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ISO 9001:2008
QEC-14024



**FLEXIBLE
CONNECTORS**



TORSION

- Flexible Connectors
- Laminate Flexibles
- Stranded Cables
- Braided Flexible
- Earthing Tapes
- Braided Tapes



Flexible CONNECTORS

HIGH FLEXIBLE AIR COOLED COPPER CONNECTORS

Highly flexible connectors are manufactured by braided tapes with bare, tin or silver coated copper wires diameter of 0.10/0.20 mm. Standard flexibles are non insulated but on request it is possible to deliver the connectors with insulation tubes. Standard lengths are 300 mm and drilling patterns are specified, however the designs lengths and drilling patterns are changeable to suit your fitment. The contact areas are assembled with solderless pressed bare copper connectors which on request are tin or silver coated.

The advantages of the solderless pressing process is that only material of same analysis and same conductivity is being connected which is not the case where tin or welding is additionally used.

Standard manufactured connectors have a width of 20-300mm. Possible cross-sections are 25-6000 sq mm or above.

FLEXIBLE EXPANSION CONNECTORS

Flexible connectors are manufactured of Copper or Aluminium strips.

They consist of several stacked strips riveted or welded at contact areas having a constant cross-section over the whole length. Busbars and laminated connectors with the same cross-section can be loaded with the same current.

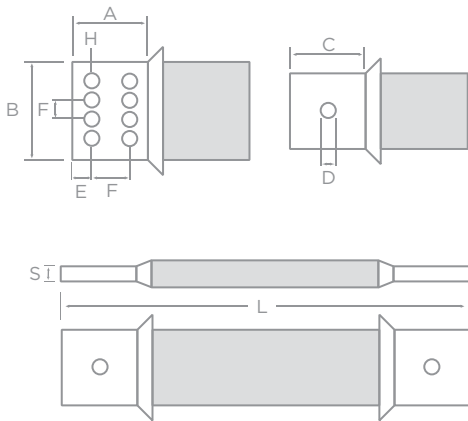
Laminated connectors are utilised as flexible expansion connectors in order to connect busbars of switch gears, transformers, generators, etc. Due to their elasticity, thermal expansion of busbars is being compensated. Most of the parts are being used as expansion connectors to prevent damages caused by vibration at switch gear operations.

Another area of applications are inside parts of machinery (e.g. welding machines, transformers) or switch gears as flexible components. These kind of connectors have to realise movement inside machines and switch gears. We have different methods of production, to manufacture suitable connectors for the variable applications. Hence, we are able to manufacture connectors in

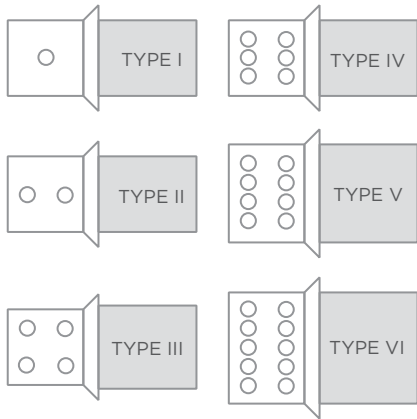
- press-riveted design
- fusion-welded or soldered design
- press-welded design

We at Torsion, are also developing customised connectors in co-operation with user companies.

Flexible CONNECTORS



TYPES



Standard flexible have dimensions
L = 300 F = 50 E = 25

While enquiring please specify

- Type (Braided/Laminated)
- Material (Copper/Aluminium)
- Changes if required in dimension (L, F, E)
- Dimensions (A, B, C, D)
- Braids/Lamination (Bare/Tinned)
- Contact areas (Bare/Tinned/Silver plating)
- Drilling details
- Aluminium/Copper bimetallic connections if any

Besides flexibles can also be fabricated as per your design, size and specifications.

