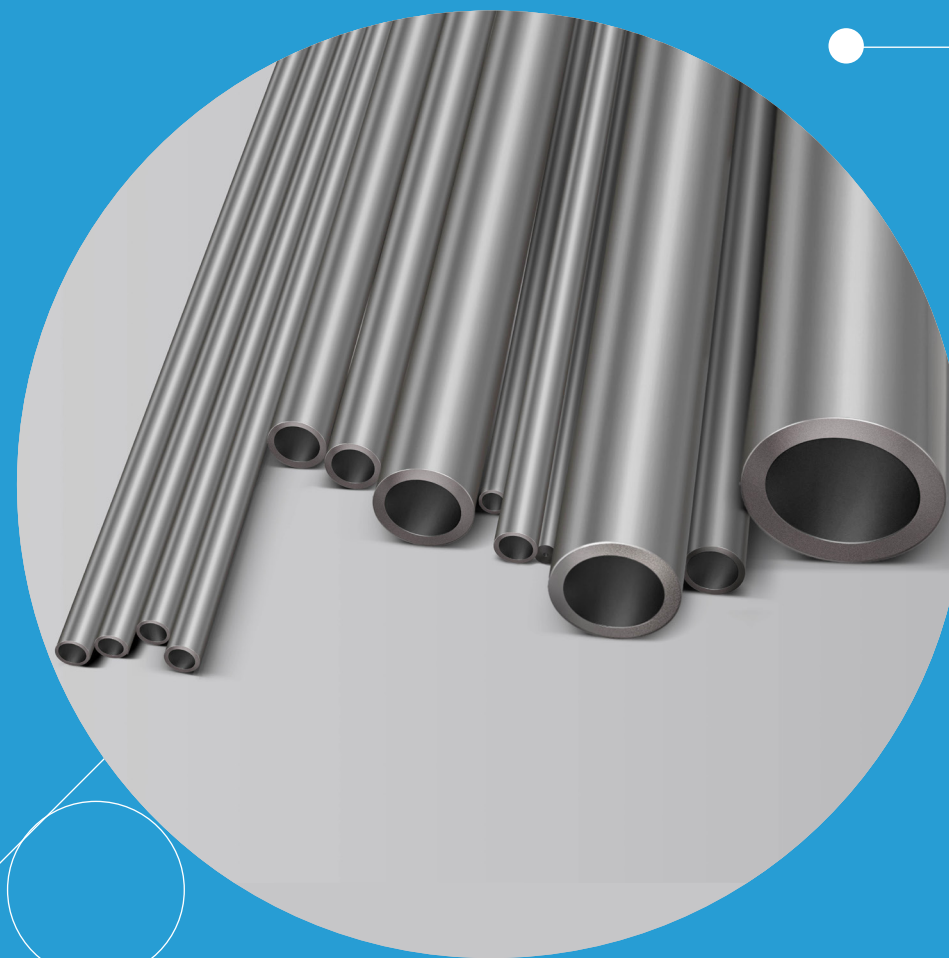




COLD DRAWN BRIGHT ANNEALED SEAMLESS TUBES



Panchshil Plaza,
201-204, A Wing, 55 Hughes Rd,
Gamdevi, Behind Dharam Palace,
Mumbai – 400007 Tel.: +91 22 23634179
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GANDHI SPECIAL TUBES LTD. CIN : L27104MH1985PLC036004



ISO 9001:2015 & IATF 16949:2016
Certified Company

Product Highlights

- Tubes are exclusively manufactured out of fully Aluminium killed steel to avoid problem of ageing which can lead to embrittlement & cracks.
- Our steel tubes undergo bright annealing in an advanced German continuous Roller Hearth Furnace. This method ensures that our tubes emerge bright and completely free from any scale formation, thereby eliminating the need for pickling or buffing.
- Tubes are heat treated above the upper critical transformation temperature, resulting in exceptionally bright, scale-free, soft, and ductile tubes ideal for Hydraulic Systems and other engineering applications.
- Our tubes ensure an unparalleled level of reliability and ductility for various forming operations like bending, flaring, fluting, soldering, and ferrule biting.
- Tubes can be supplied with closer dimensional tolerance than permitted by various codes/specifications, subject to prior agreement.
- We offer flexible manufacturing options, delivering in small batch sizes or large orders, ensuring that you receive the quantity you want, precisely when you need it.

Product Range

- Outer Diameter: From 3.0 mm up to 65 mm.
- Wall Thickness: From 0.5 mm up to 7 mm.

Surface Coatings

Tubes can be supplied in Plain Oiled, Phosphated or in externally Electroplated condition. Different passivation's such Trivalent / Hexavalent Chrome passivation are offered based on client preference.

