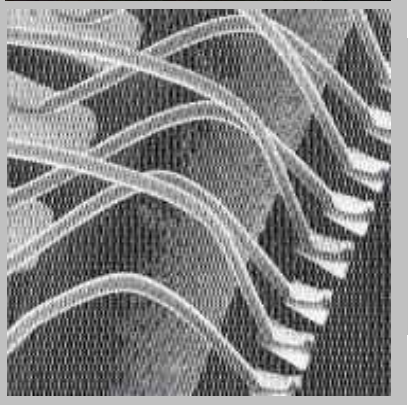
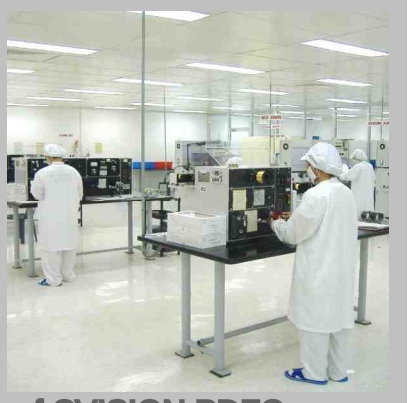
C.C.C.

Bonding Wire





Dr. Peter Douglas

" The quality of any product or service is what the customer says it is."

THE MANAGEMENT TEAM

Hugh G. Weeks
Chairman

Dr. Peter Douglas
President

John Rubino
Vice President

Aaron Au
Operations Director

The C.C.C. Companies are privately owned:

Cebu Chip Connections Inc.

Founded in 1995 in Cebu, Philippines. The first bonding wire manufacturer in the Philippines. Established to provide local service to the growing semiconductor assembly industry. State-of-the-art manufacturing and facilities.

Custom Chip Connections

Founded in 1990 in Huntsville, Alabama, U.S.A. One of the largest suppliers of fine Aluminum bonding wires in the world. Manufactures the complete range of bonding wire products.

CCC BONDING WIRES PRODUCTION AND EQUIPMENT

10K CLASS CLEANROOM

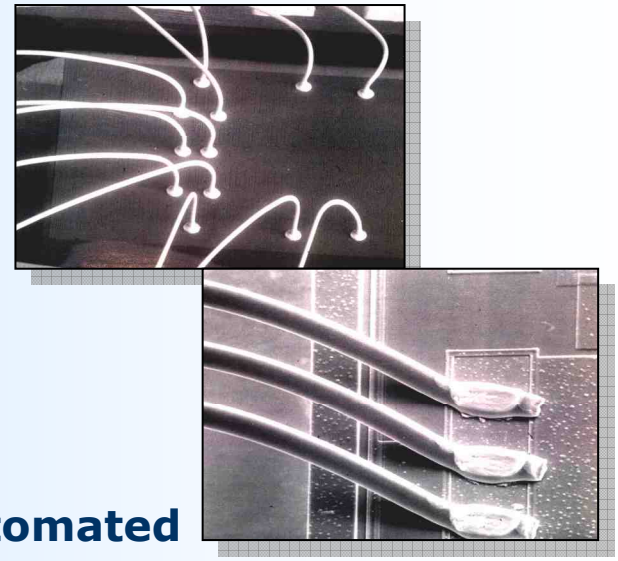
STATE-OF-THE-ART FACILITIES

In the early 1990's, C.C.C. grew very rapidly to become one of the largest suppliers of fine aluminum-silicon bonding wires in the world. The company also became an increasingly important supplier of large diameter aluminum bonding wires for power devices. In 1995, after extensive development work, C.C.C. began to manufacture and market fine gold bonding wires and therefore, can now offer the industry the full range of bonding wire products. Bonding wire remains one of the most critical components in electronic device assembly.

The management team at C.C.C. has well over 100 years of collective experience in the technology, manufacture and application of bonding wire. C.C.C. has the expertise, resource and world-wide experience to provide the semiconductor assembly industry with state-of-the-art bonding wire products.

