Refrigerants
ASTM B306	Seamless Drainage Tube Code (DWV)
NSF/ANSI 372	Safe Drinking Water (Lead Content)

Copper [tube or fitting] UNS C12000 has been evaluated by NSF International to NSF/ANSI/CAN 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.



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COPPER FITTINGS FOR PLUMBING AND MECHANICAL APPLICATIONS

Job Name	Buckstaff Bathhouse	Contractor	Comfort Systems USA (Arkansas), Inc.
Job Location	Hot Springs, Arkansas	Wholesaler	
Engineer	IMEG Corp	Streamline[®] Rep	

Product Description:

Streamline[®] Wrot Copper Pressure and DWV fittings for use in plumbing or mechanical applications. Available sizes ranging from 1/4" to 8" in diameter. Product is designed to join ASTM B88 and ASTM B280 Seamless Copper Tube.

Material:

Streamline[®] Wrot Copper fittings shall be made from material in compliance with UNS C12200 grade of copper.

Key Specifications:

Streamline[®] Wrot Copper; solder joint, pressure fittings shall conform to the NSF/ANSI 61 Annex G requirements. Wrot copper pressure fittings shall be manufactured to meet ASME B1.6.22 and MSS SP104. Wrot DWV copper fittings shall be made to meet ASME B1.6.29. All threaded fittings conform to ASME B1.20.1.

Installation:

Installations shall comply with the latest applicable building codes for the local jurisdiction. For detailed installation instructions, consult the Copper Development Association at copper.org.

References:

NSF/ANSI 61 Annex G	Safe Drinking Water Act (third party certification)
C12200	99.9% pure copper
ASME B1.6.22	Wrot Copper and Copper Alloy Solder Joint Pressure Fittings
MSS SP104	Wrot Copper Solder and Joint Pressure Fittings
ASME B1.6.29	Drain, Waste and Vent (DWV) Fittings
ASME B1.20.1	Threaded Fittings

Other Applicable Standards:

ASTM B88	Seamless Copper Water and Gas Tube (Types K, L, M)
ASTM B280	Seamless Copper Tube for Air Conditioning and Refrigeration

Copper [tube or fitting] UNS C122000 has been evaluated by NSF International to NSF/ANSI 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.



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Spec Section 232113, 2.4, A.

Equipment Drains and Overflows

COPPER TUBE FOR PLUMBING AND MECHANICAL APPLICATIONS

Job Name Buckstaff Bathhouse

Contractor Comfort Systems USA (Arkansas), Inc.

Job Location Hot Springs, Arkansas

Wholesaler

Engineer IMEG Corp

Streamline® Rep

Product Description:

Streamline® CopperTube for use in plumbing and mechanical applications. Available sizes (Type K, L, M, & DWV) ranging from ¼" to 8" in diameter. All tube shall be manufactured in the United States.

Material:

Streamline® CopperTube is manufactured from UNS C12200 grade of copper.

Key Specifications:

Streamline® CopperTube (Type K, L, M) shall conform to the NSF/ANSI/CAN 61 Annex G requirements and is manufactured to meet ASTM B88. Copper drainage tube (DWV) is made to meet ASTM B306. Copper refrigeration coils, ACR/Nitrogenized straight lengths and line sets are made to meet the chemical, mechanical, cleanliness and eddy current testing requirements of the applicable specifications of ASTM B280. Coils are manufactured to 060 temper, and straight lengths are manufactured to H58 temper.

Installation:

Installations shall comply with the latest applicable building codes for the local jurisdiction. For detailed installation instructions, consult the Copper Development Association at copper.org.

References:

C12200	99.9% Pure Copper (can be used for potable water)
NSF/ANSI/CAN 61 Annex G	Safe Drinking Water Act (third party certification)
ASTM B88	Seamless Copper Water and Gas Tube (Type K, L, M)
ASTM B280	Seamless Copper Tube for Air Conditioning and Refrigerants
ASTM B306	Seamless Drainage Tube Code (DWV)
NSF/ANSI 372	Safe Drinking Water (Lead Content)

Copper [tube or fitting] UNS C12000 has been evaluated by NSF International to NSF/ANSI/CAN 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.



MADE IN USA

A BRAND OF MUELLER INDUSTRIES 

COPPER FITTINGS FOR PLUMBING AND MECHANICAL APPLICATIONS

Job Name Buckstaff Bathhouse

Contractor Comfort Systems USA (Arkansas), Inc.

Job Location Hot Springs, Arkansas

Wholesaler

Engineer IMEG Corp

Streamline® Rep

Product Description:

Streamline® Wrot Copper Pressure and DWV fittings for use in plumbing or mechanical applications. Available sizes ranging from 1/4" to 8" in diameter. Product is designed to join ASTM B88 and ASTM B280 Seamless Copper Tube.

Material:

Streamline® Wrot Copper fittings shall be made from material in compliance with UNS C12200 grade of copper.

Key Specifications:

Streamline® Wrot Copper; solder joint, pressure fittings shall conform to the NSF/ANSI 61 Annex G requirements. Wrot copper pressure fittings shall be manufactured to meet ASME B1.6.22 and MSS SP104. Wrot DWV copper fittings shall be made to meet ASME B1.6.29. All threaded fittings conform to ASME B1.20.1.

Installation:

Installations shall comply with the latest applicable building codes for the local jurisdiction. For detailed installation instructions, consult the Copper Development Association at copper.org.

References:

NSF/ANSI 61 Annex G	Safe Drinking Water Act (third party certification)
C12200	99.9% pure copper
ASME B1.6.22	Wrot Copper and Copper Alloy Solder Joint Pressure Fittings
MSS SP104	Wrot Copper Solder and Joint Pressure Fittings
ASME B1.6.29	Drain, Waste and Vent (DWV) Fittings
ASME B1.20.1	Threaded Fittings

Other Applicable Standards:

ASTM B88	Seamless Copper Water and Gas Tube (Types K, L, M)
ASTM B280	Seamless Copper Tube for Air Conditioning and Refrigeration

Copper [tube or fitting] UNS C122000 has been evaluated by NSF International to NSF/ANSI 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.



Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.

P.O. Box 16620

LittleRock, AR 72231

Phone 501-834-3320

Fax 501-834-5416

Spec Section 232113, 2.5

Pipe Hangers and Supports

Adjustable Clevis Hanger Fig. 260 (Formerly Afcon Fig. 371)

Size Range: ½" through 30"

Material: Carbon Steel

Finish: ☐ Plain, ☐ 8" & Smaller: Zinc Plated (Hot-Dip Galvanized optional),
☐ 10" & Larger: Hot-Dip Galvanized with Zinc Plated Bolts & Nuts, or
☐ Primed, also available in ☐ Plastic or ☐ Epoxy Coated.

Service: Recommended for the suspension of stationary pipe lines.

Maximum Temperature: Plain 650° F, Galvanized and Epoxy 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 1), WW-H-171-E (Type 1), ANSI/MSS SP-69 and MSS SP-58 (Type 1). FM Approved (Sizes ¾" through 8"), UL and ULC Listed (Sizes ½" through 8").

Installation: Hanger load nut above clevis must be tightened securely to assure proper hanger performance.

Adjustment: Vertical adjustment without removing pipe may be made from ¾" through 5/8", varying with the size of clevis. Tighten upper nut after adjustment.

Features:

- Design has yoke on outside of lower U-strap so yoke cannot slide toward center of bolt, thus bending of bolt is minimized.
- Sizes 5" and up have rod and two nuts instead of bolt and nut; thread length on clevis rod is such that the thread locks the nuts in place, and threads are not in shear plane.

Ordering:

Specify pipe size, figure number, name and finish.

Notes:

- Punched forming holes may be present on certain sizes of this clevis hanger. These holes are solely for the purpose of manufacturing, and do not effect the structural integrity or load carrying capacities of these hangers.
- For insulated line options without shields, see Figures 260 ISS and Figure 300. For insulated line options with shields, see Figures 167 and 168. For ductile iron pipe sizes, see Figure 590.
- Fig. 260F (Felt lined) – available for use for suspension of copper (or other material) so as to prevent electrolysis between the dissimilar metals of the hanger and the pipe, tube or conduit.

Caution:

When an oversize clevis is used, a pipe spacer or multispace should be placed over clevis bolt to ensure that the lower U-strap will not move in on the bolt.



PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

Adjustable Clevis Hanger (Cont.)

Fig. 260 (Formerly Afcon Fig. 371)

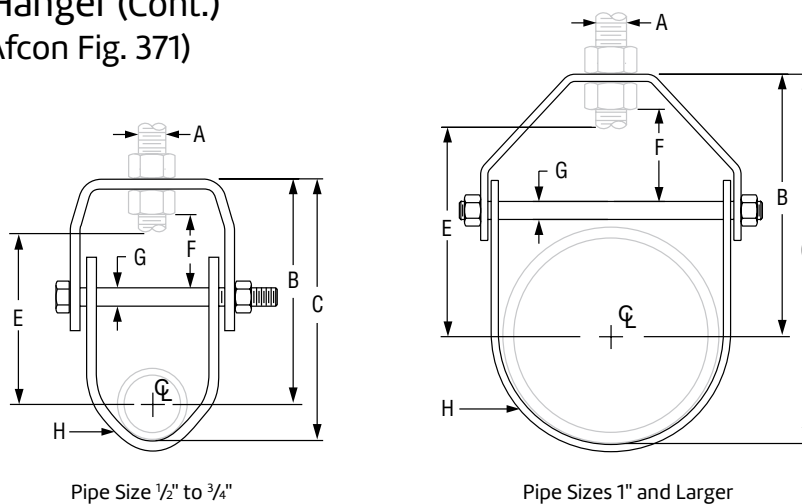


Fig. 260: Dimensions (in) • Loads (lbs) • Weight (lbs)

Pipe Size	Max Load	Span Ft.	Weight	Rod Size A	B	C	Rod Take Out E	Adjust. F	G	H Width Lower
1/2	610	7*	0.34	3/8	2 ³ / ₁₆	2 ¹¹ / ₁₆	1 ¹ / ₂	5/8	1/4	1
3/4			0.34		2		1 ⁵ / ₁₆			
1			0.35		2 ⁵ / ₁₆		1 ⁵ / ₈			
1 1/4	730	9*	0.40	1/2	2 ³ / ₈	3 ¹³ / ₁₆	1 ¹¹ / ₁₆	7/8	3/8	1 1/4
1 1/2			0.45		2 ¹³ / ₁₆		2 ¹ / ₈			
2			0.50		3 ⁵ / ₁₆		2 ⁵ / ₈			
2 1/2	1,350	11*	0.65	5/8	4 ¹ / ₁₆	7 ¹ / ₁₆	3 ³ / ₁₆	1 ⁵ / ₁₆	1/2	1 7/16
3		12*	0.85		4 ³ / ₄		4 ¹ / ₁₆			
3 1/2		13*	1.10		5 ¹ / ₁₆		4 ³ / ₁₆			
4	1,430	14*	1.51	3/4	5 ⁹ / ₁₆	8 ¹⁵ / ₁₆	4 ¹ / ₂	1 ¹¹ / ₁₆	5/8	1 3/16
5		16*	1.70		6 ⁹ / ₁₆		5 ¹ / ₂			
6		17*	3.10		6 ¹⁵ / ₁₆		5 ³ / ₄			
8	2,000	19*	4.75	7/8	8 ³ / ₈	12 ¹¹ / ₁₆	7 ³ / ₁₆	2	3/4	2 1/2
10	3,600	22*	8.60		9 ⁷ / ₈		8 ⁷ / ₁₆			
12	3,800	23*	11.20		11 ⁹ / ₁₆		10 ¹ / ₈			
14	4,200	25*	12.50	1	12 ⁹ / ₁₆	19 ⁹ / ₁₆	10 ¹¹ / ₁₆	2 ³ / ₄	1	3
16	4,600	27	19.85		14		12			
18	4,800	28	22.25		15 ¹⁵ / ₁₆		13 ¹⁵ / ₁₆			
20	4,800	30	40.33	1 1/4	17 ⁹ / ₁₆	27 ⁹ / ₁₆	15 ³ / ₁₆	3 ⁷ / ₈	1 1/4	3
24**	4,800	32	49.83		19 ¹³ / ₁₆		17 ⁵ / ₁₆			
30***	6,000	33	70.18		24 ³ / ₁₆		21 ⁹ / ₁₆			

