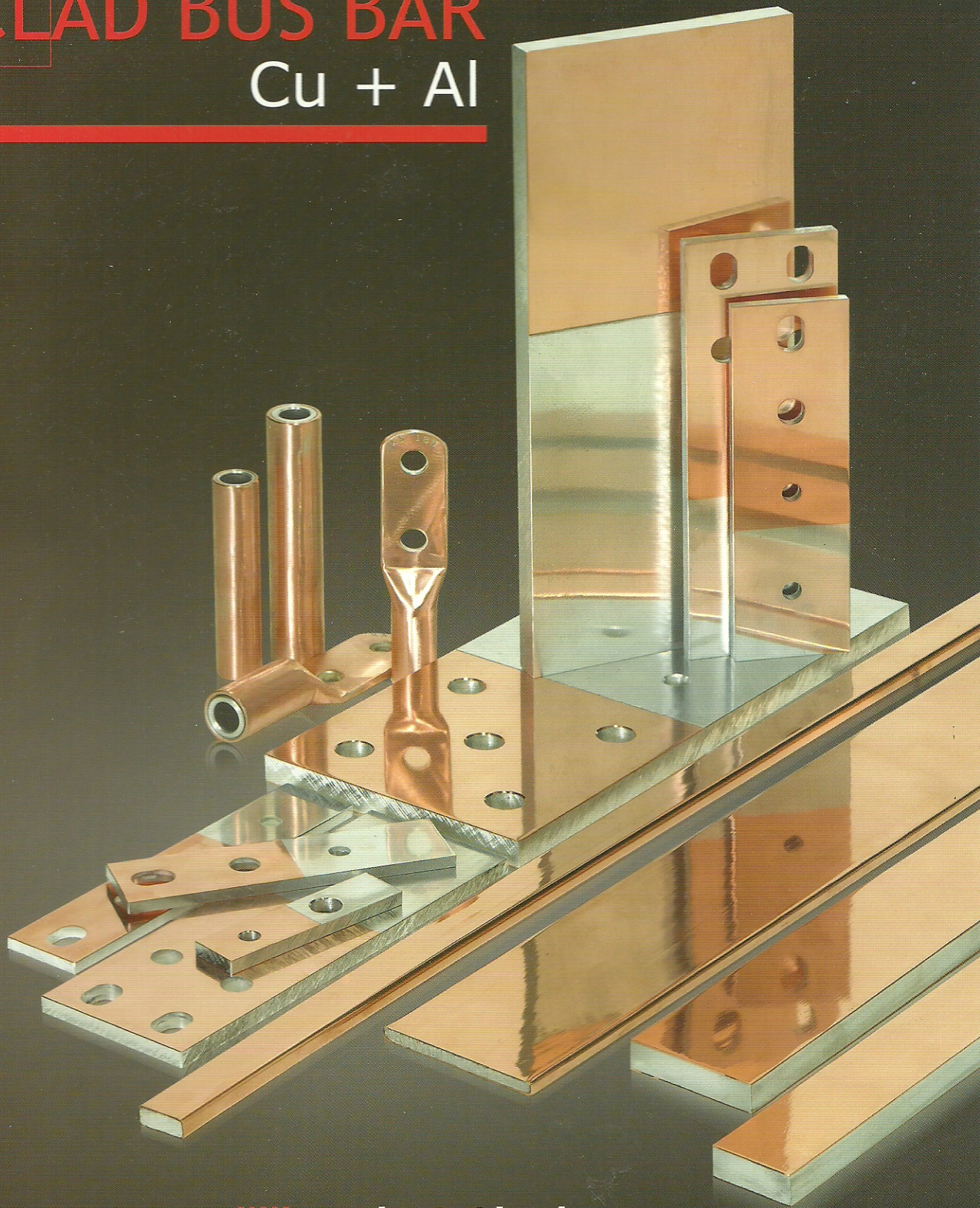


# CLAD BUS BAR

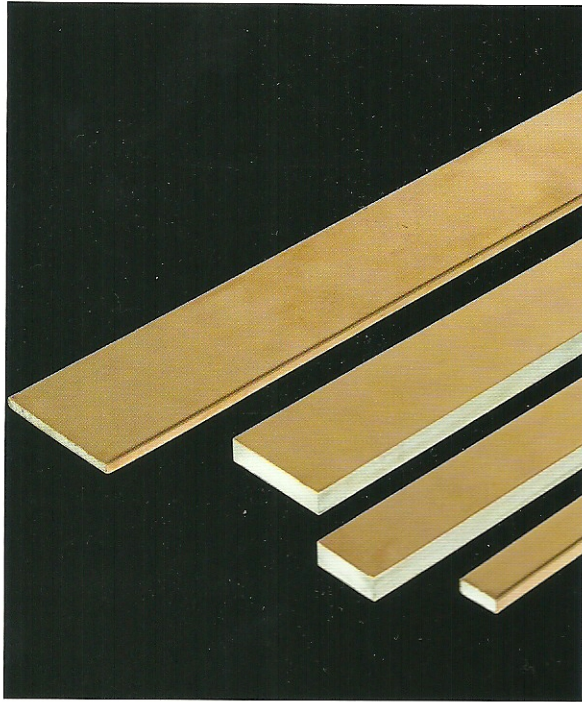
Cu + Al



정보산업

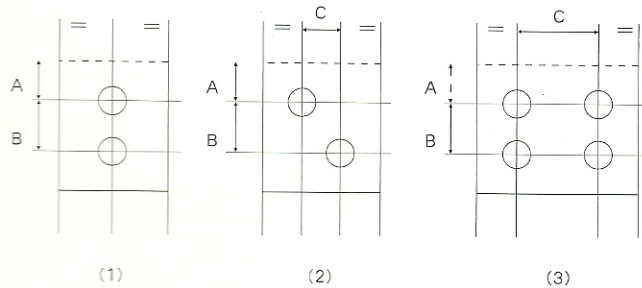
JUNG BO INDUSTRY. CO.