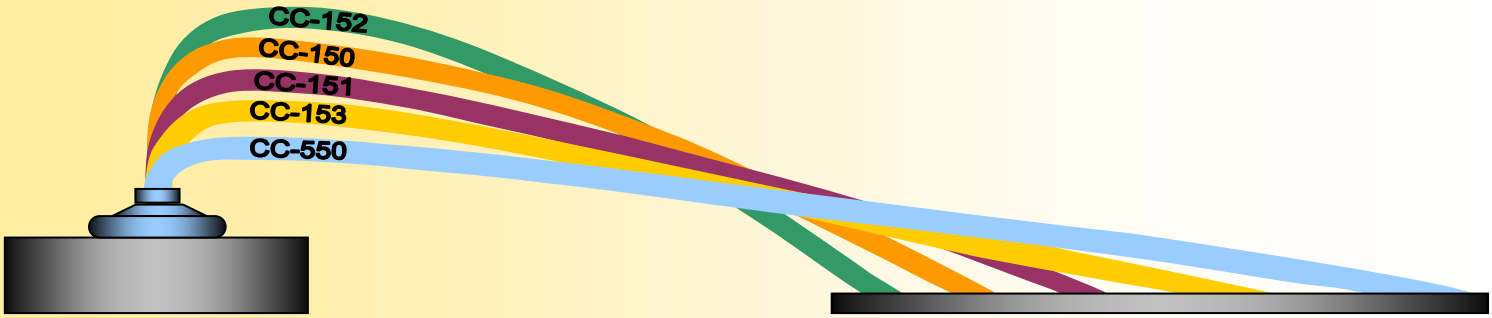
CCC BONDING WIRES THE COMPETITIVE EDGE

- Application specific, gold and aluminum bonding wire products
- Most experienced technical team in the industry
- New, multi-layer winding technology for trouble free feeding
- O.D.C. - free process
- Immediate response
- Cleanroom manufacturing
- J.I.T. delivery
- State-of-the-art and fully automated manufacturing equipment
- Product customization in each application for optimum yield and reliability
- Process controlled to maintain a six sigma quality level in all products



Customer service is our most important responsibility

GOLD BONDING WIRES TYPES AND APPLICATIONS



	CC-150	CC-151	CC-152	CC-153	CC-550
LOOP HEIGHT (mil)	6 - 8	4 - 6	8 OR ABOVE	4 OR BELOW	4 OR BELOW
LOOP SPAN (mil)	200 OR BELOW	250 OR BELOW	150 OR BELOW	300 OR BELOW	300 OR BELOW
HEAT AFFECTED ZONE H.A.Z. (mil)	5 OR BELOW	4 OR BELOW	6 OR BELOW	3 OR BELOW	3 OR BELOW
REMARKS	THE ABOVE DATA ARE BASED ON 1.0 mil WIRE DIAMETER TEST RESULTS				
APPLICATIONS	COB, S0T, PLCC, QFP, SOIC, TSOP	BGA, COB, QFP, PLCC, SOT, SOIC, TSOP, TQFP	S0T, SOIC, PLCC, TO, COB, TRANSISTORS REQUIRES LARGER WIRE SIZE	BGA, QFP, MQFP, TSOP, VSSOP, FINE & SUPER FINE PITCH BGA's REQUIRES SUPER FINE WIRE SIZE	BGA, QFP, MQFP, TQFP, VSSOP, SUPER FINE PITCH BGA's REQUIRES SUPER FINE WIRE SIZE, BUMPS FOR FLIP CHIP

PRODUCT DESCRIPTION

CCC Bonding Wire is designed to provide optimum bondability, stability and reliability for a wide range of Metallization, Package geometric configuration and technologies.

CC-150

Medium strength, all-purpose gold bonding wire, designed for both low lead count discrete devices and the most complex high lead count multi-chip modules as well as chip on board applications. Consistent performance on both manual and high-speed automatic bonding equipments.

CC-151

High strength, all-purpose gold bonding wire for long and/or low loop applications, designed for the most complex high lead count multi-chip modules. Consistent performance on high-speed automatic bonding equipments.

CC-152

Soft, all-purpose gold bonding wire for high or flexible loop applications and for larger wire diameter applications, designed for low lead count discrete and power devices. Consistent performance on both manual and high-speed automatic bonding equipments.

CC-153

Very high strength, fine diameter gold bonding wire for ultra long and/or low loop, fine pitch and very fine wire size applications, designed for most complex high lead count and fine pitch devices. Consistent performance on high-speed automatic bonding equipments.

CC-550

Super high strength, fine diameter gold-1% Pd bonding wire for ultra long and/or low loop, fine pitch and very fine wire size applications, designed for most complex high lead count and fine pitch devices. Reproducible ball and ball neck properties for consistent bump formation in bumped die applications (e.g. Flip Chip).

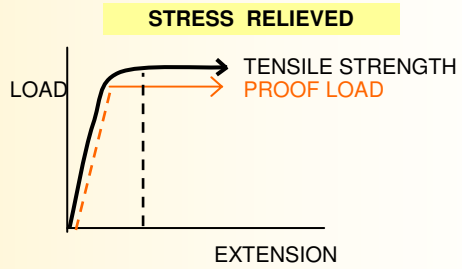
GOLD BONDING WIRES SPECIFICATIONS

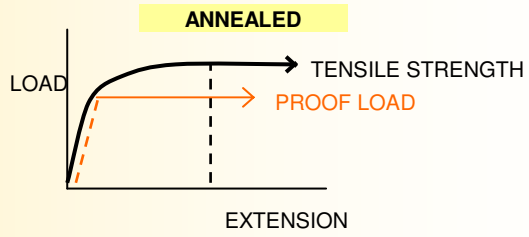
Wire Diameter		CC-150		CC-151		CC-152		CC-153		CC-550	
mils	microns	T S (grams)	Elongation (%)	TS (grams)	Elongation (%)	TS (grams)	Elongation (%)	TS (grams)	Elongation (%)	TS (grams)	Elongation (%)
0.70	18	3 - 6	2 - 5	4 - 7	2 - 5	TO BE SPECIFIED		6 - 9	2 - 5	7 min.	2-5
0.80	20	4 - 7	2 - 5	6 - 9	2 - 5			7 - 10	2 - 6	8 min.	2-5
0.90	23	6 - 9	3 - 6	8 - 11	3 - 6			10 - 13	3 - 6	10 min.	3-6
0.95	24	7 - 10	3 - 6	9 - 12	3 - 6			10.5 - 13.5	2 - 7	11-14	3-6
1.00	25	8 - 11	3 - 6	10 - 13	3 - 6			11 - 15	2 - 7	12-15	3-6
1.10	28	10 - 13	3 - 6	12 - 15	3 - 6	9 - 13	3 - 6	13 - 17	2 - 7	17-21	0.5-3
1.20	30	12 - 16	3 - 6	14 - 18	3 - 6	11 - 15	3 - 6	TO BE SPECIFIED		TO BE SPECIFIED	
1.25	32	13 - 17	3 - 6	15 - 19	3 - 6	12 - 16	3 - 6				
1.30	33	15 - 19	3 - 6	17 - 21	3 - 6	14 - 18	3 - 6				
1.50	38	20 - 25	3 - 7	23 - 28	3 - 7	18 - 23	3 - 7				
2.00	51	35 - 45	4 - 8	40 - 50	4 - 8	30 - 40	4 - 8				
3.00	76	90 - 100	4 - 8	To be specified		88 - 98	4 - 8				

