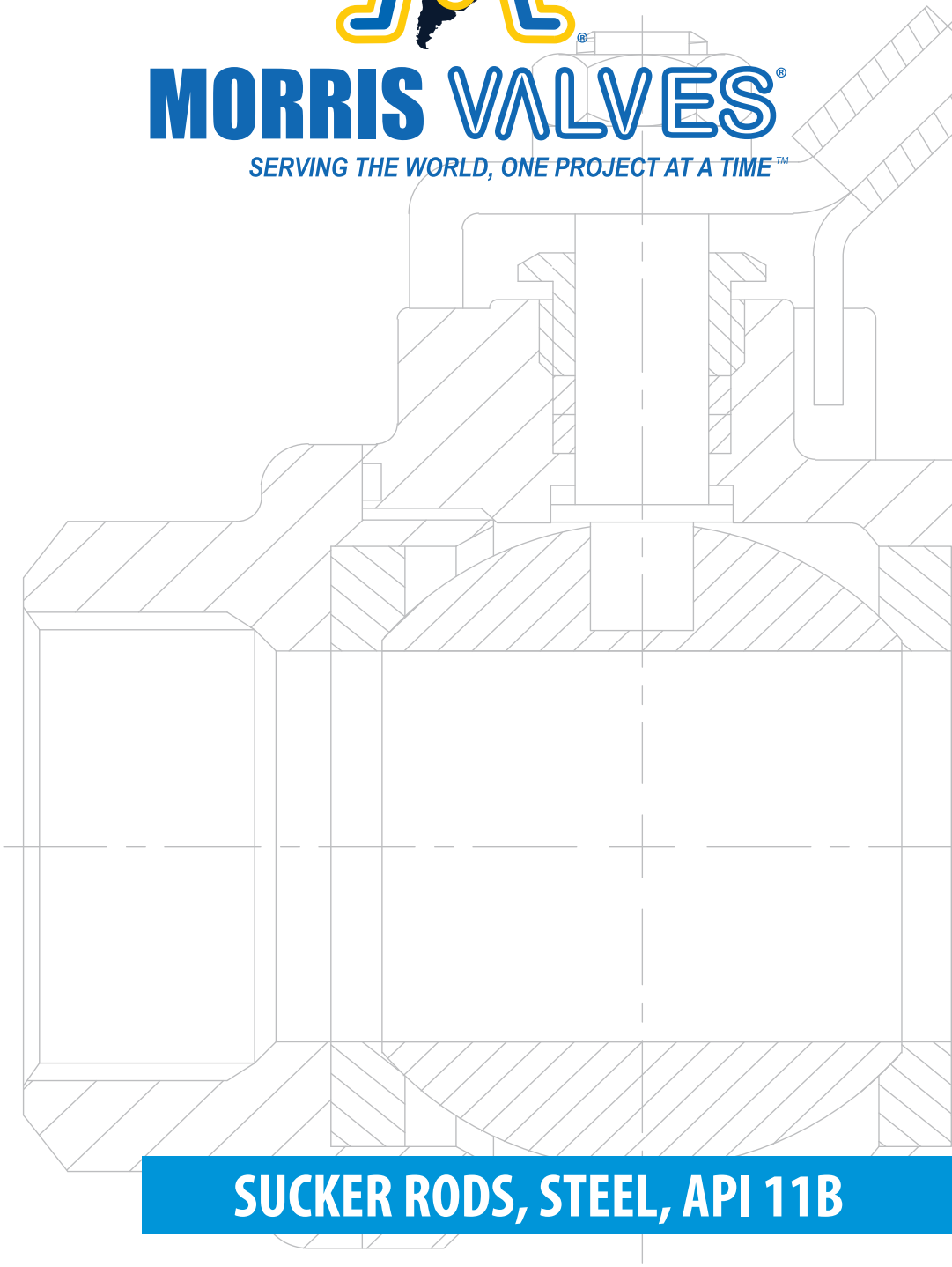
MORRIS VALVES®

SERVING THE WORLD, ONE PROJECT AT A TIME™



SUCKER RODS, STEEL, API 11B

www.morrisvalve.com

United States of America

United States Patent and Trademark Office

Reg. No. 6,185,062

Registered Oct. 27, 2020

Int. Cl.: 6

Trademark

Principal Register

Morris Valves, Inc. (FLORIDA CORPORATION)
14335 Sw 120th St, Suite 201
Miami, FLORIDA 33186