# Clad Bus Bar



## 특징

- 경제적이다(동대비 20%이상)
- 가볍다(비중 3.6~3.9)
- 전체가 Si이므로 가공이 쉽다
- 조립 생산성이 높다(동대비 35%)
- 내구성이 좋다(전식 방지 효과)  
(Electrical Corrsion)



## Hole 크기 간격

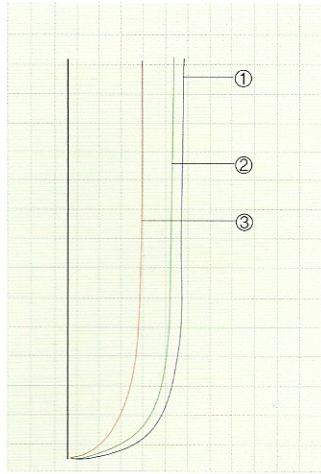
Bar Width (mm)	Overlap Length (mm)	Bolting Arrangement	Dimensions			Bolt Size	Hole Diameter (mm)
			A(mm)	B(mm)	C(mm)		
25	55	1	12.5	30	-	M10	11
30	60	1	15	30	-	M10	11
32	60	1	15	30	-	M10	11
40	80	1	20	40	-	M12	14
50	80	1	20	40	-	M12	14
60	60	2	17	26	26	M12	14
63	60	2	17	26	26	M12	14
75	80	3	20	40	35	M12	14
80	80	3	20	40	40	M12	14
100	80	3	20	40	50	M12	14

## 벤딩시 주의사항

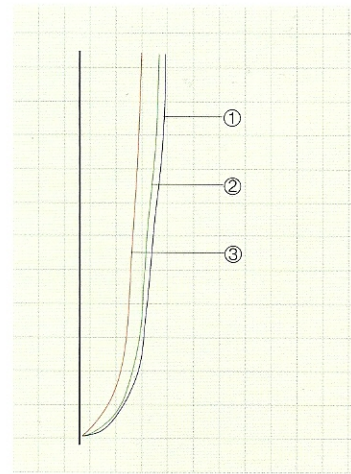
Thickness (T) mm	Width (W) Range mm	Up to 90°	91° - 120°	Over 120°
4 and 5 6 and 6.3	20 - 60	1 × T	2 × T	4 × T
	20 - 40	1 × T	2 × T	4 × T
	50 - 120	2 × T	3 × T	4 × T
8 and 10 12 and 15	20 - 120	2 × T	3 × T	4 × T
	40 - 120	2 × T	3 × T	4 × T

## Clad Bus Bar 온도상승표

제품 : Clad Bus Bar  
6T x 60w x 400 l  
용량 : 720A



제품 : Cu  
6T x 60w x 400 l  
용량 : 720A  
(C1100)



KERI 시험표 (06년 9월)

항목	시험결과
시험주파수	60 Hz
시험시간	3.5 h
측정부위	온도 상승치(K)
BUS 양측 단자 (Ch. 1)	49.9
BUS 양측 단자 (Ch. 2)	45.5
BUS 양측 단자 (Ch. 3)	32.3
주위온도 (°C)	27.4

KERI 시험표 (06년 9월)

항목	시험결과
시험주파수	60 Hz
시험시간	3.0 h
측정부위	온도 상승치(K)
BUS 양측 단자 (Ch. 1)	32.3
BUS 양측 단자 (Ch. 2)	29.5
BUS 양측 단자 (Ch. 3)	22.7
주위온도 (°C)	26.7

