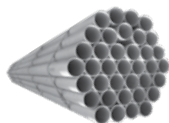


BLACK & HOT DIPPED GALVANIZED STEEL PIPES



SPECIFICATION FOR STANDARD SIZES
EN 10255 : 2004 + A1 : 2007 FOR
BLACK AND HOT DIPPED GALVANIZED STEEL PIPES

Tube	Size		OD (Specified)		Wall Thickness (mm)	Weight of Tube (Kg/Mtr)		Pressure
	Inch	NB	Min	Max		Black	S/S	Bar
T Y P E - L	1/2"	15	21.0	21.7	2.3	1.08	1.09	50
	3/4"	20	26.4	27.1	2.3	1.40	1.41	50
	1"	25	33.2	34.0	2.9	2.20	2.22	50
	1 1/4"	32	41.9	42.7	2.9	2.82	2.85	50
	1 1/2"	40	47.8	48.6	2.9	3.25	3.29	50
	2"	50	59.6	60.7	3.2	4.51	4.58	50
	2 1/2"	65	75.2	76.0	3.2	5.75	5.87	50
	3"	80	87.9	88.7	3.2	6.76	6.93	50
	3 1/2"	90	100.3	101.2	3.6	8.70	8.88	50
	4"	100	113.0	113.9	3.6	9.83	10.1	50
	5"	125	138.5	140.8	4.5	15.00	15.5	50
	6"	150	162.9	166.5	4.5	17.80	18.4	50
T Y P E - LI	1/2"	15	21.0	21.7	2.3	1.08	1.09	50
	3/4"	20	26.4	27.1	2.3	1.39	1.40	50
	1"	25	33.2	34.0	2.9	2.20	2.22	50
	1 1/4"	32	41.9	42.7	2.9	2.82	2.85	50
	1 1/2"	40	47.8	48.6	2.9	3.24	3.28	50
	2"	50	59.6	60.7	3.2	4.49	4.56	50
	2 1/2"	65	75.2	76.0	3.2	5.73	5.85	50
	3"	80	87.9	89.4	3.6	7.55	7.72	50
	4"	100	113.0	114.9	4.0	10.80	11.1	50
T Y	1/2"	15	21.0	21.4	2.0	0.947	0.956	50
	3/4"	20	26.4	26.9	2.3	1.38	1.39	50



SPECIFICATION FOR STANDARD SIZES
EN 10255 : 2004 + A1 : 2007 FOR
BLACK AND HOT DIPPED GALVANIZED STEEL PIPES

Tube	Size		OD (Specified)		Wall Thickness (mm)	Weight of Tube (Kg/Mtr)		Pressure
	Inch	NB	Min	Max		Black	S/S	
P E - L2	1"	25	33.2	33.8	2.6	1.98	2.00	50
	1 1/4"	32	41.9	42.5	2.6	2.54	2.57	50
	1 1/2"	40	47.8	48.4	2.9	3.23	3.27	50
	2"	50	59.6	60.2	2.9	4.08	4.15	50
	2 1/2"	65	75.2	76.0	3.2	5.71	5.83	50
	3"	80	87.9	88.7	3.2	6.72	6.89	50
	4"	100	113.0	113.9	3.6	9.75	10.00	50
M E D I U M	1/2"	15	21.1	21.8	2.6	1.21	1.22	50
	3/4"	20	26.5	27.3	2.6	1.56	1.57	50
	1"	25	33.3	34.2	3.2	2.41	2.43	50
	1 1/4"	32	42.0	42.9	3.2	3.10	3.13	50
	1 1/2"	40	47.9	48.8	3.2	3.56	3.6	50
	2"	50	59.7	60.8	3.6	5.03	5.1	50
	2 1/2"	65	75.3	76.6	3.6	6.42	6.54	50
	3"	80	88.0	89.5	4.0	8.36	8.53	50
	4"	100	113.1	115.0	4.5	12.2	12.5	50
	5"	125	138.5	140.8	5.0	16.6	17.1	50
	6"	150	163.9	166.5	5.0	19.8	20.4	50
H E A V Y	1/2"	15	21.1	21.8	3.2	1.44	1.45	50
	3/4"	20	26.5	27.3	3.2	1.87	1.88	50
	1"	25	33.3	34.2	4.0	2.93	2.95	50
	1 1/4"	32	42.0	42.9	4.0	2.79	3.82	50
	1 1/2"	40	47.9	48.8	4.0	4.37	4.41	50
	2"	50	59.7	60.8	4.5	6.19	6.26	50