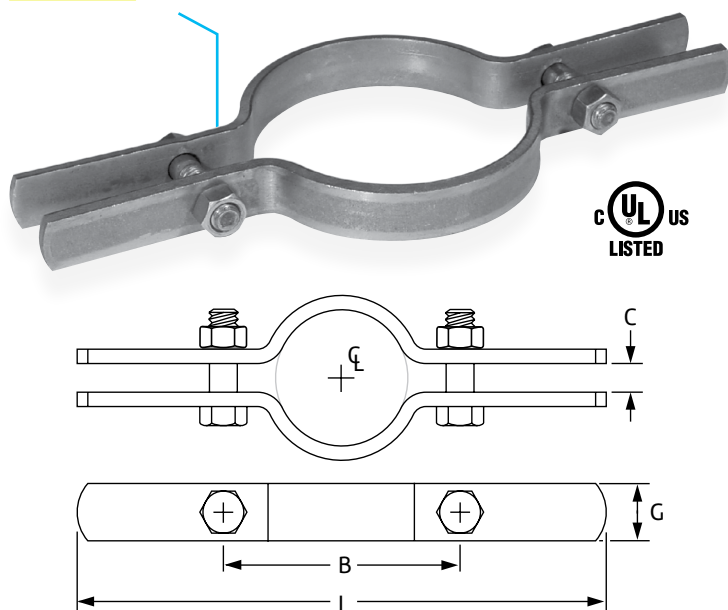
"Span" represents the maximum recommended distance between hangers on a continuous and straight run of horizontal standard weight steel pipe filled with water. In all cases, verify that chosen location of hangers does not subject hangers to a load greater than the maximum recommended load shown above.

*Indicates that span represents the maximum span for water filled pipe.

**The 24" pipe size assembly includes a 1 1/4" SCH 40 pipe spacer over the 7/8" threaded rod.

***The 30" pipe size assembly includes a 1 1/4" SCH 40 pipe spacer over the 1 1/4" threaded rod. When assembled, the U-strap sits outside of the yoke.

Extension Pipe or Riser Clamp Fig. 261 (Formerly Afcon Fig. 400)



Size Range: ¾" through 24"

Material: Carbon steel

Finish: ☐ Plain, ☐ Hot-Dip Galvanized with Zinc Plated
Bolts & Nuts, ☐ Epoxy Coated or ☐ Painted.

Service: For support of stationary steel pipe risers, cast iron pipe or conduit. This product is not intended for use with hanger rods. For this application refer to Fig. 40 Riser Clamp.

Maximum Temperature: Plain 650° F, Galvanized and Epoxy 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 8) WW-H-171-E (Type 8), ANSI/MSS SP-69 and MSS SP-58 (Type 8). UL, ULC Listed (Sizes 1½" – 8").

Installation: Clamp is fitted and bolted preferably below a coupling, hub or welded lugs on steel pipe. Bolt torques should be per industry standards (see page 248). Clamp is designed for standard steel pipe O.D. and this must be considered in sizing the riser for other types of piping.

Ordering: Specify pipe size, figure number, name and finish.

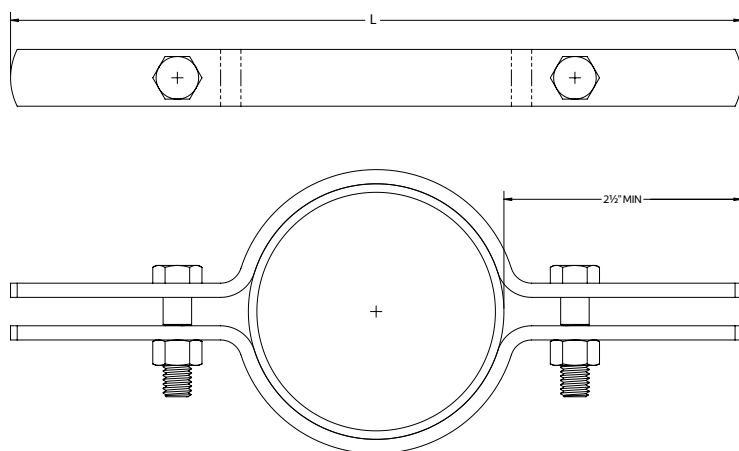
Note: Refer to Technical Data Section of the Pipe Hanger Catalog for cast iron soil pipe data.