## Clad Bus Bar 사양표

Property	Units	Copper Annealed H.C.	Copper 1/2 Hard	Clad Bus BAR	Aluminium		
					EIE(EC)		E91E(6101)
					M	H2	TF
0.1% proof stress	MN/m <sup>2</sup>	62		★	-	-	163
0.2% proof stress	MN/m <sup>2</sup>	78	108-186	★	-	-	170
Min. ultimate tensile strength	MN/m <sup>2</sup>	217	235-300	130-170 (see tables)	60	85	200
Modulus of elasticity	MN/m <sup>2</sup>	95 × 10 <sup>9</sup>	120 × 10 <sup>9</sup>	85 × 10 <sup>9</sup>	69 × 10 <sup>9</sup>	69 × 10 <sup>9</sup>	65 × 10 <sup>9</sup>
Density at 20°C	kg/m <sup>3</sup>	8,89 × 10 <sup>3</sup>	8,89 × 10 <sup>3</sup>	3,63 × 10 <sup>3</sup>	2,70 × 10 <sup>3</sup>	2,70 × 10 <sup>3</sup>	2,70 × 10 <sup>3</sup>
Max. electrical resistivity at 20°C	Ω m	1.724 × 10 <sup>-8</sup>	1.777 × 10 <sup>-8</sup>	2.65 × 10 <sup>-8</sup>	2.862 × 10 <sup>-8</sup>	2.862 × 10 <sup>-8</sup>	3.133 × 10 <sup>-8</sup>
Min. electrical cond. at 20°C	1/Ω m	58 × 10 <sup>8</sup>	56 × 10 <sup>8</sup>	37.7 × 10 <sup>8</sup>	35.4 × 10 <sup>8</sup>	35.4 × 10 <sup>8</sup>	31.9 × 10 <sup>8</sup>
Temp. coefficient of resistance at 20°C	%IACS	100	97	65	61	61	55
Coefficient of linear thermal expansion 20 - 100°C	1/°C	3.39 × 10 <sup>-3</sup>	3.93 × 10 <sup>-3</sup>	4.01 × 10 <sup>-3</sup>	4.03 × 10 <sup>-3</sup>	4.03 × 10 <sup>-3</sup>	3.64 × 10 <sup>-3</sup>
Melting Point	1/°C	17 × 10 <sup>-6</sup>	17 × 10 <sup>-6</sup>	21.9 × 10 <sup>-6</sup>	23 × 10 <sup>-6</sup>	23 × 10 <sup>-6</sup>	23 × 10 <sup>-6</sup>
Specific heat	°C	1083	108.3	658	658	658	600-650
Thermal cond.	J/kg/°C	393.5	393.5	711.7	921.1	921.1	879.2
	W/m <sup>2</sup> m/°C	3.85 × 10 <sup>8</sup>	3.85 × 10 <sup>8</sup>	2.38 × 10 <sup>8</sup>	2.22 × 10 <sup>8</sup>	2.22 × 10 <sup>8</sup>	1.80 × 10 <sup>8</sup>

1. 주위 온도 35℃
2. Bus Bar 온도상승 50℃
3. Cycle 50 ~ 60 Hz
4. 동함유량 20% 내외
5. Bus Bar 85℃
6. Cu : C-1020
7. Al : A-1060
8. 최대 500w
9. 최대 20T 이상

두께	폭	중량	n - 1		n - 2		n - 3	
			DC	AC	DC	AC	DC	AC
3	10	0.106	131	131				
	20	0.217	231	231				
	25	0.271	280	280				
4	15	0.225	225	220				
	20	0.287	260	260				
	25	0.36	300	300				
	30	0.432	360	360				
5	40	0.627	480	480				
	20	0.356	300	300				
	25	0.447	350	350				
	30	0.545	400	400				
	40	0.726	530	530	980	970		
	50	0.977	640	640	1180	1170	1700	1650
6	60	1.174	760	760	1350	1340	1950	1900
	80	1.586	980	970	1750	1700	2550	2380
	30	0.641	450	450	850	840		
	40	0.859	570	570	1070	1070		
	50	1.027	700	700	1280	1270	1800	1750
	60	1.287	850	850	1500	1470	2100	2000
	75	1.759	980	980	1850	1800	2680	2500
6.3	80	1.878	1050	1050	1970	1900	2800	2800
	100	2.37	1300	1270	2400	2280	3480	3000
	120	2.823	1550	1500	2780	2600	3980	3400
	25	0.559	420	420	800	790		
	32	0.719	520	520	950	960		
	38	0.857	520	520	1110	1100		
	40	0.902	620	620	1150	1140		
	50	1.131	700	750	1380	1360		
8	65	1.6	950	950	1740	1680	2500	2380
	80	1.972	1150	1190	2020	1980	2900	2700
	100	2.469	1418	1380	2500	2370	3590	2190
	120	2.965	1650	1600	2930	2740	4190	3600
	40	1.149	700	700	1250	1220		
	50	1.44	850	840	1500	1450		
	60	1.73	950	950	1780	1720	2550	2350
10	75	2.166	1100	1100	2150	2000	3000	2700
	80	2.311	1200	1200	2200	2170	3300	2980
	90	2.601	1400	1370	2500	2330	3600	3100
	100	2.892	1500	1450	2700	2500	3820	3200
	40	1.452	800	800	1500	1470		
	50	1.815	950	940	1800	1720		
12	60	2.178	1100	1070	2000	1880	3000	2700
	75	2.694	1300	1250	2400	2230	3500	3000
	80	2.904	1400	1360	2600	2400	3720	3100
	100	3.63	1700	1630	3000	2700	4400	3650
	120	4.328	2000	1900	3520	3380	5000	3800
	40	1.714	910	900	1740	1670		
	42	1.83	960	950	1820	1740		
15	50	2.15	1100	1080	2050	1950		
	60	2.58	1280	1250	2380	2210	3470	3000
	80	3.458	1630	1560	2980	2680	4320	3500
	100	4.328	1980	1880	3590	3160	5180	4060
	120	5.199	2320	2180	4170	3620	6000	4500
	32	1.83	930	910	1800	1730		
15	40	2.15	1050	1030	2030	1920		
	50	2.694	1260	1230	2390	2200		
	60	3.239	1460	1410	2750	2480	4000	3360
	80	4.29	1830	1780	3420	3208	4650	3700
	100	5.35	2200	2150	4100	4000	5300	4100
120	6.506	2620	2420	4760	3940	6880	4950	

