

Columbia Specialty Company, Inc.

DISTRIBUTOR OF
CARBON, STAINLESS AND ALLOY PIPING MATERIALS

SUBMITTAL INFORMATION

BOLTS, NUTS, AND FLAT WASHERS
ABSTRACT OF ASTM A307 GRADE A / GRADE B
CARBON STEEL BOLTS AND STUDS, 60,000 PSI TENSILE STRENGTH

GRADE: LOW CARBON STEEL

CHEMICAL REQUIREMENTS:

	<u>GRADE A</u>	<u>GRADE B</u>
PHOSPHORUS, MAX%	0.06	0.04
SULFUR, MAX%	0.15	0.05

CHEMICAL ANALYSIS SHALL BE PERFORMED IN ACCORDANCE WITH ASTM A751.

MECHANICAL REQUIREMENTS:

	<u>MIN.</u>	<u>MAX.</u>
HARDNESS – BRINELL	121	241
HARDNESS – ROCKWELL	69	100
TENSILE STRENGTH (KSI)	60	100
ELONGATION IN 2", %	18	

DIMENSIONS:

UNLESS OTHERWISE SPECIFIED, THREADS SHALL BE COURSE THREAD SERIES AS SPECIFIED IN THE LATEST ISSUE OF ANSI/ASME B1.1. HAVING CLASS 2A TOLERANCE, GRADE A BOLTS SHALL BE HEX BOLTS WITH DIMENSIONS AS GIVEN IN THE LATEST ISSUE OF ANSI/ASME B18.2.1, GRADE B BOLTS SHALL BE HEAVY HEX BOLTS.

IDENTIFICATION SYMBOL:

“A307 A” or “A307 B”

NUTS:

NUTS SHALL CONFORM TO ASTM A563 “CARBON AND ALLOY STEEL NUTS” AND SHALL CONFORM IN DIMENSIONS PRESCRIBED IN ANSI/ASME B18.2.2. UNLESS OTHERWISE SPECIFIED, FINISHED HEX NUTS WILL BE SUPPLIED WITH GRADE A307 A BOLTS AND HEAVY HEX SERIES WILL BE SUPPLIED WITH GRADE A307 B BOLTS.

OTHER:

BOLTS AND NUTS MAY BE SUPPLIED IN PLAIN, ZINC PLATED, CADMIUM PLATED, HOT-DIPPED OR MECHANICALLY GALVANIZED FINISHES.

FLAT WASHERS:

ALL WASHERS SHALL BE OF THE SAME MATERIAL AS THE NUTS.

ADDITIONAL INFORMATION:

ADDITIONAL INFORMATION CAN BE FOUND IN ASTM A307, DTD 2010, AND ASTM A563, DTD 2007.

- Long Beach -
562.634.6425
5875 Obispo Avenue
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SUBMITTAL INFORMATION

STAINLESS STEEL BOLTS
HEX CAP SCREWS, STUDS AND T-HEAD BOLTS
STAINLESS STEEL NUTS
ABSTRACT FROM ASTM F593 & F594
"304"

GRADE: UNSTABILIZED 18 CHROMIUM 8 NICKEL (AISI TYPE 304)

<u>CHEMICAL REQUIREMENTS:</u>	<u>PERCENT MAXIMUM</u>
CARBON MAX	0.08
MANGANESE	2.00
PHOSPHORUS MAX	0.045
SULFUR MAX	0.030
CHROMIUM	18.0-20.0
NICKEL	8.0-10.05

<u>MECHANICAL REQUIREMENTS:</u>	<u>MINIMUM</u>
TENSILE STRENGTH (KSI)	75
YIELD STRENGTH (KSI)	30
ELONGATION (%)	25
HARDNESS (ROCKWELL)	B95-C32

NOTES:

HEADED AND ROLLED FROM ANNEALED STOCK THUS REQUIRING A DEGREE OF COLD WORK (CW).
SIZES 0.75 IN. AND LARGER MAY BE HOT WORKED.

