

CATALOG 2012



Exel International
ABSOLUTE SYNERGY

TABLE OF CONTENTS

FLEXIBLE BRAIDED CONNECTORS

01	FLEXIBLE BRAIDED CONNECTORS		
02	SPECIAL SHAPES AND BOLTING INFORMATION		
03	X075 STANDARD FLEXIBLE SERIES	160A-290A RATING	3/4" WIDTH
04	XX075 EXTRA FLEXIBLE SERIES	160A-300A RATING	3/4" WIDTH
05	X100 STANDARD FLEXIBLE SERIES	250A-470A RATING	1" WIDTH
06	XX100 EXTRA FLEXIBLE SERIES	200A-470A RATING	1" WIDTH
07	X125 STANDARD FLEXIBLE SERIES	330A-560A RATING	1 1/4" WIDTH
08	X126 STANDARD FLEXIBLE SERIES	360A-950A RATING	1 1/4" WIDTH
09	X150 STANDARD FLEXIBLE SERIES	340A-910A RATING	1 1/2" WIDTH
10	XX150 EXTRA FLEXIBLE SERIES	330A-890A RATING	1 1/2" WIDTH
11	X151 STANDARD FLEXIBLE SERIES	420A-1880A RATING	1 1/2" WIDTH
12	XX151 EXTRA FLEXIBLE SERIES	410A-1830A RATING	1 1/2" WIDTH
13	X163 STANDARD FLEXIBLE SERIES	430A-1900A RATING	1 5/8" WIDTH
14	XX163 EXTRA FLEXIBLE SERIES	420A-1840A RATING	1 5/8" WIDTH
15	X175 STANDARD FLEXIBLE SERIES	450A-1910A RATING	1 3/4" WIDTH
16	XX175 EXTRA FLEXIBLE SERIES	440A-1860A RATING	1 3/4" WIDTH
17	X200 STANDARD FLEXIBLE SERIES	660A-1870A RATING	2" WIDTH
18	XX200 EXTRA FLEXIBLE SERIES	650A-1890A RATING	2" WIDTH
19	X300 STANDARD FLEXIBLE SERIES	1090A-3030A RATING	3" WIDTH
20	XX300 EXTRA FLEXIBLE SERIES	1070A-2950A RATING	3" WIDTH
21	X400 STANDARD FLEXIBLE SERIES	1210A-3310A RATING	4" WIDTH
22	X600 STANDARD FLEXIBLE SERIES	1940A-4560A RATING	6" WIDTH
23	BRAIDED COPPER CABLES		
24	STANDARD WIRE GAUGE		

TABLE OF CONTENTS

ELECTRICAL COMPONENTS

- 25 LAMINATED COPPER AND ALUMINIUM CONNECTORS
- 26 COPPER AND ALUMINUM BUS BARS
- 27 ELECTRICAL COMPONENTS FOR GENERAL APPLICATIONS
- 28 BRAZED ELECTRICAL CONTACTS

GENERAL MACHINING

- 29 GENERAL MACHINING

TECHNICAL INFORMATION

- 30 METAL PROPERTIES
- 31 GALVANIC CORROSION OR DISSIMILAR METAL CORROSION
- 32 CONVERSIONS



FLEXIBLE BRAIDED CONNECTORS



Exel International
ABSOLUTE SYNERGY

FLEXIBLE BRAIDED CONNECTORS

Both on a large and small scale, Exel provides customized solutions to respond to the various needs of its customers. Manufactured with proven procedures using quality materials and cutting edge equipment such as an exclusive CNC equipment designed by the Exel engineering team, Exel's flexible braided connectors bear witness to the highest quality and output levels.

APPLICATION

For low and medium voltages, flexible braided connectors are mostly used by the following industries: wind energy, power transformers, generators, substations, circuit breakers and rectifiers. They are also used in the automobile, aerospace, information technology as well as the military.

Flexible braided connectors can mainly be found under the following conditions:

- High mechanism vibrations
- Thermal contractions and/or extensions of attached units
- Space constraints

MATERIALS USED

FERRULES

- Seamless copper tube, C11000 ETP according to ASTM B-188
- Seamless copper tube, C12200 DHP according to ASTM B-75 or ASTM B-88

FERRULE PLATING OPTIONS

- Electrolytic tin according to ASTM B-545
- Electrolytic silver according to ASTM B-700
- Electroless nickel according to ASTM B-733
- Lead free hot tin

Ferrule plating have a standard 0.0003" thickness although they can reach up to 0.004", upon customer request.

FLAT, ROUND OR TUBULAR BRAIDS

- Tin plated C11000 ETP copper according to ASTM B-33
- Silver plated C11000 ETP copper according to ASTM B-298
- Nickel plated C11000 ETP copper according to ASTM B-335
- C11000 ETP bare copper
- Stainless steel alloys 302, 304, 321 or 430
- Aluminum alloy 5056

Most commonly used wire gauges in the industry are 30 AWG (.010") to 44 AWG (.002").

DIMENSIONS

- Ferrule width up to 10"
- Ferrule thickness up to 3"
- Total connector length up to 120"
- Mounting holes according to NEMA standards

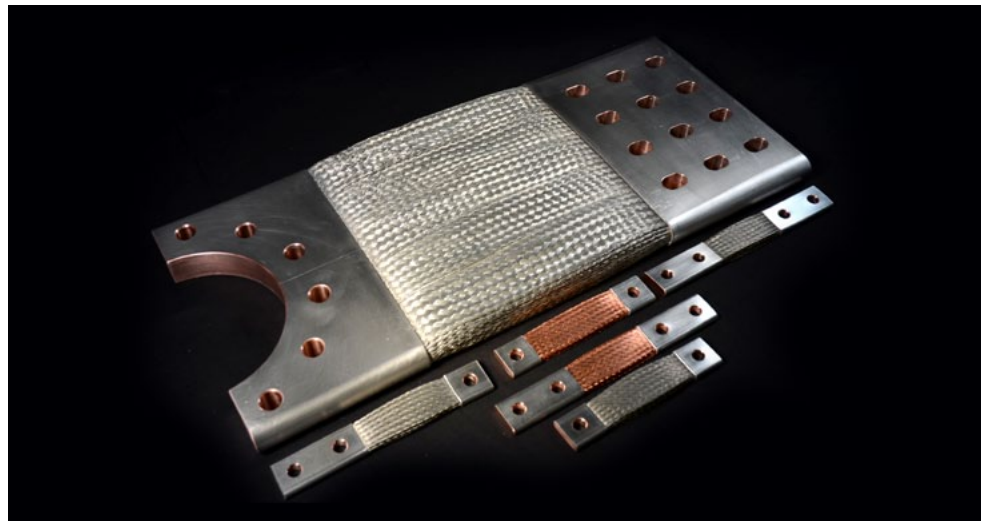
Please note that customized sizes are also available.

CURRENT CAPACITY

- 100 Amperes to 7,500 Amperes

OPTIONS

- Insulation: Heat shrink PVC and polyolefin, ceramic heat shield and several other types of insulation materials are also available.