***Other requirements can be met per Customer Specification.**

HEAT AFFECTED ZONE

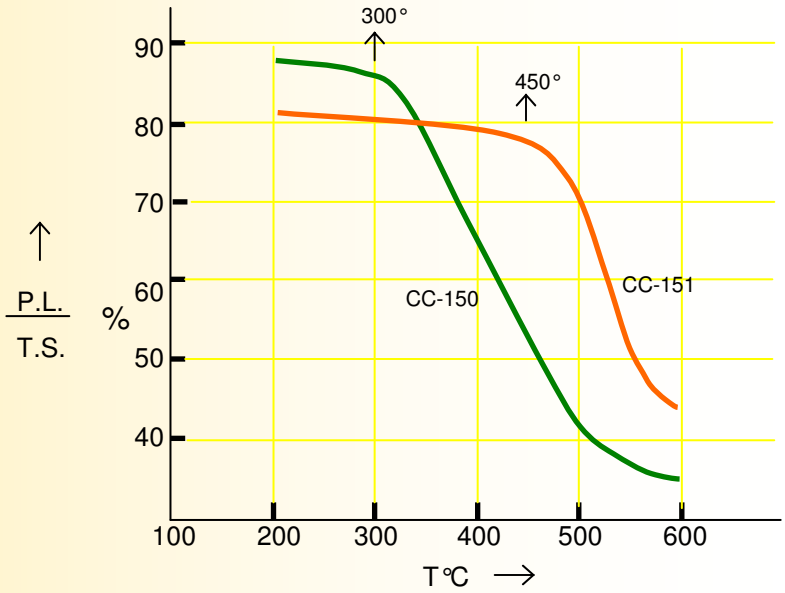
Typical tensile test curves are shown for stress-relieved and annealed gold wires. These curves illustrate that the ratio proof load/tensile strength is a very sensitive function of the heat affected zone on the material and decreases as the material softens.





RATIO $\frac{\text{PROOF LOAD}}{\text{TENSILE STRENGTH}}$ ↓ AS ANNEALING ↑

The variation of this ratio, as a function of annealing temperature, for a particular type of gold can therefore provide a clear indication of the heat affected zone on that material. The P.L./T.S. % ratio is plotted as a function of temperature for the CC-150 and CC-151 gold wires. The curves show that much more thermal energy is required to soften the CC-151 material. This characteristic provides a short Heat-Affected Zone (H.A.Z.) in the bond neck above the ball for the CC-151 material which facilitates low loop formation.