IDENTIFICATION SYMBOL: BOLTS – 304, 18-8, F593 (C OR D), OR TWO "SLASH MARKS"
NUTS – 304, 18-8, F594 (C OR D)

OTHER:

ALL BOLTS, NUTS & STUDS, UNLESS OTHERWISE SPECIFIED IN THE PURCHASE ORDER, SHALL BE THREADED IN ACCORDANCE WITH ANSI/ASME B18.2.1. FOR HEX CAP SCREWS (FINISHED HEX BOLTS), UNLESS OTHERWISE SPECIFIED, THE DIMENSIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ANSI/ASME B18.2.2 FOR HEX NUTS.

ADDITIONAL INFORMATION CAN BE FOUND IN ASTM F593, DTD 2008 (STAINLESS STEEL BOLTS, HEX CAP SCREWS, AND STUDS) AND IN ASTM F594, DTD 2009 (STAINLESS STEEL NUTS).

FLAT WASHERS:

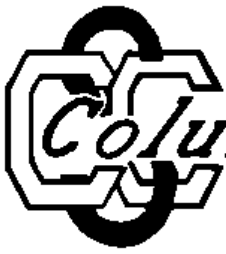
ALL WASHERS SHALL BE OF THE SAME MATERIAL AS THE NUTS.

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STAINLESS STEEL BOLTS
HEX CAP SCREWS, STUDS AND T-HEAD BOLTS
STAINLESS STEEL NUTS
ABSTRACT FROM ASTM F593 & F594
"316"

GRADE: 18 CHROMIUM, 10 NICKEL, 2 MOLYBDENUM (AISI TYPE 316)

<u>CHEMICAL REQUIREMENTS:</u>	<u>PERCENT MAXIMUM</u>
CARBON MAX	0.08
MANGANESE	2.00
PHOSPHORUS MAX	0.045
SULFUR MAX	0.030
SILICON	1.00
CHROMIUM	16.0-18.0
NICKEL	10.0-14.0
MOLYBDENUM	2.0-3.0

<u>MECHANICAL REQUIREMENTS:</u>	<u>MINIMUM</u>
TENSILE STRENGTH (KSI)	75
YIELD STRENGTH (KSI)	45
ELONGATION (%)	25
HARDNESS (ROCKWELL)	B95-C32

NOTES:

HEADED AND ROLLED FROM ANNEALED STOCK THUS REQUIRING A DEGREE OF COLD WORK (CW). SIZES 0.75 IN. AND LARGER MAY BE HOT WORKED.

IDENTIFICATION SYMBOL: BOLTS – 316, F593 (G OR H)
NUTS – 316, F594 (G OR H)

OTHER:

ALL BOLTS, NUTS & STUDS, UNLESS OTHERWISE SPECIFIED IN THE PURCHASE ORDER, SHALL BE THREADED IN ACCORDANCE WITH ANSI/ASME B18.2.1. FOR HEX CAP SCREWS (FINISHED HEX BOLTS), UNLESS OTHERWISE SPECIFIED, THE DIMENSIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ANSI/ASME B18.2.2 FOR HEX NUTS.

ADDITIONAL INFORMATION CAN BE FOUND IN ASTM F593, DTD 2008 (STAINLESS STEEL BOLTS, HEX CAP SCREWS, AND STUDS) AND IN ASTM F594, DTD 2009 (STAINLESS STEEL NUTS).

FLAT WASHERS:

ALL WASHERS SHALL BE OF THE SAME MATERIAL AS THE NUTS.

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SUBMITTAL INFORMATION

BOLTS, NUTS, AND FLAT WASHERS
ABSTRACT FROM ASTM A193 /ASTM A194
GRADE B8
"304"

GRADE: UNSTABILIZED 18 CHROMIUM 8 NICKEL (AISI TYPE 304)

<u>CHEMICAL REQUIREMENTS:</u>	<u>RANGE</u>	<u>VARIATION</u>
CARBON MAX	0.08	0.01 OVER
MANGANESE	2.00	0.04 OVER
PHOSPHORUS MAX.	0.045	0.01 OVER
SULFUR MAX	0.030	0.005 OVER
SILICON	1.00	0.005 OVER
CHROMIUM	18.0-20.0	0.20
NICKEL	8.0-10.5	0.15

