



**GALVANISED  
WIRE &  
STRANDS**  
*FOR POWER SECTOR*



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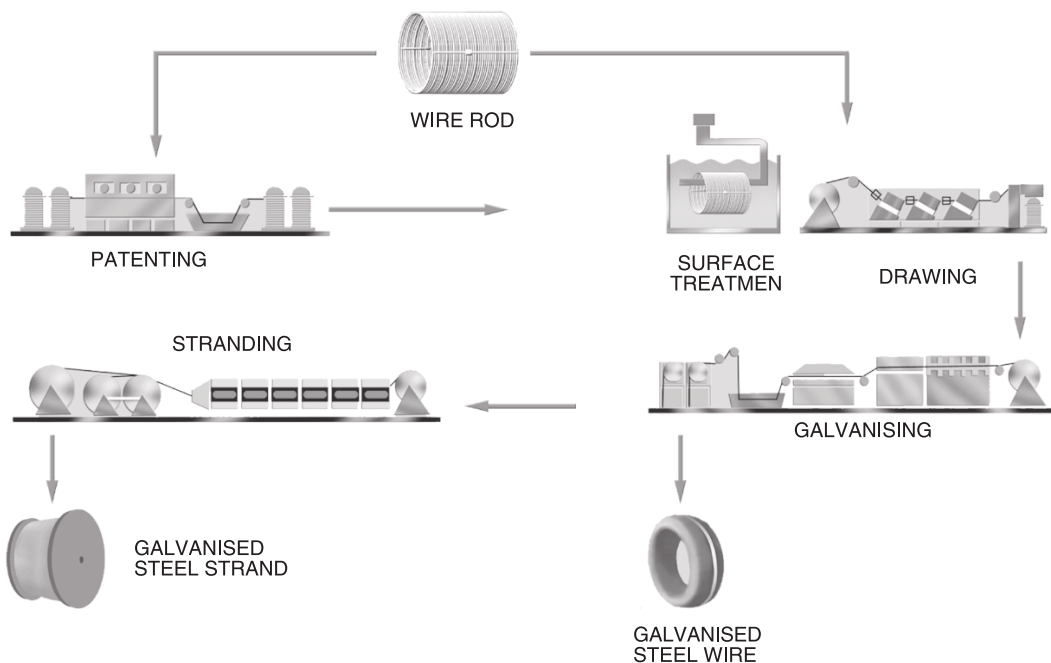
 **usha martin**

The Wire and Wire Rope Division of Usha Beltron Ltd. Is an integral part of the globally acclaimed Usha Martin Group, active in steel wires, steel wire ropes; high carbon alloy and speciality steel wire rods and bars; telecom cables and software; oil drilling services and worldwide distribution of its products.

Our ACSR Core Wire and Strands help reinforce conductors in the Power sector worldwide. These high tensile galvanized steel wires or strands are also used as earthing members for all overhead transmission lines. Also cables like XLPE, PVC, Power and Control Cables etc. require armouring with either round or formed mild steel galvanized wires.

Our wire/strands and earthwire strands are produced from the finest quality high carbon wire rods which are pickled and cooled in a state-of-the-art, fully automatic pickling plant. They are then cold drawn through meticulously die drafts and are finally patented and galvanized inline to produce a smooth surface. A uniform and adherent zinc coating ensures long field life under severe atmospheric conditions. The intricate thermomechanical controls in process technology ensure uniform tensile strength and guarantees torsion and elongation properties. Cable armouring formed wires are produced in rolling mills equipped with precision rollers to ensure perfect curvature and trouble free rapping of PVC over the armouring wires.

Behind our international manufacturing standards are our dedicated machines and ever attentive team of experienced professionals. Together, they have made us renowned as comprehensive, reliable and quality conscious solution provider to the Power sector.



# Galvanised Steel Core Wire for Aluminium Conductors (ACSR Wire)

**End Use : Aluminium Conductors Steel Reinforced  
(for overhead power transmission)**

Specifications : BS-4565, ASTM-B-498/88, IS-398/PART-2/96, IS-398/Part-5/92, Powergrid specification and as per customers' specification.