# 동판 가동 단자(Laminated Flexible Connector)

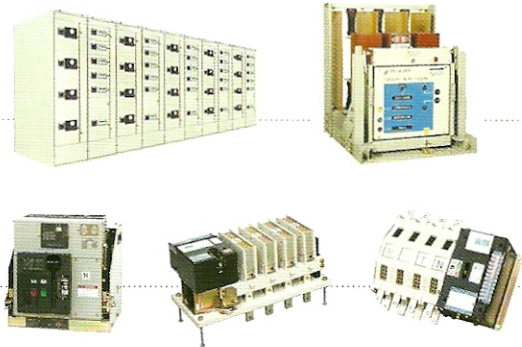


## 특징

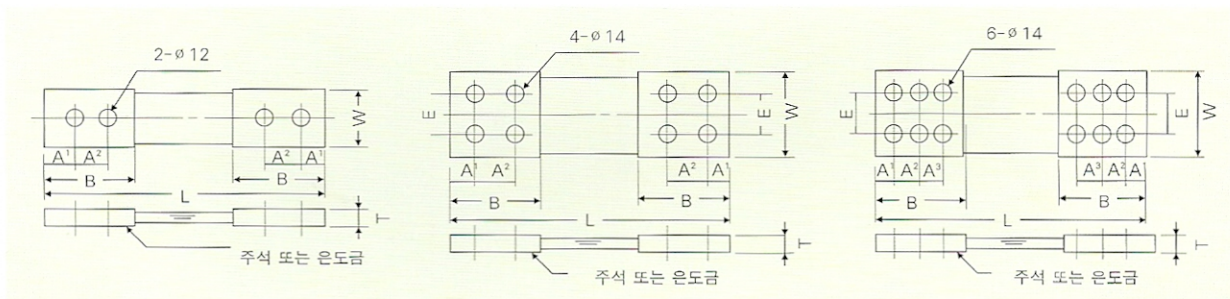
- 동판을 여러겹을 합하여 용접한것임 (0.035~0.5T)
- 대전류 이동이 가능하고 견고하며 내구성이 뛰어남
- 납 또는 이물질을 사용하지않아 녹이슬거나 부서짐이 없다 (Welding)

## 용도

- V.C.B., A.C.B., A.T.S., Bus Ductor, 고속철도차량, 전기로, 분해로(전기분해)

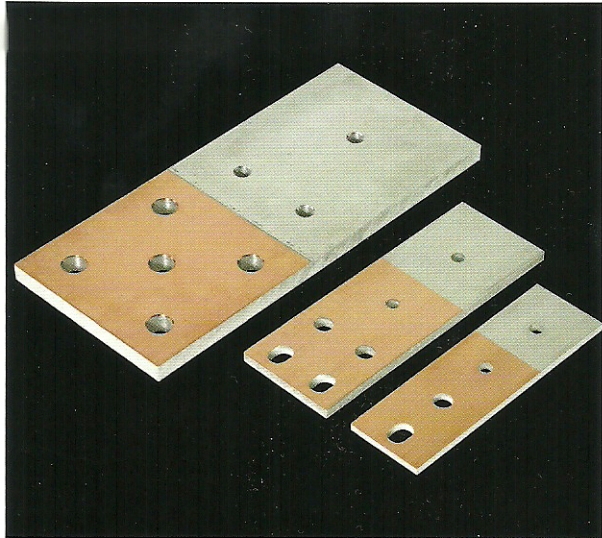


## 치수 및 사양(Dimensions & Specification)



WIDTH (mm)	SQ (mm <sup>2</sup> )	CURRENT (A)	STYLE	PARTIAL LENGTH(mm)						BOLT DIA
				A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	E	T	
50	100	400	A	20	35	-	75	-	6	M12
	150	600							7	
	260	800							9.2	
75	170	600	B	25	50	-	100	40	6.2	M14
	300	800							8	
	460	1000							10.1	
100	270	800	B	25	50	-	100	50	6.7	M14
	400	1000							8	
	600	1200							10	
150	530	1200	C	25	50	50	150	75	7.5	M14
	740	1500							9	
	1100	2000							11.4	