FC001



FC002



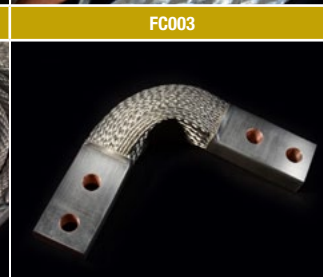
FC003



FC004



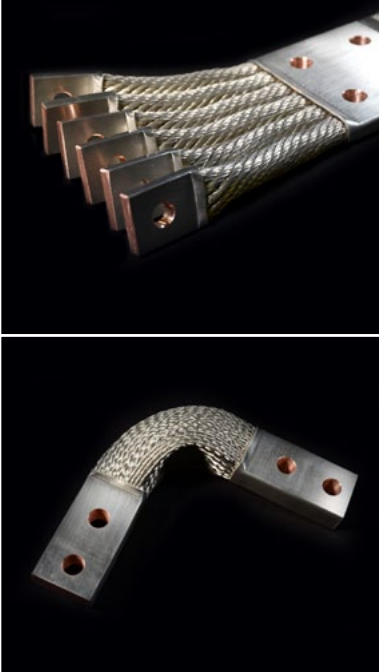
FC005



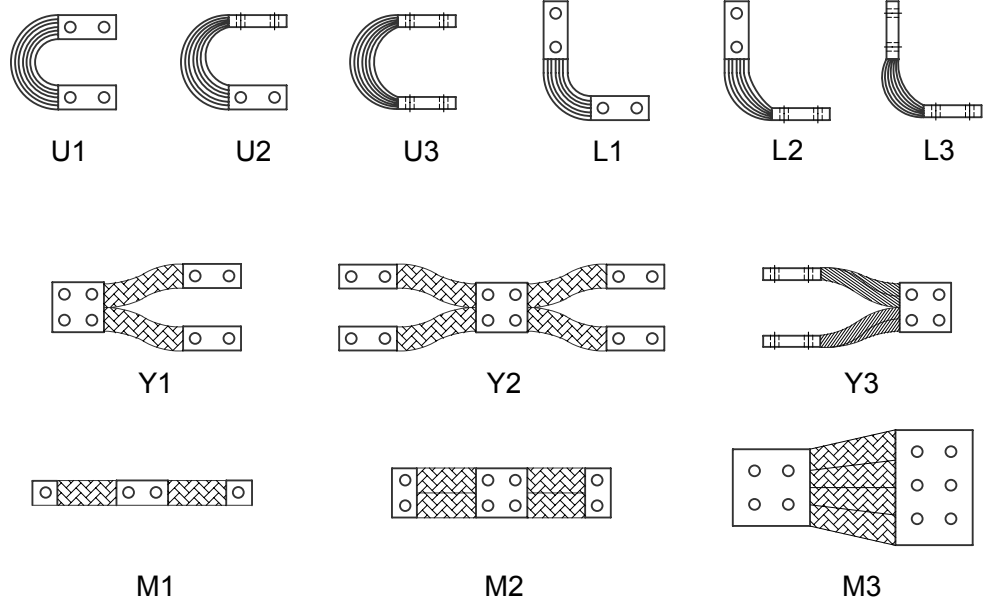
FC006



FC007



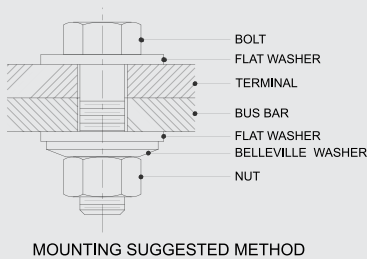
SPECIAL SHAPES AND CONFIGURATIONS



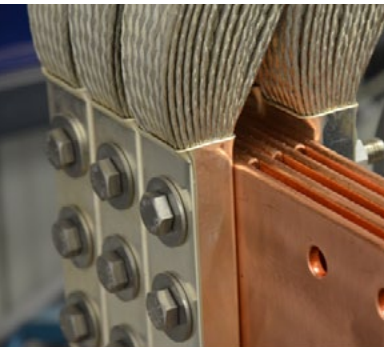
CUSTOM SHAPES ARE ALSO AVAILABLE

COPPER AND ALUMINIUM BUS BAR BOLTING TORQUES

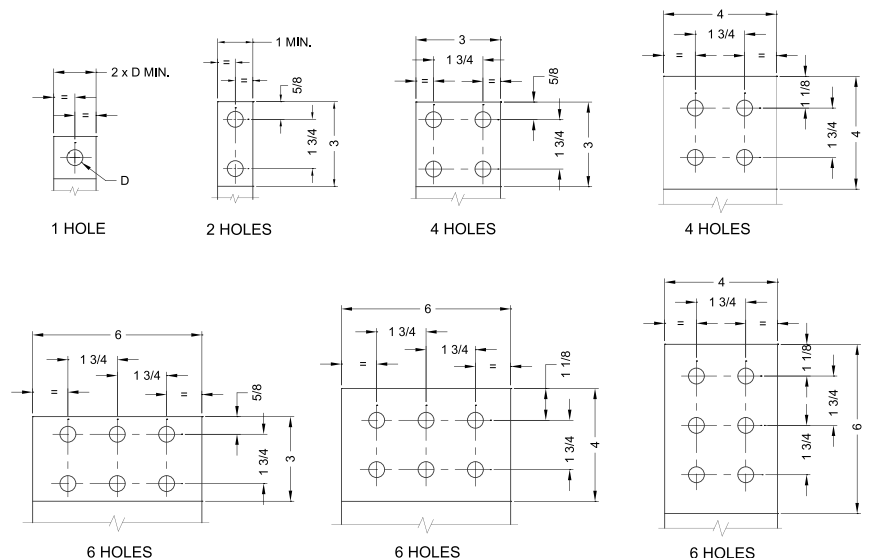
BOLT SIZE (UNC)	TERMINAL HOLE SIZE (IN)	FLAT WASHER STAINLESS STEEL 18-8 & 316		RECOMMENDED TIGHTENING TORQUES			
		OUTSIDE DIAMETER (IN)	NOMINAL THICKNESS (IN)	STAINLESS STEEL 18-8 OR SILICON BRONZE		ALUMINIUM 2024-T4 (LUBRICATED)	
				FT-LBS	INCH-LBS	FT-LBS	INCH-LBS
5/16-18	3/8	0.750	0.050	15	180	10	120
3/8-16	7/16	0.875	0.050	20	240	14	168
1/2-13	9/16	1.250	0.062	40	480	25	300
5/8-11	11/16	1.500	0.078	55	660	40	480
3/4-10	13/16	1.875	0.109	80	960	60	840



MOUNTING SUGGESTED METHOD



NEMA BOLT HOLES CONFIGURATIONS FOR TERMINAL CONNECTORS



WARNING

When copper and aluminium are exposed to air, a very thin film of oxide forms rapidly on the surface of the conductor. Before the joining and bolting of the conductor, it is necessary to properly remove the oxide film and quickly apply a thin layer of the electrical contact compound on the contact area.

Special care shall be taken for the joining of different materials due to the galvanic corrosion and differential thermal expansion. See galvanic corrosion table.



X075 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"
4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X075A 12

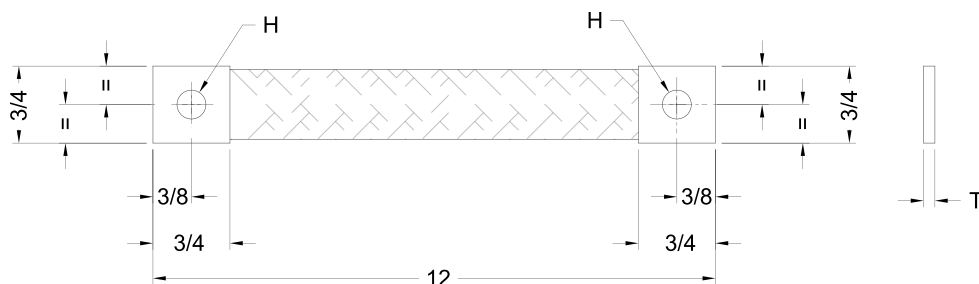
Standard length

CUSTOM PART NUMBER

X075A 16.50 - S3

Required length Plating

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X075A12	0.125	0.343	0.15	19.5	0.030	38400	130	160
X075B12	0.209	0.343	0.30	38.9	0.060	76800	190	240
X075C12	0.250	0.343	0.42	58.4	0.090	115200	240	290





XX075 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

EXTRA FLEXIBLE BRAIDS

36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545 ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part number for the required length in inches.

FERRULE PLATING

Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001" **4** = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

XX075A 12

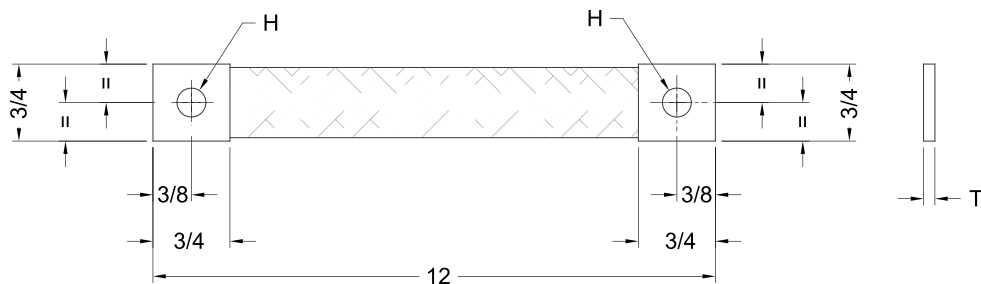


CUSTOM PART NUMBER

XX075A 16.50 - S3



EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
XX075A12	0.125	0.343	0.16	20.4	0.032	40200	130	160
XX075B12	0.214	0.343	0.31	40.7	0.063	80400	200	240
XX075C12	0.250	0.343	0.41	61.1	0.095	120600	250	300





X100 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545. ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part number for the required length in inches.

FERRULE PLATING

Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001" **4** = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X100A 12

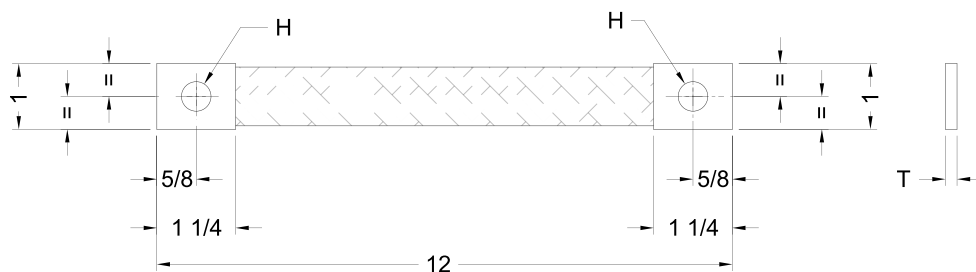
Standard length

CUSTOM PART NUMBER

X100A 16.50 - S3

Required length Plating

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X100A12	0.178	0.438	0.34	38.9	0.060	76800	210	250
X100B12	0.198	0.438	0.41	48.6	0.075	96000	230	290
X100C12	0.232	0.438	0.56	73.0	0.113	144000	290	360
X100D12	0.282	0.438	0.72	97.3	0.151	192000	340	420
X100E12	0.339	0.438	0.90	121.6	0.188	240000	390	470





XX100 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

EXTRA FLEXIBLE BRAIDS

36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545. ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part number for the required length in inches.

FERRULE PLATING

Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001" **4** = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

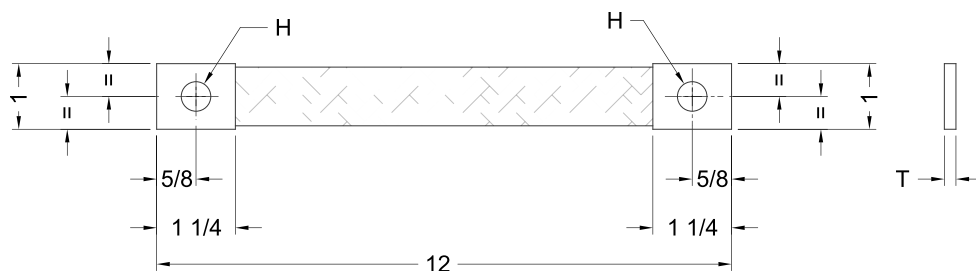
XX100A 12

Standard length
CUSTOM PART NUMBER

XX100A 16.50 - S3

Required length Plating

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
XX100A12	0.148	0.438	0.25	24.3	0.038	48000	160	200
XX100B12	0.198	0.438	0.41	48.6	0.075	96000	230	290
XX100C12	0.232	0.438	0.56	73.0	0.113	144000	290	360
XX100D12	0.282	0.438	0.72	97.3	0.151	192000	340	420
XX100E12	0.339	0.438	0.90	121.6	0.188	240000	390	470





X125 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545. ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part number for the required length in inches.

FERRULE PLATING

Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001" **4** = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X125A 12

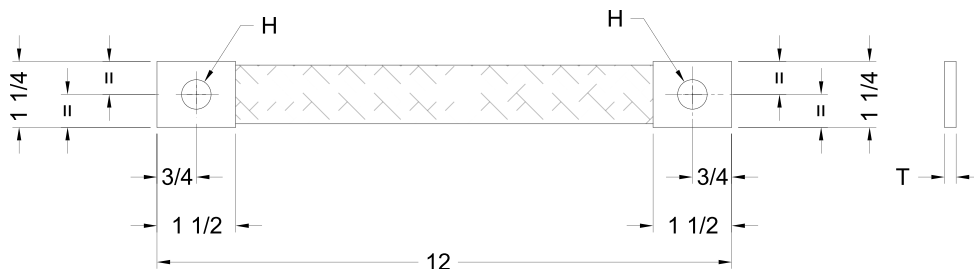
Standard length

CUSTOM PART NUMBER

X125A 16.50 - S3

Required length Plating

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X125A12	0.220	0.563	0.51	53.5	0.083	105600	270	330
X125B12	0.260	0.563	0.68	77.8	0.121	153600	320	400
X125C12	0.300	0.563	0.93	116.8	0.181	230400	400	490
X125D12	0.364	0.563	1.19	155.7	0.241	307200	420	560





X126 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"
4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X125A 12

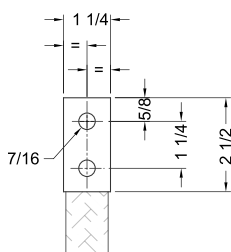
Standard length

CUSTOM PART NUMBER

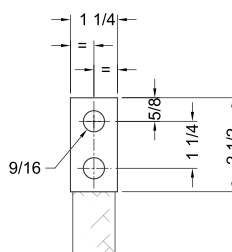
X125A 16.50 AB - S3

Required length
Ferrule
configuration
Plating

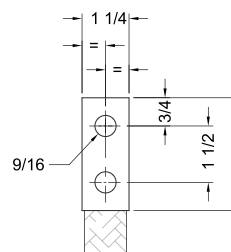
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X126A12	0.220	D	D	0.67	53.5	0.083	105600	290	360
X126B12	0.260	D	D	0.84	77.8	0.121	153600	360	440
X126C12	0.300	D	D	1.09	116.8	0.181	230400	440	540
X126D12	0.364	D	D	1.35	155.7	0.241	307200	520	630
X125E12	0.453	D	D	1.71	194.6	0.302	384000	590	720
X126F12	0.478	D	D	1.87	233.5	0.362	460800	650	790
X126G12	0.541	D	D	2.13	272.4	0.422	537600	720	870
X126H12	0.647	D	D	2.53	311.3	0.483	614400	780	950



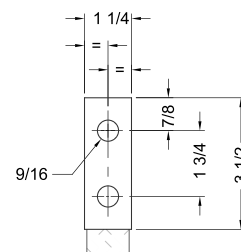
TYPE A



TYPE B

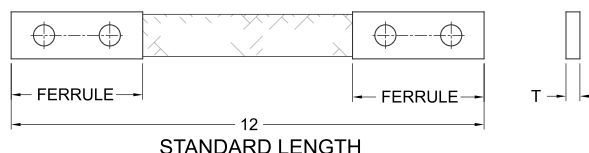


TYPE C



TYPE D

FERRULE CONFIGURATION



STANDARD LENGTH



X150 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545. ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part number for the required length in inches.