Size Range Nominal Diameter (mm)	Minimum UTS			Size Tolerance		Minimum Elongation % GL=200mm	Minimum Torsion GL=100x Diameter
	BS-4565 (kg/mm <sup>2</sup> )	ASTM B-498 (kg/mm <sup>2</sup> )	IS-398 Part-2 (kg/mm <sup>2</sup> )	ASTM B-498 (mm)	IS-398 Part-2 (±mm)		
1.18-1.32	142.8	148	-	+0.038	-	4	18
1.33-1.55	142.8	148	142	-0.025	0.03	4	18
1.56-1.80	142.8	148	142		0.03	4	18
1.81-2.24	142.8	148	134		0.04	4	18
2.25-2.72	134.7	144	134	+0.051	0.05	4	18
2.73-3.15	134.7	144	134	-0.51	0.06	4	18
3.16-3.55	134.7	144	134	+0.076/-0.051	0.07	4	18
3.56-4.25	134.7	141	134	+0.102	0.08	4	18
4.26-5.00	134.7	141	-	-0.076	-	4	18

Size Range Nominal Diameter (mm)	Minimum Zinc coating weight			Minimum no. of dips (minutes)	Coil Weight (kg)	Coil I.D. (inches)
	BS-4565 (g/m <sup>2</sup> )	ASTM B-498 (g/m <sup>2</sup> )	IS-398 Part-2 (g/m <sup>2</sup> )			
1.18-1.32	170	183	-	2.0	75-85	16/18"
1.33-1.55	180	183	190	2.0	75-85	16/18"
1.56-1.80	200	198	190	2.0	90-100	21/23"
1.81-2.24	215	214	210	2.0	125-135	21/23"
2.25-2.72	230	229	230	2.5	125-135	21/23"
2.73-3.15	240	244	240	3.0	130-140	21/23"
3.16-3.55	250	259	250	3.0	140-150 or 280-300	23/27"
3.56-4.25	260	274	275	3.0	140-150 or 280-300	27"

Note:

- Size tolerance as per British standard is  $\pm 2\%$  of wire diameter. However more restricted size tolerances as per specific customer's requirements can also be maintained
- The above mentioned values of UTS, Elongation, Torsion and Zinc Coating are before stranding. After stranding, these values are to be modified as below:
  - UTS to be reduced by 5%
  - Elongation to be reduced to 3.5% minimum instead of 4%
  - Torsion to be reduced to 16 instead of 18
  - Zinc coating weight to be reduced by 5%
- We can also produce as per other international standards and /or as per specific customers' requirements
- We can also produce 2.54 mm and 3.53 mm wire for Bersimis and Moose conductors respectively as per powergrid specification

# Galvanised Steel Earthwire Strand/ Groundwire Strand/Core strand for Aluminium Conductors (ACSR Strand)

**End Use :**Earthwire for overhead transmission lines and core strands for aluminium conductors.

Specifications :BS-183, BS-215; ASTM-B-498; IS-2141/92; IS-12776; IS-398 Part-2; is-398 Part-5; Powergrid specification and as per customer's specifications

Construction No. of Wires/ Wire Diameter	Minimum Breaking Load of finished strand						
	Grade 480	Grade 700	Grade 1000	Grade 1100	Grade 1150	Grade 1300	Grade 1570
	(Grade indicates wire tensile grade in N/mm <sup>2</sup> )						
(mm)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)	(kN)
7/0.80	-	2.24	-	3.67	-	-	5.24
7/0.90	2.14	3.10	4.45	-	5.12	5.80	-
7/1.00	2.65	3.85	5.50	-	6.32	7.15	-
7/1.25	4.10	6.00	8.55	8.97	9.88	11.15	12.80
7/1.40	5.17	7.54	10.75	-	12.35	14.00	-
7/1.60	6.75	9.85	14.10	14.70	16.20	18.30	20.98
7/1.80	8.55	12.45	17.80	-	20.50	23.20	-
7/2.00	10.55	15.40	22.00	22.97	25.30	28.60	32.78
7/2.24	-	18.34	-	28.82	-	-	41.12
7/2.36	14.70	21.40	30.60	-	35.20	39.80	-
7/2.50	-	22.86	-	35.92	-	-	51.22
7/2.65	18.50	27.50	38.26	-	44.40	50.20	-
7/3.00	23.75	39.65	49.50	-	56.90	61.30	-
7/3.15	26.20	38.20	54.55	56.98	62.75	70.50	-
7/3.25	27.85	40.65	58.55	-	66.80	75.50	-
7/3.65	35.15	51.75	73.25	-	84.70	95.70	-
7/3.66	-	-	68.40	-	-	-	-
7/4.00	42.20	61.60	88.00	91.88	101.00	111.11	-
7/4.25	47.65	69.90	99.30	-	111.00	129.00	-
7/4.75	59.45	86.80	124.00	-	142.70	161.30	-
Elongation % on 600mm GL	12	8	4	4	4	4	3



