

GROUNDING CONNECTION SPECIFICATION

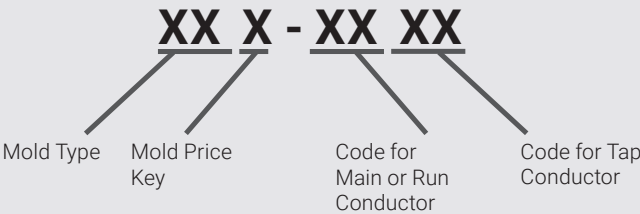
This specification covers the nVent ERICO Cadweld exothermic welding system for use in making electrical connections. The Cadweld system supplied under this specification shall include welding material, molds, tools and accessories as required.

Unless otherwise specified, Cadweld exothermic welding system shall be used for all electrical grounding connections of copper to copper and copper to steel conductors. Cadweld connections shall be suitable for exposure to the elements of direct burial in earth or concrete without degradation over the lifetime of the grounding system.

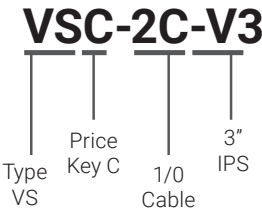
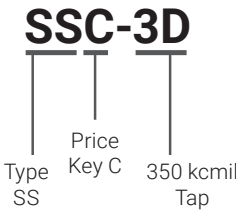
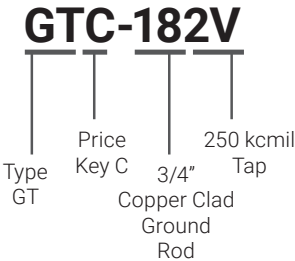
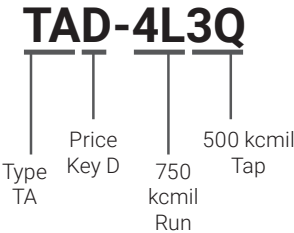
The Cadweld exothermic welding system furnished under this specification shall meet the applicable requirements of IEEE Standard 80 "IEEE Guide for Safety in AC Substation Grounding" and IEEE Standard 837 IEEE "Standard for Qualifying Permanent Connections Used in Substation Grounding". Independent test data showing conformance to IEEE Std. 837 shall be readily available.

The Cadweld Mold Numbering System

The Cadweld mold part number gives, in code, the complete information about the mold.
Type of connection, mold price key, and conductor size(s)



Examples:



CONNECTIONS USED FOR GROUNDING REINFORCING BARS

Cadweld provides efficient and permanent connections for both grounding and attaching lightning protection conductors to rebar. When making Cadweld connections to rebar, the normal materials required are: mold, handle and weld metal. In addition, packing material is also required. These materials act as a seal between the mold and rebar to prevent leaks. One unit of packing material must be ordered for each weld.

CONNECTIONS TO STRUCTURAL REINFORCING BAR AND ANCHOR BOLTS

Welding of ground conductors to reinforcing bars (rebar) by the Cadweld process should not be harmful if stresses in the rebar are below yield. As design stresses are normally only about 50% to 60% of the nominal yield strength of the rebar, welding by the Cadweld process should not be detrimental under design stresses.

As the ACI Building Code (ACI318-14 Commentary, 25.5.2.1) advises, "splice requirements encourage splicing bars at points of minimum stress ... encourage the location of splices away from regions of high tensile stress." The same advice should apply to locations of Cadweld connections of a ground conductor to rebar. Where possible, locate the weld area away from areas of maximum tensile stress, e.g., near the free end of the bar in a lap splice, on the hook extension for a hooked bar, etc. The same considerations apply to Cadweld connections to anchor bolts.

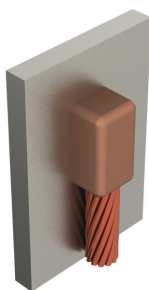
NOTE:

For lightning protection applications where the main lightning protection conductor is connected to the rebar, nVent ERICO recommends a 2/0 AWG copper conductor for structures over 75 feet in height and a #2 AWG copper conductor for structures under 75 feet. For a bonding conductor, a #6 AWG copper may be used. These sizes meet NFPA78 Code requirement. Anchor bolts are connected in the same way.

All welds to rebar requiring larger than a #150 weld metal will be sold only after review by nVent ERICO.