APPLICATIONS

- Transformer
- Switchgear
- Bus ducts / Bus ways
- Terminal connectors
- Generators
- Cable tray

ADVANTAGES

- Prevents damages by vibration
- Thermal expansion & misalignment compensated
- Realises movements & expansion in equipments
- Prevents damages due to earthquake

Part no.	Type	mm ²	B	A	T
20005	I	25	20	20	3.0
20010	I	50	20	20	5.0
20015	I	75	20	20	6.0
20020	I	100	20	20	8.0
25005	I	25	25	25	3.0
25010	I	50	25	25	4.0
25015	I	75	25	25	7.0
25020	I	100	25	25	8.0
25025	I	125	25	25	9.0
30010	I	50	30	30	5.0
30015	I	75	30	30	6.0
30020	I	100	30	30	7.0
30030	I	150	30	30	9.0
30040	I	200	30	30	11.0
30060	I	300	30	30	15.0
38020	I	100	38	38	6.0
38030	I	150	38	38	8.0
38040	I	200	38	38	9.0
38050	I	250	38	38	10.5
38060	I	300	38	38	12.0
38080	I	400	38	38	15.0
40020	I	100	40	40	6.0
40030	I	150	40	40	8.0
40040	I	200	40	40	9.0
40050	I	250	40	40	10.0
40060	I	300	40	40	12.0
40080	I	400	40	40	15.0
50028	II	140	50	50	7.0
50042	II	210	50	50	8.0
50056	II	280	50	50	10.0
50084	II	420	50	50	13.0
50112	II	560	50	50	16.0
55028	II	140	55	55	6.0
55042	II	210	55	55	8.0
55056	II	280	55	55	9.0
55084	II	420	55	55	12.0
55112	II	560	55	55	14.0
60028	II	140	60	60	6.0
60042	II	210	60	60	7.0
60070	II	350	60	60	10.0
60098	II	490	60	60	13.0
60112	II	560	60	60	14.0
65028	II	140	65	65	6.0
65042	II	210	65	65	7.0
65070	II	350	65	65	9.0
65098	II	490	65	65	11.0
65112	II	560	65	65	13.0
70028	III	140	70	70	5.5
70042	III	210	70	70	6.5
70070	III	350	70	70	8.5
70098	III	490	70	70	10.5
70112	III	560	70	70	12.0
75068	III	340	75	75	8.0
75100	III	500	75	75	11.0
75135	III	670	75	75	13.0
75168	III	840	75	75	16.0
75202	III	1010	75	75	18.0
80068	III	340	80	80	8.0
80100	III	500	80	80	10.0
80135	III	670	80	80	12.0
80168	III	840	80	80	15.0
80202	III	1010	80	80	17.0

Part no.	Type	mm ²	B	A	T
90100	III	500	90	90	9.0
90134	III	670	90	90	11.0
90168	III	840	90	90	13.0
90200	III	1000	90	90	15.0
90240	III	1200	90	90	17.0
90300	III	1500	90	90	21.0
100100	III	500	100	100	9.0
100134	III	670	100	100	11.0
100168	III	840	100	100	13.0
100200	III	1000	100	100	14.0
100240	III	1200	100	100	16.0
100300	III	1500	100	100	20.0
110100	III	500	110	100	8.0
110134	III	670	110	100	10.0
110168	III	840	110	100	11.0
110200	III	1000	110	100	13.0
110240	III	1200	110	100	15.0
110300	III	1500	110	100	18.0
120120	III	600	120	100	9.0
120200	III	1000	120	100	12.0
120300	III	1500	120	100	17.0
120400	III	2000	120	100	22.0
120600	III	3000	120	100	30.0
120900	III	4500	120	100	44.0
127120	III	600	127	100	8.0
127200	III	1000	127	100	12.0
127300	III	1500	127	100	16.0
127400	III	2000	127	100	20.0
127600	III	3000	127	100	28.0
127900	III	4500	127	100	40.0
150400	IV	2000	150	100	18.0
150520	IV	2600	150	100	22.0
150660	IV	3300	150	100	28.0
150940	IV	4700	150	100	38.0
151200	IV	6000	150	100	46.0
160400	IV	2000	160	100	17.0
160520	IV	2600	160	100	21.0
160660	IV	3300	160	100	25.0
160940	IV	4700	160	100	34.0
161200	IV	6000	160	100	43.0
175400	V	2000	175	100	16.0
175500	V	3000	175	100	22.0
175600	V	4000	175	100	28.0
175940	V	5000	175	100	34.0
171200	V	6000	175	100	39.0
185400	V	2000	185	100	15.0
185500	V	3000	185	100	21.0
185600	V	4000	185	100	26.0
185940	V	5000	185	100	32.0
181200	V	6000	185	100	37.0
200400	V	2000	200	100	16.0
200500	V	3000	200	100	21.0
200600	V	4000	200	100	26.0
200940	V	5000	200	100	31.0
201200	V	6000	200	100	37.0
240400	VI	2000	240	100	14.0
240500	VI	3000	240	100	18.0
240600	VI	4000	240	100	22.0
240940	VI	5000	240	100	27.0
241200	VI	6000	240	100	31.0