**SPECIFICATION FOR STANDARD SIZES
EN 10255 : 2004 + A1 : 2007 FOR
BLACK AND HOT DIPPED GALVANIZED STEEL PIPES.**

Tube	Size		OD (Specified)		Wall Thickness (mm)	Weight of Tube (Kg./Mtr)		Pressure
	Inch	NB	Min	Max		Black	S/S	Bar
	2 1/2"	65	75.3	76.6	4.5	7.93	8.05	50
	3"	80	88.0	89.5	5.0	10.3	10.5	50
	4"	100	113.1	115.0	5.4	14.5	14.8	50
	5"	125	138.5	140.8	5.4	17.9	18.4	50
	6"	150	163.9	166.5	5.4	21.3	21.9	50

Tolerance : As per the above table

1. Outside Diameter : Straightness shall no exceed 0.002 L.

2. Staightness : =7.5% on bundles of 10 tons or more, for M and H series and Type L
: -10% - 8% on individual tubes for Types L1 and L2.

3. Mass : + 10% for M and H series & Types L

4. Thickness : -8% with the plus tolerance limited by the mass tolerance for Types L1 and L2.

5. Ends : Cut cleanly and nominally square with the axis of the tube and free from excessive burrs.

6. Chemical Composition : % Max: C - 0.20%, Mn - 1.40%, S - 0.03% & P - 0.035%

7. Mechanical Properties : UTS - 320 to 520 N/mm², YS - 195 N/mm² (minimum & %EL - 20 (minimum)



**SPECIFICATION FOR STANDARD SIZES
EN 10255 : 2004 + A1 : 2007 FOR
BLACK AND HOT DIPPED GALVANIZED STEEL PIPES.**

- 8. Flattening Test** :The flattening test shall be applied to bare tubes with specified outside diameter greater than 60.3mm.
Welded tubes shall be flattened with the weld placed alternately at 0° or 90° to the direction of the Flattening force.
:For Weld Test - Flatten up to 75% of original tube OD.No cracks in the weld.
:For Material other than Weld-Flatten up to 60% of original tube OD.No cracks in the metal other than in the weld.

- 9. Bend Test** :Bend test up to 60.3mm OD. Radius at the bottom of the groove of the former shall be as per below table .The tubes shall show no cracks visible without magnifying aids.

Diameter (D)	21.3	26.9	33.7	42.4	48.3	60.3
Bending Radius	65	85	100	150	170	220

- 10. Leak Tightness Test** a) :On line NDT (Eddy Current)
b) :Hydro testing at pressure as per above table and holding time min. 5 Second.

- 11. Zinc Coating** :As per EN 10240A1
:For 1/2" to 3/4" - 14 TPI and from 1" to 6" - 11 TPI
Check with standard ring and plug gauges.

- 12. Threading** :We can do on line stenciling as per this stanadrd & as per customer needs at one meter interval

- 13. Marking** :We can do on line stenciling as per this stanadrd & as per customer needs at one meter interval



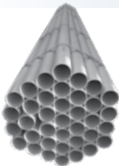
**SPECIFICATION FOR STANDARD SIZES
EN 10255 : 2004 + A1 : 2007 FOR
BLACK AND HOT DIPPED GALVANIZED STEEL PIPES.**

14. Packing : Hexagonal Type

15. Color Coading : For Type L --- Green
For Type L1 --- White
For Type L2 --- Brown
For Heavy --- Red
For Medium --- Blue

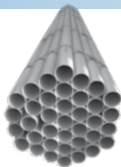
16. Mill Test Certificate We can issue a MTC, Certifying that the tubes supplied comply with this standard.