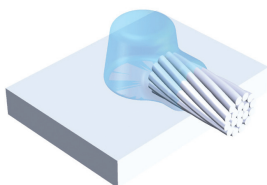
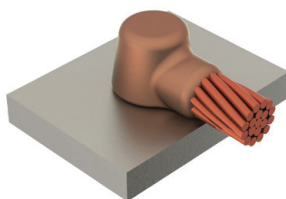
Global Part Number	Mold family	Price Key	Conductor 1	Conductor 2	Ground Rod Size, Nominal	Ground Rod Size Actual	Ground Rod Type	Welding Material Required	Ease of Use	Handle Clamp
NDR181Y	ND	R	#1 Concentric	#1 Concentric	3/4"	0.682"	Copper-bonded	150 or 150PLUSF20	Preferred	L160
NDR182C	ND	R	1/0 Concentric	1/0 Concentric	3/4"	0.682"	Copper-bonded	200 or 200PLUSF20	Preferred	L160
NDR182G	ND	R	2/0 Concentric	2/0 Concentric	3/4"	0.682"	Copper-bonded	250 or 250PLUSF20	Preferred	L160
NDR182Q	ND	R	4/0 Concentric	4/0 Concentric	3/4"	0.682"	Copper-bonded	150 x 2 or 300PLUSF20	Preferred	L160
NDR221V	ND	R	#2 Concentric	#2 Concentric	1"	0.914"	Copper-bonded	250 or 250PLUSF20	Preferred	L160
NDR311V	ND	R	#2 Concentric	#2 Concentric	5/8"	0.625"	Steel	150 or 150PLUSF20	Preferred	L160
NDR312C	ND	R	1/0 Concentric	1/0 Concentric	5/8"	0.625"	Steel	200 or 200PLUSF20	Preferred	L160
NDR312G	ND	R	2/0 Concentric	2/0 Concentric	5/8"	0.625"	Steel	250 or 250PLUSF20	Preferred	L160
NDR332G	ND	R	2/0 Concentric	2/0 Concentric	3/4"	0.750"	Steel	150 x 2 or 300PLUSF20	Preferred	L160

CABLE TO STEEL



- Forms a permanent, low resistance connection
- Provides a molecular bond
- Cadweld Exothermic Connections are rated with the same current capacity as the conductor
- Portable installation equipment with no external source of power required
- Installers can be easily trained to make Cadweld Exothermic Connections
- Connections are visually inspected

HA MOLDS



Global Part Number	Mold Family	Price Key	Conductor Size	Connects To	Pipe Diameter	Welding Material Required	Ease of Use	Handle Clamp Required	Conductor Sleeve
HAA1G	HA	A	#6 Solid	Flat Surface or Steel Pipe	14" and Larger	45 or 45PLUSF20	Preferred	Included with Mold	B1331L
HAA1G162C	HA	A	#6 Solid	Steel Pipe	1 1/4" to 2"	45 or 45PLUSF20	Preferred	Included with Mold	B1331L
HAA1G350C	HA	A	#6 Solid	Steel Pipe	3" to 4"	45 or 45PLUSF20	Preferred	Included with Mold	B1331L
HAA1H	HA	A	#6 Concentric	Flat Surface or Steel Pipe	14" and Larger	45 or 45PLUSF20	Preferred	Included with Mold	B112
HAA1H11C	HA	A	#6 Concentric	Steel Pipe	10" to 12"	45 or 45PLUSF20	Preferred	Included with Mold	B112
HAA1H162C	HA	A	#6 Concentric	Steel Pipe	1 1/4" to 2"	45 or 45PLUSF20	Preferred	Included with Mold	B112
HAA1H350C	HA	A	#6 Concentric	Steel Pipe	3" to 4"	45 or 45PLUSF20	Preferred	Included with Mold	B112
HAA1H7C	HA	A	#6 Concentric	Steel Pipe	6" to 8"	45 or 45PLUSF20	Preferred	Included with Mold	B112

