Kumwell®

Exothermic Welding

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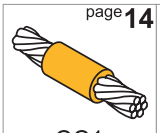
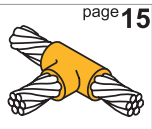
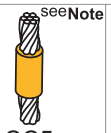
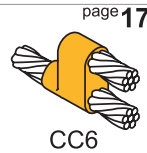
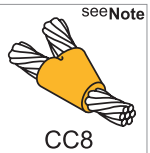
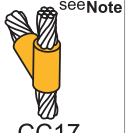
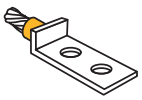
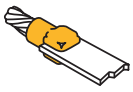
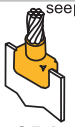
Exothermic Welding

Selection Chart

Cable to Cable

 page 14 CC1	 page 15 CC2	 see Note CC3	 page 16 CC4	 see Note CC5	 page 17 CC6	 page 18 CC7	 see Note CC8
 page 19 CC11	 page 20 CC13	 page 21 CC14	 see Note CC17	 see Note CC18	 see Note CC19	 see Note CC20	 see Note CC22
 see Note CC23	 see Note CC-24	 see Note CC25	 see Note CC26	 see Note CC27	 see Note CC28	 see Note CC29	 see Note CC30
 see Note CC31	 see Note CC33	 page 22 CC34	 see Note CC35	 see Note CC36	 see Note CC37	 see Note CC38	 see Note CC39

Cable to Bus Bar

 page 23 (Lug) CB1	 page 24 CB1	 see Note CB2	 see Note CB3	 page 25 CB4	 page 26 CB5	 see Note CB6	 see Note CB7
see Note CB8	see Note CB9	see Note CB11	see Note CB12	see Note CB15	see Note CB16	see Note CB17	see Note CB18
see Note CB19	see Note CB20	see Note CB21	see Note CB22	see Note CB23	see Note CB24	see Note CB25	see Note CB26
see Note CB27	see Note CB28	page 27 CB29	see Note CB30	see Note CB31	see Note CB32	page 28 CB34	

Note : Special requirement can be requested.
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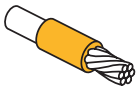
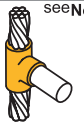
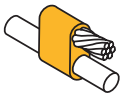
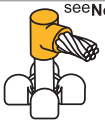
Exothermic Welding

Selection Chart

Cable to Ground Rod

 page 29 CR1	 page 30 CR2	 page 31 CR3	 see Note CR4	 see Note CR-6	 see Note CR7	 see Note CR8	 see Note CR9
 see Note CR12	 see Note CR13	 see Note CR14	 see Note CR15	 see Note CR16	 page 32 CR17	 see Note CR18	 see Note CR19
 see Note CR20	 see Note CR21	 see Note CR22	 see Note CR23	 page 33 CR24	 page 34 CR25	 see Note CR26	 see Note CR27
 see Note CR29	 see Note CR30	 see Note CR31	 see Note CR32	 page 35 CR33			

Cable to Rebar (Partially Wrapped)

 page 36 CRE1P	 page 37 CRE3P	 page 38 CRE4P
 see Note CRE5P	 page 39 CRE6P	 page 40 CRE17P
 page 41 CRE18P	 page 42 CRE19P	 page 43 CRE20P

Cable to Rebar (Fully Wrapped)

 page 44 CRE1	 page 45 CRE2	page 46 CRE6	see Note CRE7
see Note CRE8	see Note CRE9	see Note CRE11	see Note CRE12
see Note CRE13	see Note CRE14	see Note CRE15	see Note CRE16
page 47 CRE17	page 48 CRE18	page 49 CRE19	page 50 CRE20