<u>MECHANICAL REQUIREMENTS:</u>	<u>MINIMUM</u>
TENSILE STRENGTH (KSI)	75
YIELD STRENGTH (KSI)	30
ELONGATION (%)	30
REDUCTION OF AREA (%)	50
HARDNESS (BRINELL)	223
HARDNESS (ROCKWELL)	B96

NOTES: MATERIALS ARE CARBIDE SOLUTION TREATED

IDENTIFICATION SYMBOL: B8

OTHER:

ALL BOLTS, NUTS & STUDS, UNLESS OTHERWISE SPECIFIED IN THE PURCHASE ORDER SHALL BE THREADED IN ACCORDANCE WITH ANSI/ASME B1.1, CLASS 2A FIT.

BOLT HEADS SHALL BE IN ACCORDANCE WITH THE DIMENSIONS OF ANSI/ASME B18.2.1. UNLESS OTHERWISE SPECIFIED IN THE PURCHASE ORDER, HEAVY HEX SCREWS SERIES SHOULD BE USED. NUTS SHALL CONFORM TO ASTM A194, UNLESS OTHERWISE SPECIFIED, HEAVY HEX SERIES SHALL BE USED.

ADDITIONAL INFORMATION CAN BE FOUND IN ASTM A193/A193M, DTD 2011 (ALLOY STEEL AND STAINLESS STEEL BOLTING MATERIALS FOR HIGH-TEMPERATURE SERVICES), AND ASTM A194/A194M, DTD 2011 (CARBON AND ALLOY STEEL NUTS FOR HIGH-TEMPERATURE SERVICE).

FLAT WASHERS:

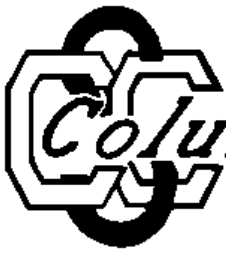
ALL WASHERS SHALL BE OF THE SAME MATERIAL AS THE NUTS.

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BOLTS, NUTS, AND FLAT WASHERS
ABSTRACT FROM ASTM A193 /ASTM A194
GRADE B8M
"316"

GRADE: 18 CHROMIUM, 10 NICKEL, 2 MOLYBDENUM (AISI TYPE 316)

<u>CHEMICAL REQUIREMENTS:</u>	<u>RANGE</u>	<u>VARIATION</u>
CARBON MAX	0.08	0.01 OVER
MANGANESE	2.00	0.04 OVER
PHOSPHORUS MAX	0.045	0.10 OVER
SULFUR MAX	0.030	0.005 OVER
SILICON	1.00	0.05 OVER
CHROMIUM	16.0-18.0	0.20
NICKEL	10.0-14.0	0.15
MOLYBDENUM	2.00-3.00	0.10

<u>MECHANICAL REQUIREMENTS:</u>	<u>MINIMUM</u>
TENSILE STRENGTH (KSI)	75
YIELD STRENGTH (KSI)	45
ELONGATION (%)	30
REDUCTION OF AREA (%)	50
HARDNESS (BRINELL)	223
HARDNESS (ROCKWELL)	B96

NOTES: MATERIALS ARE CARBIDE SOLUTION TREATED

IDENTIFICATION SYMBOL: B8M

OTHER:

ALL BOLTS, NUTS & STUDS, UNLESS OTHERWISE SPECIFIED IN THE PURCHASE ORDER, SHALL BE THREADED IN ACCORDANCE WITH ANSI/ASME B1.1, CLASS 2A FIT.

BOLT HEADS SHALL BE IN ACCORDANCE WITH THE DIMENSIONS OF ANSI/ASME B18.2.1. UNLESS OTHERWISE SPECIFIED IN THE PURCHASE ORDER, HEAVY HEX SCREWS SERIES SHOULD BE USED. NUTS SHALL CONFORM TO ASTM A194, UNLESS OTHERWISE SPECIFIED, HEAVY HEX SERIES SHALL BE USED.