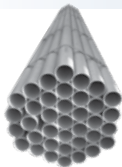
SPECIFICATION FOR STANDARD SIZES EXTRACTS FROM ASTM A53 GR-A SCHEDULE - 40 FOR BLACK AND GALVANIZED STEEL PIPES

Designation		OD (Minimum)		OD (Maximum)		Wall Thickness		Weight Tube (Plain End)		Pressure E Gr.A	Weight of the (SS)		Pieces Per Bundle	
		Inch	NB(mm)	Inch	mm	Inch	mm	Lb./Ft.	Kg./Mtr.		Lb./Ft.	Kg./Mtr.		
	1/2"		0.822	20.90	0.854	21.70	0.109	2.77	0.850	1.27	700	0.860	1.27	120
	3/4"		1.035	26.30	1.070	27.10	0.113	2.87	1.130	1.69	700	1.140	1.69	84
	1"		1.300	33.00	1.330	33.80	0.133	3.38	1.680	2.50	700	1.690	2.50	60
	1 1/4"		1.645	41.80	1.680	42.60	0.140	3.56	2.270	3.39	1200	2.280	3.40	42
	1 1/2"		1.885	47.90	1.920	48.70	0.145	3.68	2.720	4.05	1200	2.740	4.04	36
	2"		2.350	59.70	2.400	60.90	0.154	3.91	3.660	5.44	2300	3.680	5.46	26
	2 1/2"		2.850	72.30	2.900	73.70	0.203	5.16	5.800	8.63	2500	5.850	8.67	18
	3"		3.460	88.00	3.530	89.80	0.216	5.49	7.580	11.29	2220	7.680	11.35	14
	3 1/2"		3.960	100.60	4.040	102.60	0.226	5.74	9.120	13.57	2030	9.270	13.71	12
	4"		4.450	113.20	4.540	115.40	0.237	6.02	10.800	16.07	1900	10.920	16.23	10
	5"		5.507	139.90	5.620	142.70	0.258	6.55	14.630	21.77	1670	14.900	22.07	7
	6"		6.560	166.60	6.690	169.90	0.280	7.11	18.990	28.26	1520	19.340	28.58	7
	8"		8.562	217.50	8.700	221.00	0.322	8.18	28.58	42.55	1340	--	--	4
	10"		10.669	271.00	10.820	275.00	0.365	9.27	40.52	60.29	1220	--	--	4
	12"		12.637	321.00	12.850	326.50	0.406	10.31	53.57	79.70	1150	--	--	2



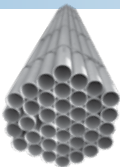
SPECIFICATION FOR STANDARD SIZES EXTRACTS FROM ASTM A53 GR-A SCHEDULE - 40 FOR BLACK AND GALVANIZED STEEL PIPES

1. Tolerance	a) On Thickness	The minimum wall thickness at any point shall be not more than 12.5% under the specified wall thickness.
	b) On Diameter	For NPS 1 1/2" & under any point shall not vary more than ± 0.4 mm. For NPS 2" & above shall not vary more than $\pm 1\%$ from the standard specified
	c) Weight	The weight of the pipe shall not more than $\pm 10\%$ of the specified weight.
3. Internal Debeading	a) 1 1/2" and below size -	End finish shall be at the option of manufacturer which is nominally square cut with the axis of tube and free from excessive
	b) 2" and over size	Bevelled with ends beveled to an angle of 30, + 5 / -0 degree measured from a line perpendicular to the axis of the pipe with a root face of 1.6 mm ± 0.8 mm.
	2" and above	Internal beads to be removed completely.
4. Chemical Composition (% Max)		C - 0.25%, Mn - 0.95%, S - 0.045%, P - 0.050%, Cu - 0.40%, Ni - 0.40%, Cr - 0.40%, Mo - 0.15% & V - 0.08% (Cu+Ni+Cr+Mo+V=1.0% max.)
5. Mechanical (Min)		Yield Strength-205 N/mm ² , Tensile Strength-330 N/mm ² , Elongation-24-36%
6. Bend Test	a)	Applicable to tubes upto and including nominal size of 50 mm When ordered for close coiling bend up to 180 degrees around a cylindrical mandrel, The diameter of which is 8 times the OD of pipe.
	b)	Bend up to 90 degree around a cylindrical mandrel, the diameter is 12 times the OD of pipe. : No Crack at any portion and no open in the weld.