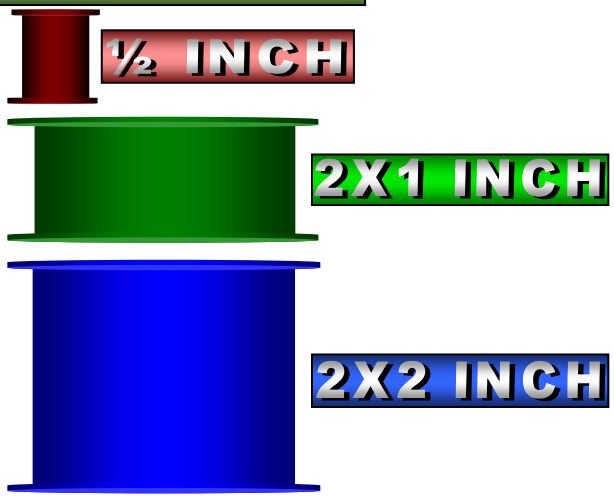


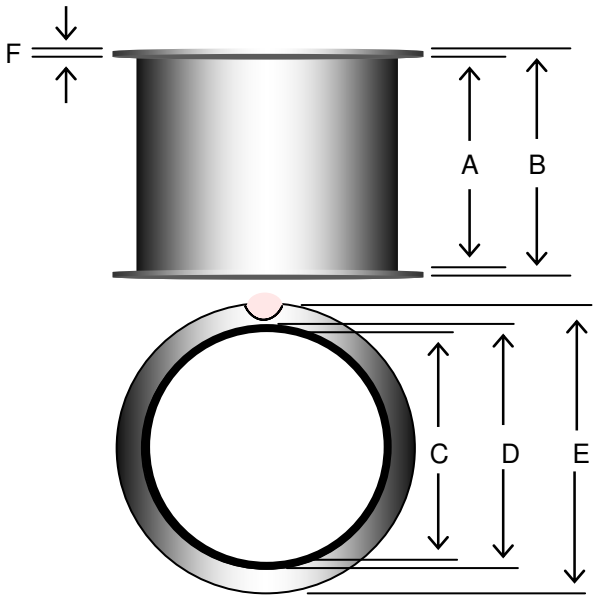
GOLD WIRE STANDARD FOOTAGE PER SPOOL

WIRE DIAMETER	STANDARD FOOTAGE/SPOOL		
	½ INCH SPOOL	2x1 INCH SPOOL	2x2 INCH SPOOL
0.7 mil (18 µm) - 0.8 mil (20 µm)	500 ft. MAX OR (150 me.)	1,640 ft. OR (500 me.)	1,640 ft. OR (500 me.)
0.9 mil (23 µm) - 1.1 mil (28 µm)	500 ft. MAX OR (150 me.)	1,640 ft. up to 3,280 ft. OR (500 me. up to 1,000 me.)	3,280 ft. up to 9,840 ft. OR (1,000 me. up to 3,000 me.)
1.2 mil (30 µm) - 1.3 mil (33 µm)	210 ft. MAX	1,640 ft. up to 3,280 ft. OR (500 me. up to 1,000 me.)	3,280 ft. up to 9,840 ft. OR (1,000 me. up to 3,000 me.)
1.5 mil (38 µm) - 2.0 mil (51 µm)	200 ft. MAX	1,000 ft. up to 3,280 ft. OR (300 me. up to 1,000 me.)	3,280 ft. up to 6,560 ft. OR (1,000 me. up to 2,000 me.)
3.0 mil (76 µm)	90 ft. MAX	375 ft. MAX	750 ft. MAX

*Other footages can be supplied per Customer Specification.

SPOOL SIZES





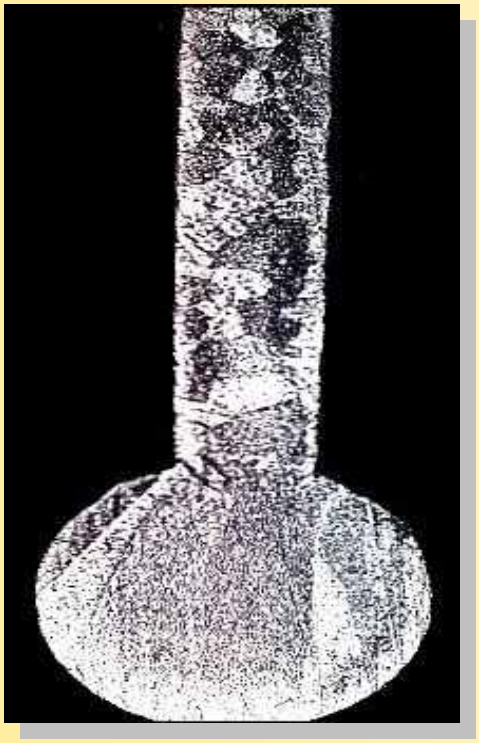
SIZE	COLOR	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
½ "	Red	18.0	19.0	12.7	13.5	17.4	0.40
2" X 1"	Green	26.5	28.0	48.85	50.31	58.5	0.75
2" X 1"	Blue	26.5	28.0	48.85	50.31	58.5	0.75
2" X 1"	Black	26.5	28.0	48.85	50.31	58.5	0.75
2" X 1"	Yellow	26.5	28.0	48.85	50.31	58.5	0.75
2" X 1"	Light Purple	26.5	28.0	48.85	50.31	58.5	0.75
2" X 1"	Dark Purple	26.5	28.0	48.85	50.31	58.5	0.75
2" X 1"	Red	26.5	28.0	48.85	50.31	58.5	0.75
2" X 1"	Brown	26.5	28.0	48.85	50.31	58.5	0.75
2" X 1"	Gray	26.5	28.0	48.85	50.31	58.5	0.75
2" X 2"	Green	45.5	47.0	48.85	50.31	58.5	0.75
2" X 2"	Blue	45.5	47.0	48.85	50.31	58.5	0.75
2" X 2"	Light Purple	45.5	47.0	48.85	50.31	58.5	0.75
2" X 2"	Dark Purple	45.5	47.0	48.85	50.31	58.5	0.75
2" X 2"	Black	45.5	47.0	48.85	50.31	58.5	0.75
2" X 2"	Silver	45.5	47.0	48.85	50.31	58.5	0.75
80 mm	Black	49.5	50.5	77.7	80.0	85.0	1.00

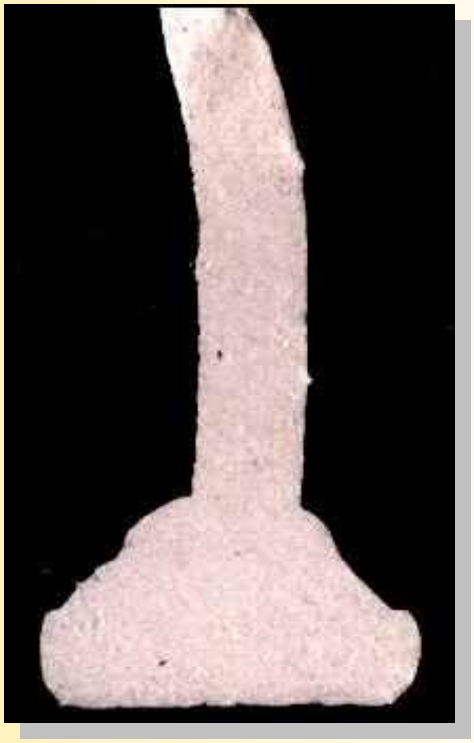
*Other spool color can be supplied per Customer Specification.