FERRULE PLATING

Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001" **4** = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X150A 12

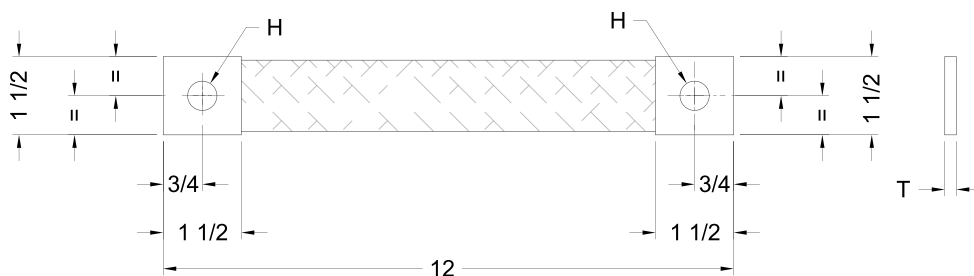
Standard length

CUSTOM PART NUMBER

X150A 16.50 - S3

Required length Plating

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X150A12	0.171	0.563	0.52	53.5	0.083	105600	280	340
X150B12	0.242	0.563	0.87	107.0	0.166	211200	400	490
X150C12	0.313	0.563	1.22	160.5	0.249	316800	500	610
X150D12	0.438	0.563	1.65	214.0	0.332	422400	590	720
X150E12	0.500	0.563	2.00	267.6	0.415	528000	670	820
X150F12	0.563	0.563	2.36	321.1	0.498	633600	740	910





XX150 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

EXTRA FLEXIBLE BRAIDS

36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545. ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part number for the required length in inches.

FERRULE PLATING

Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001" **4** = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

XX150A 12

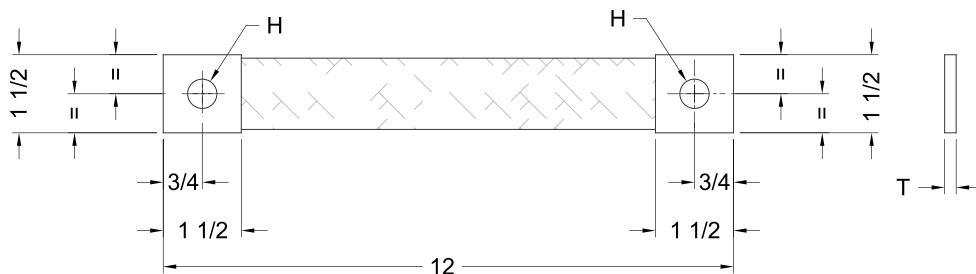


CUSTOM PART NUMBER

XX150A 16.50 - S3



EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
XX150A12	0.168	0.563	0.50	51.1	0.079	100800	270	330
XX150B12	0.236	0.563	0.84	102.2	0.158	201600	390	480
XX150C12	0.304	0.563	1.18	153.2	0.238	302400	490	600
XX150D12	0.375	0.563	1.51	204.3	0.317	403200	570	700
XX150E12	0.477	0.563	1.92	255.4	0.396	504000	650	800
XX150F12	0.546	0.563	2.26	306.5	0.475	604800	720	890





X151 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"
4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X151A 12

Standard length

CUSTOM PART NUMBER

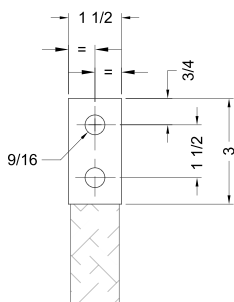
X151A 16.50 AB - S3

Required length

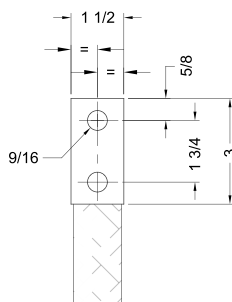
Ferrule
configuration

Plating

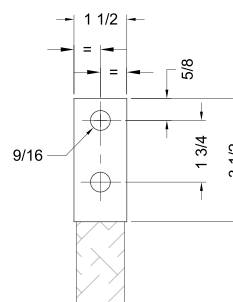
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X151A12	0.171	C	C	0.74	53.5	0.083	105600	350	420
X151B12	0.242	C	C	1.09	107.0	0.166	211200	500	610
X151C12	0.313	C	C	1.44	160.5	0.249	316800	640	750
X151D12	0.438	C	C	1.96	214.0	0.332	422400	740	890
X151E12	0.500	C	C	2.32	267.6	0.415	528000	840	1010
X151F12	0.566	C	C	2.67	321.1	0.498	633600	930	1120
X151G12	0.625	C	C	2.99	374.6	0.581	739200	1010	1220
X151H12	0.688	C	C	3.35	428.1	0.664	844800	1100	1320
X151I12	0.785	C	C	3.85	481.6	0.746	950400	1180	1430
X151J12	0.856	C	C	4.20	535.1	0.829	1056000	1260	1520
X151K12	0.929	C	C	4.55	588.6	0.912	1161600	1340	1620
X151L12	0.985	C	C	4.91	642.1	0.995	1267200	1410	1700
X151M12	1.080	C	C	5.26	695.7	1.078	1372800	1490	1800
X151N12	1.150	C	C	5.74	749.2	1.161	1478400	1560	1880



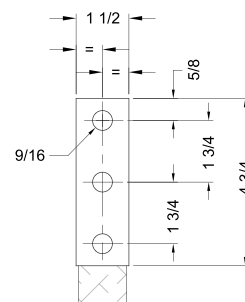
TYPE A



TYPE B

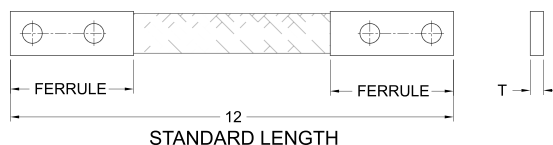


TYPE C



TYPE D

FERRULE CONFIGURATION





XX151 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

EXTRA FLEXIBLE BRAIDS

36 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"
4 = .002" **5** = .004"

EXAMPLE

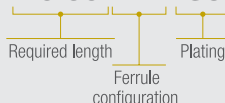
STANDARD PART NUMBER

XX151A 12

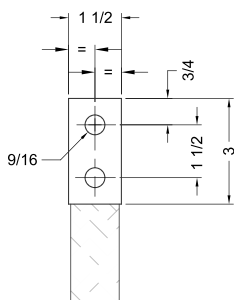


CUSTOM PART NUMBER

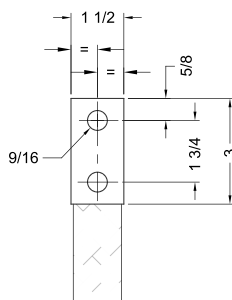
XX151A 16.50 AB - S3



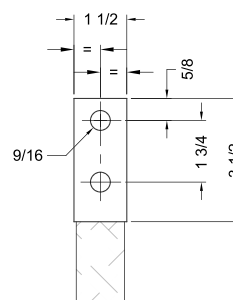
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
XX151A12	0.168	C	C	0.72	51.1	0.079	100800	340	410
XX151B12	0.236	C	C	1.06	102.2	0.158	201600	490	590
XX151C12	0.304	C	C	1.39	153.2	0.238	302400	610	730
XX151D12	0.375	C	C	1.73	204.3	0.317	403200	710	860
XX151E12	0.477	C	C	2.24	255.4	0.396	504000	810	980
XX151F12	0.546	C	C	2.57	306.5	0.475	604800	900	1090
XX151G12	0.590	C	C	2.88	357.6	0.554	705600	980	1190
XX151H12	0.660	C	C	3.22	408.6	0.633	806400	1060	1290
XX151I12	0.760	C	C	3.70	459.7	0.713	907200	1150	1390
XX151J12	0.830	C	C	4.04	510.8	0.792	1008000	1230	1480
XX151K12	0.900	C	C	4.38	561.9	0.871	1108800	1300	1570
XX151L12	0.950	C	C	4.72	613.0	0.950	1209600	1370	1650
XX151M12	1.020	C	C	5.06	664.0	1.029	1310400	1440	1740
XX151N12	1.100	C	C	5.50	715.1	1.108	1411200	1520	1830



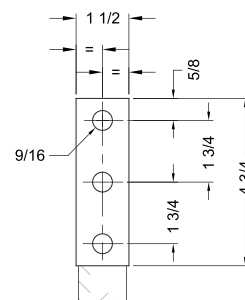
TYPE A



TYPE B

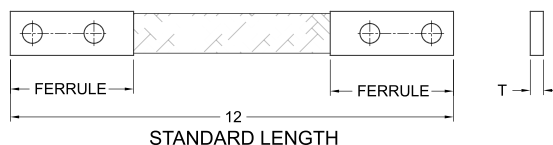


TYPE C



TYPE D

FERRULE CONFIGURATION





X163 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"
4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X163A 12