CLASS 6: Threaded metal rods, namely, sucker rods

FIRST USE 4-1-2020; IN COMMERCE 4-1-2020

The mark consists of the stylized letter "M" with a stylized letter "V" appearing in the middle of the "M".

OWNER OF U.S. REG. NO. 4241186, 4840307, 5676109

SER. NO. 88-874,625, FILED 04-16-2020

Director of the United States
Patent and Trademark Office

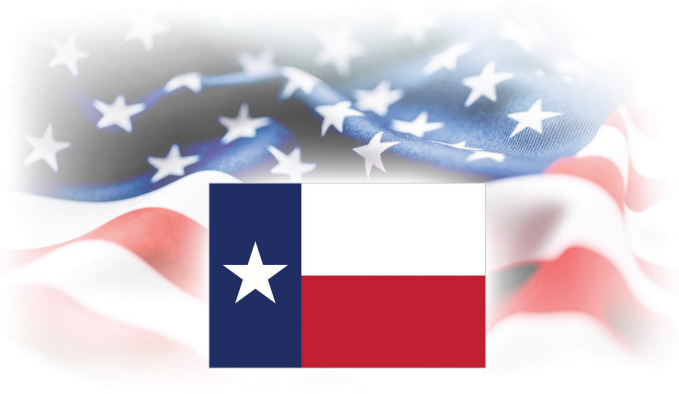
MORRIS VALVES®

SERVING THE WORLD, ONE PROJECT AT A TIME™

In 1984, our journey into the business of repairing valves and industrial instrumentation began. That journey has led us to represent and service well known American brands and companies. In early 2000, our experience and growing passion for the valve industry encouraged our decision to launch our own brand, Morris Valves. Starting with the highly requested Ball Valves, the brand has been based on the principal of quality and performance to match our customers' needs. Our high standards of production later lead us to incorporate other models such as Gate Valve and Check Valves to our production. These additions were carefully selected to match our Standard of Quality. Our success has been driven by our belief of "Tradition with Quality" in everything we do. Our products are developed with that belief which drives our growth and guides the service we provide to our customers.

Contacts

Address: 13548 Cedar Hill Rd., Montgomery, TX. 77356, USA.
Telephone: +1 (832) 666-5576
Cel: +1 (832) 983 – 0744
Email: sales@morrisvalve.com



Vission

Our vision is to be amongst the leading corporations in the supply of goods and services related to valves, their components and industrial equipment in general. We want to conquer new markets in conformity with international standards and remain committed to customer satisfaction, the welfare of our company and the sustainability our planet.

Mission

Our mission is to use our highly trained, highly focused, and extremely motivated staff to work with manufacturers who value quality and have the vision for new development and product applications to ensure the timely provision of goods and services related to valves, their components and industrial equipment in general. We maintain a rigorous standard of customer satisfaction, which will provide for the welfare of the company, the welfare of the countries we serve, and most importantly the sustainability of the planet.

"Serving the world, one project at a time"

SUCKER RODS, STEEL (SSR)

Manufactured to Handle Torque & Weight, used in beam pumping and in the PCP systems as drive strings.
Sucker Rods connected with an internally thread coupling which is specified by API 11B; Class T (or through hard) and Class SM (or spray metal) do form the Rod string. The sucker-rod string; is the Key component of the pumping system. It provides the link between the surface pumping unit and the sub-surface pump (sucker-rod lift type of artificial lift system).