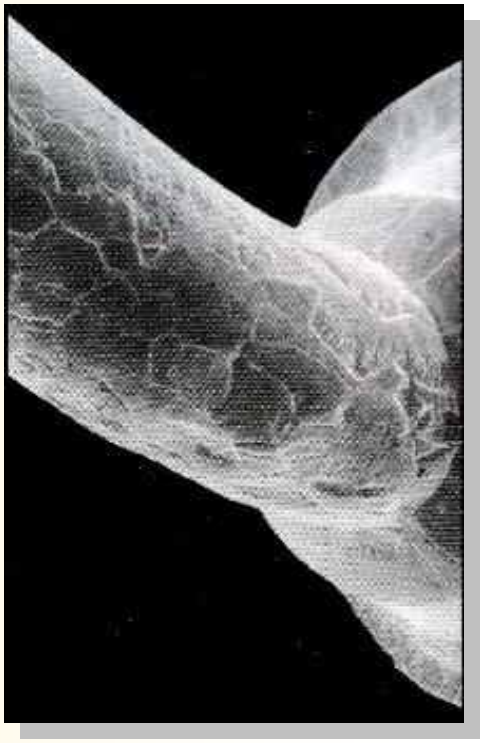
GOLD BONDING WIRES H.A.Z. AND GRAIN STRUCTURE

Heat-Affected Zone (H.A.Z.) and Neck Grain Structure

The S.E.M. micrographs show the H.A.Z. and the neck grain structure of the bonding wire. Note the uniformly fine, equiaxed grain structure.







Dopants

The purity of fine gold bonding wires is typically specified as 99.99 wt% Au. The mechanical properties and thermal characteristics of a particular gold wire are controlled by the addition of dopants at the ppm level. A list of typical dopants is shown and are classified into three types, as a function of the nature of their miscibility with gold in the solid state.

Type 1 **Complete Solid Solubility**

Palladium	Pd	Complete Miscibility	
Silver	Ag	Ordering	Ag Au
Copper	Cu	Ordering	$CuAu_3$.CuAu.Cu_3Au
Platinum	Pt	Ordering	Pt Au_3. Miscibility Gap

Type 2 **Significant Solid Solubility (~ 1 To 10wt%)**

Germanuim	Ge	Simple Eutectic	
Indium	In	Compounds	In Au.In_2Au.
Magnesium	Mg	Compounds	MgAu.Mg_2Au. Mg_5Au_2.Mg_3Au.

