Hiver

ELECTRICAL WIRES

CCA COPPER CLAD ALUMINIUM WIRE

AL-ALLOY ALUMINIUM ALLOY WIRE

Garg Inox Ltd.

we make the wire you desire

Backed by Experience

Years of experience enable our engineers, designers, tool makers, technicians, machining and production staff to offer the innovative advice to shape the best possible solutions.

At GARG INOX, our people stand behind their ideas and we stand behind our people. In our continuous efforts to innovate and bring internationally acclaimed products to India we introduce, Hiver range of electrical wire in two categories 'CCA' & 'AL-ALLOY'.

GARG INOX established in 1995, marketing its product under the brand name GARG WIRE having an annual turnover of over 70 million US Dollars is amongst the top wire manufacturers of the country.

The Company is a government certified Export House, having Sales Offices in USA, U.K. and Turkey. It is this quality probably that Garg Inox today exports its high quality products to a very vast clientele in over 50 countries of the world and its operations spanning 4 continents.


Certificate of Approval

Garg Inox Limited

ISO 9001:2000

IAF

ISO 9001 : 2000 Certified


GOVERNMENT OF INDIA

MINISTRY OF COMMERCE & INDUSTRY

OFFICE OF THE JOINT DIRECTOR GENERAL OF FOREIGN TRADE

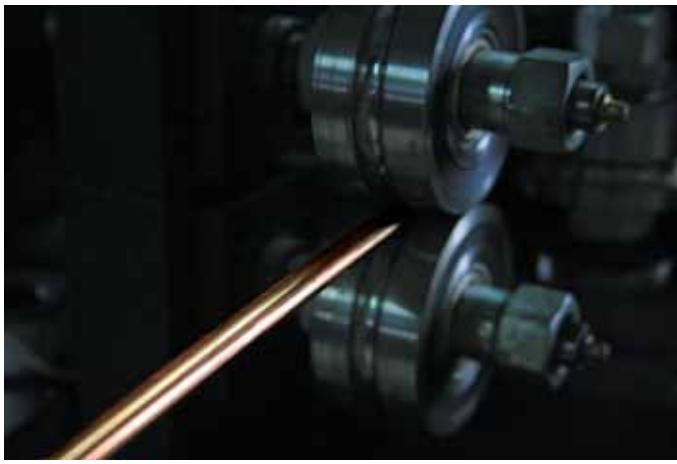
Certificate of Recognition

ONE STAR EXPORT HOUSE

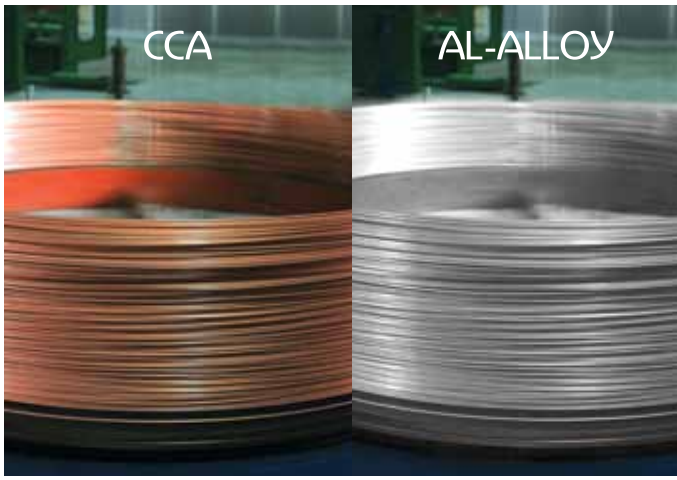
Government Approved Export House

INFRASTRUCTURE

The Company is a Government Certified Export House, having Sales Offices in USA, U.K. and Turkey.



Production Capacity -
100 MT of Copper Clad Aluminium Wire &
100 MT of AL- ALLOY Wire Per Month



All Products are tested against lowest possible level of Radioactive Contamination (RaC).