Nominal Diameter of Element Wires	Diameter Tolerance	Minimum Zinc Coating Weight of single wire before stranding (After Stranding the coating weight shall be reduced by 5%)			
		BS-183 / BS-215	IS-2141/IS-1277/ IS-398	Powergrid Specification	ASTM B-498
(mm)	(±mm)	(g/m <sup>2</sup> )	(g/m <sup>2</sup> )	(g/m <sup>2</sup> )	(g/m <sup>2</sup> )
0.80	0.03	-	140	-	-
0.90	0.04	140	150	-	-
1.00	0.04	150	150	-	-
1.25	0.04	170	160	-	-
1.40	0.04	180	180	-	183
1.60	0.06	200	190	-	198
1.80	0.06	200	200	-	198
2.00	0.06	215	210	-	214
2.24	0.06	-	210	-	214
2.36	0.06	230	230	-	229
2.50	0.06	-	230	-	229
2.65	0.06	230	230	-	244
3.00	0.06	240	240	-	244
3.15	0.06	240	240	290	259
3.25	0.07	250	250	-	259
3.65	0.07	260	260	-	274
3.66	0.07	-	260	290	274
4.00	0.10	260	275	-	274
4.25	0.10	260	275	-	274
4.75	0.10	275	275	-	305

Note:

- We can also produce 19 wire strand in sizes 1.40 mm and above
- Zinc coating weight and uniformity of coating:
  - For strands as per BS-183 shall be as per BS-443
  - For strands as per ASTM 498 shall be as per Class A coating
  - For strands as per IS-398 Part-2 and Part-5 shall be as per IS-4826
- Lay strength is usually 12-18 times that of overall strand diameter or as per customers' specifications
- Lay direction of outer wire layer is usually right hand or as specified by customer
- We can also produce as per other international standards and/or as per specific customers' requirements

Packing :



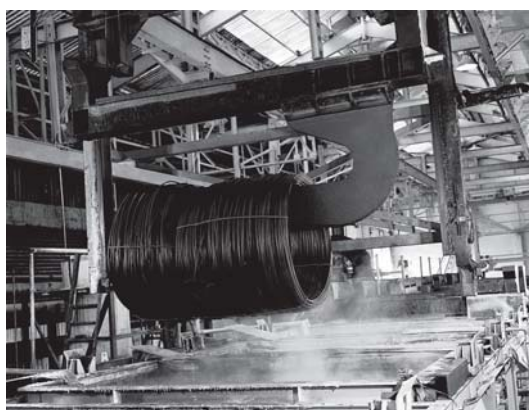
Supplied as per customers' requirement in wooden reels or in coils as per BS-183

# Mild Steel Round and Formed wires for armouring of cables

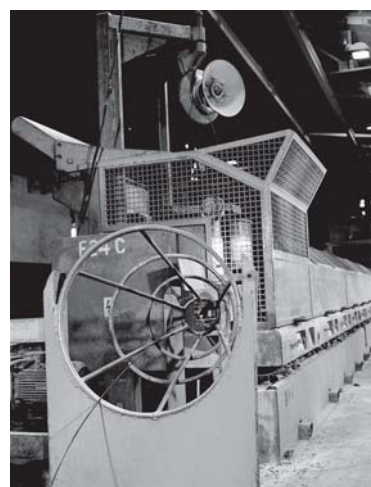
**End Use: Armouring of XLPE, PVC, Power and control cables for various voltage levels**