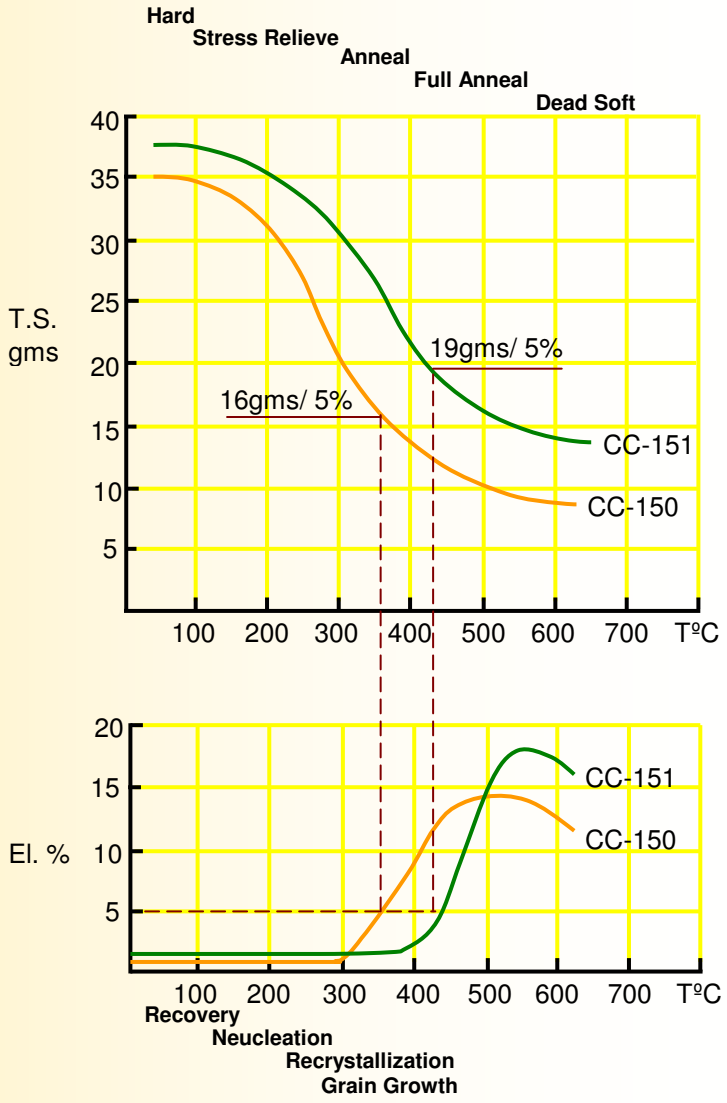
Type 3 **Very Low Solid Solubility**

All These Dopants Show Very Little Solid Solubility And Form A Range Of Intermetallic Compounds With Gold As Shown Below:

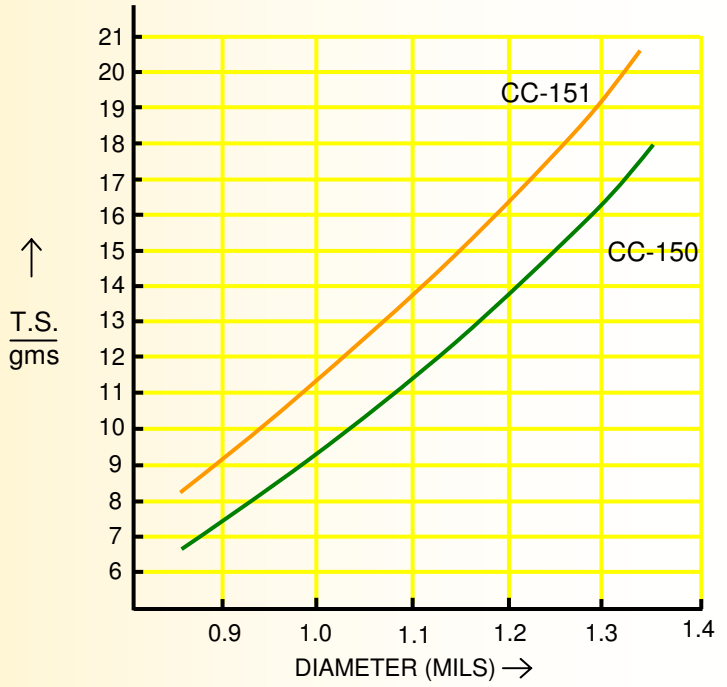
Dopant		Au-Rich				Dopant-Rich		
Beryllium	Be	-	$BeAu_3$	$BeAu_2$	Be_3Au_4	BeAu	-	-
Calcium	Ca	$CaAu_4$	$CaAu_3$	$CaAu_2$	-	-	Ca_4Au_3	Ca_2Au
Lanthanum	La	-	$LaAu_3$	$LaAu_2$	-	LaAu	-	La_2Au
Cerium	Ce	-	$CeAu_3$	$CeAu_2$	-	CeAu	-	Ce_2Au

1 - 3 mil Au Wires

The strength (T.S.) and ductility (EL.) of CC-150 and CC-151 gold wires are shown as a function of temperature. In relation to gold ball bonding, significant features are the high strength of the CC-151 gold in the annealed condition (for long loop) and the relatively high strength and very high ductility of both materials in the dead-soft condition (optimum bond-neck properties).



Tensile Strength vs Diameter Annealed Au Wires



Al BONDING WIRES TYPES AND SPECIFICATIONS

FINE DIAMETER Al - 1% Si (CC-250)

WIRE DIAMETER		CC-250	
MILS	MICRONS	B.L. (gms.)	EL (%)
0.70	18	8 - 12	1 - 4
0.80	20	8 - 12	1 - 4
0.90	23	13 - 15	1 - 4
0.90	23	15 - 17	1 - 4
1.00	25	13 - 15	1 - 4
1.00	25	15 - 18	1 - 4
1.25	32	17 - 19	1 - 4
1.25	32	19 - 21	1 - 4
1.25	32	21 - 23	1 - 4
1.25	32	22 - 24	1 - 4
1.25	32	24 - 26	1 - 4
1.25	32	26 - 29	1 - 4
2.00	51	45 - 55	2 - 6
2.00	51	55 - 65	2 - 6
3.00	76	95 - 115	2 - 7

*Other requirements can be met per Customer Specification.

Typical Al/Si wire specifications

A special feature of our CC-250 wires is the ability to provide material of distinctly different hardnesses with the same nominal diameter. This is illustrated in the data shown.

This enables the user to optimize for die and land metallization, bond span, bond force and power and bond geometry for optimum functionality and reliability.