Global Part Number	Mold Family	Price Key	Conductor Size	Connects To	Pipe Diameter	Welding Material Required	Ease of Use	Handle Clamp Required	Conductor Sleeve
VSC1T	VS	C	#2 Solid	Flat Surface or Steel Pipe	32" and Larger	45 or 45PLUSF20	Preferred	L160 or B396	
VSC1TV21C	VS	C	#2 Solid	Steel Pipe	12" to 30"	45 or 45PLUSF20	Preferred	L160	
VSC1TV3C	VS	C	#2 Solid	Steel Pipe	1-1/2" to 4"	45 or 45PLUSF20	Preferred	L160 or B160V	
VSC1TV5C	VS	C	#2 Solid	Steel Pipe	4" to 6"	45 or 45PLUSF20	Preferred	L160, B160V or B158	
VSC1TV8C	VS	C	#2 Solid	Steel Pipe	6" to 10"	45 or 45PLUSF20	Preferred	L160, B160V or B158	
VSC1V	VS	C	#2 Concentric	Flat Surface or Steel Pipe	32" and Larger	45 or 45PLUSF20	Preferred	L160 or B396	
VSC1VV21C	VS	C	#2 Concentric	Steel Pipe	12" to 30"	45 or 45PLUSF20	Preferred	L160	
VSC1VV3C	VS	C	#2 Concentric	Steel Pipe	1-1/2" to 4"	45 or 45PLUSF20	Preferred	L160 or B160V	
VSC1VV5C	VS	C	#2 Concentric	Steel Pipe	4" to 6"	45 or 45PLUSF20	Preferred	L160, B160V or B158	
VSC1VV8C	VS	C	#2 Concentric	Steel Pipe	6" to 10"	45 or 45PLUSF20	Preferred	L160, B160V or B158	
VSC1Y	VS	C	#1 Concentric	Flat Surface or Steel Pipe	32" and Larger	65 or 65PLUSF20	Preferred	L160 or B396	
VSC1YV21C	VS	C	#1 Concentric	Steel Pipe	12" to 30"	65 or 65PLUSF20	Preferred	L160	
VSC1YV3C	VS	C	#1 Concentric	Steel Pipe	1-1/2" to 4"	65 or 65PLUSF20	Preferred	L160 or B160V	
VSC1YV5C	VS	C	#1 Concentric	Steel Pipe	4" to 6"	65 or 65PLUSF20	Preferred	L160, B160V or B158	
VSC1YV8C	VS	C	#1 Concentric	Steel Pipe	6" to 10"	65 or 65PLUSF20	Preferred	L160, B160V or B158	
VSC2C	VS	C	1/0 Concentric	Flat Surface or Steel Pipe	32" and Larger	90 or 90PLUSF20	Preferred	L160 or B396	
VSC2CV21C	VS	C	1/0 Concentric	Steel Pipe	12" to 30"	90 or 90PLUSF20	Preferred	L160	
VSC2CV3C	VS	C	1/0 Concentric	Steel Pipe	2" to 4"	90 or 90PLUSF20	Preferred	L160 or B160V	
VSC2CV5C	VS	C	1/0 Concentric	Steel Pipe	4" to 6"	90 or 90PLUSF20	Preferred	L160, B160V or B158	
VSC2CV8C	VS	C	1/0 Concentric	Steel Pipe	6" to 10"	90 or 90PLUSF20	Preferred	L160, B160V or B158	
VSC2G	VS	C	2/0 Concentric	Flat Surface or Steel Pipe	32" and Larger	90 or 90PLUSF20	Preferred	L160 or B396	
VSC2GV21C	VS	C	2/0 Concentric	Steel Pipe	12" to 30"	90 or 90PLUSF20	Preferred	L160	
VSC2GV3C	VS	C	2/0 Concentric	Steel Pipe	2" to 4"	90 or 90PLUSF20	Preferred	L160 or B160V	
VSC2GV5C	VS	C	2/0 Concentric	Steel Pipe	4" to 6"	90 or 90PLUSF20	Preferred	L160, B160V or B158	
VSC2GV8C	VS	C	2/0 Concentric	Steel Pipe	6" to 10"	90 or 90PLUSF20	Preferred	L160, B160V or B158	
VSC2Q	VS	C	4/0 Concentric	Flat Surface or Steel Pipe	32" and Larger	115 or 115PLUSF20	Preferred	L160 or B396	
VSC2QV21C	VS	C	4/0 Concentric	Steel Pipe	12" to 30"	115 or 115PLUSF20	Preferred	L160	
VSC2QV3C	VS	C	4/0 Concentric	Steel Pipe	2" to 4"	115 or 115PLUSF20	Preferred	L160 or B160V	
VSC2QV5C	VS	C	4/0 Concentric	Steel Pipe	4" to 6"	115 or 115PLUSF20	Preferred	L160, B160V or B158	
VSC2QV8C	VS	C	4/0 Concentric	Steel Pipe	6" to 10"	115 or 115PLUSF20	Preferred	L160, B160V or B158	
VSC2V	VS	C	250 kcmil Concentric	Flat Surface or Steel Pipe	32" and Larger	115 or 115PLUSF20	Preferred	L160 or B396	
VSC3A	VS	C	300 kcmil Concentric	Flat Surface or Steel Pipe	32" and Larger	150 or 150PLUSF20	Preferred	L160 or B396	
VSC3D	VS	C	350 kcmil Concentric	Flat Surface or Steel Pipe	32" and Larger	200 or 200PLUSF20	Preferred	L160 or B396	
VSC3H	VS	C	400 kcmil Concentric	Flat Surface or Steel Pipe	32" and Larger	200 or 200PLUSF20	Preferred	L160 or B396	
VSC3Q	VS	C	500 kcmil Concentric	Flat Surface or Steel Pipe	32" and Larger	200 or 200PLUSF20	Preferred	L160 or B396	
VSP1K	VS	P	#4 Solid	Flat Surface or Steel Pipe	32" and Larger	45 or 45PLUSF20	Preferred	Mini EZ Attached or B399BM	
VSP1T	VS	P	#2 Solid	Flat Surface or Steel Pipe	32" and Larger	45 or 45PLUSF20	Preferred	Mini EZ Attached or B399BM	
VST1G	VS	T	#6 Solid	Flat Surface or Steel Pipe	32" and Larger	25 or 25PLUSF20	Preferred	Mini EZ Attached or B399AM	
VST1H	VS	T	#6 Concentric	Flat Surface or Steel Pipe	32" and Larger	25 or 25PLUSF20	Preferred	Mini EZ Attached or B399AM	
VST1L	VS	T	#4 Concentric	Flat Surface or Steel Pipe	32" and Larger	25 or 25PLUSF20	Preferred	Mini EZ Attached or B399AM	