Fig. 261: Dimensions (in) • Loads (lbs) • Torque (ft-lbs) • Weight (lbs)

Pipe Size	Max Load	Weight	L	G Width	B	C	Bolt Diameter	Torque Values
½ & ¾	220	1.1	8⅞	1	2⅞	⅜	⅜	21
1		1.1	3⅞					
1¼		1.6	3½					
1½	250	1.6	10¼		3⅞	½	⅞	32
2		1.7	4¼					
2½		1.9	4¾					
3	500	1.9	11⅜		5½	½	½	46
3½	600	2.3	12⅞		6½			
4	750	2.4	13¾		7			
5	1,500	3.6	14¾	1½	8	⅝	⅝	100
6	1,600	4.0	18½		9			
8	2,500	7.6	20¼		12			
10		11.1	22¾	13¾	¾	¾	150	
12		16.5	24	15¾				
14	17.7	26	17¼					
16	2,900	30.4	28	2½	19¾	¾	¾	150
18		33.8	30		21¾			
20		35.0	30		23¾			
24	3,200	82.0	36¾	3	30	1	⅞	190

PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
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Notes 1:	
Notes 2:	

Light Duty Copper Tubing Riser Clamp Fig. 008CTG



Size Range: ½" through 6" CTS

Material: Carbon Steel

Finish: Epoxy coated

Service: Recommended for the suspension of stationary copper tube.

Maximum Temperature: 450° F

Approvals: MSS SP-58 (Type-8)

Installation: Clamp is to be fitted and bolted below a coupling or hub. Bolt torques should be per industry standards. Clamp is designed for standard copper tube O.D. and this must be considered in sizing the riser for other types of piping.

Ordering: Nominal pipe size and figure number.

Notes:

- For U.S. domestic product see Figure CT-121 copper tubing riser clamp.

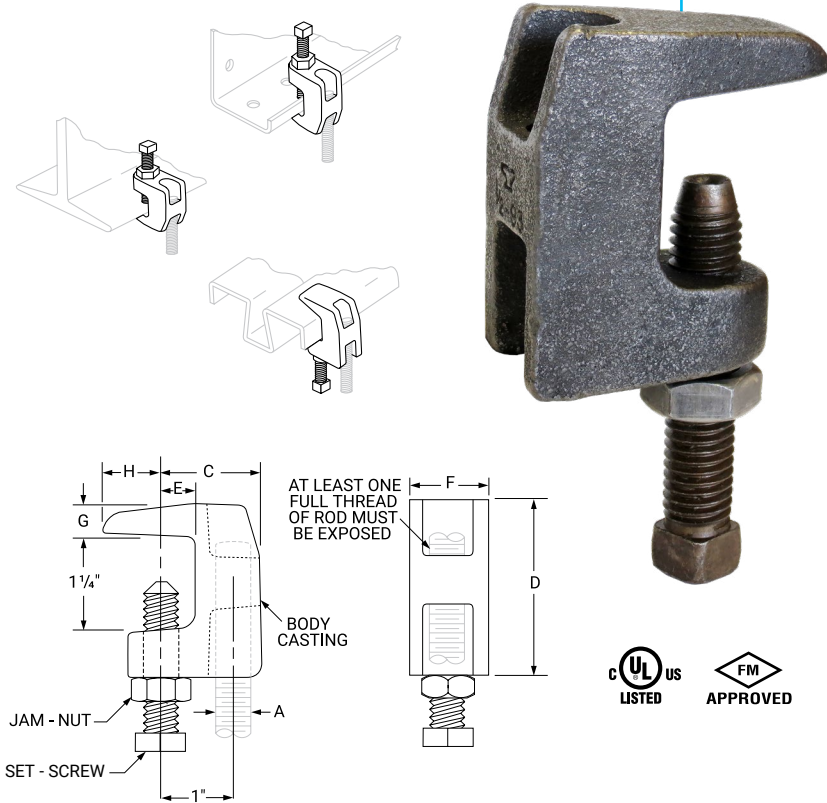
Fig. 008CTG: Dimensions (in) Loads (lbs)

Pipe Size	Max Load	Length
½	150	8½
¾	150	9¼
1	150	9⅝
1¼	150	9½
1½	150	9⅝
2	150	10⅞
2½	150	11⅜
3	200	11⅝
4	250	12½
6	480	15⅜



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Notes 2:	

Universal C-type Clamp (Wide Throat) Fig. 93 (Formerly Afcon Fig. 105)



Dimensions (In) - Load (Lbs) - Torque (In-Lbs) - Weight (Lbs)

Rod Size A	Set Screw Size B	Torque Value	Max Loads ■		Weight	C	D	E	F	G	H
			Top	Bottom							
3/8	3/8	60	500	250	0.41	1 5/16	2 5/32	9/16	13/16	3/8	5/8
1/2	1/2	125	950	760	0.75	1 3/8	2 11/32	1/2	1 1/16	7/16	13/16

Note:

- Maximum temperature of 450° F

Material Specifications

Size Range

3/8" and 1/2"

Material

Ductile iron, hardened steel cup point set screw and locknut.

Finish

- ☐ Plain
- ☐ Zinc Plated (Hot-Dip Galvanized optional)

Service

Recommended for use under roof installations with bar joist type construction, or for attachment to the top or bottom flange of structural shapes where the vertical hanger rod is required to be offset from the edge of the flange and where the thickness of joist or flange does not exceed 1 1/4".

Approvals

Complies with Federal Specification A-A-1192A (Type 19 & 23), WW-H-171-E (Type 23), ANSI/MSS SP-69 and MSS SP-58 (Type 19 & 23). UL, ULC Listed and FM Approved.

How to size

Size of clamp is determined by size of rod to be used.

Installation

Follow recommended set screw torque values per MSS-SP-69.

Features

- They may be attached to horizontal flanges of structural members in either the top beam or bottom beam positions.
- Secured in place by a cup-pointed Set Screw tightened against the flange. A Jam Nut is provided for tightening the Set Screw against the Body Casting.
- Thru tapping of the body casting permits extended adjustment of the threaded rod.
- Wider throat for attaching to flange with up to 1 1/4" thickness.

Ordering

Specify rod size, figure number, name of clamp and finish.