* Design Standard:
- API 11B
* Sucker Rod Size:
- Length: 25 or 30 ft.
* Diameter:
- 5/8", ¾", 7/8", 1", & 1-1/4",1-1/2"
* End Connections:
- Pin x Pin
- Pin x BOX using a Coupling (Class T / Class SM), Full Size (FS) or Slim Hole (SH)
* Test: API 11B

PONY RODS, STEEL, (PNYR)

Sucker rods having lengths less than 25 ft. are called Pony Rods.
* Design Standard:
- API 11B
* Pony Rod Size:
- Length: 2Ft, 4Ft, 6Ft, 8Ft and 10 ft.
- Diameter: 5/8", ¾", 7/8", 1", & 1-1/4",1-1/2"
* End Connections:
- Pin x Pin
- Pin x BOX using a Coupling (Class T / Class SM), API Full Size (FS) or Slim Hole (SH).
- Note. Type T Coupling are recommended for installation where abrasion or corrosion-abrasion are not at problem.
* Test: API 11B

FEATURES.
- Produced from micro-alloyed, modified special quality hot rolled alloy steel.
- Available in three API grades, K, C, and D
- High strength sucker rod available (not specified by API.)
- High Alloy sucker rods available for corrosive environment (option)
- API specifies the chemical composition for each grade.
- Free of surface defects, each rod is straightened and inspected by Eddy Current.
- Upsetting on both ends by Automatic, High Speed Hot-Forging.
- Each Rod is relieved of residual stresses by a full-length normalizing.
- Improved resistance by Tempered & Air-quenching.
- Free of remaining heat treat scale by nor peened procedure.
- Each Piece is Inspected and Tested by API 11B procedure.
- Shipped using Metal Packages (Beams and Box protecting ends).
- Material & Test report According API 11B.

MORRIS VALVES
13548 Cedar Hill Rd., Montgomery, TX. 77356, USA. Phone :+1 (832) 666-5576 www.morrisvalve.com

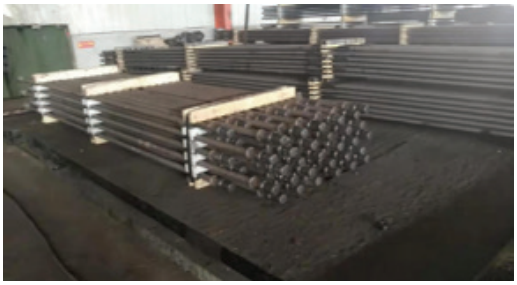
Specifications.

AISI SERIES		A-4330-M	A-4142-M	A-4320-M	A-4138-M	A-4330-M
API GRADE		D special	D alloy	D special	Special	Special
CHEMICAL PROPERTIES (%)						
TYPE		75	78	90	96	97
Aluminum		0.035Max	0.035Max	0.035Max	0.035Max	0.035Max
Carbon		0.30/0.34	0.38/0.45	0.18/0.24	0.36/0.45	0.28/0.35
Chromium		0.8/1.0	0.8/1.1	0.7/0.9	0.52-0.88	0.7/1.0
Columbium					0.020/0.045	
Copper		0.35Max	0.35Max	0.35Max	0.35Max	0.35Max
Manganese		0.8/1.0	0.8/1.0	0.8/1.0	0.88/1.52	0.7/1.0
Molybdenum		0.2/0.3	0.15/0.25	0.2/0.3	0.25/0.35	0.2/0.3
Nickel		1.65/2.0	0.45Max	1.15/1.50	0.3Max	1.65/2.00
Phosphorus		0.035Max	0.035Max	0.025Max	0.035Max	0.035Max
Silicon		0.15/0.35	0.15/0.35	0.15/0.35	0.20/0.35	0.15/0.35
Sulfur		0.04Max	0.035Max	0.025Max	0.04Max	0.04Max
Vanadium		0.04/0.09	0.02/0.07	0.04/0.09	0.04/0.09	0.04/0.09
Tensile Strength	Ksi	125/140	120/140	120/140	140/150	140/150
	MPa	861/965	827/965	827/965	965/1034	965/1034
Yield 2% offset	Ksi	100min	95min	95min	115min	115min
	MPa	689min	655min	655min	792min	792min
Reduction %		45min	45min	45min	45min	45min
Reduction %		25/31	25/31	23/31	23/31	30/34