# LT. Terminal



## 특징

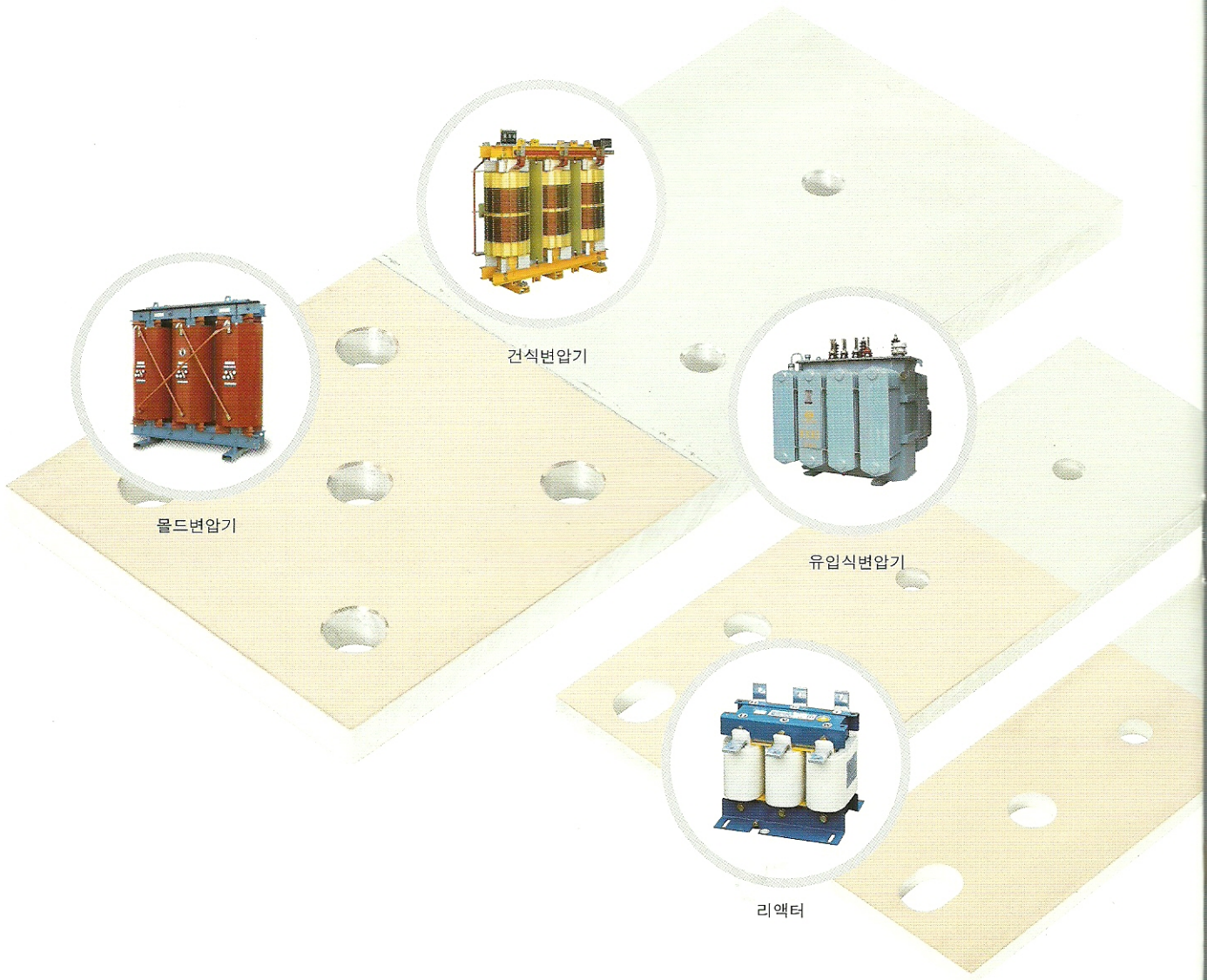
- 변압기의 내부 코일을 알루미늄으로 사용후 2차측 단자를 동 BUS BAR에 연결시 전식방지를 위한 제품
- 가벼우며 가공이 쉽고, 내구성이 좋다