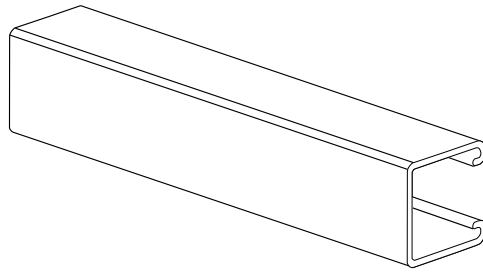
Available with oversized tapped rod hole for Hot Dip Galvanized finish.



PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

Pipe Hangers & Supports

Channel Fig. AS 200

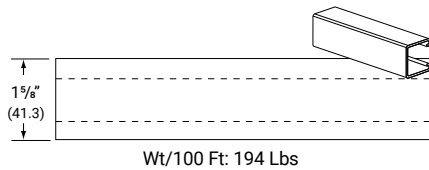


Description

Anvil-Strut channels are manufactured by a series of forming dies, or rolls, which progressively cold work the strip steel into the desired channel configuration. This method produces a cross section of uniform dimensions within a tolerance of plus or minus 0.015", on outside dimensions.

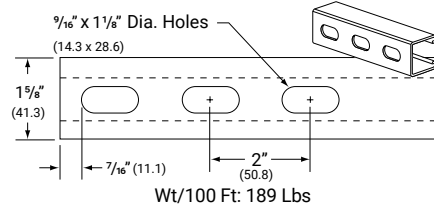
Solid ☐ AS 200

☐ PL, ☐ GR, ☐ PG, ☐ SS, ☐ ZTC, ☒ HG



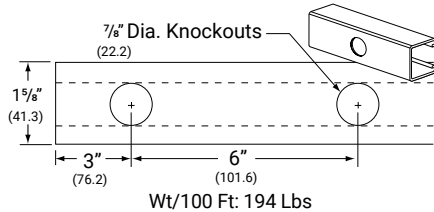
With Elongated Holes ☒ AS 200EH

☐ PL, ☒ GR, ☐ PG, ☐ SS, ☐ ZTC, ☐ HG



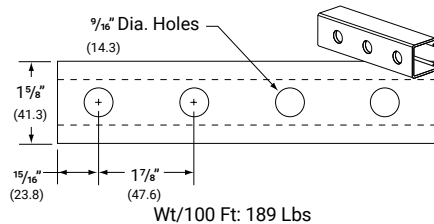
With Knock Out ☐ AS 200KO

☐ PL, ☐ GR, ☐ PG, ☐ Other



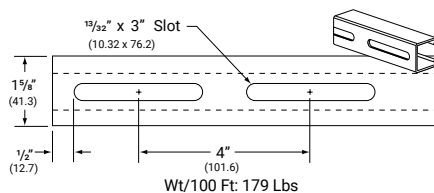
With Holes ☐ AS 200H

☐ PL, ☐ GR, ☐ PG, ☐ Other



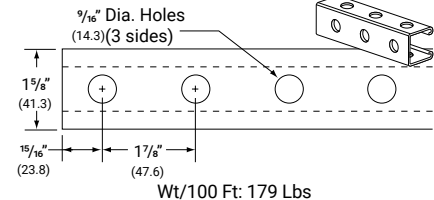
With Long Slots ☐ AS 200S

☐ PL, ☐ GR, ☐ PG, ☐ Other



With Holes on 3 Sides ☐ AS 200H3

☐ PL, ☐ GR, ☐ PG, ☐ Other



Specifications

Size:

1 5/8" X 1 5/8" (41.3 x 41.3mm)

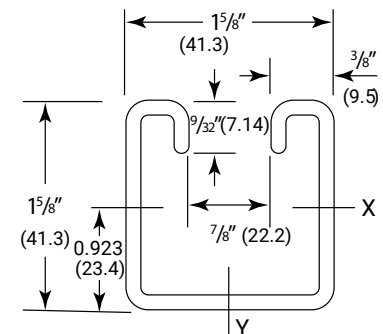
12 Gauge Channel • wt./100 ft. - 194 lbs.

Materials:

Carbon Steel
Stainless Steel
Aluminum

Finishes

Pre-Galvanized
Hot Dip Galvanized - Post Fabrication
Supr-Green Powder Coated
Zinc Trivalent Chromium
PVC



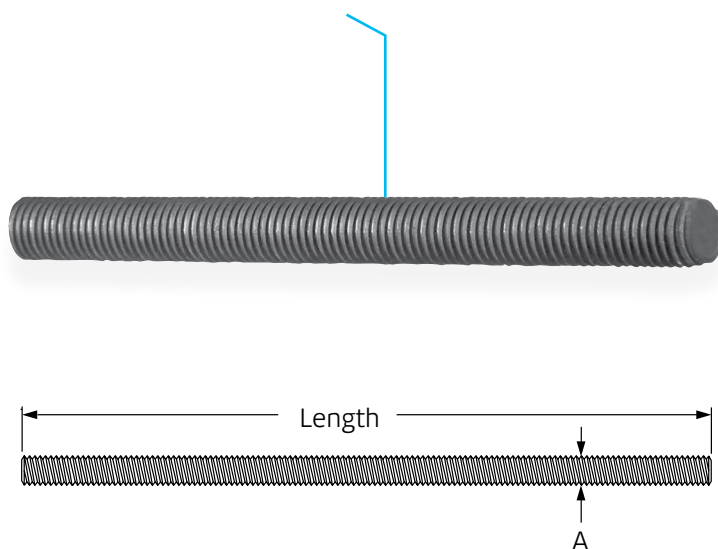
LEGEND:

GR: Powder Coated Supr-Green
EG: Electro-Galvanized
PG: Pre-Galvanized
AL: Aluminum
HG: Hot Dipped Galvanized
PL: Plain
SS: Stainless Steel
ZTC: Zinc Trivalent Chromium Stainless Steel (**SS**), Zinc Trivalent Chromium (**ZTC**) and Hot Dipped Galvanized (**HG**) are specialty finishes. Pricing is located in the Specialty Strut Section of the Anvil-Strut price book.