Standard length

CUSTOM PART NUMBER

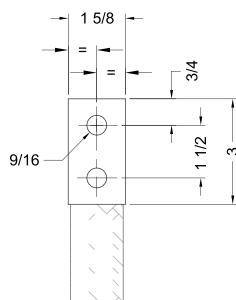
X163A 16.50 AB - S3

Required length

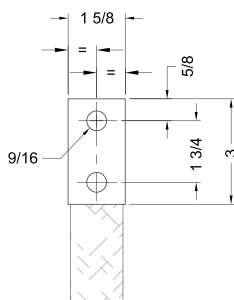
Ferrule
configuration

Plating

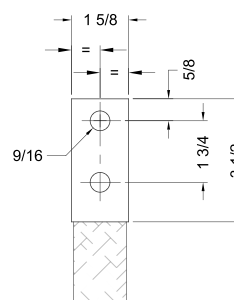
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X163A12	0.165	C	C	0.74	53.5	0.083	105600	360	430
X163B12	0.231	C	C	1.09	107.0	0.166	211200	510	620
X163C12	0.330	C	C	1.44	160.5	0.249	316800	620	770
X163D12	0.396	C	C	1.96	214.0	0.332	422400	750	910
X163E12	0.463	C	C	2.32	267.6	0.415	528000	850	1030
X163F12	0.500	C	C	2.67	321.1	0.498	633600	940	1130
X163G12	0.570	C	C	2.99	374.6	0.581	739200	1020	1240
X163H12	0.663	C	C	3.35	428.1	0.664	844800	1110	1340
X163I12	0.729	C	C	3.85	481.6	0.746	950400	1200	1440
X163J12	0.796	C	C	4.20	535.1	0.829	1056000	1270	1540
X163K12	0.847	C	C	4.55	588.6	0.912	1161600	1350	1630
X163L12	0.914	C	C	4.91	642.1	0.995	1267200	1420	1720
X163M12	0.980	C	C	5.26	695.7	1.078	1372800	1500	1810
X163N12	1.062	C	C	5.74	749.2	1.161	1478400	1570	1900



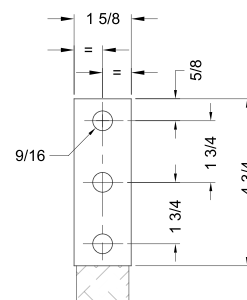
TYPE A



TYPE B

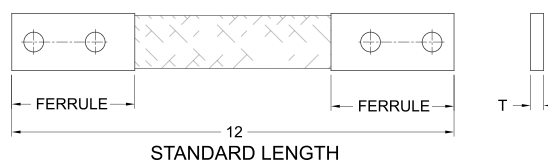


TYPE C



TYPE D

FERRULE CONFIGURATION



STANDARD LENGTH



XX163 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

EXTRA FLEXIBLE BRAIDS

36 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"
4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

XX163A 12

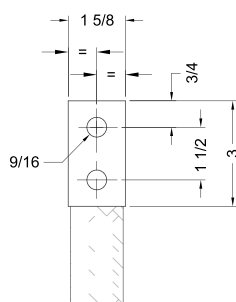
Standard length

CUSTOM PART NUMBER

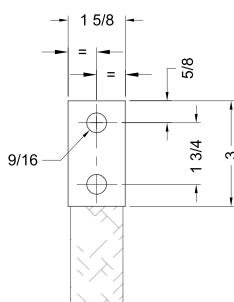
XX163A 16.50 AB - S3

Required length Ferrule configuration Plating

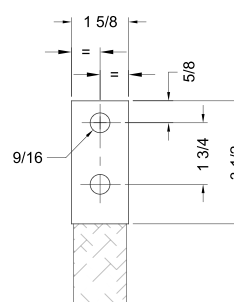
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
XX163A12	0.162	C	C	0.72	51.1	0.079	100800	350	420
XX163B12	0.225	C	C	1.06	102.2	0.158	201600	500	600
XX163C12	0.321	C	C	1.56	153.2	0.238	302400	620	750
XX163D12	0.384	C	C	1.90	204.3	0.317	403200	730	880
XX163E12	0.448	C	C	2.24	255.4	0.396	504000	830	1000
XX163F12	0.486	C	C	2.54	306.5	0.475	604800	910	1100
XX163G12	0.549	C	C	2.88	357.6	0.554	705600	1000	1210
XX163H12	0.612	C	C	3.22	408.6	0.633	806400	1080	1300
XX163I12	0.702	C	C	3.70	459.7	0.713	907200	1160	1400
XX163J12	0.765	C	C	4.04	510.8	0.792	1008000	1240	1500
XX163K12	0.829	C	C	4.40	561.9	0.871	1108800	1310	1580
XX163L12	0.877	C	C	4.72	613.0	0.950	1209600	1380	1670
XX163M12	0.941	C	C	5.06	664.0	1.029	1310400	1450	1750
XX163N12	1.020	C	C	5.50	715.1	1.108	1411200	1530	1840



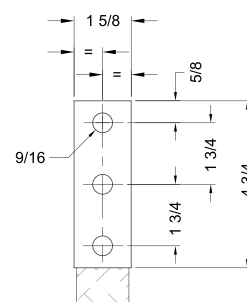
TYPE A



TYPE B

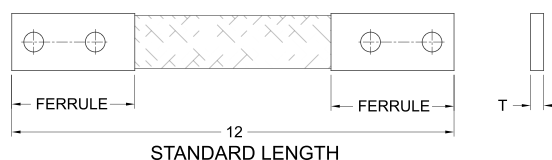


TYPE C



TYPE D

FERRULE CONFIGURATION



STANDARD LENGTH



X175 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"
4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X175A 12

Standard length

CUSTOM PART NUMBER

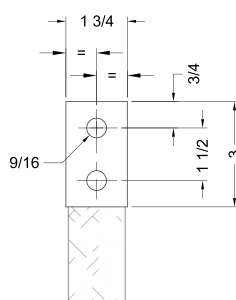
X175A 16.50 AB - S3

Required length

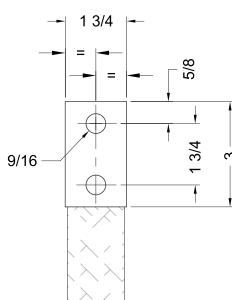
Ferrule
configuration

Plating

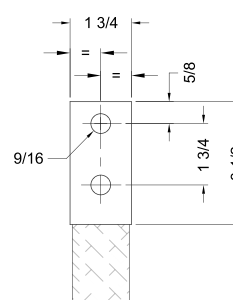
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X175A12	0.190	C	C	0.90	53.5	0.083	105600	370	450
X175B12	0.250	C	C	1.25	107.0	0.166	211200	530	640
X175C12	0.314	C	C	1.61	160.5	0.249	316800	660	790
X175D12	0.353	C	C	1.93	214.0	0.332	422400	760	920
X175E12	0.413	C	C	2.28	267.6	0.415	528000	860	1040
X175F12	0.474	C	C	2.64	321.1	0.498	633600	950	1150
X175G12	0.560	C	C	3.14	374.6	0.581	739200	1050	1260
X175H12	0.625	C	C	3.49	428.1	0.664	844800	1130	1360
X175I12	0.683	C	C	3.85	481.6	0.746	950400	1210	1460
X175J12	0.731	C	C	4.20	535.1	0.829	1056000	1290	1550
X175K12	0.792	C	C	4.56	588.6	0.912	1161600	1360	1640
X175L12	0.853	C	C	4.91	642.1	0.995	1267200	1440	1730
X175M12	0.929	C	C	5.38	695.7	1.078	1372800	1510	1800
X175N12	1.000	C	C	5.73	749.2	1.161	1478400	1580	1910



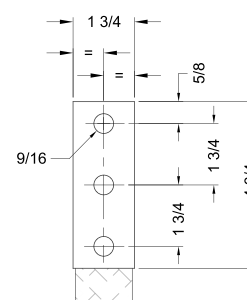
TYPE A



TYPE B

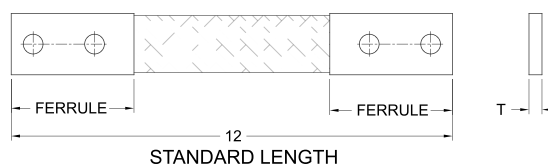


TYPE C



TYPE D

FERRULE CONFIGURATION





XX175 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

EXTRA FLEXIBLE BRAIDS

36 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"
4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

XX175A 12

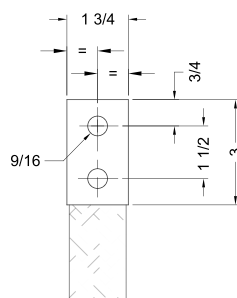
Standard length

CUSTOM PART NUMBER

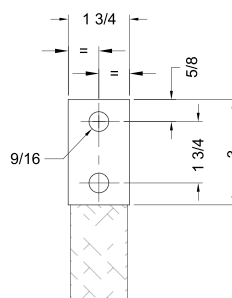
XX175A 16.50 AB - S3

Required length
Ferrule configuration
Plating

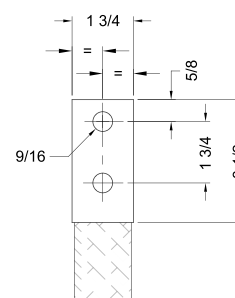
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X175A12	0.189	C	C	0.89	51.1	0.079	100800	360	440
X175B12	0.247	C	C	1.22	102.2	0.158	201600	520	620
X175C12	0.306	C	C	1.56	153.2	0.238	302400	640	770
X175D12	0.342	C	C	1.87	204.3	0.317	403200	740	900
X175E12	0.400	C	C	2.20	255.4	0.396	504000	840	1010
X175F12	0.458	C	C	2.54	306.5	0.475	604800	930	1120
X175G12	0.541	C	C	3.03	357.6	0.554	705600	1020	1230
X175H12	0.573	C	C	3.27	408.6	0.633	806400	1100	1320
X175I12	0.658	C	C	3.70	459.7	0.713	907200	1180	1420
X175J12	0.703	C	C	4.04	510.8	0.792	1008000	1250	1510
X175K12	0.761	C	C	4.38	561.9	0.871	1108800	1300	1600
X175L12	0.819	C	C	4.72	613.0	0.950	1209600	1400	1690
X175M12	0.892	C	C	5.17	664.0	1.029	1310400	1470	1770
X175N12	0.951	C	C	5.50	715.1	1.108	1411200	1540	1860



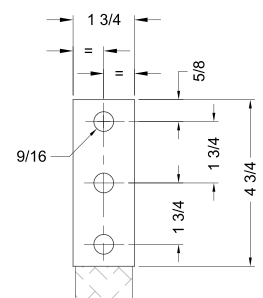
TYPE A



TYPE B

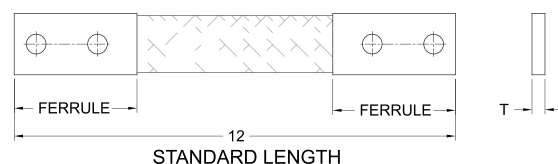


TYPE C



TYPE D

FERRULE CONFIGURATION



STANDARD LENGTH



X200 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"