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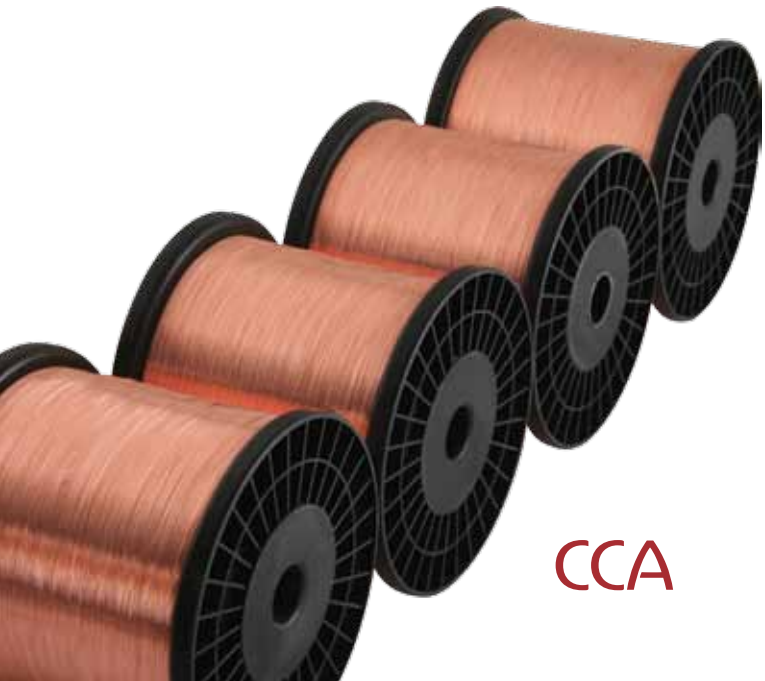
ELECTRICAL WIRES

AL-ALLOY

Exploring Technologies

After being immensely successful and acquiring the status of masters in the field of stainless steel wires, we are the first and only Indian company venturing into the arena of producing the finest quality of COPPER CLAD ALUMINIUM & ALUMINIUM ALLOY WIRE used in electrical and mechanical applications.

The USP of these revolutionary products are that they have reduced costs yet giving a better finished product.



CCA

The Shape of Things to Come

Today and tomorrow, our company will be shaped by innovation.

Like our founders, we will continue to embrace a timeless commitment to quality and craftsmanship.

We will continue to put customers first, drawing on our proven experience.

And, we will continue to grow-building on our unique technology and processes to embrace challenges that are ahead of our time.

Today and tomorrow, we will be shaped by our desire to provide more innovative wires & components than any other quality wire producer.

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CCA COPPER CLAD ALUMINIUM WIRE

As per ASTM : B-566

Copper clad aluminium wire is produced with the production process of cladding welding drawing method. By cladding copper strip concentrically on the outer surface of the aluminium core. To meet customer's requirement wire is treated and drawn several times. CCA wire has the characteristics of both copper wire & aluminium wire low density from aluminium wire & good conductor from copper wire. This kind of bimetallic wire is suitable for most electrical applications.

ADVANTAGES

- The bimetallic wire integrates the beneficial properties of good conductivity of copper & light weight of aluminium in a single wire called CCA wire
- CCA wire can be easily processed to fine or flat wire
- The density of CCA is about 37-40 % of that of copper. Its length is 2.45 – 2.65 times of copper in the same weight & diameter. These factors reduce the raw material cost for cable manufacturers.
- Environment friendly, CCA saves the copper resources & its production is a nonpolluting process.
- CCA is easy to transport & install as its light weight.

NOW A DAYS CCA WIRES ARE WIDELY USED IN

Telecommunications
CATV
Coaxial drop wire
Antenna wire
Composite cables
50 ohm antenna cable

Telephone
Drop wire
Telephone conductor

Electric Utilities
Transmission Lines
Buried counterpoise wire

Data Cable
Structure ground leads
Flexible Cable

Switch Yards and Substations
Substation ground grid wire
Fence and structure grounds

Distribution Lines
Pole ground wire
Transformer grounds
Surge arrestor down leads

Generation Plants
Building lightning protection
Building ground wire

Industrial
Drop wire
Magnet wire
Transformer windings
Building wire
Automotive wiring harnesses
Battery cables
Railway Signals

Electronics
Substation ground grid wire
Fence and structure grounds
Coax center conductor for LANs
Electronic components
Lead wire for transistors, resistors, capacitors
Radio frequency shielding

Transit
Substation ground grid wire
Fence and structure grounds
Catenaries messenger wire
Grounding wire
Guy wire