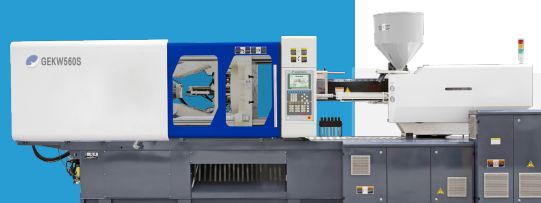
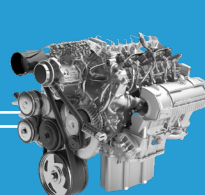
Applications

- Hydraulics • High Pressure Diesel Fuel Injection Systems • Automotive
- General Engineering • Construction Equipment • Shipping Equipment
- Fuel Lines • Compressors • Evaporative Coils • Oil Lines • Power Steering
- Farming Equipment • Defense • Bearings

Gandhi Special Tubes Ltd. delivers innovative and reliable tubular solutions to a diverse range of industries & niche markets in core sectors such as automotive and commercial vehicles, hydraulics, and general engineering. The Group manufactures client-specific seamless steel tubes, high-pressure tubes, welded tubes, and coupling nuts. We blend our technical expertise with uncompromising standards to provide top-notch quality with utmost precision.

We listen, we adapt, and we innovate to ensure that every interaction with us is a step towards achieving your goals. Our dedication for customer centricity along with our 38 plus years of tubular experience has been instrumental in nurturing long standing relationships, establishing us as the preferred choice for our customers.

Throughout our history, we have remained steadfast in our commitment to quality, flexibility, and reliability. We continue to embrace new challenges and strive to redefine industry standards, driven by our passion for precision and our desire to shape the future of tubular solutions.



Specifications

- EN 10305-1 & EN10305-4
 - DIN 2391
 - SAE J 524
 - IS 3074
 - JIS G 3445
 - EN 10216-2
 - DIN 73000
 - ISO 8535
 - BS 980
- BS 3059
 - IS 3601
 - DIN2445
 - DIN 17175
 - SAE J 1958
 - SA 179
 - SA 210
 - SA 334

Common Specifications [Chemical Composition]

Steel Grade	C% (Max)	Si% (Max)	Mn%	P% (Max)	S% (Max)	Al (Min)
St 30 Al	0.10	0.05	≤ 0.55	0.025	0.025	0.02
St 37.4	0.17	0.35	≥ 0.35	0.04	0.04	0.02
St 35	0.17	0.35	≥ 0.40	0.025	0.025	-
St 45	0.21	0.35	≥ 0.40	0.025	0.025	-
St 52	0.22	0.55	≤ 1.60	0.025	0.025	-
E 235	0.17	0.35	≤ 1.20	0.025	0.015	0.015
E 355	0.22	0.55	≤ 1.60	0.025	0.015	0.020

Mechanical Properties

BK			NBK / + N		
Steel Grade	Tensile Strength Kg/Sq. mm (min)	Elongation at rupture (% min)	Tensile Strength Kg/Sq mm (min)	Upper yield point Kg/Sq mm (min)	Elongation at rupture (% min)
St 30 Al	-	-	29.6 - 42.8	21.9	30
St 37.4	-	-	35.7 – 49	24	25
St 35	49	6	34.7 - 47.9	24	25
St 45	59.2	5	44.9 - 58.1	26	21
St 52	65	4	50 - 64.3	36.2	22
E 235	-	-	34.7 – 49	24	25
E 355	-	-	50 - 64.3	36.2	22

BK – Cold finished as drawn - No heat treatment after last cold forming process.
NBK /+ N – Normalized. - Tubes are normalized above the upper transformation point in controlled atmosphere.

Tube selection and sizing

Proper tube selection depends on several criteria :

1. Pressure

The operating pressure of the system is a factor in determining the material and wall thickness of tube to be used. General - Recommendations are as shown below

2. Velocity and flow

The quantity of fluid that must pass through the line in a given period of time is a major factor in determining the inside diameter of tubing to be used.

3. Pressure drops Inside the tubes

4. Corrosion conditions

Proper tubing material and size depend also on corrosion conditions and various operating requirements of the system.

Calculations of Pressures

Calculation of pressures given are according to
DIN 2413 case I for predominant static stress

Material Characteristic value K = 226 N/mm2
(Permanent fatigue strength)

$$P = \frac{20 \text{ K.s.c.}}{S.da} \quad (\text{bar})$$

Safety correction value S = 1.5 for static & dynamic stress.

Material Characteristic value K = 235 N/mm2 And
DIN 2413 case III
For dynamic stress

Factor c for consideration of wall thickness divergence for static & dynamic stress = 0.8 for tube O.D. 4 to 5; 0.85 for tube O.D. 6 to 8; 0.9 for larger tube O.D.

$$P = \frac{20 \text{ K.s.c.}}{S.(da+s.c.)} \quad (\text{bar})$$

Additional allowances towards other factors like corrosion, thinning of tubes while bending etc. are not considered for calculation of pressures.