Specifications: BS-1442, IS-3975/88, ASTM-A-411-1980 AND AS PER CUSTOMER'S SPECIFICATIONS

Nominal Wire Diameter	Diameter Tolerance			Minimum UTS		Minimum Elongation 10% on GL	
	(±)			BS-1442/ ASTM-A-411	IS-3975	BS-1442	IS-3975
	BS-1442	IS-3975	ASTM-A-411				
(mm)	(mm)	(mm)	(mm)	(kg/mm <sup>2</sup> )	(kg/mm <sup>2</sup> )	(mm)	(mm)
0.70	-	0.04	-	-	-	-	125
0.90	0.025	0.05	-	35-49	31-51	90	125
1.25	0.035	0.05	-	35-49	31-51	125	125
1.40	-	0.06	-	35-49	31-51	-	125
1.60	0.045	0.08	-	35-49	31-51	160	125
1.65	-	-	0.08	35-49	-	-	-
2.00	0.050	0.08	-	35-49	31-51	200	250
2.11	-	-	0.08	35-49	-	-	-
2.50	0.065	0.10	-	35-49	31-51	250	250
2.77	-	-	0.10	35-49	-	-	-
3.15	0.080	0.12	-	35-49	31-51	250	250
3.40	-	-	0.10	35-49	-	-	-
4.00	0.100	0.12	-	35-49	31-51	250	250
4.19	-	-	0.10	35-49	-	-	-
CA formed 4.0x3.40x0.8.	-	10%	-	-	31-51	-	250



State-of-the-art pickling plant



High speed wire drawing machine



Nominal Wire Diameter	Minimum Torsion No.			Minimum Zinc coating weight Coil			Coil Weight	I.D.
	GL=152mm ASTM-A-411	BS-1442/IS-3975		BS-1442	IS-3975	ASTM-A-411		
	(mm)	Value	GL (mm)					
0.70	-	43	75	-	60	-	10-20	12-13
0.90	-	33	75	150	75	-	15-25	12-13
1.25	-	24	75	200	90	-	40-60	16-18
1.40	-	43	150	-	90	-	50-70	21-22
1.60	-	37	150	230	95	-	50-70	21-22
1.65	14	-	-	-	-	150	50-70	21-22
2.00	-	30	150	240	105	-	100-110	21-22
2.11	14	-	-	-	-	180	100-110	21-23
2.50	-	24	150	260	110	-	100-110	21-23
2.77	14	-	-	-	-	240	100-110	21-23
3.15	-	19	150	275	120	-	100-110	21-23
3.40	10	-	-	-	-	240	100-110	21-23
4.00	-	15	150	290	135	-	100-110	21-23
4.19	10	-	-	-	-	270	100-110	21-23
CA Formed 4.0x3.40 x0.80	-	NIL	Nil	-	110	-	70-100	21-23

Note

- Uniformity of zinc coating as per various standards are as follows-
  - For wires as per BS-1442, uniformity as per BS -443
  - For wires as per IS-3975, uniformity as per IS-4826, Medium coating  
For 4.0 x 3.40 x 0.80 as per IS-3975, uniformity dips for force and 0.5 dips for edge
- Resistivity 14.5 x 10 ohm -cm for all round wires and formed wires as per IS-3975
- Resistivity 13.8 x 10 ohm-cm for all wires as per BS-1442
- We can also produce as per other international standards and/or as per specific customer's requirements
- Higher coil weights can be as per customers' requirements

Packing :