STANDARD FOOTAGE PER SPOOL

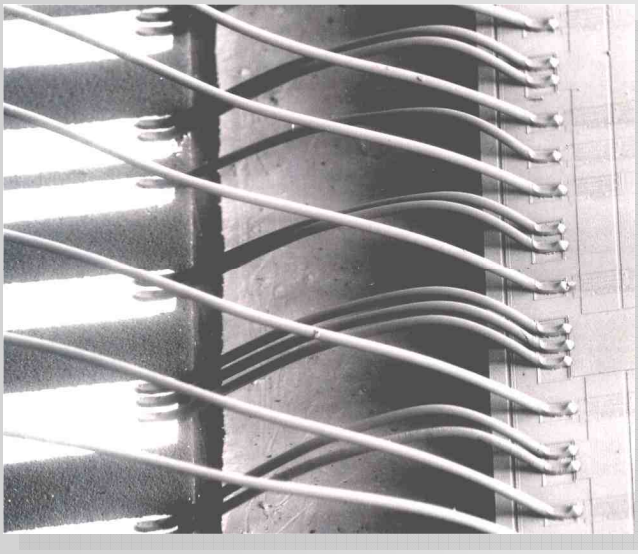
WIRE DIAMETER	½ INCH SPOOL	2x1 INCH SPOOL
0.7 mil (17.5 µm)	100 ft. to 300 ft.	375 ft. to 1000 ft.
0.8 mil (20 µm)	100 ft. to 300 ft.	375 ft. to 1000 ft.
0.9 mil (23 µm)	90 ft. to 270 ft.	375 ft. to 1000 ft.
1.0 mil (25 µm)	90 ft. to 400 ft.	375 ft. to 2500 ft.
1.25 mil (32 µm)	75 ft. to 825 ft.	325 ft. to 2500 ft.
1.5 mil (38 µm)	60 ft. to 300 ft.	275 ft. to 1000 ft.
2.0 mil (50 µm)	45 ft. to 225 ft.	225 ft. to 1000 ft.

*Other footages can be supplied per Customer Specification.

PRODUCT DESCRIPTION

CC-250 ALUMINUM-SILICON BONDING WIRE

Fine Diameter Aluminum-Silicon Bonding Wire for ultra-sonic wedge bonding. Adaptable to both hard and soft chip bond-pad metallizations, long fine-pitched loop geometries and Tier-packaging technologies. Consistent performance on both manual and high speed automated bonding equipment.



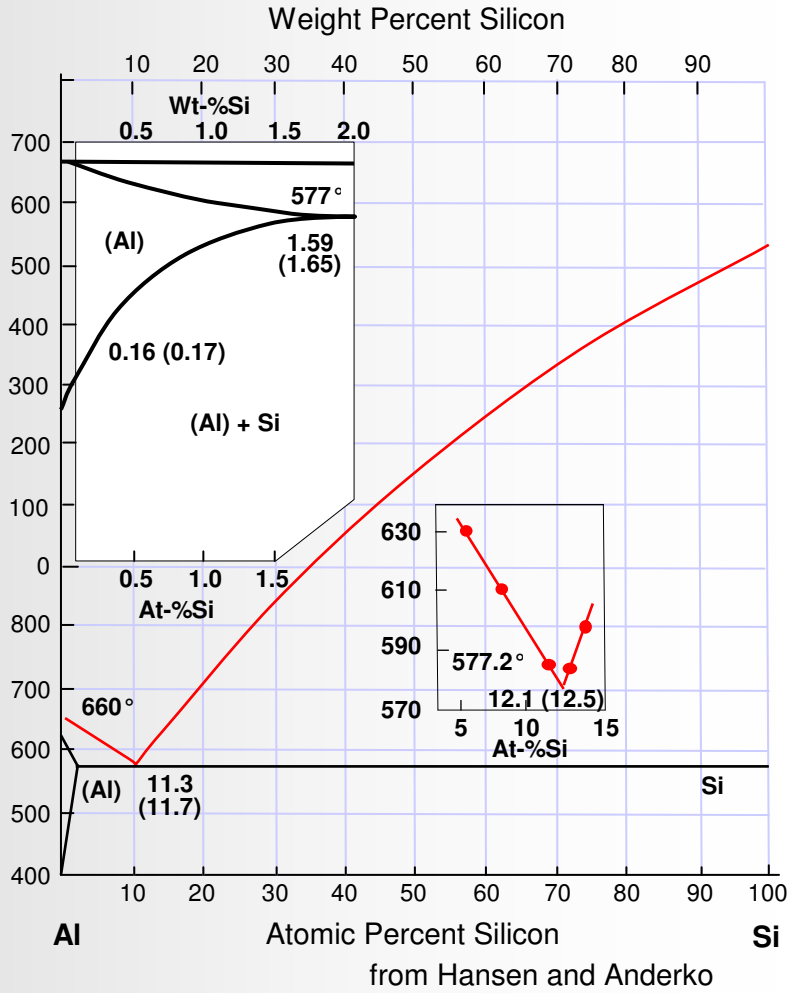
Wedge-Bonded, 1.25 mil Diameter Al / 1%Si Wire In A 300 I/O Quad Package.

Such complexity requires precise and uniform wire properties.

Al/Si Binary Equilibrium Phase Diagram

The phase diagram illustrates the potential of this binary alloy system for providing classical dispersion strengthening mechanisms.