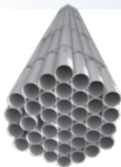
SPECIFICATION FOR STANDARD SIZES EXTRACTS FROM ASTM A53 GR-A SCHEDULE - 40 FOR BLACK AND GALVANIZED STEEL PIPES

8. Flattening Test	Applicable to tubes greater than nominal sizes of 50 mm & weld located 0/90 degree from line of direction of force. For weld ductility until 2/3 of outside dia of specimen tube. For ductility of steel until 1/3 of outside dia of specimen tube. Full flattening for testing of laminated and unsound material.
8. Leak Tightness Test	a) On line NDT(Eddy Current) b) Hydro testing at pressure as per above Table and holding time Min. 5 second.
11. Black Varnish	Tubes are uniformly varnished externally over their full length.
10. Zinc Coating	Average 550 Gm/mm² but one side should not be less than 490 Gm/mm². Free from bare Spot, Black spot, rough, overcoating, Peel off or any other surface defect.
11. Threading	For 1/2" & 3/4" - 14 Tpi, 1" To 2" - 11.5 Tpi And 2 1/2" To 6" - 8tpi. Check With Standard Astm Ring And Plug Gauges.
12. Marking	We can do on line stenciling as per this standard & as per customer needs at one meter interval
13. Packing	Hexagonal Type
14. Mill Test Certificate	We can issue a MTC, certifying that the tubes supplied comply with this ASTM A 53 Standard



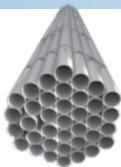
**SPECIFICATION FOR STANDARD SIZES
ASTM A53 GR-B SCHEDULE - 40 FOR
BLACK AND HOT DIPPED GALVANIZED STEEL PIPES**

Designation		OD (Minimum)		OD (Maximum)		Wall Thickness		Weight Tube (Plain End)		Pressure E Gr.A	Weight of the (SS)		Pieces Per Bundle
Inch	NB(mm)	Inch	mm	Inch	mm	Inch	mm	Lb./Ft.	Kg./Mtr.	PSI	Lb./Ft.	Kg./Mtr.	
1/2"	15	0.822	20.90	0.854	21.70	0.109	2.77	0.850	1.27	700	0.860	1.27	120
3/4"	20	1.035	26.30	1.070	27.10	0.113	2.87	1.130	1.69	700	1.140	1.69	84
1"	25	1.300	33.00	1.330	33.80	0.133	3.38	1.680	2.50	700	1.690	2.50	60
1 1/4"	32	1.645	41.80	1.680	42.60	0.140	3.56	2.270	3.39	1300	2.280	3.40	42
1 1/2"	40	1.885	47.90	1.920	48.70	0.145	3.68	2.720	4.05	1300	2.740	4.04	36
2"	50	2.350	59.70	2.400	60.90	0.154	3.91	3.660	5.44	2500	3.680	5.46	26
2 1/2"	65	2.850	72.30	2.900	73.70	0.203	5.16	5.800	8.63	2500	5.850	8.67	18
3"	80	3.460	88.00	3.530	89.80	0.216	5.49	7.580	11.29	2500	7.680	11.35	14
3 1/2"	90	3.960	100.60	4.040	102.6	0.226	5.74	9.120	13.57	2370	9.270	13.71	12
4"	100	4.450	113.20	4.540	115.4	0.237	6.02	10.80	16.07	2210	10.92	16.23	10
5"	125	5.507	139.90	5.620	142.7	0.258	6.55	14.63	21.77	1950	14.90	22.07	7
6"	150	6.560	166.60	6.690	169.9	0.280	7.11	18.99	28.26	1780	19.34	28.58	7
8"	200	8.562	217.50	8.70	221.0	0.322	8.18	28.58	42.55	1570	--	--	4
10"	250	10.669	271.00	10.82	275.0	0.365	9.27	40.52	60.29	1430	--	--	4
12"	300	12.637	321.00	12.85	326.5	0.406	10.31	53.57	79.70	1340	--	--	2