CHARACTERISTICS COMPARISON

Characteristic	CCA Wire	Copper Wire	Aluminium Wire
Copper Volume	15	100	O
Gravity	3.63	8.89	2.7
Length Comparison With Copper	2.5 : 1	1:1	3.29 : 1
Conductivity	70	100	62
DC Resistivity	0.02462	0.01724	0.0274
Tensile Strength(N/mm2)	95-135	215-265	68-107
Elongation (%)	≥10	≥20	≥8
Windablity	Good	Very Good	Good
Weight	Good	Bad	Very good
Soldering	Very good	Very good	Bad
DC resistance	Good	Very Good	Good

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PHYSICAL PROPERTIES

Specification	Copper in volume %	Copper in mass %	length comparison	Density (g/cm3)	Max. DC resistivity Ω.mm2/ /m(20°c)	Min. conductivity (% IACS)
CCA-10% Copper Volume	8~<13	27	2.65:1	3.32	0.02743	63
CCA-15% Copper Volume	13-17	37	2.45:1	3.63	0.02676	65
Copper Wire	100	100	1:1	8.89	017241	100

CCA CHARACTERISTICS

Nominal Diameter	Cross Section	Copper Thickness (mm)		Mass Per Unit Length (kg/km)			DC Resistance Per Unit Length (Ω/km)20°c			Tensile Strength (N/mm2)		Elongation %	
		CCA-10%	CCA-15%	CCA-10%	CCA-15%	COPPER	CCA-10%	CCA-15%	Copper	Annealed	Hard	Annealed	Hard
6.00	28.26	0.105	0.150	93.82	102.58	251.20	0.97	0.95	0.61	138	124	15	1.5
5.15	20.82	0.090	0.129	69.12	75.58	185.09	1.32	1.29	0.83	138	152	15	1.5
5.08	20.26	0.089	0.127	67.26	73.54	180.11	1.35	1.32	0.85	138	152	15	1.5
4.97	19.39	0.087	0.124	64.37	70.39	172.57	1.41	1.38	0.89	138	152	15	1.5
4.90	18.85	0.086	0.123	62.58	68.42	167.75	1.46	1.42	0.91	138	152	15	1.5
4.85	18.47	0.085	0.121	61.32	67.03	164.34	1.49	1.45	0.93	138	152	15	1.5
4.80	18.09	0.084	0.120	60.06	65.65	160.97	1.48	1.52	0.95	138	152	15	1.5
4.50	15.90	0.079	0.113	52.79	57.70	141.47	1.73	1.68	1.08	138	159	15	1.5
4.00	12.56	0.070	0.100	41.70	45.59	111.78	2.18	2.13	1.37	138	166	15	1.5
3.85	11.70	0.068	0.097	38.84	42.46	104.69	2.35	2.29	1.47	138	166	15	1.5
3.60	10.17	0.063	0.090	33.76	36.93	90.56	2.70	2.63	1.69	138	172	15	1.5
3.50	9.616	0.061	0.088	31.93	34.91	85.58	2.85	2.78	1.79	138	172	15	1.5
3.38	8.968	0.059	0.085	29.77	32.55	79.82	3.06	2.98	1.92	138	172	15	1.5
3.20	8.038	0.056	0.080	26.69	29.18	71.54	3.41	3.33	2.14	138	179	15	1.5
3.00	7.065	0.053	0.075	23.45	25.65	62.88	3.88	3.79	2.44	138	179	15	1.5
2.85	6.376	0.050	0.071	21.17	23.15	56.75	4.30	4.20	2.70	138	186	15	1.5
2.80	6.154	0.049	0.070	20.43	22.34	54.77	4.46	4.35	2.80	138	186	15	1.5
2.77	6.023	0.046	0.069	19.88	21.86	53.61	4.55	4.44	2.86	138	186	15	1.5
2.50	4.906	0.044	0.063	16.29	17.81	43.66	5.59	5.54	3.51	138	193	15	1.5
2.30	4.153	0.040	0.058	13.97	15.08	36.96	6.61	6.44	4.15	138	200	15	1.5
2.20	3.799	0.0385	0.055	12.61	13.79	33.81	7.22	7.04	4.54	138	200	15	1.5
2.18	3.730	0.0382	0.054	12.39	13.54	33.20	7.35	7.17	4.62	138	200	15	1.5
2.15	3.629	0.0377	0.058	12.06	13.17	33.30	7.56	7.37	4.75	138	200	15	1.5
2.05	3.299	0.036	0.051	10.95	11.98	29.36	8.31	8.11	5.23	138	205	15	1.5
2.00	3.140	0.035	0.050	10.42	11.4	27.95	8.74	8.52	5.49	138	205	15	1.5
1.95	2.985	0.034	0.049	9.910	10.84	26.57	9.91	8.96	5.78	138	205	15	1.5
1.81	2.572	0.032	0.045	8.539	9.34	22.89	10.67	10.40	6.70	138	205	15	1
1.70	2.269	0.030	0.043	7.533	8.24	20.19	12.09	11.8	7.60	138	205	15	1
1.63	2.086	0.0289	0.041	6.926	7.57	18.57	13.15	12.8	8.27	138	205	15	1
1.50	1.766	0.026	0.038	5.863	6.41	15.72	15.53	15.2	9.76	138	205	15	1
1.30	1.327	0.023	0.035	4.406	4.82	11.81	20.68	20.2	13.0	138	205	15	1
1.02	0.082	0.018	0.026	2.712	2.97	7.27	33.59	32.8	21.1	138	205	15	1
0.95	0.708	0.017	0.024	2.350	2.57	6.30	38.72	37.8	24.3	138	205	15	1
0.81	0.515	0.014	0.200	0.710	1.87	4.58	53.26	52.0	33.5	138	205	15	1
0.75	0.442	0.013	0.019	1.467	1.6	3.93	62.12	60.6	39.0	138	205	15	1
0.63	0.316	0.011	0.016	1.049	1.15	2.81	88.04	85	55.3	138	205	15	1
0.50	0.196	0.009	0.013	0.651	0.71	1.74	139.77	136	87.9	138	205	10	1
0.30	0.071	0.005	0.006	0.263	0.258	0.632	388.25	379	244	138	205	5	1
0.10	0.008	0.02	0.003	0.027	0.029	0.071	3494	3409	2196	138	205	5	1