PROJECT INFORMATION	APPROVAL STAMP
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Address:	☐ Approved as noted
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Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

Continuous Threaded Rod Fig. 146 (Formerly Afcon Fig. 650)



Size Range: ¼" through 1½" stocked in six, ten, and twelve foot lengths. Other even foot lengths can be furnished to order.

Material: Carbon steel or Stainless Steel Gr 304

Threads: National Coarse (UNF), rod threaded complete length.

Finish: ☐ Plain or ☐ Zinc Plated (Hot-Dip Galvanized optional)

Maximum Temperature:
Zinc Plated 450°F, Stainless Steel 650°F

Approvals: Complies with MSS SP-58.

Ordering: Specify rod diameter and length, figure number, name and finish.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.

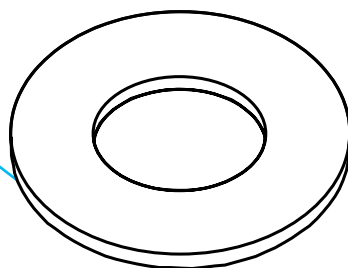


Fig. 146: Dimensions (in) • Loads (lbs) • Weight (lbs)

Rod Size A	Threads per Inch	Max Load	Weight per Ft.
		650° F	
¼	20	240	0.12
⅜	16	730	0.30
½	13	1,350	0.53
⅝	11	2,160	0.84
¾	10	3,230	1.20
⅞	9	4,480	1.70
1	8	5,900	2.30
1¼	7	9,500	3.60
1½	6	13,800	5.10

PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

Flat Washer Figs. AS 209, AS 3500, AS 211, AS 83, AS 209, AS 6108, AS 230

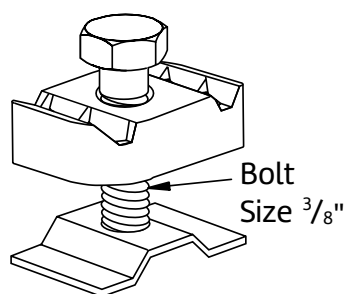


Description

Anvil-Strut Hardware, when used in conjunction with Anvil-Strut Channel and Nuts, provides a superior grip between channels and fittings.

Seismic Rod Stiffener

☐ AS 3500 ☐ EG, ☐ ZTC

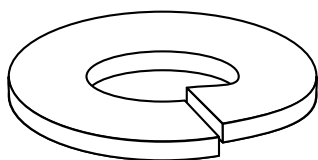


Size	Wt./100 Pcs.
$\frac{3}{8}$ " - $\frac{5}{8}$ "	16

Std Pkg: 25 - Wt/100 pcs: See chart above.

Lock Washer

☐ AS 211 ☐ EG



Size	Wt./100 Pcs.
$\frac{1}{4}$ "	0.3
$\frac{3}{8}$ "	0.7
$\frac{1}{2}$ "	1.5

Std Pkg: 100 - Wt/100 pcs: See chart above.

LEGEND:

GR: Powder Coated Supr-Green **EG:** Electro-Galvanized **PG:** Pre-Galvanized **AL:** Aluminum

HG: Hot Dipped Galvanized **PL:** Plain **SS:** Stainless Steel

ZTC: Zinc Trivalent Chromium Stainless Steel (**SS**), Zinc Trivalent Chromium (**ZTC**) and Hot Dipped Galvanized (**HG**) are specialty finishes. Pricing is located in the Specialty Strut Section of the Anvil-Strut price book.



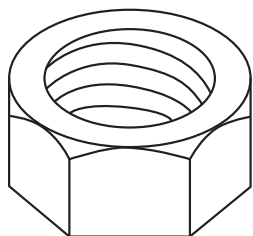
PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

Flat Washer

Figs. AS 209, AS 3500, AS 211, AS 83, AS 209, AS 6108, AS 230

Hexagon Nut

☐ AS 83 ☒ EG

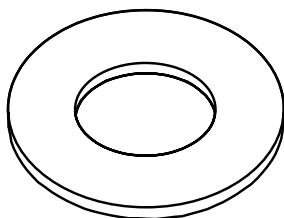


Size	Std. Pkg.	Wt./100 Pcs.
1/4"	500	0.6
3/8"	500	1.6
1/2"	100	4.8
5/8"	50	7.0
3/4"	50	12.0

Std Pkg & Wt/100 pcs: See chart above.

Flat Washer

☐ AS 209 ☐ EG

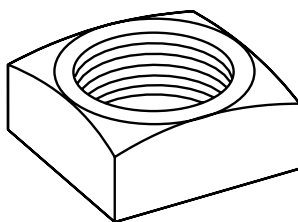


Size	Std. Pkg.	Wt./100 Pcs.
1/4"	200	0.7
3/8"	100	1.5
1/2"	100	3.5
5/8"	100	8.0
3/4"	100	11.0

Std Pkg & Wt/100 pcs: See chart above.

Square Nut

☐ AS 6108 ☐ EG

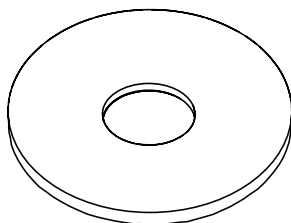


Size	Std. Pkg.	Wt./100 Pcs.
1/4"	100	0.9
5/16"	100	1.6
3/8"	100	2.7
1/2"	100	5.8

Std Pkg & Wt/100 pcs: See chart above.

Square Nut

☐ AS 230 ☐ EG



Size	Std. Pkg.	Wt./100 Pcs.
1/4"	100	3.3
3/8"	100	3.0
1/2"	100	2.8

Std Pkg & Wt/100 pcs: See chart above.