4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X200A 12

Standard length

CUSTOM PART NUMBER

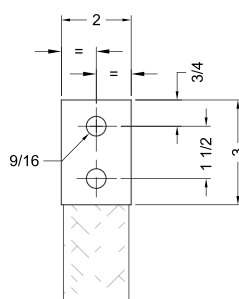
X200A 16.50 AB - S3

Required length

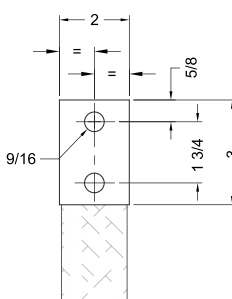
Ferrule
configuration

Plating

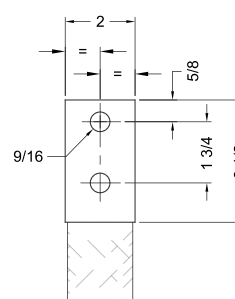
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X200A12	0.187	C	C	0.91	77.8	0.121	153600	460	560
X200B12	0.235	C	C	1.43	155.7	0.241	307200	670	800
X200C12	0.362	C	C	2.21	233.5	0.362	460800	830	1000
X200D12	0.440	C	C	2.72	311.3	0.483	614400	970	1180
X200E12	0.505	C	C	3.24	389.2	0.603	768000	1100	1330
X200F12	0.582	C	C	3.75	467.0	0.724	921600	1220	1470
X200G12	0.672	C	C	4.38	544.8	0.844	1075200	1340	1610
X200H12	0.750	C	C	4.89	622.7	0.965	1228800	1450	1740
X200I12	0.827	C	C	5.41	700.5	1.086	1382400	1550	1870



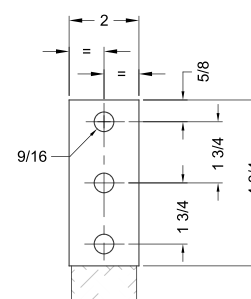
TYPE A



TYPE B

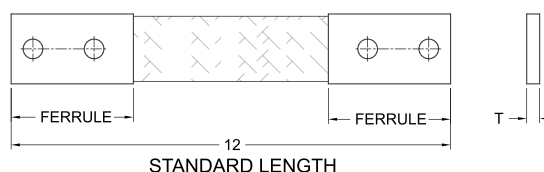


TYPE C



TYPE D

FERRULE CONFIGURATION



STANDARD LENGTH



XX200 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

EXTRA FLEXIBLE BRAIDS

36 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end of
the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"
4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

XX200A 12

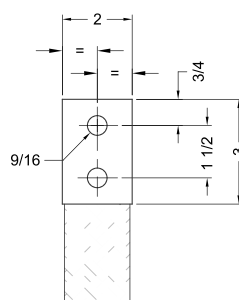
Standard length

CUSTOM PART NUMBER

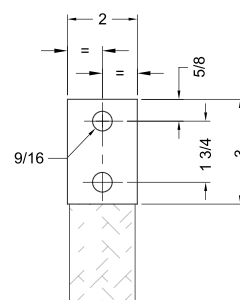
XX200A 16.50 AB - S3

Required length
Ferrule configuration
Plating

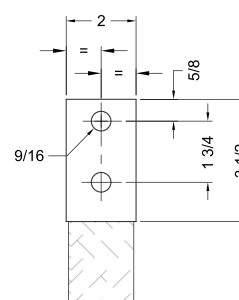
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
XX200A12	0.187	C	C	1.07	102.2	0.158	201600	540	650
XX200B12	0.235	C	C	1.41	153.2	0.238	302400	660	800
XX200C12	0.335	C	C	2.01	204.3	0.317	403200	780	940
XX200D12	0.384	C	C	2.35	255.4	0.396	504000	880	1060
XX200E12	0.437	C	C	2.69	306.5	0.475	604800	970	1170
XX200F12	0.486	C	C	3.05	357.6	0.554	705600	1050	1270
XX200G12	0.524	C	C	3.37	408.6	0.633	806400	1130	1370
XX200H12	0.575	C	C	3.71	459.7	0.713	907200	1210	1460
XX200I12	0.625	C	C	4.04	510.8	0.792	1008000	1290	1550
XX200J12	0.740	C	C	4.83	613.0	0.950	1209600	1430	1730
XX200K12	0.790	C	C	5.17	664.0	1.029	1310400	1500	1810
XX200L12	0.841	C	C	5.50	715.1	1.108	1411200	1570	1890



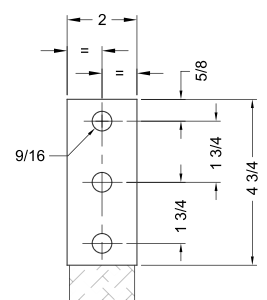
TYPE A



TYPE B

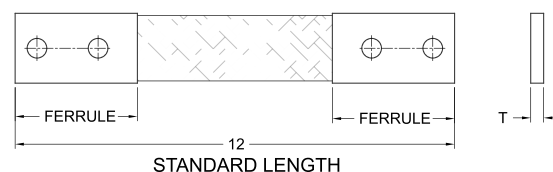


TYPE C



TYPE D

FERRULE CONFIGURATION



STANDARD LENGTH



X300 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545. ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part number for the required length in inches.

FERRULE PLATING

Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"
4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X300A 12

Standard length

CUSTOM PART NUMBER

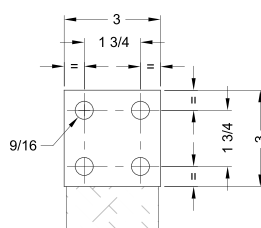
X300A 16.50 AB - S3

Required length

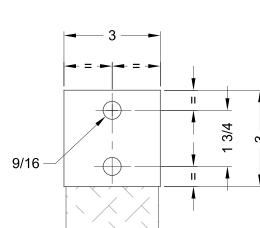
Ferrule configuration

Plating

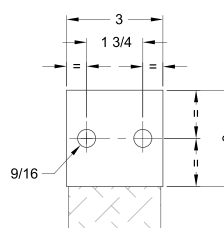
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X300A12	0.250	A	A	2.14	214.0	0.332	422400	900	1090
X300B12	0.323	A	A	2.85	321.1	0.498	633600	1120	1350
X300C-12	0.392	A	A	3.56	428.1	0.664	844800	1300	1570
X300D-12	0.461	A	A	4.27	535.1	0.829	1056000	1470	1770
X300E12	0.530	A	A	4.97	642.1	0.995	1267200	1620	1950
X300F12	0.615	A	A	5.87	749.2	1.161	1478400	1760	2130
X300G12	0.685	A	A	6.57	856.2	1.327	1689600	1900	2290
X300H12	0.754	A	A	7.28	963.2	1.493	1900800	2030	2450
X300I12	0.824	A	A	7.99	1070.2	1.659	2112000	2150	2600
X300J12	1.032	A	A	10.21	1391.3	2.156	2745600	2500	3030



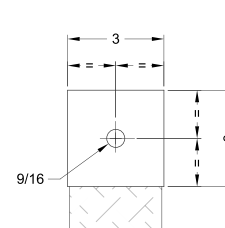
TYPE A



TYPE B

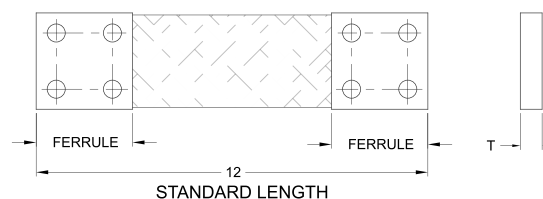


TYPE C



TYPE D

FERRULE CONFIGURATION





XX300 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

EXTRA FLEXIBLE BRAIDS

36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545. ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part number for the required length in inches.

FERRULE PLATING

Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001" **4** = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

XX300A 12

Standard length

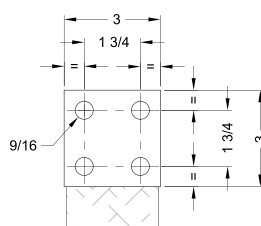
CUSTOM PART NUMBER

XX300A 16.50 AB - S3

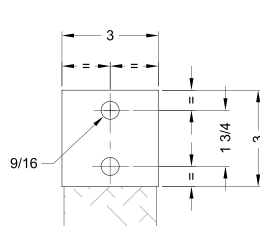
Required length

Ferrule configuration

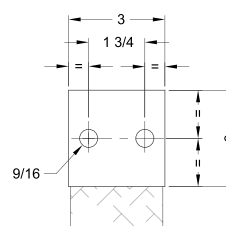
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
XX300A12	0.250	A	A	2.08	204.3	0.317	403200	880	1070
XX300B12	0.313	A	A	2.76	306.5	0.475	604800	1090	1320
XX300C-12	0.375	A	A	3.43	408.6	0.633	806400	1270	1530
XX300D12	0.445	A	A	4.11	510.8	0.792	1008000	1430	1720
XX300E12	0.511	A	A	4.78	613.0	0.950	1209600	1580	1900
XX300F12	0.593	A	A	5.64	715.1	1.108	1411200	1720	2070
XX300G12	0.660	A	A	6.32	817.3	1.267	1612800	1850	2230
XX300H12	0.726	A	A	6.99	919.4	1.425	1814400	1980	2390
XX300I12	0.792	A	A	7.70	1021.6	1.583	2016000	2100	2530
XX300J12	1.000	A	A	9.79	1328.1	2.058	2620800	2440	2950



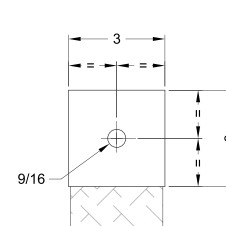
TYPE A



TYPE B

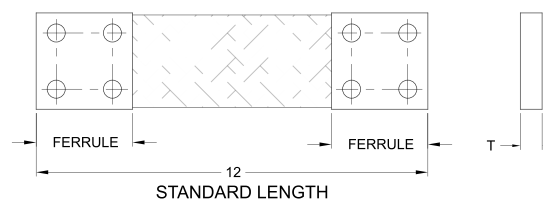


TYPE C



TYPE D

FERRULE CONFIGURATION





X400 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"

4 = .002" **5** = .004"

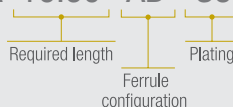
EXAMPLE

STANDARD PART NUMBER

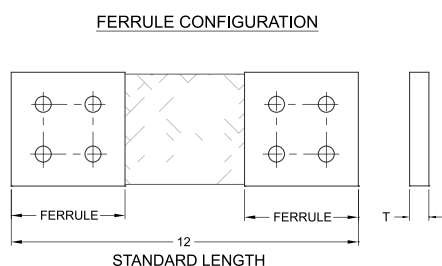
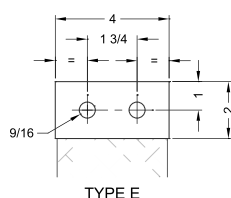
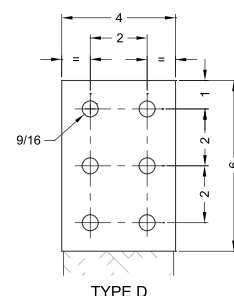
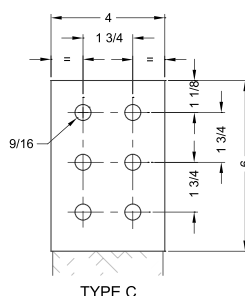
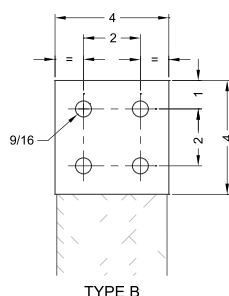
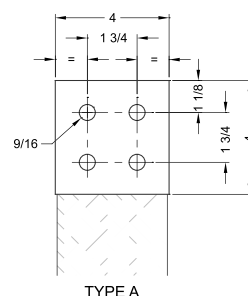
X400A 12