Diameter of Rod Body(in)	Pin Size(in)	Max. Pin Thread Mayor Diameter (in)	Wrench Square Size (in)±0.031
5/8"	5/8"	15/16"	7/8"
¾"	¾"	1-1/16"	1"
7/8"	7/8"	1-3/16"	1"
1"	1"	1-3/8"	1-5/16"
1"	7/8"	1-3/16"	1"
1-1/4"	1"	1-3/8"	1-5/16"
1-1/4"	1-1/8"	1-9/16"	1-1/2"
1-1/2"	1-1/8"	1-9/16"	1-1/2"

HOW TO ORDER

SSR – AISI SERIES / API GRADE - SIZE - LGTH - END (FS/SH)



POLISHED RODS (PLSHDR)

Manufactured ensuring a surface finish to facilitate a pressure seal in a stuffing box of the well bore and to provide a mechanical link between Rod String and outside the well.
The polished rod is the top and strongest part of the sucker-rod string and it connects the rods to the pumping unit.

* Design Standard:
- API 11B
- Length: 8,11,16,22,24,26,30,36,42 ft.
- Diameter: 1-1/8", 1- ¼", 1-½" and other size available on request.
* End Connections:
- Pin x Pin
- Pin x BOX using Polished rod Couplings (Class T / Class SM), API Full Size (FS) or Slim Hole (SH) in all sucker Rods sizes and combination sizes.
Note. Polished Rods coupling are to be used with current API Polished Rods with the nine-degree Cone Pin.
* Test: API 11B

POLISHED RODS DIMENSIONS:

DIAMETER		LENGTH									SIZE OF SUCKER ROD
BODY	PIN	8	11	16	22	24	26	30	36	42	
1-1/8"	5/8"	•	•	•	•	•	•				5/8"
1-1/8"	¾"	•	•	•	•	•	•				¾"
1-1/4"	7/8"	•	•	•	•	•	•	•	•		7/8"
1-1/2"	1"	•	•	•	•	•	•	•	•	•	1"

Features
- Produced from micro-alloyed, modified special quality hot rolled alloy steel.
- Alloyed to improve its hardenability, increasing its tolerance to corrosion & Abrasion.
- Free of surface defects, each rod is straightened and inspected by Eddy Current.
- Cold-formed, fully rolled pin thread, improving resistance to corrosion and reduces abrasion withing the threads.
- Each Rod is relieved of residual stresses by a full-length normalizing.
- Improved resistance by Tempered & Air-quenching.
- Extremely smooth surface, provided by a Ni60 based Coating.
- Coating thickness 0.008" to 0.020" per side.
- API specifies the chemical composition for each grade.
- Each Piece is Inspected and Tested by API 11B procedure.
- Material & Test report According API 11B.
- Shipped using Metal Packages (Beams and Box protecting ends).

MORRIS VALVES
SERVING THE WORLD, ONE PROJECT AT A TIME
13548 Cedar Hill Rd., Montgomery, TX. 77356, USA. Phone :+1 (832) 666-5576 www.morrisvalve.com

AISI SERIES		4140	431	1045
TYPE		ALLOY STEEL	STAINLESS STEEL	
Chemical properties%				
Carbon (C)		0.3/0.43	0.2Max	0.43/0.5
Chromium(Cr)		0.30/0.34	15.0/17.0	--
Iron(Fe)		0.8/1.1	BALANCE	--
Manganese(Mn)		0.75/1.0	1.0Max.	0.6/0.9
Molybdenum(Mo)		0.15/0.25	-	--
Nickel(Ni)		-	1.25/2.50	--
Phosphorus(P)		0.035 Max.	0.04 Max.	0.04Max.
Silicon(Si)		0.2/0.35	1.0	--
Sulfur(S)		0.04 Max.	0.03Max.	0.05Max.
Physical properties				
Tensile Strength	Ksi	125Min	115 Min.	90Min.
	Mpa	861Min	792Min.	620Min.
Diameter Tolerance	Inch	+0.005 / -0.010	+0.005 / -0.010	+0.005 / -0.010
Length Tolerance	Inch	-2.0 / +2.0	-2.0 / +2.0	-2.0 / +2.0
ReSurface Finish, Ra	Micro Inch	8 / 32	8 / 32	8 / 32