LEGEND:

GR: Powder Coated Supr-Green **EG:** Electro-Galvanized **PG:** Pre-Galvanized **AL:** Aluminum

HG: Hot Dipped Galvanized **PL:** Plain **SS:** Stainless Steel

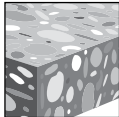
ZTC: Zinc Trivalent Chromium Stainless Steel (**SS**), Zinc Trivalent Chromium (**ZTC**) and Hot Dipped Galvanized (**HG**) are specialty finishes. Pricing is located in the Specialty Strut Section of the Anvil-Strut price book.

3.3.12 HDI+, HDI-L+, AND HDI DROP IN ANCHORS

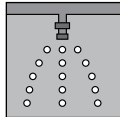
PRODUCT DESCRIPTION

HDI+, HDI-L+, and HDI Drop-in anchors

Anchor System		Features and Benefits
	HDI-L+ and HDI+ with Auto setting tools 1/4" to 1/2"	- Anchor, setting tool and Hilti drill bit form a matched tolerance system to provide reliable fastenings - Allows shallow embedment without sacrificing performance - Lip allows accurate flush surface setting, independent of hole depth for the HDI-L+ - Ideal for repetitive fastenings with threaded rods of equal length
		- HDI+ and HDI-L+ have an innovative stepped plug that reduces number of hammer blows by up to 50% - HDI+ and HDI-L+ can be installed with the new HDI+ Setting Tool system (stop drill bit and machine setting tool) for improved productivity



Uncracked concrete



Fire sprinkler listings

Approvals/Listings	
FM (Factory Mutual)	Pipe hanger components for automatic sprinkler systems HDI+ 3/8, HDI-L+ 3/8, HDI+1/2, HDI-L+ 1/2, HDI 5/8 and HDI 3/4
UL and cUL (Underwriters Laboratory)	Pipe hanger equipment for fire protection services HDI+ 3/8, HDI-L+ 3/8, HDI+1/2, HDI-L+ 1/2, HDI 5/8 and HDI 3/4



INSTALLATION PARAMETERS

Table 1 - Hilti HDI+, HDI-L+ and HDI specifications¹

Setting Information	Symbol	Units	HDI+ and HDI-L+			HDI	
			1/4	3/8	1/2	5/8	3/4
Insert thread	d	UNC	1/4-20	3/8-16	1/2-13	5/8-11	3/4-10
Nominal bit diameter	d _{bit}	in.	3/8	1/2	5/8	27/32	1
Nominal embedment	h _{nom}	in.	1	1-9/16	2	2-9/16	3-3/16
Anchor length	ℓ	(mm)	(25)	(40)	(51)	(65)	(81)
Hole depth	h _o						
Useable thread length	ℓ _{th}	in.	7/16	5/8	11/16	7/8	1-3/8
		(mm)	(11)	(15)	(17)	(22)	(34)
Installation torque	T _{inst}	ft-lb	4	11	22	37	80
		(Nm)	(5)	(15)	(30)	(50)	(109)
Minimum slab thickness	h	in.	3	3-1/8	4	5-1/8	6-3/8
		(mm)	(76)	(79)	(102)	(130)	(162)

¹ HDI+ and HDI-L+ are available in 1/4-, 3/8- and 1/2-in. The HDI is available in 5/8- and 3/4-in.

MATERIAL SPECIFICATIONS

HDI+, HDI-L and HDI anchors are manufactured from mild carbon steel. Anchor bodies are zinc plated in accordance with ASTM B633, AC 1, Type III

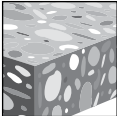
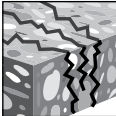
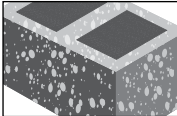
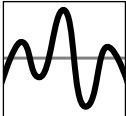
HDI stainless steel anchors are manufactured from AISI Type 303 stainless steel

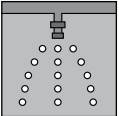
3.3.5 KWIK BOLT TZ EXPANSION ANCHOR

PRODUCT DESCRIPTION

KWIK Bolt TZ carbon steel and stainless steel anchors

Anchor System		Features and Benefits
 Carbon Steel KB-TZ	 Stainless Steel KB-TZ	- Used with Hilti Dust Removal System (DRS) for dustless drilling and installation (compliant with Table 1 of OSHA 1926.1153 regulations for silica dust exposure). - Accurate SafeSet™ installation when using the Hilti SIW-6AT-A22 impact wrench and the SI-AT-A22 Adaptive Torque Module - Product and length identification marks facilitate quality control after installation. - Through fixture installation and variable thread lengths improve productivity and accommodate various base plate thicknesses. - Type 316 stainless steel wedges provide superior performance in cracked concrete.
	 Hilti SIW-6AT-A22 impact wrench and the SI-AT-A22 Adaptive Torque Module	

Uncracked concrete
 Cracked concrete
 Grout-filled concrete masonry
 Seismic Design Categories A-F
 Hollow Drill Bit with Adaptive Torque Tool (AT)
 Profis Anchor design software
 Fire sprinkler listings

Approvals/Listings	
ICC-ES (International Code Council) - 2018 International Building Code / International Residential Code (IBC/IRC) - 2015 National Building Code of Canada (NBC-C)	ESR-1917 in concrete per ACI 318-14 Ch. 17 / ACI 355.2/ ICC-ES AC193 ESR-3785 in grout-filled CMU per ICC-ES AC01 ELC-1917 in concrete per CSA A23.3-14 / ACI 355.2
City of Los Angeles	2017 LABC Supplement (within ESR-1917) RR 26057 grout-filled CMU
Florida Building Code	2010 FBC with HVHZ
FM (Factory Mutual)	Pipe hanger components for automatic sprinkler systems 3/8 through 3/4
UL and cUL (Underwriters Laboratory)	Pipe hanger equipment for fire protection services for 3/8 through 3/4



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Phone 501-834-3320

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Spec Section 232113, 2.6, A.