## 사용처

- 태양열발전, 풍력발전, 고속열차, 통신설비, 변압기 등

## 국내 공급처

- LS산전, ABB, 효성, 현대중공업, 산일, 삼일, 재룡, 조일성업, 성진 이외 다수



물드변압기

건식변압기

유입식변압기

리액터

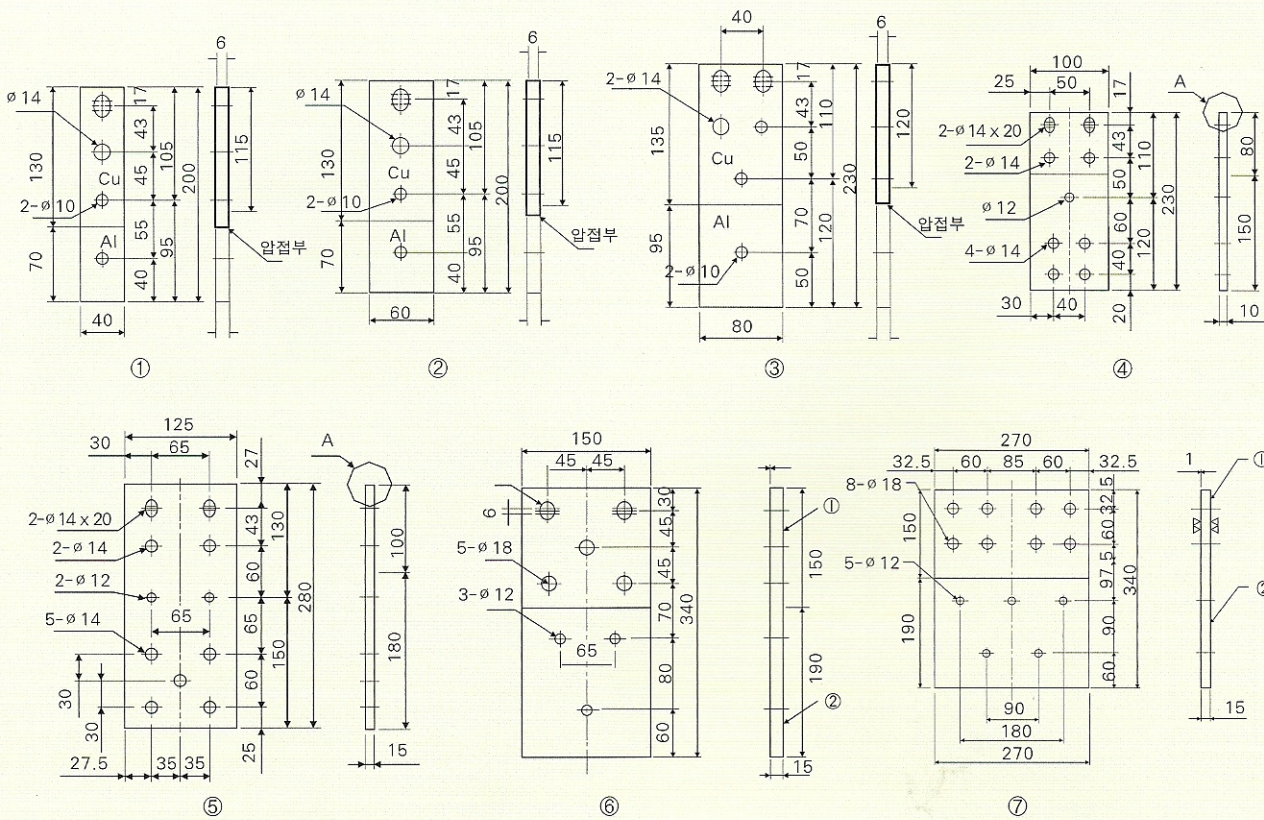
# CAST-Resin Transformer Terminal (Low Voltage Terminal)

## 2차 Bus Bar 구성표

도면번호	용량kr A	규격	허용전류 (A)	폭 (mm)	두께 (mm)	길이 (mm)
①	100~400		700A	40	6	200
②	500~600		1100A	60	8	200
③	750~1000		1600A	80	8	230
④	1000~1500		1700A	100	10	230
⑤	1500~2000		2300A	125	15	280
⑥	2000		3600A	150	15	340
⑦	3000		4600A	270	15	

\* 원자재 CU : C1100, C1020, AL : A1050~1060 사용

## 2차 Bus Bar 상세도



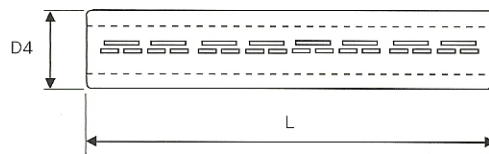
# Cable Lugs (Al-Cu), (Sleeve)



## 특징

- 배전선로에서 Al과 Cu가 겹치는 곳에 전식 방지
- 제품은 Al과 Cu가 완전 결합하여 내구성이 좋다 (Electrical Corrosion)

## Dimensions

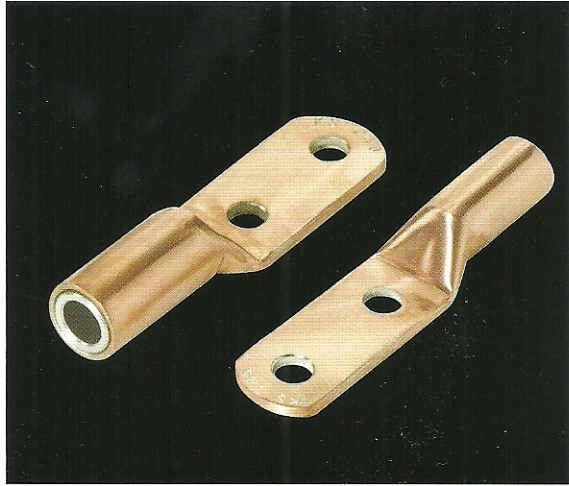


- Q = Nominal cross section
- RM = Multi-core stranded round
- SM = Multi-core stranded sector shaped
- SE = Sector shaped solid
- ∅Al = Outer diameter aluminium
- ∅Cu = Outer diameter copper
- D4 = Outer diameter
- L = Length
- K = Outer diameter

## 사 양(Specification)

Type		Q mm <sup>2</sup>			∅Al mm	∅Cu mm	D4 mm	L mm	K Al/Cu
		Al RM	Al SE	Cu RM/SM					
AL-Cu	70-95/95	70	95	50	11.5	10.0	18.5	85.0	18/14
	95-120/50	95	120	50	13.5	10.0	23.0	85.0	22/14
	120-150/95	120	150	95	15.0	13.5	23.0	87.0	22/18
	150-185/95	150	185	95	16.5	13.5	25.0	107.5	25/18
	150-185/150	150	185	150	16.5	16.5	25.0	112.5	25/22
	185-240/95	185	240	95	18.5	13.5	25.5	108.0	28/18
	185-240/150	185	240	150	18.5	16.5	25.5	113.0	28/22

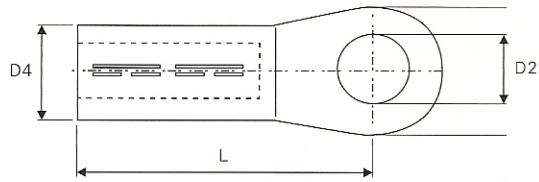




### 특징

- 송전선로에서 배전선로로 변경되는 구간에 이질금속에 의한 전식방지 효과가 크다(Electrical Corrosion)
- 여러가지 유형으로 단자와 슬리브 등 변형하여 사용.