Rebar to Rebar

page 90 RE1	page 91 RE2

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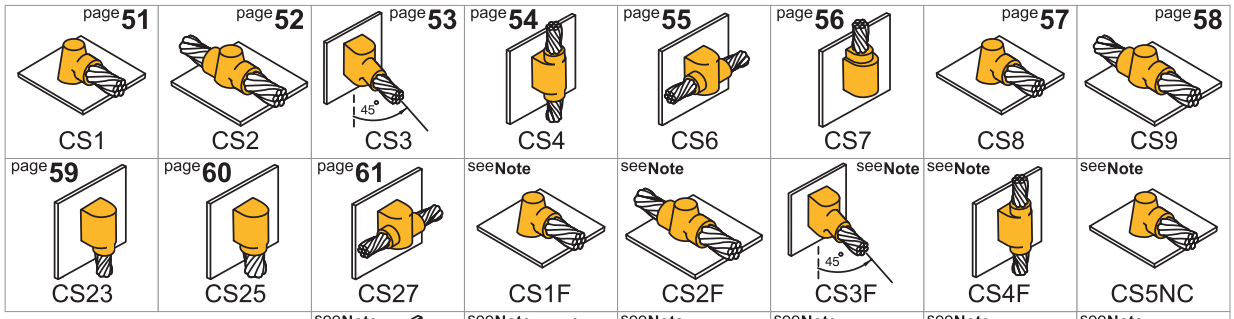
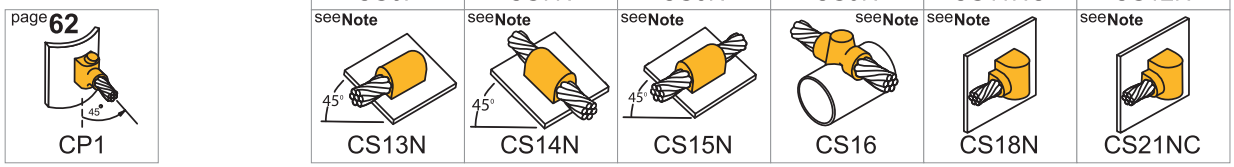
Selection Chart