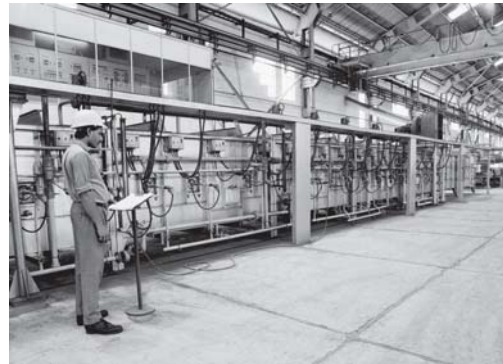
In coil form wrapped with polythene or polycoated hessian or as per Customer's Specifacaton

### *Some prestigious orders executed include:*

Product Details	Quantity	Client/Project
3.53mm ACSR Core Wire	2000 MT	Powergrid for North Eastern Grid through EMC Ltd.
2.21 mm ACSR Core Wire	250 MT	Powergrid 400Kv Naptha-Jhakari Project through Modern Malleables Ltd.
7/1.90 MM ACSR Strand	966 KM	RMI Steels for export to Iraq
7/3.66 mm Earthwire Strand	477 KM	Powergrid Talcher II Project Pkg.D through KEC International Ltd.
7/3.66 mm Earthwire Strand	561 KM	Powergrid Talcher II Project Pkg C through Jyoti Structures Ltd.
7/3.66 mm Earthwire Strand	610 KM	Powergrid Talcher II Project Pkg B through Kalpataru P.T. Ltd.
7/3.66 mm Earthwire Strand	558 KM	Powergrid Talcher II Project Pkg E through Hyundai Engineering Ltd.
7/3.66 mm Earthwire Strand	734 KM	Powergrid Talcher II Project Pkg A through Hyundai Engineering Ltd
Various sizes/constructions of Earth wire stand	530 MT	Bullivants Pty. Ltd., Australia
7/4.00 mm Earth wire stand	350 MT	Electricity Authority of Cyprus, Cyprus
19/2.16 mm Earth wire stand	1000 MT	Midal Cables Ltd., Bahrain
Various sizes/constructions of Earth wire stand	400 MT	Necks LB Material AB, Sweden

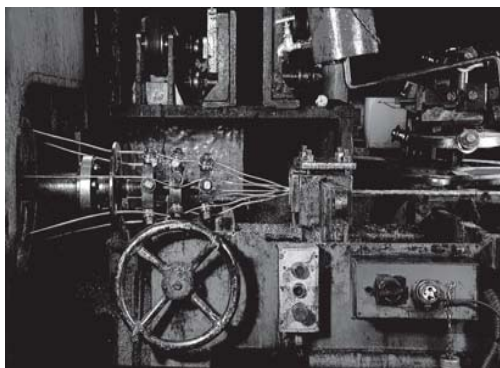






Le Four furnace for high quality patenting/galvanising

DSW furnace



Seven wire stranding machine

## Corporate Office

### USHA MARTIN LIMITED

2A, Shakespeare Sarani, 'Mangal Kalash', Kolkata - 700071  
Phone: +91 33 3980 0300, Fax: +91 33 2282 9029/ 3980 0500  
Email: feedback@ushamartin.com

## Domestic Offices

### East Regional Office

#### USHA MARTIN LIMITED

2A, Shakespeare Sarani  
'Mangal Kalash'  
Kolkata - 700071  
Phone: +91 33 3980 0300/ 0458  
Fax: +91 33 2282 9029/ 3980 0500  
Email: marketing-east@ushamartin.com

### South Regional Office

#### USHA MARTIN LIMITED

Plot No. L9 (1), Phase-II  
Sipcot Industrial Park, Sriperumbudur  
Kancheepuram - 602105  
Chennai, Tamilnadu  
Phone: +91 44 3717 5100 (24 Lines)  
Fax: +91 44 3717 5200  
Email: marketing-south@ushamartin.com

### North Regional Office

#### USHA MARTIN LIMITED

701, 'Surya Kiran'  
19, Kasturba Gandhi Marg  
New Delhi - 100 001  
Phone: +91 11 2331 5156 / 5157 / 5158  
2371 1232 / 2371 5220  
Fax: +91 11 2332 0723 / 5586  
Email: marketing-north@ushamartin.com