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ELECTRICAL WIRES

AL-ALLOY

ALUMINIUM ALLOY WIRE

ADVANTAGES

Aluminium's unique combination of properties make it a highly versatile material when alloyed with various metals. Besides light weight characteristics and corrosion resistance property it's excellent workability make it an natural choice for industrial use.
AL-ALLOY wires are used in many products by the leaders of the industry as raw material.

MECHANICAL PROPERTIES

Diameter (mm)	Tensile Strength (N/mm2)	Elongation (%)	Resistivity at 20 ^{O} C	Diameter Tolerance (mm)
0.22	≥ 210	≥ 12	≥ 0.051	+/- 0.006
0.20	≥ 210	≥ 10	≥ 0.051	+/- 0.006
0.18	≥ 210	≥ 9	≥ 0.051	+/- 0.005
0.16	≥ 210	≥ 8	≥ 0.051	+/- 0.004
0.15	≥ 210	≥ 8	≥ 0.051	+/- 0.004
0.12	≥ 210	≥ 7	≥ 0.051	+/- 0.004

NOW A DAYS AL-ALLOY WIRES ARE WIDELY USED IN

- Electrical & Telecommunication cables.
- Flexible cables.
- Coaxial cables.
- Wire used electrical appliances.
- Aluminium pads (example: metal sponges for cleaning bristles)
- Anodic treatment (example for fixing profiles)
- Water-bottle carrier/parcel grids for bicycles
- Ornamental chains for costume jewellery
- Mosquito nets
- Metal network: nets, mesh, filters and other products
- Cold presswork sector including: rivets, solid, no-through, semi-bored, semi-rounded, flat headed (example) for jeans, for blocking saucepan handles, for the automobile industry and household appliances rivets - screw and nails (for nailing frames, verandas, roof coverings)
- Zips - trouser zips
- Darning needles
- Foodstuff clips, metal staples (example for sausage type foods, tea bags)
- Lightning conductors
- Clips, staples for staplers, paper clips
- Clothes pegs, Aluminium clothes hangers, usually used by dry cleaners
- Refrigerator grilles
- Drying racks
- Metal coating
- Pipe hose for sanitary fittings
- Pipe hose for low pressure drinking water, for low pressure oil, air and petrol, anti-vibration tubes
- Steel deoxidizer in the continuous casting process
- TV Aerials
- Wire Cloth.
- Hoses

CHEMICAL COMPOSITION

	Element (%)							
STANDARD	Si	Fe	Cu	Mn	Mg	Zn	Ti	Al
5154	0.45	0.45	0.10	0.8-1.3	2.8-3.5	0.20	0.20	Remaining

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AL-ALLOY

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