SPECIFICATION FOR STANDARD SIZES ASTM A53 GR-B SCHEDULE- 40 FOR BLACK AND HOT DIPPED GALVANIZED STEEL PIPES

1. Tolerance	a) On Thickness	The minimum wall thickness at any point shall be not more than 12.5% under the specified wall thickness.
	b) On Diameter	For NPS 1 1/2" & under any point shall not vary more than ± 0.4 mm. For NPS 2" & above shall not vary more than $\pm 1\%$ from the standard specified
	c) On Weight	The weight of the pipe shall not more than $\pm 10\%$ of the specified weight.
2. Ends	a) 1 1/2" and below size -	End finish shall be at the option of manufacturer which is nominally square cut with the axis of tube and free from excessive burrs.
	b) 2' and over size	Bevelled with ends beveled to an angle of $30^\circ + 5^\circ - 0^\circ$ degree measured from a line perpendicular to the axis of the pipe with a root face of $1.6 \text{ mm} \pm 0.8 \text{ mm}$.
	2" and above	Internal beads to be removed completely.
3. Internal Debeading		
4. Heat Treatment		Weld Seam of the ERW Pipe in Grade B shall be heat treated after welding to a minimum temperature of 540°C , so that no untempered martensite remains
5. Chemical Composition (% Max)		C - 0.30%, Mn - 1.20%, S - 0.045%, P - 0.050%, Cu - 0.40%, Ni - 0.40%, Cr - 0.40%, Mo - 0.15% & V - 0.08% (Cu+Ni+Cr+Mo+V = 1.0% max.)
	6. Mechanical (Min)	Yield Strength-240 N/mm ² , Tensile Strength-415 N/mm ² , Elongation-19-30%
7. Bend Test	a)	Applicable to tubes upto and including nominal size of 50 mm When ordered for close coiling bend up to 180 degrees around a cylindrical mandrel, The diameter of which is 8 times the OD of pipe.



SPECIFICATION FOR STANDARD SIZES ASTM A53 GR-B SCHEDULE - 40 FOR BLACK AND HOT DIPPED GALVANIZED STEEL PIPES

8. Flattening Test	b) Bend up to 90 degree around a cylindrical mandrel, the diameter is 12 times the OD of pipe. No Crack at any portion and no open in the weld. Applicable to tubes greater than nominal sizes of 50 mm & weld located 0/90 degree from line of direction of force. Stage -1 For weld ductility until 2/3 of outside dia of specimen tube. Stage -2 For ductility of steel until 1/3 of outside dia of specimen tube. Stage -3 Full flattening for testing of laminated and unsound material.
9. Leak Tightness Test	a) On line NDT (Eddy Current) b) Hydro testing at pressure as per above Table and holding time Min. 5 second.
10. Black Varnish	Tubes are uniformly varnished externally over their full length.
11. Zinc Coating	Average 550 Gm/mm² but one side should not be less than 490 Gm/mm². Free from bare Spot, Black spot, rough, overcoating, Peel off or any other surface defect.
12. Threading	For 1/2" & 3/4" - 14 Tpi, 1" To 2" - 11.5 Tpi And 2 1/2" To 6" - 8tpi. Check With Standard Astm Ring And Plug Gauges.
13. Marking	: We can do on line stenciling as per this stanadrd & as per customer needs at one meter interval
14. Packing	Hexagonal Type
15. Mill Test Certificate	We can issue a MTC, certifying that the tubes supplied comply with this ASTM A 53 Standard