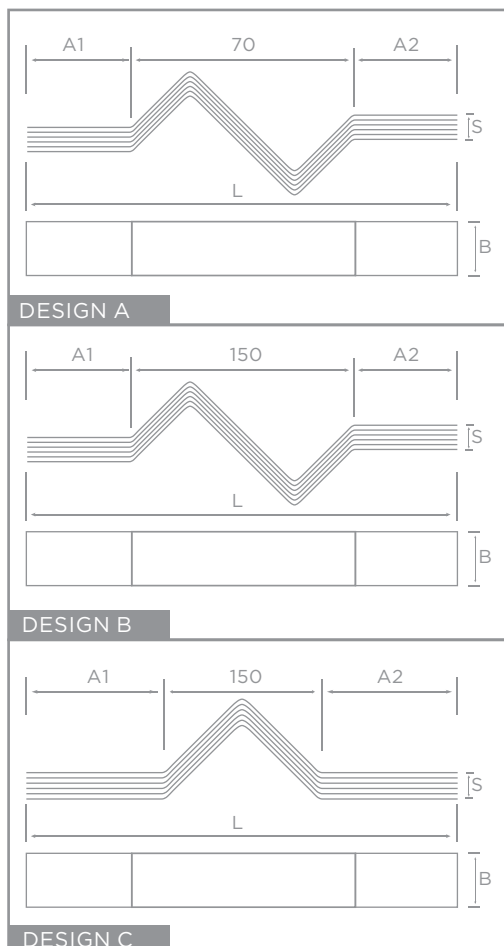
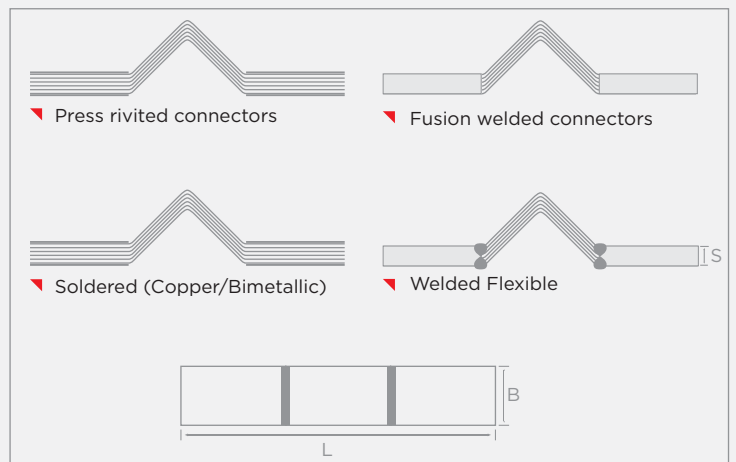
Design	mm ²	L	B	C	D	E	F	S
20024	21024	120	430	40	20	9	20	10
25037	26037	185	500	50	25	11	25	12
30048	31048	240	600	60	30	11	32	12
40059	41059	300	700	80	40	14	40	12
40079	41079	400	850	80	40	14	40	14
40100	41100	500	950	80	40	14	40	17
50120	51120	600	1000	80	50	14	40	16
50140	51140	700	1200	80	50	14	40	18
50150	51150	750	1250	80	50	14	40	19
50170	51170	850	1350	80	50	14	40	22
50200	51200	1000	1500	80	50	14	40	25

Laminate FLEXIBLES



Flexible connectors are manufactured by Copper or Aluminium strips. They consist of several stacked strips with riveted or welded contact areas. They have a constant cross-section over the whole length. Busbars and laminated connectors with the same cross-section can be loaded with the same current. To manufacture suitable connectors for the variable applications we have different methods of production. So we manufacture connectors in various types.