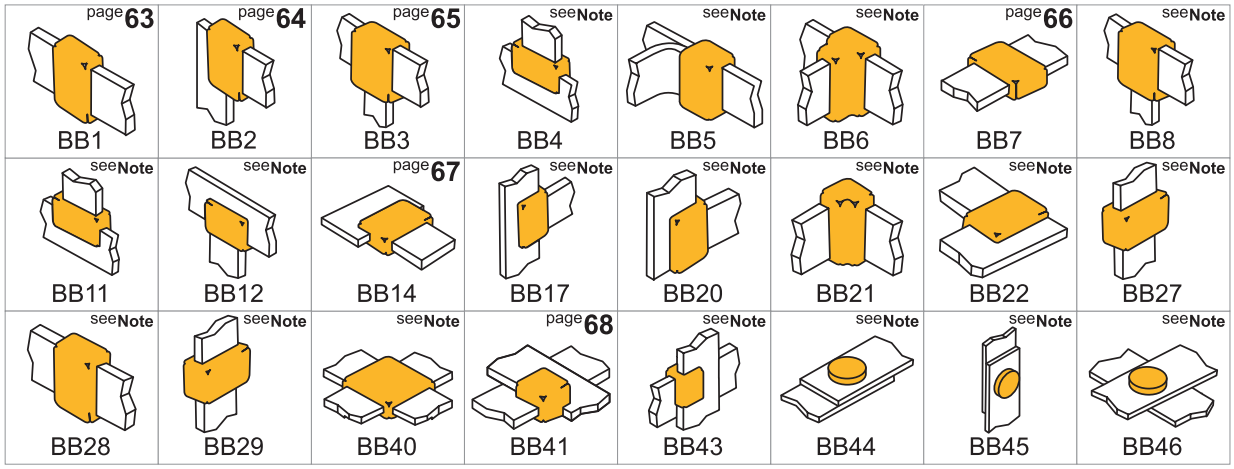
Cable to Steel



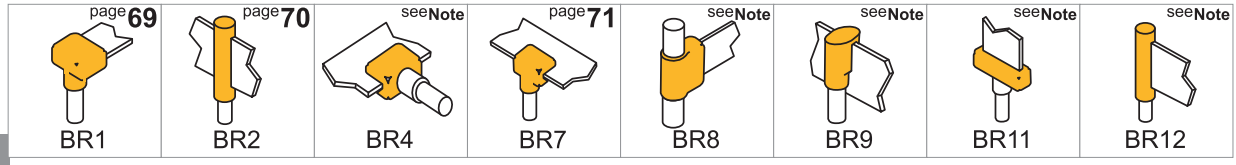
Cable to Pipe



Bus Bar to Bus Bar



Bus Bar to Ground Rod



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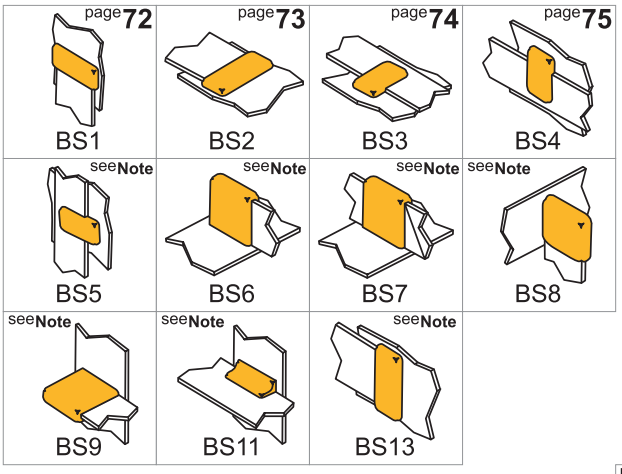
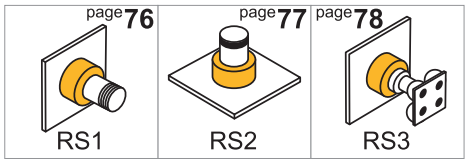
Selection Chart