CUSTOM PART NUMBER

X400A 16.50 AB - S3



EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X400A12	0.230	A	A	2.77	214.0	0.332	422400	1000	1210
X400B12	0.250	A	A	3.12	255.4	0.396	504000	1100	1320
X400C12	0.280	A	A	3.41	311.3	0.483	614400	1210	1470
X400D12	0.320	A	A	4.04	394.0	0.611	777600	1370	1650
X400E-12	0.336	A	A	4.18	428.1	0.664	844800	1430	1730
X400F-12	0.354	A	A	4.52	467.0	0.724	921600	1500	1810
X400G12	0.375	A	A	4.81	510.8	0.792	1008000	1570	1890
X400H12	0.438	A	A	5.68	642.1	0.995	1267200	1770	2130
X400I12	0.500	A	A	6.58	778.4	1.206	1536000	1960	2360
X400J12	0.763	A	A	10.27	1284.3	1.991	2534400	2570	3100
X400K12	0.841	A	A	11.33	1444.8	2.239	2851200	2740	3310





X600 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is an approximate value. Exel shall not be responsible for damage of any type due to variation in current under any circumstance. Exel offers a letter of compliance or a third party heat rise test report upon request.

STANDARD FLEXIBLE BRAIDS

30 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE

Seamless copper tube C12200 as per
ASTM B-88.

STANDARD FERRULE PLATING

Electro-tin .0003" as per ASTM B-545.
ROHS compliant.

OPTIONAL INFORMATION WHEN ORDERING

LENGTH

Change the standard length of the part
number for the required length in inches.

FERRULE PLATING

Add the required plating material
and thickness codes at the end
of the part number.

FERRULE PLATING CODE

PLATING MATERIAL

S = Silver **N** = Nickel **T** = Tin

PLATING THICKNESS

1 = .0003" **2** = .0005" **3** = .001"

4 = .002" **5** = .004"

EXAMPLE

STANDARD PART NUMBER

X600A 12

Standard length

CUSTOM PART NUMBER

X600A 16.50 AB - S3

Required length

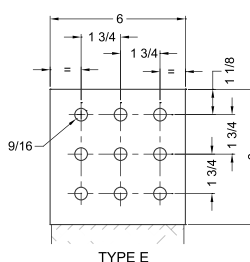
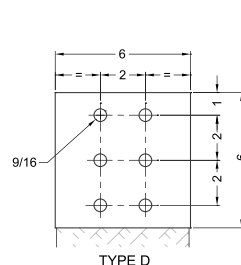
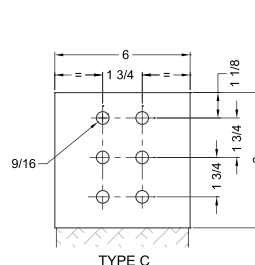
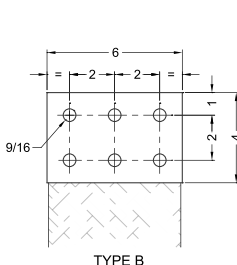
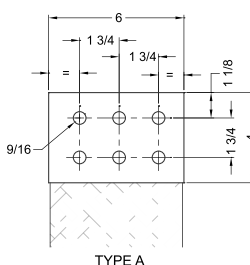
Ferrule configuration

Plating

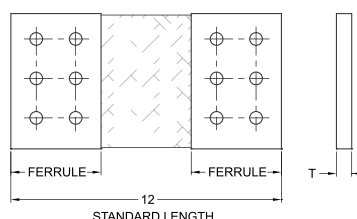
EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm ²	CROSS-SECTION in ²	CIRCULAR MIL	45°C RISE	65°C RISE
X600A12*	0.250	A	A	4.94	389.2	0.603	768000	1610	1940
X600B12**	0.286	A	A	5.46	467.0	0.724	921600	1750	2120
X600C-12	0.348	A	A	6.61	642.1	0.995	1267200	2030	2450
X600D12	0.366	A	A	7.00	700.5	1.086	1382400	2130	2570
X600E12	0.416	A	A	8.03	856.2	1.327	1689600	2360	2850
X600F12	0.441	A	A	8.54	934.0	1.448	1843200	2470	2980
X600G12	0.484	A	A	9.44	1070.2	1.659	2112000	2650	3190
X600H12	0.515	A	A	10.08	1167.5	1.810	2304000	2770	3340
X600I12	0.552	A	A	10.86	1284.3	1.991	2534400	2910	3510
X600J12	0.589	A	A	11.63	1401.0	2.171	2764800	3050	3680
X600K12	0.663	A	A	13.17	1634.5	2.533	3225600	3310	4000
X600L12	0.737	A	A	14.71	1868.0	2.895	3686400	3550	4280
X600M12	0.756	A	A	15.10	1926.4	2.986	3801600	3610	4360
X600N12	0.812	A	A	16.26	2101.6	3.257	4147200	3780	4560

* ferrule width = 6.375 instead of 6.000

** ferrule width = 6.250 instead of 6.000



FERRULE CONFIGURATION



BRAIDED COPPER CABLES

THE BRAIDED COPPER CABLES SHOWN ON THIS PAGE ARE THE MOST COMMONLY USED IN THE INDUSTRY. THEY ARE EITHER TIN PLATED OR BARE COPPER. SILVER AND NICKEL PLATING ARE ALSO AVAILABLE.

Wires are made of copper C11000 soft annealed.

TIN COPPER BRAID

The raw material meets ASTM B33.

BARE COPPER BRAID

The raw material meets ASTM B3.

NICKEL PLATED COPPER BRAID

The raw material meets ASTM B355.

SILVER PLATED COPPER BRAID

The raw material meets ASTM B298.

When bare copper is required, add (B) at the end of our part number.

When nickel plated copper is required, add (N) at the end of our part number.

When silver plated copper is required, add (S) at the end of our part number.

All dimensions are approximate and for reference only.

	EXEL PART NUMBER	NOMINAL FLAT WIDTH (IN)	NOMINAL THICKNESS (IN)	INDIVIDUAL AWG	CONSTRUCTION	TOTAL CIRCULAR MIL	APPROX. AWG EQUIVALENT	APPROX. WEIGHT (LBS/1000 FT)
FLAT BRAID EXTRA FLEXIBLE	FBC36-24-7	0.250	0.030	36	24 x 7	4200	14	14.0
	FBC36-24-16	0.375	0.063	36	24 x 16	9600	11	32.0
	FBC36-48-15	0.625	0.040	36	48 x 15	18000	8	61.2
	FBC36-24-40	0.500	0.094	36	24 x 40	24000	7	75.2
	FBC36-26-67	0.750	0.094	36	26 x 67	40200	4	142.7
	FBC40-48-86	1.000	0.060	40	48 x 86	40700	4	140.0
	FBC36-48-40	1.000	0.094	36	48 x 40	48000	4	163.0
FLAT BRAID STANDARD FLEXIBLE	FBC36-48-84	1.625	0.080	36	48 x 84	100800	1	359.0
	FBC30-24-10	0.500	0.094	30	24 x 10	24120	6	85.0
	FBC30-24-16	0.625	0.094	30	24 x 16	38400	4	125.0
	FBC30-24-20	0.750	0.110	30	24 x 20	48000	4	170.0
	FBC30-24-27	0.937	0.130	30	24 x 27	64800	2	225.0
	FBC30-24-32	1.000	0.140	30	24 x 32	76800	1	270.0
	FBC30-24-44	1.250	0.125	30	24 x 44	105600	1/0	362.0
MULTI-LAYER FLAT BRAID	FBC30-48-22	1.375	0.125	30	48 x 22	105600	1/0	362.0
	FBC30-48-32	2.000	0.140	30	48 x 32	153600	3/0	530.0
	FBC30-48-52	2.500	0.190	30	48 x 52	249600	250 MCM	900.0
	FBC30-2-24-32	1.250	0.290	30	2 x 24 x 32	153600	3/0	560.0
	FBC30-2-24-35	1.250	0.300	30	2 x 24 x 35	168000	3/0	600.0
	FBC30-3-24-32	1.250	0.400	30	3 x 24 x 32	230400	4/0	825.0
	FBC30-4-24-32	1.375	0.510	30	4 x 24 x 32	307200	300 MCM	1110.0

	EXEL PART NUMBER	NOMINAL DIAMETER (IN)	INDIVIDUAL AWG	CONSTRUCTION	TOTAL CIRCULAR MIL	APPROX. AWG EQUIVALENT	APPROX. WEIGHT (LBS/1000 FT)
ROPE-LAY ROUND BRAID	RLC36-7-7-43	0.339	36	7 x 7 x 43	52675	3	169.0
	RLC30-7-7-34	0.605	30	7 x 7 x 34	167601	3/0	538.0
	RLC36-19-7-64	0.690	36	19 x 7 x 64	212800	4/0	689.0
	RLC30-7-7-43	0.681	30	7 x 7 x 43	211966	4/0	680.0

	EXEL PART NUMBER	NOMINAL INSIDE DIAMETER (IN)	INDIVIDUAL AWG	CONSTRUCTION	TOTAL CIRCULAR MIL	APPROX. AWG EQUIVALENT	APPROX. WEIGHT (LBS/1000 FT)
TUBULAR BRAID	TBC30-24-7	0.375	30	24 x 7	16880	8	62.0
	TBC30-24-15	0.500	30	24 x 15	36180	5	122.0
	TBC30-48-8	1.000	30	48 x 8	38600	4	140.0
	TBC30-48-9	1.125	30	48 x 9	43200	4	155.0
	TBC30-48-10	1.250	30	48 x 10	48240	3	168.0
	TBC30-48-11	1.375	30	48 x 11	53060	3	185.0
	TBC30-48-12	1.500	30	48 x 12	57890	3	200.0
	TBC30-48-14	2.000	30	48 x 14	67540	2	230.0
	TBC30-48-16	2.500	30	48 x 16	77180	1	260.0