### West Regional Office

#### USHA MARTIN LIMITED

168, CST Road,  
Agarwal Industrial Estate  
Kalina, Santa Cruz (E)  
Mumbai - 400 098  
Phone: +91 22 3064 5400  
Fax: +91 22 2652 6774  
Email: marketing-west@ushamartin.com

## Overseas Offices

### USHA MARTIN UK LIMITED

#### USHA MARTIN INTERNATIONAL LIMITED

Tasman House, Mariner Court  
Clydebank, Glasgow, UK G81 2NR, UK  
Tel: + 44 (0)141 951 8801  
Fax: + 44 (0) 141 951 8802  
Email: marketing-uk@ushamartin.com

### EUROPEAN MANAGEMENT & MARINE CORP.

Howe Moss Place, Kirhill Industrial Estate  
Dyce, Aberdeen AB 21 OGS, Scotland, U.K  
Ph: +44 1224 77 5151  
Fax: +44 1224 775252  
Email: info@emmcorg.com

### BRUNTON SHAW UK

(A Division of Usha Martin UK Limited)  
Sandy Lane, Workshop, S80 3ES, UK  
Tel: + 44 1909 537 600  
Fax: + 44 1909 500 199  
Email: marketing-bsuk@ushamartin.com

### DE RUITER STAALKABLEL B.V.

Ringerstraat 7, 3164 BA, Sliedrecht  
Holland  
Tel: + 31 (0)184 49 9999  
Fax: +31 (0) 184 41 8351  
Email: sales@drstk.nl

### USHA MARTIN AMERICAS, INC

701 Plastics Avenue, Houston  
Texas 77020, USA  
Ph: +1 713 676 1800  
Fax: +1 713 333 0615  
Email: marketing-us@ushamartin.com

### USHA MARTIN AUSTRALIA PTY LTD

Unit 2/ 468-470, Victoria Street  
St.Wetherill Park, NSW 2164, Australia  
Ph: +61 296 094971  
Fax: +61 297 566516  
Email: marketing-australia@ushamartin.com

### USHA MARTIN SINGAPORE PTE LIMITED

91 Tuas Bay Drive, Usha Martin Building,  
Singapore - 637307  
Ph: +65 6265 7756  
Fax: +65 6265 7226  
Email: marketing-singapore@ushamartin.com

### USHA MARTIN VIETNAM CO. LTD

Unit 201, 18A, D2 Street ,  
Ward 25, Binh Thanh Dist.  
Ho Chi Minh City, S.R Vietnam  
Tel: +84 8 3512 2209  
Fax : +84 8 3512 2210  
Email : marketing-vietnam@ushamartin.com

### PT. USHA MARTIN INDONESIA

Konica Building 3A Fl  
Jl. Gunung Sahari Raya 78  
Jakarta 10610 - Indonesia  
Ph: +62 21 42870794  
Fax: +62 21 42870795  
Email: marketing-indonesia@ushamartin.com

### BRUNTON WOLF WIRE ROPES FZCO

P.O. Box. 17491, M00301  
Jebel Ali Free Zone, Dubai, U.A.E  
Tel: + 971 04 8838151  
Fax: + 971 04 8838152  
Email: marketing-bsme@ushamartin.com

### USHA SIAM STEEL INDUSTRIES PUBLIC CO. LTD

209 K-Tower-B, 22nd Floor, Unit 3/1  
Sukhumvit 21 Road (Asok)  
Bangkok - 10110, Thailand  
Te l: +662 261 7361 to 64  
Fax: +662 640 8227  
Email: marketing-thailand@ushamartin.com

### USHA MARTIN EUROPE B.V.

Leerlooierstraat 3  
2984 BK Ridderkerk  
The Netherlands  
Phone: +31 (0)180 74 50 99  
Mobile: +31 (0)635 11 29 31  
E-mail: d.gelton@ushamartineurope.com

### USHA MARTIN CHINA CO. LTD.

No. 3261 Shanghai Zhenhua Building B, Unit 1618  
Dong Fang Road, Shanghai, P,R, China  
Postal Code: 200125  
Tel: +86 21 6858 8699  
Fax: +86 21 6858 8711  
Email: yhw@umchina.com.cn