TYPES OF LAMINATED FLEXIBLES



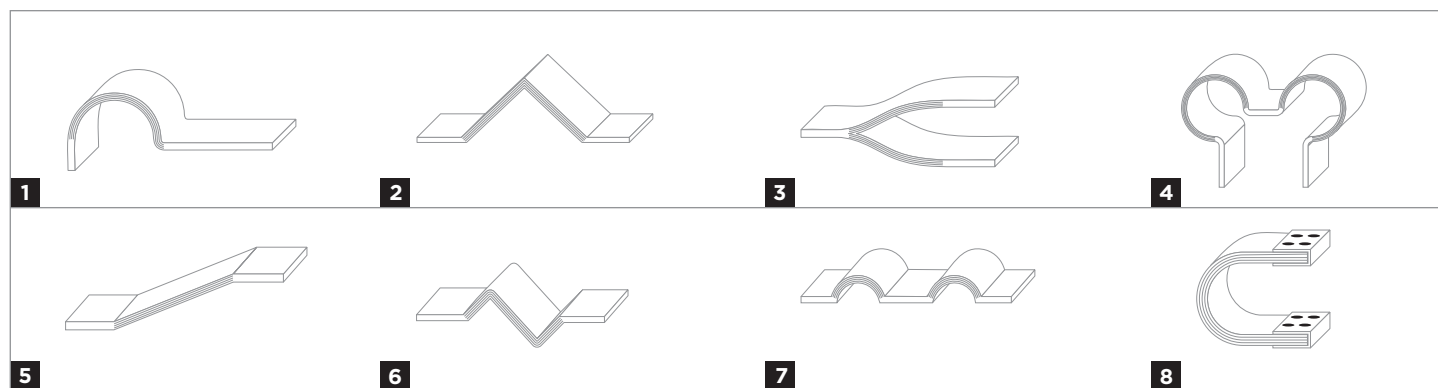
Part no.	mm ²	B	A1/A2	S	L
F50600	300	50	50	6	250
F50100	500	50	50	10	250
F50120	600	50	50	12	250
F75090	450	75	75	6	300
F75150	750	75	75	10	300
F75180	900	75	75	12	300
F100120	600	100	100	6	350
F100200	1000	100	100	10	350
F100240	1200	100	100	12	350
F120144	720	120	120	6	390
F120240	1200	120	120	10	390
F120288	1440	120	120	12	390
F150180	900	150	150	6	450
F150300	1500	150	150	12	450
F150360	1800	150	150	12	450
F200240	1200	200	200	6	550
F200400	2000	200	200	10	550
F200480	2400	200	200	12	550

While ordering please specify

- Part no.
- Design (A/B or C)
- Shape
- Length of the contact areas i.e. A1 and A2
- With or without drilling
- Material copper / Aluminium
- Lengths are changeable
- Connectors with bigger cross-section are available
- Add prefix 'T' to Part no. if connector is required tinned

Laminate FLEXIBLES

SHAPES



Stranded CABLES



Part No Copper Bare	Copper Tinned	Nominal Cross Section mm ²	Cable Construction	Overall Diameter mm	Net Weight Kg/1000M
4071	6071	2	68 x 0.19	2.2	20
4072	6072	2.5	85 x 0.19	2.4	25
4073	6073	3	102 x 0.19	2.5	30
4074	6074	4	137 x 0.19	3	40
4075	6075	5.25	179 x 0.19	3.5	52.5
4076	6076	6	205 x 0.19	4	60
4077	6077	8	273 x 0.19	4.5	80
4078	6078	10	342 x 0.19	5	100
4079	6079	12	410 x 0.19	5.5	120
4080	6080	16	546 x 0.19	6	160
4081	6081	25	854 x 0.19	7	250
4082	6082	35	1196 x 0.19	9	350
4083	6083	50	1708 x 0.19	10.5	500
4084	6084	70	2392 x 0.19	12	700
4085	6085	95	3246 x 0.19	14	950
4086	6086	120	4100 x 0.19	17	1200
4087	6087	150	5125 x 0.19	19	1500
4088	6088	185	6320 x 0.19	21	1850
4089	6089	240	8200 x 0.19	25	2400
4090	6090	300	10249 x 0.19	27	3000
4091	6091	400	13666 x 0.19	32	4000
4092	6092	500	17082 x 0.19	34	5000