General Recommendations on Seamless Tubes for Hydraulics

Tolerances according to DIN 239 Part-1/EN10305-1/EN10305-4 Material St.37.4/E235+N (Fully Aluminium Killed Steel)

da tube ø mm	Tolerance	S Wall Thickness mm	D Tube ID mm	Design Pressure Bar		Burst Pressure bar	Weight Kg./m
				DIN Case I	Case III		
4		0.5	3	313	274	1160	0.047
4	± 0.08	0.75	2.5	409	393	1820	0.067
4		1	2	522	502	2950	0.075
5	± 0.08	1	3	432	416	2120	0.099
6		0.75	4.5	333	289	1230	0.103
6		1	4	389	374	1680	0.123
6	± 0.08	1.5	3	549	528	3050	0.166
6		2	2	692	665	-	0.197
6		2.25	1.5	757	728	-	0.208
8		1	6	333	289	1190	0.222
8	± 0.08	1.5	5	431	414	1860	0.240
8		2	4	549	528	3020	0.296
8		2.5	3	658	632	-	0.339
10		1	8	282	249	870	0.222
10		1.5	7	373	358	1380	0.314
10	± 0.08	2	6	478	460	2100	0.395
10		2.5	5	576	553	3180	0.462
10		3	4	666	641	-	0.518
12		1	10	235	210	760	0.271
12		1.5	9	353	305	1150	0.388
12	± 0.08	2	8	409	393	1580	0.493
12		2.5	7	495	476	2600	0.586
12		3	6	576	553	3200	0.666
12		3.5	5	651	627	-	0.734
14		1	12	201	182	620	0.321
14		1.5	11	302	265	940	0.462
14		2	10	403	343	1340	0.592
14	± 0.08	2.5	9	434	417	1760	0.709
14		3	8	507	487	2400	0.814
14		3.5	7	576	553	3220	0.906
14		4	6	641	616	-	0.986
15		1	13	188	171	590	0.345
15	± 0.08	1.5	12	282	249	980	0.499
15			11	376	323	1250	0.641
15		2.5	10	409	393	1690	0.771
15		3	9	478	460	2120	0.888
16		1	14	176	160	540	0.370
16	± 0.08	1.5	13	264	234	820	0.536
16		2	12	353	305	1170	0.691
16		2.5	11	386	372	1470	0.832
16		3	10	452	435	1920	0.962
18		1	16	157	143	510	0.419
18	± 0.08	1.5	15	235	210	780	0.610
18		2	14	313	274	1040	0.789
18		2.5	13	392	335	1320	0.956
18		3	12	409	393	1830	1.110
20		1.5	17	212	191	570	0.684
20	± 0.08	2	16	282	249	920	0.888
20		2.5	15	353	305	1220	1.079
20		3	14	373	358	1450	1.258
20		3.5	13	426	410	1720	1.424
20		4	12	478	460	2080	1.578

da tube ø mm	Tolerance	S Wall ID Thickness mm	D tube ID ø mm	Design Pressure Bar DIN2413		Burst Pressure bar	Weight Kg./m
				Case I	Case II		
22		1	20	128	118	370	0.518
22		1.5	19	192	174	590	0.758
22	± 0.08	2	18	256	228	850	0.986
22		2.5	17	320	280	1040	1.202
22		3	16	385	329	-	1.406
25		2	21	226	202	670	1.134
25	± 0.08	2.5	20	282	249	920	1.387
25		3	19	338	294	1050	1.628
25		4	17	394	379	1520	2.072
25		4.5	16	437	420	1780	2.275
25		5	15	478	460	2120	2.466
28		1.5	25	151	139	450	0.980
28	± 0.08	2	24	201	182	620	1.282
28		2.5	23	252	224	770	1.572
28		3	22	302	265	920	1.850
28		4	20	403	343	-	2.368
28		5	18	434	417	-	2.836
30		2	26	188	171	620	1.381
30	± 0.08	2.5	25	235	210	770	1.695
30		3	24	282	249	920	1.998
30		4	22	376	323	1250	2.565
30		5	20	409	393	1580	3.083
35		2	17	212	191	570	0.684
35	± 0.15	2.5	16	282	249	920	0.888
35		3	15	353	305	1220	1.079
35		4	14	373	358	1450	1.258
35		5	13	426	410	1720	1.424
35		6	12	478	460	2080	1.578
38		2.5	33	186	168	550	2.189
38	± 0.15	3	32	223	200	660	2.589
38		4	30	297	261	970	3.354
38		5	28	371	319	1350	4.069
38		6	26	390	375	--	4.735
38		7	24	446	429	--	5.352
42		2	38	134	124	390	1.973
42	± 0.2	3	36	201	182	580	2.885
42		4	34	269	238	850	3.749
50	± 0.2	6	38	338	-	-	6.511

Quality & Inspection

Nothing is more important to us than Quality! We have implemented a robust quality management system that leaves no room for compromise. Our products conform to Indian & International standards and are manufactured with optimum process control and quality checks at every step from incoming raw material to dispatch of finished products.

Each tube is precisely crafted to meet the most stringent tolerances that our customers demand. Our manufacturing plant is fully equipped with a chemical laboratory, metallurgy department and advanced destructive and non-destructive testing equipment conducted by highly qualified engineers to ensure that each tube meets our clients desired specifications.

- Microhardness Test
- Tensile Test
- Hydrostatic Pressure Test
- Eddy Current Test
- Flattening, Flaring, Bending Test
- Surface Roughness Test
- Bubble Test
- Hardness Test
- Burst Test
- Salt Spray Test
- Chemical Composition
- Metallurgical & Stereo Microscopy
- Dimensional Checks