### Dimensions



Type		Q mm <sup>2</sup>	B mm	D2 mm	D4 mm	L mm	K
AL - Cu	95/12	95	30	13	23	85	22
	150/12	150	30	13	25	90	25
	240/12	240	38	13	32	110	32
	240/16	240	38	17	32	100	32

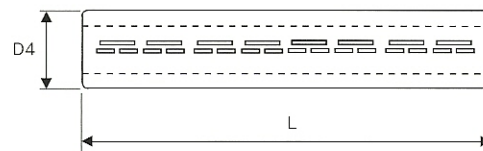
- Q = Nominal cross section
- B = Width
- D2 = Flat hole diameter
- D4 = Outer diameter
- L = Length
- K = Outer diameter



### 특징

- 송전선로에서 배전선로로 변경되는 구간에 이질금속에 의한 전식방지 효과가 크다(Electrical Corrosion)
- 여러가지 유형으로 단자와 슬리브 등 변형하여 사용.

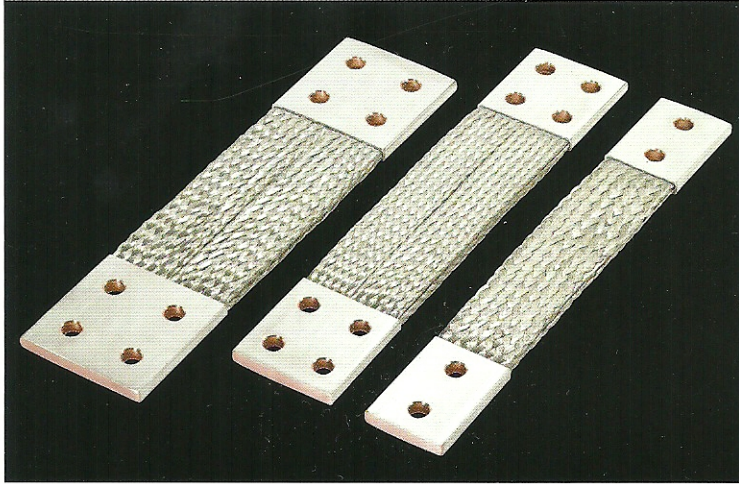
### Dimensions



Type		Q mm <sup>2</sup>		D4 mm	L mm	K Al/Cu
		Al SE	Cu			
AL - Cu	95	95	50	23	87	22/14
	150	150	95	25	87	25/18
	240	240	150	32	94	32/22

- Q = Nominal cross section
- SE = Width
- D4 = Outer diameter
- L = Length
- K = Outer diameter

# Flexible Copper Conductor



## 특징

A flexible connector for linking together conductors subjected to a differential of motion caused by thermal expansion and contraction, vibration or operational movement.

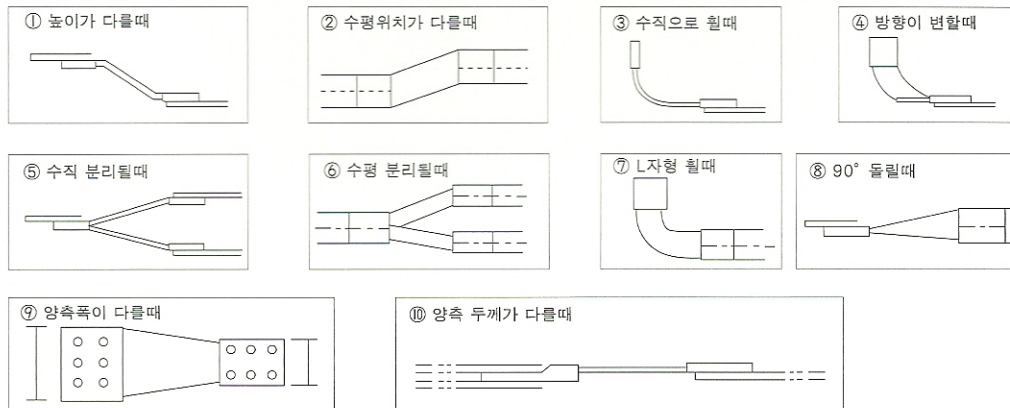
Braiding is composed of fine, tinned copper wire strands woven into concentric sleeves and flattened. The braiding is terminated at each end into a copper ferrule. Information on connectors requiring a greater number of braids will be furnished on request.

Connectors for other bar thickness and spacing available on request.