STANDARD WIRE GAUGE

COPPER			STEEL			
AWG NO	WIRE DIAMETER	CIRCULAR MIL AREA	SHEET METAL	STEEL WIRE	MUSIC WIRE	DRILL ROD
4/0	0.46000	212 000	—	0.3938	0.006	—
3/0	0.40960	168 000	—	0.3625	0.007	—
2/0	0.36480	133 000	—	0.3310	0.008	—
0	0.32480	106 000	—	0.3065	0.009	—
1	0.28930	83 700	—	0.2830	0.010	0.227
2	0.25760	66 400	—	0.2625	0.011	0.219
3	0.22940	52 600	0.2391	0.2437	0.012	0.212
4	0.20430	41 700	0.2242	0.2253	0.013	0.207
5	0.18190	33 100	0.2092	0.2070	0.014	0.204
6	0.16200	26 300	0.1943	0.1920	0.016	0.201
7	0.14430	20 800	0.1793	0.1770	0.018	0.199
8	0.12850	16 500	0.1644	0.1620	0.020	0.197
9	0.11440	13 100	0.1495	0.1483	0.022	0.194
10	0.10190	10 400	0.1345	0.1350	0.024	0.191
11	0.09070	8 230	0.1196	0.1205	0.026	0.188
12	0.08080	6 530	0.1046	0.1055	0.029	0.185
13	0.07200	5 180	0.0897	0.0915	0.031	0.182
14	0.06410	4 110	0.0747	0.0800	0.033	0.180
15	0.05710	3 260	0.0673	0.0720	0.035	0.178
16	0.05080	2 580	0.0598	0.0625	0.037	0.175
17	0.04526	2 050	0.0538	0.0540	0.039	0.172
18	0.04030	1 620	0.0478	0.0475	0.041	0.168
19	0.03589	1 290	0.0418	0.0410	0.043	0.164
20	0.03196	1 020	0.0359	0.0348	0.045	0.161
21	0.02846	810	0.0329	0.0317	0.047	0.157
22	0.02535	642	0.0299	0.0286	0.049	0.155
23	0.02257	509	0.0269	0.0258	0.051	0.153
24	0.02010	404	0.0239	0.0230	0.055	0.151
25	0.01790	320	0.0209	0.0204	0.059	0.148
26	0.01594	254	0.0179	0.0181	0.063	0.146
27	0.01420	202	0.0164	0.0173	0.067	0.143
28	0.01264	160	0.0149	0.0162	0.071	0.139
29	0.01126	127	0.0135	0.0150	0.075	0.134
30	0.01003	100	0.0120	0.0140	0.080	0.127
31	0.00893	79.2	0.0105	0.0132	0.085	0.120
32	0.00795	64.0	0.0097	0.0128	0.090	0.115
33	0.00708	50.4	0.0090	0.0118	0.095	0.112
34	0.00630	39.7	0.0082	0.0104	0.100	0.110
35	0.00561	31.4	0.0075	0.0095	0.106	0.108
36	0.00500	25.0	0.0067	0.0090	0.112	0.106
37	0.00445	20.3	0.0064	0.0085	0.118	0.103
38	0.00396	16.0	0.0060	0.0080	0.124	0.101
39	0.00353	12.3	—	0.0075	0.130	0.099
40	0.00314	9.9	—	0.0070	0.138	0.097
41	0.00280	7.8	—	—	—	—
42	0.00249	6.2	—	—	—	—
43	0.00222	4.9	—	—	—	—
44	0.00198	3.9	—	—	—	—

ELECTRICAL COMPONENTS

LAMINATED COPPER AND ALUMINIUM CONNECTORS

Where flexible braided connectors do not meet customer requirements, laminated copper and aluminum connectors may be in order. Manufactured with unsurpassed internal procedures, they offer a solution that meets the highest quality standards. Designed to be tailor-made to customer specifications, the laminated connectors are then manufactured in the factory by a team of keen experts.

APPLICATION

Frequently used to fasten an electrical connection in extreme conditions and environments, laminated connectors can mainly be found under the following circumstances:

- Low mechanism vibrations
- Minor thermal contractions and/or extensions of attached units
- Faint movements
- Space constraints

If vibration is a critical factor, we suggest using braided flexible connectors. (Link to section)

MATERIALS USED

STRIPS

- Tin plated C11000 ETP copper according to ASTM B-33
- Silver plated C11000 ETP copper according to ASTM B-298
- Nickel plated C11000 ETP copper according to ASTM B-355
- C11000 ETP bare copper
- Aluminum alloy 1350

The standard thickness of a strip varies between 0.005" and 0.040" and the width between 0.5" and 10".

PLATING OPTIONS

- Electrolytic tin according to ASTM B-545
- Electrolytic silver according to ASTM B-700
- Electroless nickel according to ASTM B-733
- Lead free hot tin

Plating have a standard 0.0003" thickness although they can reach up to 0.004", upon customer request.

OVERALL DIMENSIONS

- Width of connecting pad up to 10"
- Thickness of connecting pad up to 3"
- Total connector length up to 36"
- Mounting holes in accordance with NEMA standards (See technical section)

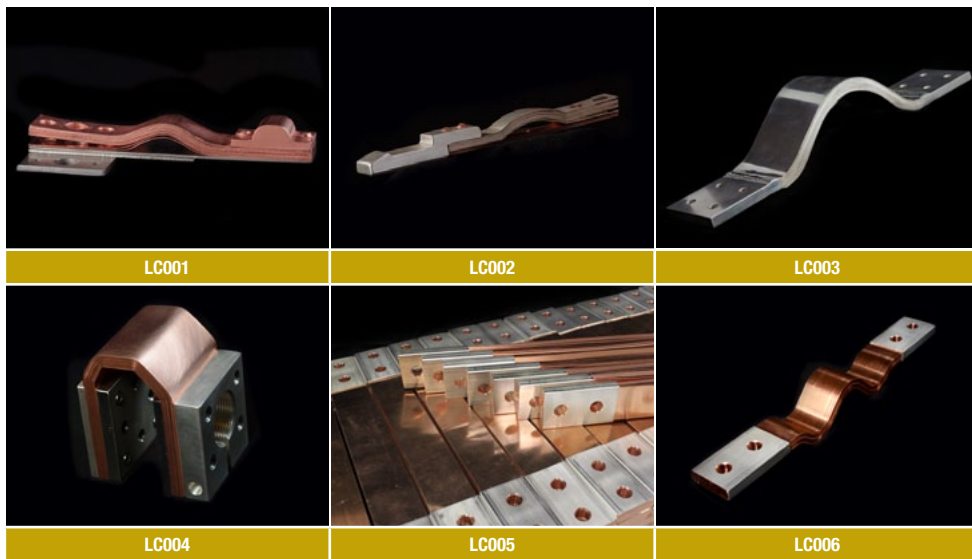
Please note that customized sizes are also available.

CURRENT CAPACITY

- 100 Amperes to 7,500 Amperes, according to the design.

INSULATION

- Insulation: Heat shrink PVC and polyolefin, ceramic heat shield and several other types of insulation materials are also available.





COPPER AND ALUMINUM BUS BARS

Parts are manufactured at a competitive price thanks to exclusive equipment with cutting edge technology designed by Exel. Primarily used for current transfers from one fixture to another, Exel manufactured bus bar assemblies are of irreproachable quality and reliability.

MATERIALS

Materials known for their conductivity properties are ETP C11000 copper and aluminum alloy 1350 and 6061. Other alloys can be used upon request.

PLATING OPTIONS

- Electrolytic tin according to ASTM B-545
- Electrolytic silver according to ASTM B-700
- Electroless nickel according to ASTM B-733
- Lead free hot tin

Plating have a standard 0.0003" thickness although they can reach up to 0.004", upon customer request.

OVERALL DIMENSIONS

- Width up to 12"
- Thickness up to 3"
- Length up to 144"
- Mounting holes according to NEMA standards (See technical section)

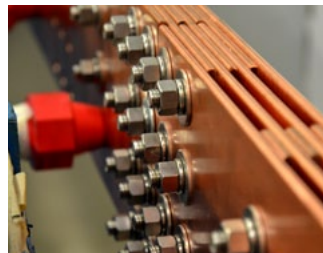
Please note that customized sizes are also available.

CURRENT CAPACITY

Current capacity is determined according to assembly configuration and bus dimension. In some cases, current capacity can reach over 50,000 Amperes.

OPTIONS

- Insulation: Heat shrink PVC and polyolefin, ceramic heat shield and several other types of insulation materials are also available.
- Moulded insulator for bus bars



BB001



BB002



BB003



BB004



BB005



BB006



BB007



BB008



BB009



ELECTRICAL COMPONENTS FOR GENERAL APPLICATIONS

More complex than the simple bus bar, electrical components are made-to-measure according to customer specifications, and are completely built and manufactured in the factory by Exel experts. Using numerical control or conventional machines as well as unique, Exel-designed equipment, high volume production of exceptional quality components remains worry-free.

APPLICATION

Electrical components are used to transfer current from one part to another frequently found in breakers, transformers, circuit breakers and wind turbines just to name a few.

MACHINABLE ALLOYS

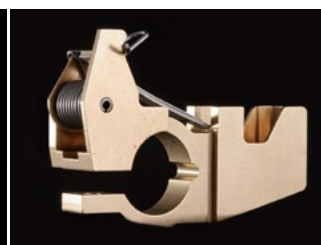
- Copper alloys, brass alloys
- Aluminum alloys, silver alloys
- GP-03 & G10 (insulation)
- Carbon
- Steel
- Stainless steel
- Other alloys may be used upon request



RC001



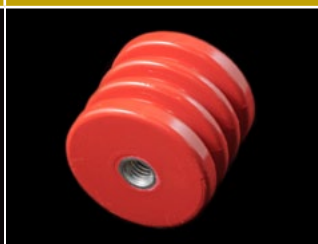
RC002



RC003



RC004



RC005



RC006



RC007



RC008



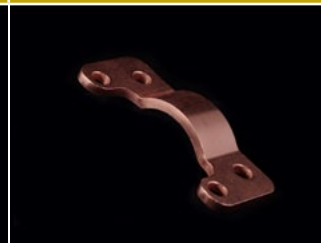
RC009



RC010



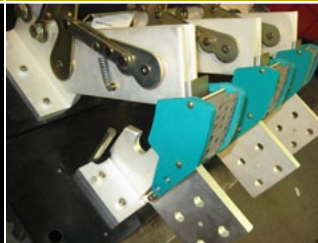
RC011



RC012



RC013



RC014



RC015

BRAZED ELECTRICAL CONTACTS

A brazed electrical contact is a machined part onto which a silver tip has been welded. Exel can design an entirely new contact, repair a damaged part or even go on location to find the best solution that suits your application.

BASE MATERIALS

The Base materials mostly used in brazed contact are copper and brass alloys in order to provide a mechanical strength over a solid precious metal contact. Other materials may be used.