** Others materials available by request

HOW TO ORDER

PLSHDR – AISI SERIES / TYPE - SIZE - LGTH - END (FS/SH)

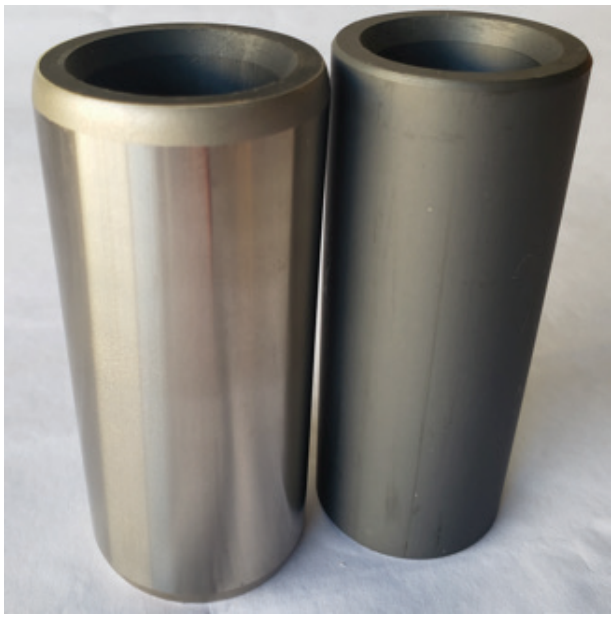
COUPLINGS, API CLASS T, HIGH STRENGTH API CLASS SM

Sucker rod couplings have the same box thread size in each end and are used to connect two sucker rods and/or pony rods, and/or sinker bars with sucker rod threads.

Polished rod couplings (to connect a sucker rod and a polished rod), Sub-couplings, and couplings for progressing cavity pumps (PCPs). are available in Full Size (FS), Slim Hole (SH) or oversize outside diameters.

All couplings are furnished with a cold-formed, fully rolled thread to provide additional strength and fatigue resistance. The threads are produced by completely cold-forming (reshaping) the steel fibers; so they follow the contour (shape) of the thread. The thread resulting improves its resistance to corrosion and reduces abrasion within the thread.

Class T	General Non-Corrosive wells
Class SM	Corrosive or abrasive wells
High Strength	Suited for Progressing Cavity Pump (PCP) applications.



COUPLING SPECIFICATIONS				
CLASS	**T**	**SM**	**HIGH STRENGTH (HS)**	
			AISI A-4130-M Chromium	AISI A-4140-M
Steel Grade	5140	5140 + Ni 60	Molybdenum	Chromium
			Alloy Steel	Molybdenum Alloy Steel
CHEMICAL COMPOSITION, %				
Carbon (C)	0.36–0.44	0.36–0.44	0.29 - 0.33	0.38-0.43
Chromium (Cr)	0.80–1.10	0.80–1.10	0.8 - 1.11	0.90–1.10
Copper (Cu)	0.30 max.	0.30 max.	0.3 Max.	--
Manganese (Mn)	0.50–0.80	0.50–0.80	0.7 - 0.9	0.75–1.00
Molybdenum (Mo)	0.15 max.	0.15 max.	0.15 - 0.25	0.15–0.25
Nickel (Ni)	0.30 max.	0.30 max.		--
Phosphorus (P)	--	--	0.035 Max.	0.02 max.
Silicon (Si)	0.17–0.37	0.17–0.37	0.15 - 0.3	0.15–0.35
Sulfur (S)	0.025 max.	0.025 max.	0.04 Max.	0.020 max.
MECHANICAL PROPERTIES				
Min. tensile strength, psi [MPa]	95,000 [655]	95,000 [655]	125,000 – 138,000	130,000
Hardness, HRA	56–62	56–62	63 - 65	64–68†
Surface Finish, O.D., Ra (Microinch/Micrometer)	125/3,175	63/1,600 2	125/3,175	125/3,175
Surface hardness of spray-metal (SM) couplings	--	595 HV200 min.	--	--
† OR PER CUSTOMER REQUIREMENTS.				
**** 4140 ALLOY STEEL HAS GREATER HARDENABILITY AND STRENGTH THAN 4130**				