Unions (2" and Below)

COPPER FITTINGS FOR PLUMBING AND MECHANICAL APPLICATIONS

Job Name Buckstaff Bathhouse

Contractor Comfort Systems USA (Arkansas), Inc.

Job Location Hot Springs, Arkansas

Wholesaler

Engineer IMEG Corp

Streamline® Rep

Product Description:

Streamline® Wrot Copper Pressure and DWV fittings for use in plumbing or mechanical applications. Available sizes ranging from 1/4" to 8" in diameter. Product is designed to join ASTM B88 and ASTM B280 Seamless Copper Tube.

Material:

Streamline® Wrot Copper fittings shall be made from material in compliance with UNS C12200 grade of copper.

Key Specifications:

Streamline® Wrot Copper; solder joint, pressure fittings shall conform to the NSF/ANSI 61 Annex G requirements. Wrot copper pressure fittings shall be manufactured to meet ASME B1.6.22 and MSS SP104. Wrot DWV copper fittings shall be made to meet ASME B1.6.29. All threaded fittings conform to ASME B1.20.1.

Installation:

Installations shall comply with the latest applicable building codes for the local jurisdiction. For detailed installation instructions, consult the Copper Development Association at copper.org.

References:

NSF/ANSI 61 Annex G	Safe Drinking Water Act (third party certification)
C12200	99.9% pure copper
ASME B1.6.22	Wrot Copper and Copper Alloy Solder Joint Pressure Fittings
MSS SP104	Wrot Copper Solder and Joint Pressure Fittings
ASME B1.6.29	Drain, Waste and Vent (DWV) Fittings
ASME B1.20.1	Threaded Fittings

Other Applicable Standards:

ASTM B88	Seamless Copper Water and Gas Tube (Types K, L, M)
ASTM B280	Seamless Copper Tube for Air Conditioning and Refrigeration

Copper [tube or fitting] UNS C122000 has been evaluated by NSF International to NSF/ANSI 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.



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Spec Section 232113, 2.6, A.

Flanges (2-1/2" and Above)



Even with all the advances in technology today, the wholly welded piping system has for decades remained the best choice for use in high pressure and high temperature application. Many piping jobs in schools, industrial plants, refineries, and factories have benefited from the inherent advantages of a completely welded system. It becomes a closed container joining pipes, valves, fittings, and flanges. A welded joint actually becomes part of the pipe, minimizing leak potential. This provides greater margins of safety, especially under conditions of high internal pressures. Additionally, welding fittings form a continuous metal structure with the pipe, adding forged-in strength to any piping system. Furthermore, smooth forged flanges simplify insulation and take up less space.

ASTM A 105

Scope

This standard covers forged carbon steel piping components for ambient- and higher-temperature service in pressure systems. Flanges are ordered either to dimensions specified by the purchaser or to dimensional specifications such as ASME 16.5 and API 6A. Forgings made to ASTM A 105 are normally limited to a maximum weight of 10,000 lb.

Materials

Weldbend flanges are made by hammering, pressing, rolling and/or machining cast or forged bars, billets or slabs. These adhere to the extent described in the following sections.

Manufacture

ASTM A 105 covers the requirements for forged steel components as finished products only.

The requirements for raw materials are covered by the standards specified in Section 2: Referenced Documents of ASTM A 105.

Heat Treatment

Heat treatment is not a mandatory requirement of this specification except for the following piping components:

- * Flanges above Class 300,
- * Flanges of special design where the design pressure at the design temperature exceeds the pressure-temperature ratings of Class 300, Group 1.1,
- * Flanges of special design where the design pressure or design temperature is not known.

Heat treatment, when required by the above, shall be annealing, normalizing, normalizing and tempering, or quenching and tempering in accordance with ASTM A 961.

Flange Summary Data Sheet

Chemical requirements (in %):

Carbon	Manganese	Phosphorus (max)	Sulfur (max)
.35 max	.60-1.05	.035	.040

Silicon	Copper	Nickel	Chromium
.10-.35	.40 max	.40 max	.30 max

Molybdenum	Vanadium	Columbium
.12 max	.08 max	.02 max

Mechanical requirements:

Tensile Strength (min)	70,000 psi
Yield Strength (min)	36,000 psi
Basic minimum elongation	30%
for walls 5/16 in. and over	
in thickness, strip tests.	
Reduction of area (min)	30%
Hardness, HB (max)	187

Dimensions

Weldbend flanges are manufactured in accordance with ASME B 16.5 (24" NPS and smaller) and ASME B 16.47 (26" - 60" NPS).

Certification

For forgings made to specified dimensions agreed upon by the purchaser, and for forgings made to dimensional standards, the application of identification marks, as required by ASTM A 961, shall be the certification that the forgings have been furnished in accordance with the requirements of this standard. The specification designation included on test reports shall include the year of issue and revision letter, if any.

Test Reports: When test reports are required, Weldbend will also provide the following, if applicable:

- *Type of heat treatment,
- *Tensile property results, i.e., yield strength and ultimate strength in ksi, elongation and reduction in area, in percent,
- *Chemical analysis results,
- *Hardness results, and,
- *Any supplementary testing required by the purchase order.

Product Marking

All flanges shall have the prescribed information stamped or otherwise suitable marked on each flange in accordance with the Standard/MSS SP-25. A Weldbend flange is marked as follows:

Weldbend's Name, Nominal Pipe Size, A105/SA105, Bore Designation, Heat Identification Number and manufacture date.

Note: All information contained in this document, and for a complete description of all requirements, refer to ASTM A 105. Sheets are subject to change without notice.