ADDITIONAL INFORMATION CAN BE FOUND IN ASTM A193/A193M, DTD 2011 (ALLOY STEEL AND STAINLESS STEEL BOLTING MATERIALS FOR HIGH-TEMPERATURE SERVICES), AND ASTM A194/A194M, DTD 2011 (CARBON AND ALLOY STEEL NUTS FOR HIGH-TEMPERATURE SERVICE).

FLAT WASHERS:

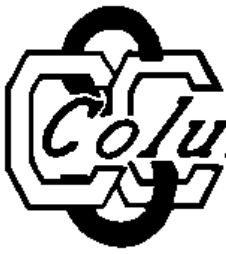
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SUBMITTAL INFORMATION

HYDRANT BREAK-OFF BOLTS
ABSTRACT FROM ASTM A307 GRADE A AND GRADE B
CARBON STEEL EXTERNALLY THREADED STANDARD FASTENERS

GRADE: LOW CARBON STEEL BOLTS MODIFIED TO REDUCE THE BOLTS STRENGTH
ALLOWING "SHEARING" AT THE FLANGED JOINT UPON IMPACT.

<u>CHEMICAL REQUIREMENTS:</u>	<u>GRADE A</u>
PHOSPHORUS MAX	0.06
SULFUR MAX (%)	0.15

MECHANICAL REQUIREMENTS:

	<u>MIN.</u>	<u>MAX.</u>
HARDNESS – BRINELL	121	241
HARDNESS – ROCKWELL	69	100
TENSILE STRENGTH (KSI)	60	100
ELONGATION IN 2 IN., %	18	

DIMENSIONS:

UNLESS OTHERWISE SPECIFIED, THREADS SHALL BE COURSE THREAD SERIES AS SPECIFIED IN THE LATEST ISSUE OF ANSI/ASME B1.1. HAVING CLASS 2A TOLERANCE, GRADE A BOLTS SHALL BE HEX BOLTS WITH DIMENSIONS AS GIVEN IN THE LATEST ISSUE OF ANSI/ASME B 18.2.1.

IDENTIFICATION SYMBOL: "A307 A"

NUTS:

NUTS SHALL CONFORM TO ASTM A563 "CARBON AND ALLOY STEEL NUTS" AND SHALL CONFORM IN DIMENSIONS PRESCRIBED IN ANSI/ASME B18.2.2. UNLESS OTHERWISE SPECIFIED, FINISHED HEX NUTS WILL BE SUPPLIED WITH GRADE A307 A BOLTS.

OTHER:

BOLTS AND NUTS MAY BE SUPPLIED IN PLAIN, ZINC PLATED, CADMIUM PLATED, HOT-DIPPED OR MECHANICALLY GALVANIZED FINISHES.

BREAK-OFF BOLTS HAVE A HOLE DRILLED IN THE SHANK WITH THE DIMENSIONS OF 11/32 INCH DIAMETER AND 2 3/8 INCHES DEEP.

FLAT WASHERS:

ALL WASHERS SHALL BE OF THE SAME MATERIAL AS THE NUTS.

ADDITIONAL INFORMATION:

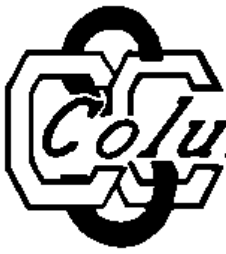
ADDITIONAL INFORMATION CAN BE FOUND IN ASTM A307, DTD 2010, AND ASTM A563, DTD 2007.

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BOLTS, NUTS, AND FLAT WASHERS
ABSTRACT FROM ASTM A193 /ASTM A194
GRADE B7

GRADE: B7

CHEMICAL REQUIREMENTS:

RANGE

CARBON	.37-.49
MANGANESE	.65-1.10
PHOSPHORUS MAX	.035
SULFUR MAX	.040
SILICON	.15-.35
CHROMIUM	.075-1.20
MOLYBDENUM	.15-.25

MECHANICAL REQUIREMENTS:

MINIMUM

TENSILE STRENGTH (KSI) – 2 1/2" & UNDER	125
YIELD STRENGTH (KSI)	105
ELONGATION (%)	16
REDUCTION OF AREA (%)	50
HARDNESS (BRINELL)	321 HB
HARDNESS (ROCKWELL)	35 HRC

IDENTIFICATION SYMBOL: B7

OTHER:

ALL BOLTS, NUTS & STUDS, UNLESS OTHERWISE SPECIFIED IN THE PURCHASE ORDER, SHALL BE THREADED IN ACCORDANCE WITH ANSI/ASME B1.1, CLASS 2A FIT.