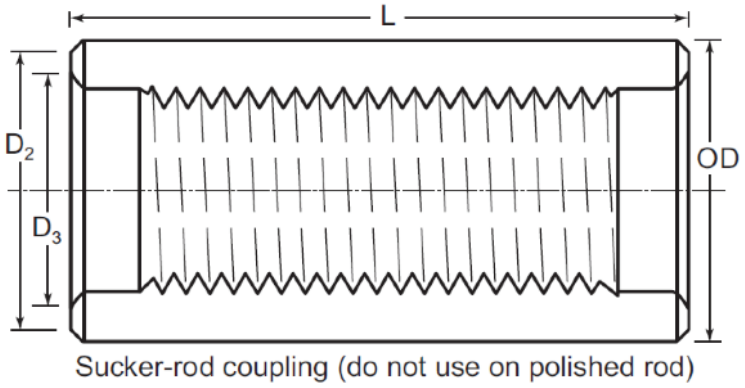
COUPLING SIZES†					
Nominal size, in	5/8	3/4	7/8	1	1-1/8
Slim hole-coupling OD, in [mm]	1.250 [31.8]	1.500 [38.10]	1.625 [41.3]	2.000 [50.80]	2.250 [57.15]
Full-size-coupling OD, in [mm]	1.500 [38.10]	1.625 [41.28]	1.812 [46.0]	2.187 [55.6]	2.375 [60.33]

† The values in mm are as stated in API Spec 11B. The 2.250-in OD is not included in this Specification.

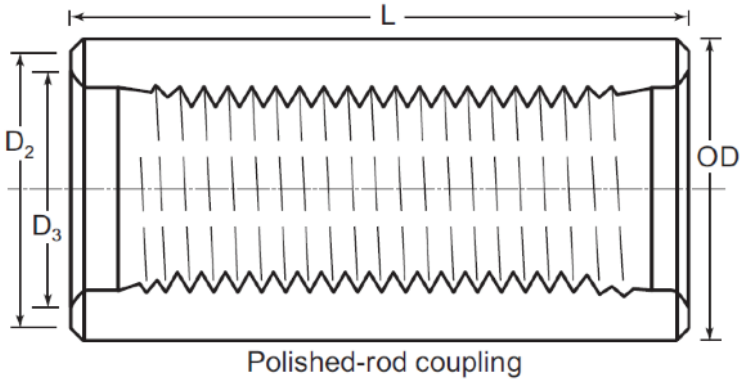
MORRIS VALVES
SERVING THE WORLD, ONE PROJECT AT A TIME

13548 Cedar Hill Rd., Montgomery, TX. 77356, USA. Phone :+1 (832) 666-5576 www.morrisvalve.com

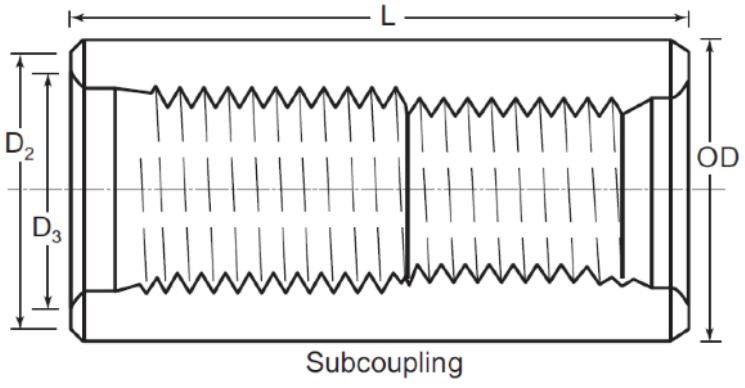
Fig. C.1 Sucker Rod Coupling, Polished Rod Coupling & Sub-Coupling.