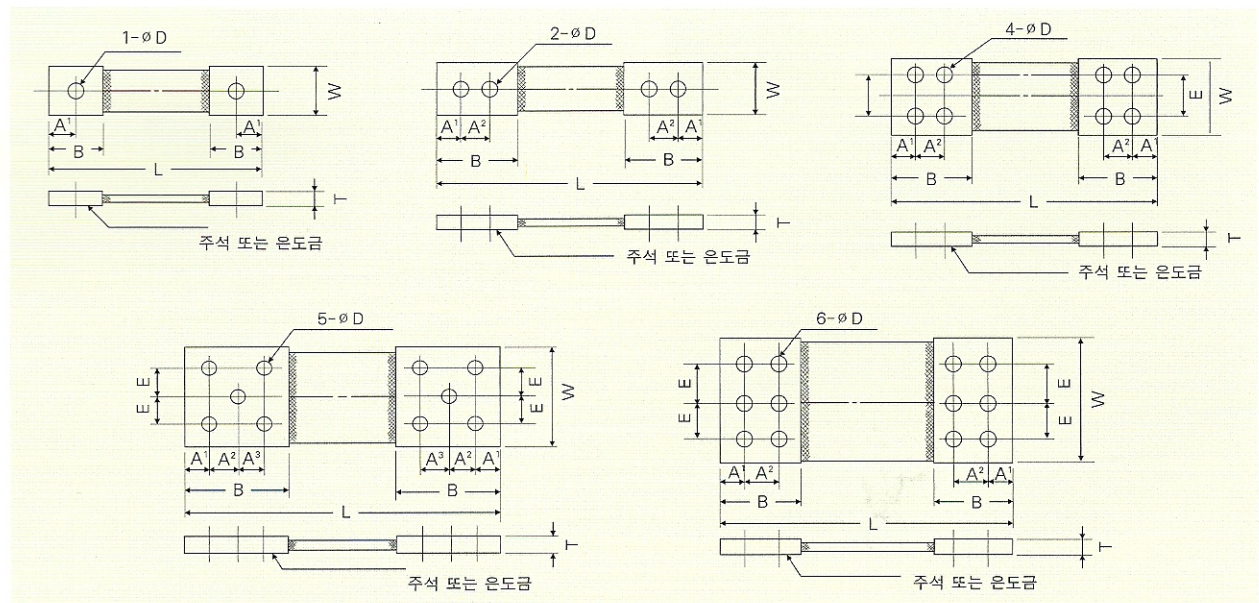
## 용도

- Bus Ductor
- Cable Tray
- Panel Boards
- A.T.S.
- A.C.B.
- V.C.B.
- Motor Control Centres

## 변형된 제품

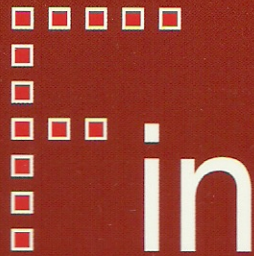


## 표준 도면(Standard Form)



## Flexible Braided Copper Conductor

Width (mm)	SQ (mm <sup>2</sup> )	Current (A)	Thickness	Partial Length (mm)						Style	T-Length (mm)
				A1	A2	A3	B	E	D		
25	38	200	6,0	20			40		12	A	200
	76	300	8,0								
	114	380	10,0								
	152	450	12,0								
40	50	290	5,6	20	40		80		12	B	300
	100	410	7,2								
	150	520	8,9								
	200	580	10,5								
	250	690	12,1								
	300	770	13,8								
50	100	450	6,5	20	40		80		12	B	300
	200	650	9,1								
	300	820	11,6								
	400	970	14,2								
	500	1,100	16,7								
60	200	680	7,0	20	40		80		12	B	350
	300	900	11,0								
	500	1,150	15,5								
	600	1,300	17,5								
	800	1,500	19,0								
	1,000	1,720	22,0								
75	150	680	8,5	25	40		90	40	14	C	350
	200	760	9,4								
	250	860	10,2								
	300	940	11,1								
	400	1,100	12,8								
	500	1,240	14,5								
	600	1,380	16,2								
	800	1,630	19,6								
	1,000	1,860	23,0								
80	200	1,000	10,0	25	50		100	40	14	C	400
	400	1,170	12,0								
	500	1,310	13,5								
	600	1,500	14,5								
	800	1,720	17,0								
	1,000	1,950	20,0								
	1,200	2,150	23,0								
100	200	860	8,5	25	50		100	50	14	C	400
	250	970	9,1								
	300	1,060	9,7								
	400	1,240	11,0								
	500	1,380	12,2								
	600	1,530	13,5								
	800	1,800	16,0								
	1,000	2,000	18,5								
	1,250	2,200	21,5								
120	300	1,200	9,0	30	40	40	140	35	14	D	450
	400	1,320	10,0								
	500	1,500	11,0								
	600	1,650	12,5								
	800	1,900	14,5								
	1,000	2,100	16,5								
	1,200	2,350	18,5								
	1,400	2,550	19,5								
	1,500	2,650	20,5								
150	400	1,460	9,5	30	50	50	160	50	16	D	500
	500	1,640	10,5								
	600	1,800	11,5								
	800	2,100	13,0								
	1,000	2,350	14,5								
	1,200	2,600	16,5								
	1,500	3,000	20,0								
	2,000	3,400	23,5								
	2,400	3,800	27,0								
200	500	1,850	9,5	30	120		180	70	18	E	600
	800	2,360	11,0								
	1,000	2,640	12,5								
	1,200	2,900	14,0								
	1,500	3,260	15,5								
	2,000	3,800	19,0								
	2,500	4,200	22,5								
	3,000	4,700	25,5								
3,500	5,100	28,5									



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