CONTACT MATERIALS

SILVER AND COPPER

- 90 % silver, 10 % copper

SILVER AND TUNGSTEN

- 50 % tungsten, 50 % silver
- 65 % tungsten, 35 % silver
- 78 % tungsten, 22 % silver

COPPER AND TUNGSTEN

- 75 % tungsten, 25 % copper
- 80 % tungsten, 20 % copper
- 70 % tungsten, 30 % copper
- 68 % tungsten, 32 % copper
- 56 % tungsten, 44 % copper

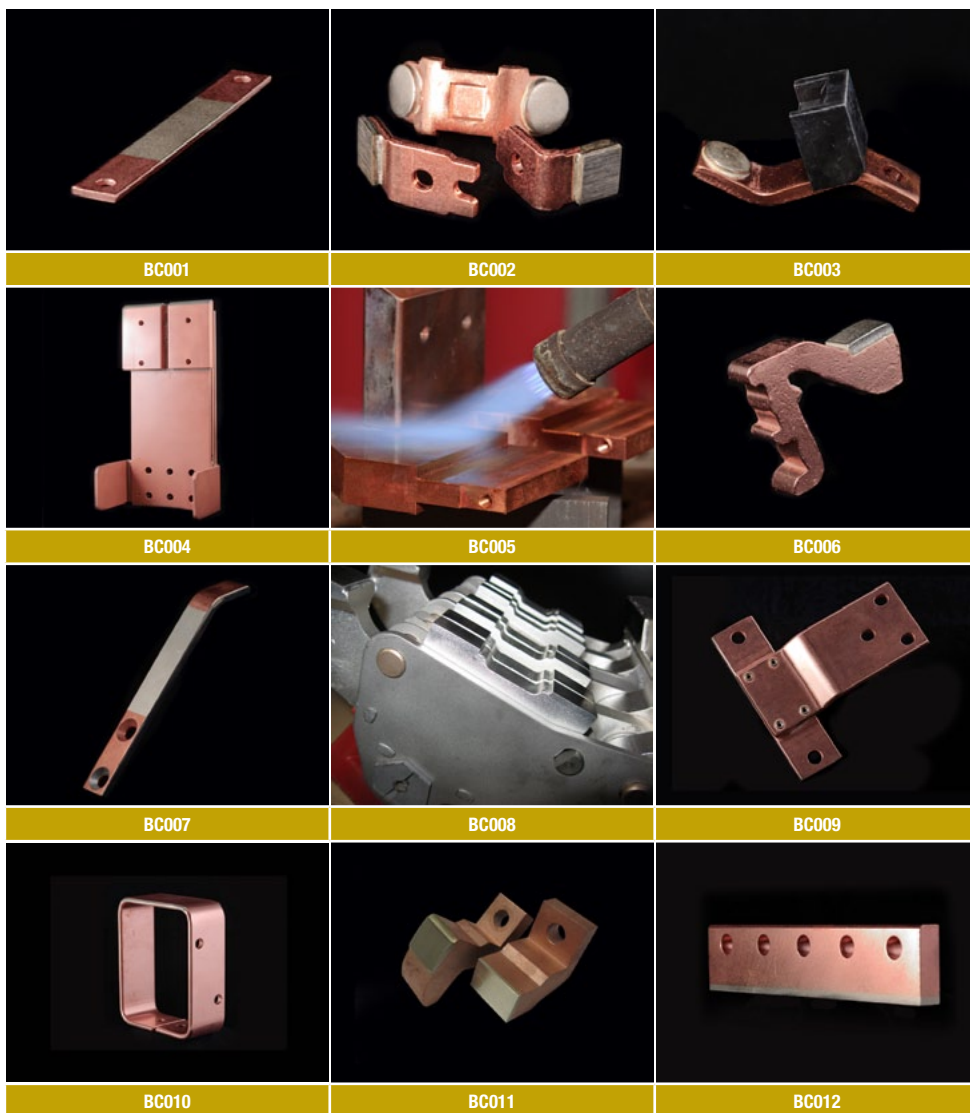
PLATING OPTIONS

- Electrolytic tin according to ASTM B-545
- Electrolytic silver according to ASTM B-700
- Electroless nickel according to ASTM B-733
- Lead free hot tin

Plating have a standard 0.0003" thickness although they can reach up to 0.004", upon customer request.

WELDING METHODS

- Tungsten-electrode Inert Gas welding (TIG)
- Metal Inert Gas welding (MIG)
- Metal-arc welding
- Resistance welding
- Brazing (silver)



GENERAL MACHINING

GENERAL MACHINING

Exel owns over 15 numerically controlled and conventional machining centres which includes more than 60 specialized equipments such as a unique numerical control hydraulic press designed exclusively by the company. Exel's team of manufacturing and machining experts will make the best use of their skills and know-how to fill a wide range of needs, whether they require basic or extremely precise machining.

With its specialty in manufacturing small to medium size electrical and industrial components from raw materials such as copper, silver, aluminum, stainless steel, steel, plastics, composite materials and other machinable materials, Exel is a reference when it comes to machining.



TECHNICAL INFORMATION

METAL PROPERTIES

METAL	CHEMICAL SYMBOL	SPECIFIC GRAVITY	WEIGHT PER CUBIC INCH (LBS)	MELTING POINT DEG. F	LINEAR EXPANSION PER UNIT LENGTH PER DEG. F	TEMPERATURE DEG. F*	ELECTRIC CONDUCTIVITY SILVER=100
ALUMINIUM	Al	2.700	0.0975	1220	0.00001244	68	63.00
COPPER	Cu	8.890	0.3230	1981	0.00000900	68	97.61
GOLD	Au	19.300	0.6969	1945	0.00000778	68	76.61
IRON	Fe	7.800	0.2830	2750	0.00000661	68	14.57
LEAD	Pb	11.342	0.4096	621	0.00001630	212	8.42
MAGNESIUM	Mg	1.741	0.0628	1204	0.00001444	68-212	39.44
MANGANESE	Mn	7.300	0.2636	2300	0.00001294	68	15.75
MOLYBDENUM	Mo	10.200	0.3683	4748	0.00000294	68	17.60
NICKEL	Ni	8.800	0.3178	2651	0.00000700	68	12.89
SILVER	Ag	10.475	0.3780	1761	0.00001025	68	100.00
STEEL, CARBON	—	—	0.2830	2500	0.00000633	68	12.00
TIN	Sn	7.290	0.2633	449	0.00001496	64-212	14.39
TITANIUM	Ti	4.500	0.1621	3272	0.00000490	68-392	13.73
TUNGSTEN	W	18.850	0.6810	6098	0.00000239	32-212	14.00
URANIUM	U	18.700	0.6753	<3362	—	—	16.47
VANADIUM	V	5.600	0.2022	3110	0.00000430	32-104	4.95
ZINC	Zn	7.100	0.2565	788	0.00001700	68	29.57

*Temperature given for each metal is that at which expansion coefficient shown in previous column was determined.

Temperature (degrees) conversion:
 Fahrenheit = (1.8 x Celsius) + 32
 Celsius = 0.5555 x (Fahrenheit - 32)
 Kelvin = Celsius + 273.2
 Rankine = Fahrenheit + 459.7

GALVANIC CORROSION OR DISSIMILAR METAL CORROSION

GALVANIC CORROSION IS AN ELECTROCHEMICAL PROCESS WHEN TWO OR MORE METALS ARE IN CONTACT.

THERE ARE THREE CONDITIONS THAT MUST EXIST FOR GALVANIC CORROSION TO OCCUR.

- 1-** Electrochemically dissimilar metals must be present.
- 2-** The metals must be in contact with electricity.
- 3-** The metals must be exposed to an electrolyte.

All materials listed within each group in the galvanic chart may be considered similar and not affected by galvanic action when coupled with other metals of that group in a normal environment such as storage in warehouses or indoor applications. Typically there should not be more than 0.25 V difference in the anodic index.

For critical environments such as outdoors, high humidity, salt environments etc...the differential anode index between the metals to be coupled together should not be more than 0.15 V. In controlled environments, the differential anode index can be tolerated up to 0.50 V.

METAL	ANODIC INDEX (V)	COMPATIBLE COUPLE GROUPING															
Gold and gold alloys, platinum and platinum alloys	0.00	C															
Rhodium (plated on silver-plated copper)	0.10	A	C														
Silver and high silver alloys	0.15	A	A	C													
Nickel, monel and high nickel copper alloys (70-30)	0.30		A	A	C												
Copper, red brass, high copper-nickel alloys (80-20), nickel silver, phosphor bronze, silicon bronze	0.35		A	A	A	C											
Brass: Cartridge, naval and commercial. Bronze commercial	0.40			A	A	A	C										
Brass half hard and free cutting yellow, manganese bronze, leaded and non-leaded copper zinc, muntz metal	0.45				A	A	A	C									
Stainless steel 18% chromium	0.50				A	A	A	A	C								
Stainless steel 12% chromium, chromium plated	0.60					A	A	A	A	C							
Tin plate and tin-lead solder	0.65						A	A	A	A	C						
Lead and high lead alloys	0.70							A	A	A	A	C					
Aluminium types 2014, 2024 and 2017	0.75								A	A	A	A	C				
Iron: gray, malleable, plain carbon Low alloys steel (.13 carbon)	0.85									A	A	A	A	C			
Aluminium types 1100, 3003, 5052, 6061 and 7075 Aluminium other than aluminium-copper alloys Aluminium casting alloys, silicon type Aluminium casting alloys other than silicon type	0.90										A	A	A	A	C		
Cadmium plate	0.95											A	A	A	A	A	C
Galvanized steel, zinc coatings	1.20															A	C
Zinc alloys	1.25																A
Magnesium and magnesium alloys	1.75																

c: indicates the cathodic member.
a: indicates the anodic member
that which will corrode.

CONVERSIONS

MULTIPLY TO OBTAIN	→ ←	BY BY	→ ←	TO OBTAIN DIVIDE
-----------------------	--------	----------	--------	---------------------

AREA CONVERSION

Circular Mil	0.000007854	Square Inch
Circular Mil	0.0005067	Square Millimetre
Square Inche	645.16	Square Millimetre

LENGTH CONVERSION

Foot	0.3048	Metre
Inch	25.4	Millimetre
Inch	25000	Micron
Mile (U.S.)	1.609344	Kilometre
Yard	0.9144	Metre

VOLUME CONVERSION

Cubic Foot	0.02831685	Cubic Metre
Gallon (U.S.)	3.785412	Litre
Cubic inch	16387.06	Cubic Millimetre
Cubic Yard	0.7645549	Cubic Metre

MASS AND DENSITY CONVERSION

Ounce (Troy)	31.10348	Gram
Pound	0.4535924	Kilogram
Ton (2000 Lbs)	907.1847	Kilogram
Ton (Metric)	1000	Kilogram

MISCELLANEOUS CONVERSION

Atmosphere	33.9	Feet of Water
Atmosphere	29.92	Inch of Mercury
Atmosphere	14.7	PSI (Pounds/sq.inch)
BTU	778.3	Foot Pound
BTU per Hour	0.2932	Watt
BTU per Minute	0.02356	Horsepower
Gallon (U.S.)	231	Cubic Inch
Horsepower	745.7	Watt
Micron	0.0004	Inch
Ounce	0.0625	Pound
Quart	0.25	Gallon
Square Feet	144	Square Inch



Exel International
ABSOLUTE SYNERGY

T 450 377-2252 | 1 866 377-2252
F 450 377-2248 | exelinternational.com