Sucker-rod coupling (do not use on polished rod)



Polished-rod coupling



Subcoupling

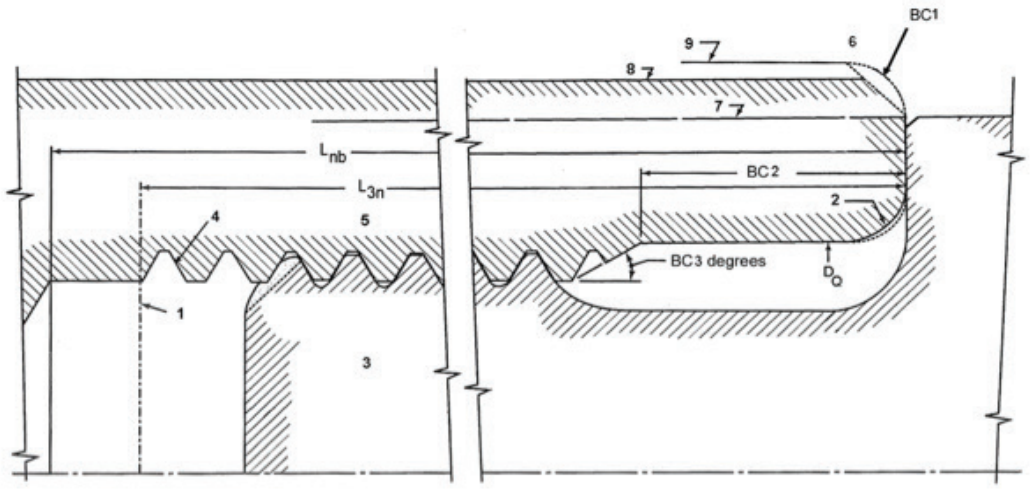
TABLE C.1—EXTERNAL DIMENSIONS AND TOLERANCES FOR SUCKER ROD COUPLINGS, POLISHED ROD COUPLINGS, AND SUB-COUPLINGS

NOMINAL SIZE (A,B)		5/8 IN.	3/4 IN.	7/8 IN.	1 IN.	1 1/8 IN.
Full size sucker rod couplings, full size polished rod couplings and full-size sub-couplings						
OD (a)	Size	1.500	1.625	1.812	2.187	2.375
	Tolerance	+0.005 –0.010	+0.005 –0.010	+0.005 –0.010	+0.005 –0.010	+0.005 –0.010
L (a) Length	Size	4.000	4.000	4.000	4.000 (f)	4.500g
	Tolerance	+0.062 –0.000	+0.062 –0.000	+0.062 –0.000	+0.062 –0.000	+0.062 –0.000
D2 (a) Minimum	Size	1.365	1.490	1.677	1.990	2.177
D3 (a)	Size	1.110	1.253	1.378	1.566	1.753
	Tolerance	+0.015 –0.055	+0.015 –0.073	+0.015 –0.073	+0.015 –0.073	+0.015 –0.073
BC1 (e) Maximum	Size	0.0625	0.0625	0.0625	0.09375	0.09375
SLIM HOLE (C) SUCKER ROD COUPLINGS, SLIM HOLE POLISHED ROD COUPLINGS AND SLIM HOLE SUB-COUPLINGS						
OD (a)	Size	1.250	1.500	1.625	2.000	
	Tolerance	+0.005 –0.010	+0.005 –0.010	+0.005 –0.010	+0.005 –0.010	
L (a) Length	Size	4.000	4.000	4.000	4.000f	
	Tolerance	+0.062 –0.000	+0.062 –0.000	+0.062 –0.000	+0.062 –0.000	
D2 (a) Minimum	Size	1.177	1.427	1.552	1.927	
D3 (a)	Size	1.090	1.253	1.378	1.566	
	Tolerance	+0.015 –0.035	+0.015 –0.073	+0.015 –0.073	+0.015 –0.073	
BC1 (e) Maximum	Size	0.03125	0.03125	0.03125	0.03125	