SPECIFICATION FOR STANDARD SIZES
AS1074
BLACK AND HOT DIPPED GALVANIZED STEEL PIPES

TUBE	SIZE		OD (Minimum)		Wall Thick-ness	Weight of Tube. (kg./Mtr)		Pressure Bar
	INCH	NB(mm)	INCH	MM	MM	BLACK.	S/S	
LIGHT	1/2"	15	21	21.4	2	0.947	0.956	50
	3/4"	20	26.4	26.9	2.3	1.38	1.39	50
	1"	25	33.2	33.8	2.6	1.98	2	50
	1 1/4"	32	41.9	42.5	2.6	2.54	2.57	50
	1 1/2"	40	47.8	48.4	2.9	3.23	3.27	50
	2"	50	59.6	60.2	2.9	4.08	4.15	50
	2 1/2"	65	75.2	76.0	3.2	5.71	5.83	50
	3"	80	87.9	88.7	3.2	6.72	6.89	50
	4"	100	113	113.9	3.6	9.75	10	50
MEDIUM	1/2"	15	21.1	21.7	2.6	1.21	1.22	50
	3/4"	20	26.6	27.2	2.6	1.56	1.57	50
	1"	25	33.4	34.2	3.2	2.41	2.43	50
	1 1/4"	32	42.1	42.9	3.2	3.1	3.13	50
	1 1/2"	40	48	48.8	3.2	3.57	3.61	50
	2"	50	59.8	60.8	3.6	5.03	5.1	50
	2 1/2"	65	75.4	76.6	3.6	6.43	6.55	50
	3"	80	88.1	89.5	4	8.37	8.54	50
	4"	100	113.3	114.9	4.5	12.2	12.5	50
	5"	125	138.7	140.6	5	16.6	17.1	50
HEAVY	6"	150	164.1	166.1	5	19.7	20.3	50
	1/2"	15	21.1	21.7	3.2	1.44	1.45	50
	3/4"	20	26.6	27.2	3.2	1.87	1.88	50
	1"	25	33.4	34.2	4	2.94	2.96	50
	1 1/4"	32	42.1	42.9	4	3.8	3.83	50
	1 1/2"	40	48	48.8	4	4.38	4.42	50
	2"	50	59.8	60.8	4.5	6.19	6.26	50
	2 1/2"	65	75.4	76.6	4.5	7.93	8.05	50
	3"	80	88.1	89.5	5	10.3	10.5	50
	4"	100	113.3	114.9	5.4	14.5	14.8	50
	5"	125	138.7	140.6	5.4	17.9	18.4	50
	6"	150	164.1	166.1	5.4	21.3	21.9	50

SPECIFICATION FOR STANDARD SIZES

AS I074

BLACK AND HOT DIPPED GALVANIZED STEEL PIPES

1.Tolerances	a) Outside Diameter As per the above Table b) Straightness 0.2 % of the length. c) Mass For quantities of 150 Mtr. and over of one size = $\pm 4\%$, for single tube = $+10\%$ / -8% d) Thickness Light Welded Tube-+ Unlimited , -8 percent, Medium and heavy Tube:-+ Unlimited , -10%
2.Ends	Cut cleanly and nominally square with the axis of the tube and free from excessive burrs.
3.Chemical Composition (% Max)	% Max: S - 0.045% & P - 0.045%, CE-0.40%
4.Mechanical (Minimum)	UTS - 320 to 460 N/mm ² , YS - 195 N/mm ² , (minimum) & %EL- 20 (minimum).
5.Flattening Test	i) For Weld Test - Flatten up to 75% of original tube OD. no cracks in the weld. ii) For Material-Flatten up to 60% of original tube OD. No cracks in the metal other than in the weld.
6. Bend Test	Applicable to tubes upto and including nominal size of 50 mn. i) Ungalvanized tube shall be capable of being bent cold without cracking through 180° round former having radius 6 times the outside dia of tube. ii) Galvanized tube shall be capable of being bent cold without cracking through 90° round former having radius 8 times the outside dia of tube.
7. Leak Tightness Test	i): On line NDT(Eddy Current) ii): Hydro testing at pressure as per above Table and holding time Min. 5 second.
8. Zinc Coating	As per AS 4792
9. Threading	All Thread shall comply with AS 1722.I
10. Color Coding	Light ----- Brown , Medium----Blue, Heavy -----Red
11. Mill Test Certificate	We can issue a MTC, certifying that the tubes supplied comply with this AS I074 Standard