Braided CABLES



Part No Copper Bare	Copper Tinning	Nominal Cross Section mm	Cable Construction	Braid Construction	Overall Diameter	Net Weight Kg/000M
4050	6050	3.75	-	128 x 0.19	2.5	37.5
4051	6051	5	-	171 x 0.19	3.5	50
4052	6052	5.25	-	180 x 0.19	3.8	52.5
4053	6053	6	-	205 x 0.19	4.0	60
4054	6054	8	129 x 0.19	144 x 0.19	4.5	80
4055	6055	10	198 x 0.19	144 x 0.19	5.0	100
4056	6056	12	266 x 0.19	144 x 0.19	5.5	120
4057	6057	16	402 x 0.19	144 x 0.19	7.5	160
4058	6058	25	710 x 0.19	144 x 0.19	8.5	250
4059	6059	35	1004 x 0.19	192 x 0.19	9.5	350
4060	6060	50	1420 x 0.19	288 x 0.19	11.0	500
4061	6061	70	1944 x 0.19	448 x 0.19	13.0	700
4062	6062	95	2798 x 0.19	448 x 0.19	16.0	950
4063	6063	120	3588 x 0.19	512 x 0.19	19.5	1200

Highly flexible as per DIN46438

Material: E copper bare/tinned/silver Add prefix to Part no. if braids are required tinned (T) or silver (S)

Earthing TAPES



Part no.	cross-section	dimensions (mm)		
	mm ²	D	L	B
8001	1.5	5	160	9
8002	4	6	160	11
8003	6	6	200	11
8004	10	6	200	11
8005	16	6	200	13
8006	25	8	250	15
8007	35	10	300	16

Part-no	cross-section	dimensions(mm)			
	mm ²	D	L	B1	B2
8025	10	5	200	15	15
8026	14	9	200	20	20
8027	16	9	200	20	20
8028	25	9	200	25	25
8029	35	9	200	30	30
8030	50	11	200	30	30
8031	70	11	250	40	40

- Drilling and length are changeable
- Connectors with bigger cross-sections are available
- Add prefix 'T' to Part no. if braids are required tinned

Braided TAPES



Part No Bare	Copper Tinned	Nominal Wire Section mm ²	Width x thickness 5%	Construction	Net Weight Kg/1000M
4002	6002	2	5.0 x 0.8	16 x 4 x 0.19	20
4003	6003	2.5	5.0 x 1.0	16 x 5 x 0.19	25
4004	6004	3	6.0 x 1.0	16 x 6 x 0.19	30
4005	6005	4	7.0 x 1.0	16 x 8 x 0.19	40
4006	6006	5.25	10.0 x 1.0	24 x 7 x 0.19	53
4007	6007	6	10.0 x 1.5	24 x 8 x 0.19	60
4008	6008	8	12.0 x 1.5	24 x 11 x 0.19	80
4009	6009	10	10.0 x 2.0	24 x 14 x 0.19	100
4010	6010	14	14.0 x 2.0	24 x 20 x 0.19	140
4011	6011	16	16.0 x 2.0	32 x 17 x 0.19	160
4012	6012	21	15.0 x 3.0	32 x 22 x 0.19	210
4013	6013	25	16.0 x 3.0	32 x 27 x 0.19	250
4014	6014	35	25.0 x 3.0	48 x 25 x 0.19	350
4015	6015	50	50.0 x 3.0	48 x 36 x 0.19	500
4016	6016	70	50.0 x 4.0	48 x 50 x 0.19	700
4017	6017	95	50.0 x 5.0	48 x 68 x 0.19	950
4018	6018	120	50.0 x 6.0	48 x 85 x 0.19	1200
4019	6019	140	50.0 x 8.0	48 x 100 x 0.19	1400
4020	6020	150	50.0 x 9.0	48 x 107 x 0.19	1500
4021	6021	168	70.0 x 6.0	48 x 120 x 0.19	1680
4022	6022	185	75.0 x 5.0	48 x 132 x 0.19	1850
4023	6023	240	80.0 x 7.0	48 x 171 x 0.19	2400
4024	6024	250	80.0 x 7.5	48 x 178 x 0.19	2500
4025	6025	300	100.0 x 8.0	48 x 214 x 0.19	3000
4026	6026	400	100.0 x 11.0	48 x 285 x 0.19	4000