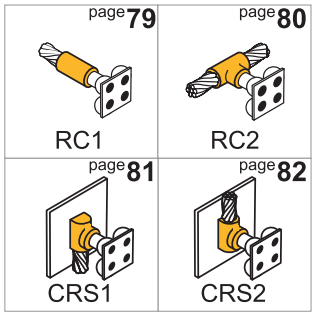
Bus Bar to Steel



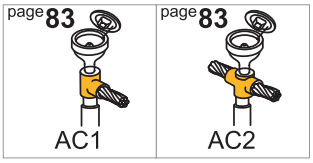
Copper or Steel Stud to Steel



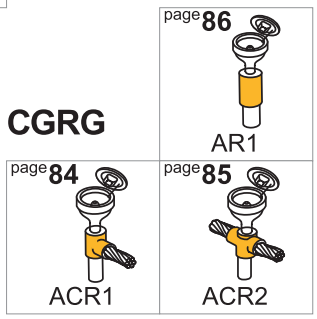
Ground Plates to Cable & Steel



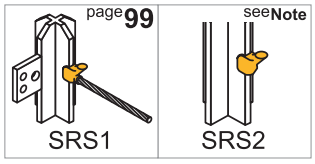
CGR



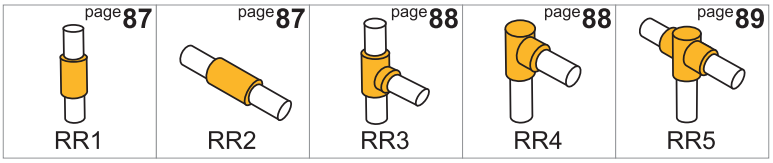
CGRG



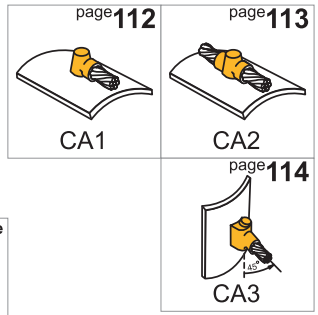
Steel Cable to Steel Rod



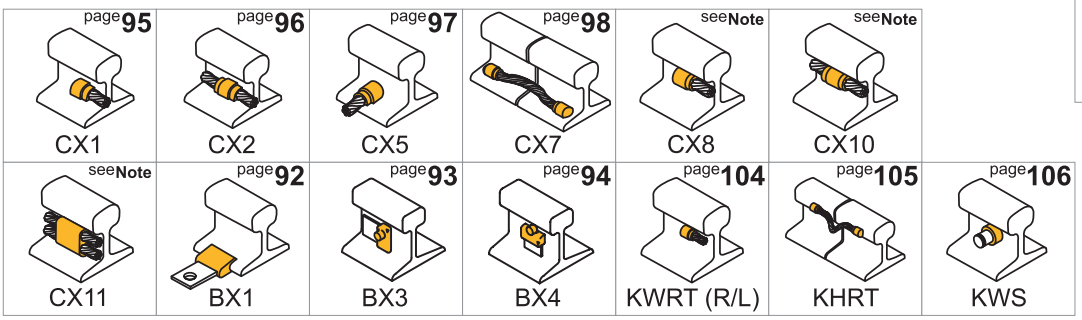
Ground Rod to Ground Rod



Cathodic Protection



Railway Application



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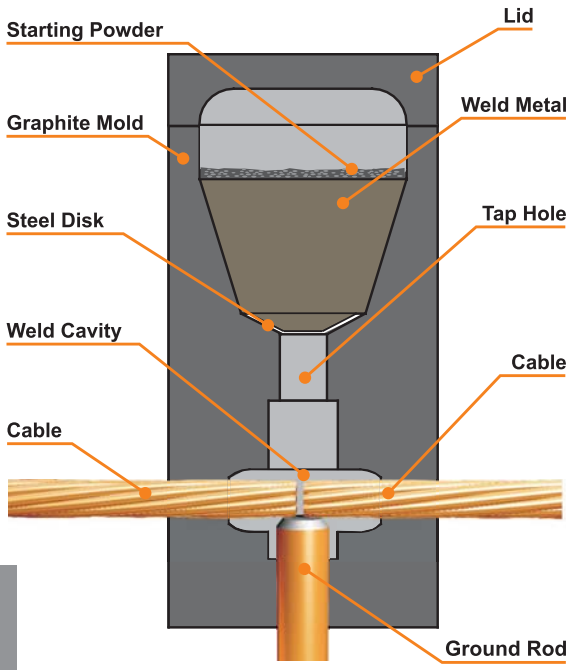
CGR = Cable to Grounding Receptacle
CGRG = Cable & Grounding Receptacle to Ground Rod

Grounding Connection

There are several main objectives providing for well-designed grounding system: first, personal safety, followed by equipment protection, signal reference quality, return path for faults and surges and static dissipation.
In order to meet these objectives, grounding connections must maintain a low contact resistance often under adverse conditions, for the expected lifetime of the grounding system. Connections in grounding network are subject to severe corrosion, high mechanical stress due to electromagnetic force, and rapid thermal heating due to high current magnitude during fault conditions.

Process

Kumwell Exothermic Welding process is a molecular chemical reaction between copper oxide and aluminum, generates a tremendous superheat with molten metals reaching approximately temperatures of 4,000° F (2,600° C). The process can be completed itself automatically without external source of power or heat.



The process use finely divided aluminum particles as the reducing agent with copper oxide to produce the following chemical reaction

$$3CuO + 2Al \longrightarrow 3\,Cu + Al_2O_3$$

• Completed Connection

Exothermic Welding

- 95 mm² Copper Cable to 40 mm Rebar

Safety

Starting and weld metal powder

- Non toxic and heavy metal
- Non self-ignite
- Ignition temperature at least 400° C
- Smooth reaction

Mould

- Earnest design: cavity, flow path
- High quality raw material
- Accurate tolerance
- Duration: at least 50 times in normal usage

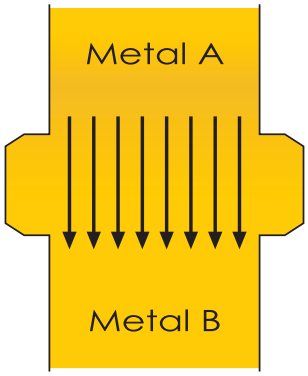
Welding Metal

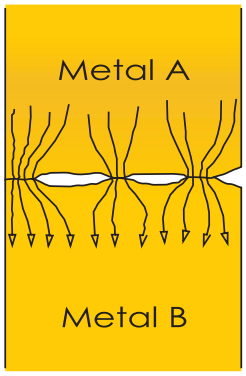
- Non toxic and heavy metal
- Steady burn without pop and fire out
- No slag and porosity
- Consistency of color
- High conductivity with at least 93% Cu

Technical Comparison

Exothermic welding withstands about 5 times higher than clamp's connection in mechanical force.

Unlike compression and bolt clamp, exothermic welded joint become homogeneous metal.





Exothermic Welding	Clamp
3000 lbf	500 lbf

Maximum result of connector's mechanical force with 70 mm² cable