BOLT HEADS SHALL BE IN ACCORDANCE WITH THE DIMENSIONS OF ANSI/ASME B18.2.1. UNLESS OTHERWISE SPECIFIED IN THE PURCHASE ORDER, HEAVY HEX SCREWS SERIES SHOULD BE USED. NUTS SHALL CONFORM TO ASTM A194, UNLESS OTHERWISE SPECIFIED, HEAVY HEX SERIES SHALL BE USED.

ADDITIONAL INFORMATION CAN BE FOUND IN ASTM A193/A193M, DTD 2011 (ALLOY STEEL AND STAINLESS STEEL BOLTING MATERIALS FOR HIGH-TEMPERATURE SERVICES), AND ASTM A194/A194M, DTD 2011 (CARBON AND ALLOY STEEL NUTS FOR HIGH-TEMPERATURE SERVICE).

FLAT WASHERS:

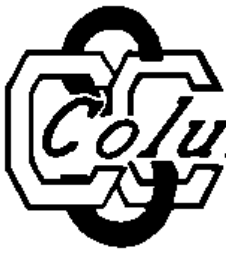
ALL WASHERS WOULD CONFORM TO ASTM F436, DTD 2011.

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BOLTS, NUTS, AND FLAT WASHERS
 ABSTRACT FROM ASTM A193 /ASTM A194
 GRADE B6
 "410"

GRADE: 12 % CHROMIUM, UNS41000 (410) ASTM A193-B6

<u>CHEMICAL REQUIREMENTS:</u>	<u>RANGE</u>
CARBON MAX	0.08
MANGANESE	1.00
PHOSPHORUS MAX.	.040
SULFUR MAX	0.30
SILICON	1.00
CHROMIUM	11.0-13.5

<u>MECHANICAL REQUIREMENTS:</u>	<u>MINIMUM</u>
TENSILE STRENGTH (KSI)	110
YIELD STRENGTH (KSI)	85
ELONGATION (%)	15
REDUCTION OF AREA (%)	50

IDENTIFICATION SYMBOL: B6

OTHER:

ALL BOLTS, NUTS & STUDS, UNLESS OTHERWISE SPECIFIED IN THE PURCHASE ORDER SHALL BE THREADED IN ACCORDANCE WITH ANSI/ASME B1.1, CLASS 2A FIT.

ALL SUBMITTAL INFORMATION IS PROVIDED TO US BY OUR THIRD PARTY MANUFACTURER / FACTORY DIRECT, HN INDUSTRIES. ALL INFORMATION IS SUBJECT TO CHANGE AT ANYTIME AND ALL MATERIAL AVAILIBLTY IS SUBJECT TO PRIOR SALES

BOLT HEADS SHALL BE IN ACCORDANCE WITH THE DIMENSIONS OF ANSI/ASME B18.2.1. UNLESS OTHERWISE SPECIFIED IN THE PURCHASE ORDER, HEAVY HEX SCREWS SERIES SHOULD BE USED. NUTS SHALL CONFORM TO ASTM A194, UNLESS OTHERWISE SPECIFIED, HEAVY HEX SERIES SHALL BE USED.

ADDITIONAL INFORMATION CAN BE FOUND IN ASTM A193/A193M, DTD 2011 (ALLOY STEEL AND STAINLESS STEEL BOLTING MATERIALS FOR HIGH-TEMPERATURE SERVICES), AND ASTM A194/A194M, DTD 2011 (CARBON AND ALLOY STEEL NUTS FOR HIGH-TEMPERATURE SERVICE).

FLAT WASHERS:

ALL WASHERS SHALL BE OF THE SAME MATERIAL AS THE NUTS.

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