Highly flexible as per DIN46438
 Material: E copper bare/tinned/silver Add prefix to Part no. if braids are required tinned (T) or silver (S)



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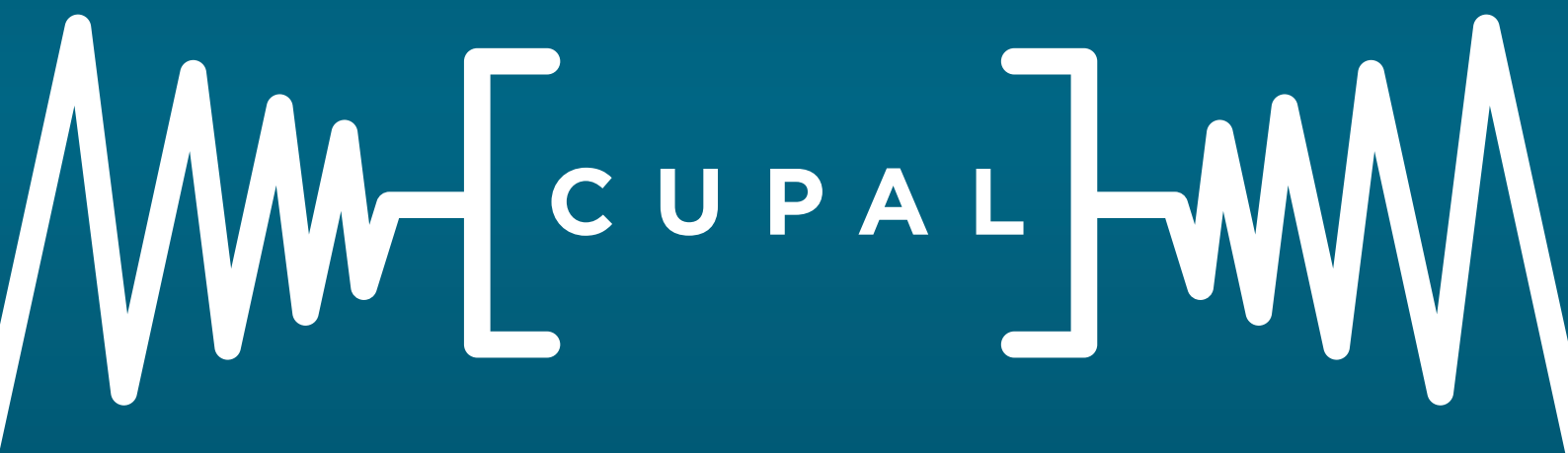
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METACLAD

BI-METALS (CUPAL)

- Bimetal ?
- Applications
- Technical data

CUPAL

Bimetal Washers to prevent bimetallic galvanic electro- corrosion at copper and aluminium joints.



WHAT IS CUPAL BIMETAL?

Cupal consists of copper (sheet metal) cladded on pure Aluminium (base metal), both metals being diffused together to form an inseparable whole by roll bonding process. Cupal, is therefore not an alloy and copper layers are not Electro plating but are rather mechanically welded Aluminium sheets.

WHY CUPAL BIMETAL AT TRANSITION JOINTS?

It is known that when the Aluminium Terminals are directly connected to Copper Terminals to carry current at a high voltage, a bimetallic galvanic corrosion occurs, resulting in a high resistance at the joint. The heated joints are oxidized and loses contact resulting in sparks, voltage dropout power losses and failure, damage to machinery.

When Cupal bimetal is placed as a transition plate between Aluminium Terminal and Copper Terminal at the joint (with Copper facing Copper and Aluminium facing Aluminium), bimetallic galvanic corrosion is averted due to absence of air in CUPAL bimetal. CUPAL is thus used at dissimilar metals joints of Aluminium and Copper to make similar metal's contact.

CUPAL has been successfully evaluated and used by many of the world's leading electrical equipment manufacturers.



Cupal **BIMETAL WASHERS**

COMMITTED TO QUALITY

Established in 1978, We have been of the forefront in the manufacture of bimetals and tri-metals. Equipped with the most modern machines and sophisticated testing equipment's, we ensure perfect quality and excellence performance of our products.