a See Figure C.1.
b Nominal size of coupling is same as corresponding sucker rod nominal size.
c Slim hole is reduced outside diameter coupling.
d For sub-couplings and slim-hole sub-couplings, the OD and length shall be determined by the largest thread size.
e See Figure C.2. Shape optional with manufacturer.
f L = 4.500 in. (114.3 mm) for 1 in. sub-couplings, full size and slim hole.
g L = 5.000 in. (127.0 mm) for 1 1/8 in. full size sub-couplings.

MORRIS VALVES
SERVING THE WORLD, ONE PROJECT AT A TIME
13548 Cedar Hill Rd., Montgomery, TX. 77356, USA. Phone :+1 (832) 666-5576 www.morrisvalve.com

Figure C.2—Sucker Rod Coupling Illustration



Positions.

1. Plane of end of thread in box
2. Shape optional with manufacturer
3. Pin
4. Coupling thread continuous at manufacturer's option
5. Box
6. Shape of coupling chamfer optional with manufacturer
7. OD of slim hole coupling
8. OD of 5/8 in. (15.9 mm), 3/4 in. (19.1 mm), 7/8 in. (22.2 mm), and 11/8 in. (28.6 mm) coupling
9. OD of 1 in. (25.4 mm) coupling

TABLE C.2—DIMENSIONAL REQUIREMENTS FOR POLISHED ROD AND SUCKER ROD BOX CONNECTIONS

NOMINAL SIZE (A,B)		5/8 IN.	3/4 IN.	7/8 IN.	1 IN.	1 1/8 IN.
Diameter of thread	Size	0.938	1.063	1.188	1.375	1.563
L(nb) (c,d) Total depth of box minimum	Dimension	1.750	1.938	2.125	2.500	2.750
L(3n) (c,d) Total length of threads in box including counterbore, min	Dimension	1.410	1.600	1.790	2.000	2.250
Minimum box major diameter (basic) (e)	Dimension	0.9380	1.0630	1.1880	1.3754	1.5630
Maximum box pitch diameter (e)	Dimension	0.8806	1.0060	1.1310	1.3190	1.5068
Minimum box pitch diameter (basic) (e)	Dimension	0.8730	0.9980	1.1230	1.3105	1.4980
Maximum box minor diameter (e)	Dimension	0.851	0.976	1.101	1.288	1.476
Minimum box minor diameter (e)	Dimension	0.830	0.955	1.080	1.267	1.455
BC2 (c) Counterbore depth, sucker rod coupling	Dimension	0.4375	0.4375	0.4375	0.4375	0.4375
	Tolerance	+0.0625	+0.0625	+0.0625	+0.0625	+0.0625
		−0.0000	−0.0000	−0.0000	−0.0000	−0.0000
BC3 (c) Thread chamfer angle	Dimension	30°	30°	30°	30°	30°
BC4 (d) Counterbore depth, polished rod coupling	Dimension	0.250	0.250	0.250	0.250	0.250
	Tolerance	+0.050	+0.050	+0.050	+0.050	+0.050
		−0.000	−0.000	−0.000	−0.000	−0.000
DQ (c,d,f) Diameter of box counterbore	Dimension	0.955	1.080			
	Tolerance	+0.010	+0.010	+0.010	+0.010	+0.010
		−0.000	−0.000	−0.000	−0.000	−0.000

a The hollow crest of cold-formed threads shall not be considered detrimental.
b See Table B.3 for polished rod box theoretical cone base dimension D4.
c See Figure C.2.
d See Figure C.3.
e See Figure A.2.
f Tapping marks in the counterbore shall not be reason for rejection.

A Tradition of Quality

Our passion is to develop solutions for difficult situations in Industrial Applications, no matter how large or small the project.

"Serving the world, one project at a time"