Over these years we have earned the confidence of reputed original equipment manufacturers, utilities and projects. The continuous patronage of these giants in the field is a testimony to the quality and performance of our products.

TOWARDS TOMORROW

With the expertise and experience gained over the past years, We look forward to meeting the challenges of tomorrow with hope and confidence.

APPLICATIONS

- Substation & Switchyard Bimetallic clamp and connectors
- Cable lugs and cable end connectors
- Distribution, panel boards, bus ducts and bus bar chambers
- Bus ducts and Plug-in Busways
- Isolators and switchgears
- Oil & Vacuum Circuit Breakers
- Overhead connectors
- Flexible connectors

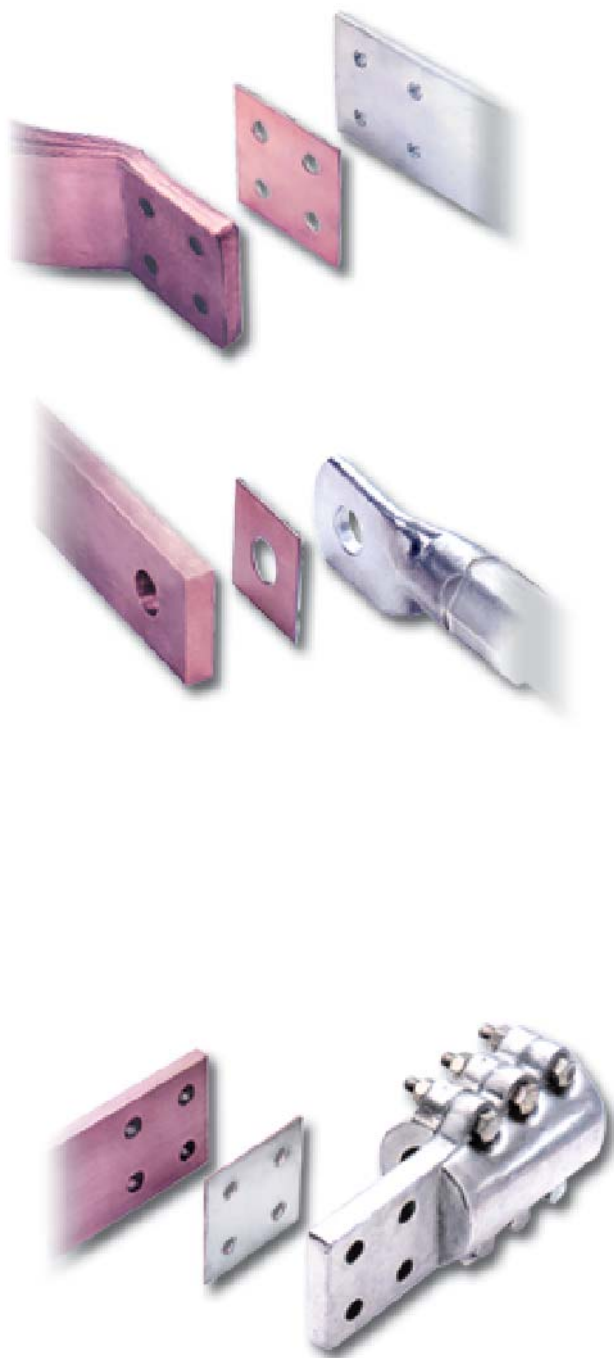
TECHNICAL SPECIFICATION

Property	Units	Cupal/Cupal	
Purity			
Aluminium	% min	99.00	
Copper	% min	99.90	
Standard Composition			
		80:20	85:15
By Volume	Copper %	20	15
	Aluminium %	80	85
By Weight	Copper %	45	40
	Aluminium %	55	60
Density at 200C	gms/cm ³	3.95	3.40
Max electrical resistivity at 200C	μΩ/cm	2.6	2.8
Min electrical conductivity at 200C	% IACS	65	63

In addition CUPAL is subject to various other mechanical test such as bend test, erichen cup test, torsion test and reversible bending test.

RANGE

- Standard sheet size of 600 x 1000mm
- Standard thickness 1, 1.6, 2 & 3mm
- Custom sizes & thickness also available on request





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