The stability and consistency of fine AL-Si wires depends upon the provision of a very fine, uniform, silicon particle dispersion.



from Hansen and Anderko

Al BONDING WIRES TYPES AND SPECIFICATIONS

LARGE DIAMETER Al WIRE FOR POWER DEVICES

WIRE DIAMETER		CC-350		CC-351		CC-450	
MILS	MICRONS	B.L. (gms.)	EL (%)	B.L. (gms.)	EL (%)	B.L. (gms.)	EL (%)
5	125	80 - 120	4 - 10	110 - 140	5 - 10	120 - 160	5 - 10
8	200	230 - 330	8 - 15	280 - 350	8 - 15	350 - 500	8 - 15
10	250	320 - 480	8 - 15	450 - 500	10 - 20	450 - 550	10 - 20
12	300	450 - 650	10 - 20	500 - 700	10 - 20	DO NOT USE	
15	375	700 - 900	15 - 25	1000 - 1200	15 - 25		
20	500	1200 - 1600	15 - 30	1200 - 1700	15 - 30		

*Other requirements can be met per Customer Specification.

STANDARD FOOTAGE PER SPOOL

WIRE DIAMETER	# 88 SPOOL STANDARD FOOTAGE/SPOOL	4 INCH SPOOL STANDARD FOOTAGE/SPOOL
3 mil (75 µm) - 6 mil (150 µm)	2,000 ft. OR (610 me.)	400 ft. - 2,000 ft. OR (610 me.)
7 mil (175 µm) - 10 mil (250 µm)	1640 ft. OR (500 me.)	400 ft. - 1,500 ft. OR (460 me.)
11 mil (275 µm) - 16 mil (400 µm)	1,640 ft. OR (500 me.)	200 ft. - 500 ft. OR (150 me.)
17 mil (425 µm) - 20 mil (500 µm)	984 ft. OR (300 me.)	325 ft. OR (100 me.)

*Other footages can be supplied per Customer Specification.

PRODUCT DESCRIPTION

CC-350 ALUMINUM BONDING WIRE

Large Diameter 99.99% Aluminum Bonding Wire for ultrasonic wedge bonding in power devices. Consistent bondability. Consistent, reproducible tailing.

CC-351 ALUMINUM-NICKEL BONDING WIRE

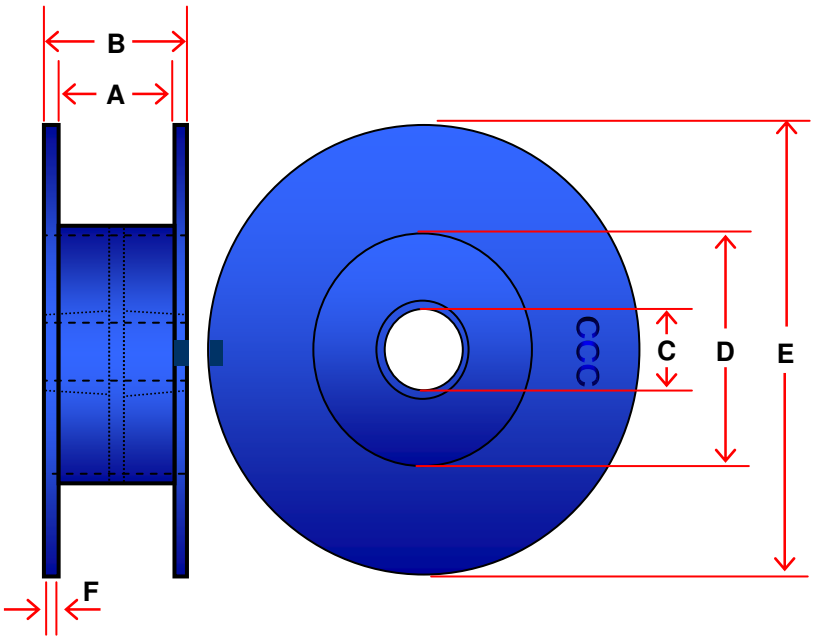
Large Diameter Corrosion Resistant Aluminum-Nickel Bonding Wire for ultra-sonic wedge bonding in power devices. Consistent bondability. Consistent, reproducible tailing.

CC- 450 ALUMINUM-MAGNESIUM BONDING WIRE

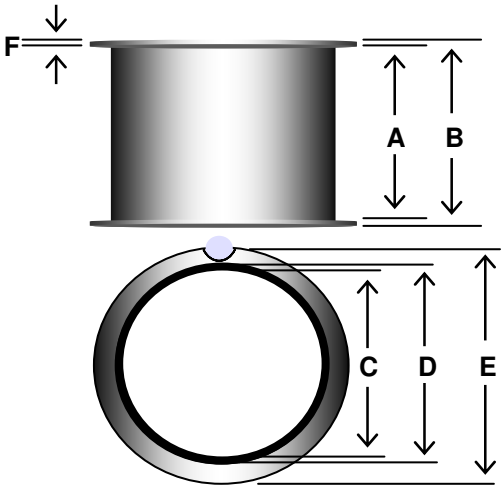
Medium Diameter Aluminum - 0.5% Mg Bonding Wire for ultrasonic wedge bonding in power devices. Consistent bondability. Consistent, reproducible tailing.

Al BONDING WIRES SPOOL SIZES

Spool For Large Al wire



Spool For Fine Al wire



For Fine Al wire - 3.0 mil below

SIZE	COLOR	A mm (in)	B mm (in)	C mm (in)	D mm (in)	E mm (in)	F mm (in)
#1 0.5" X 0.75" Df	Blue Green Red	18.42/18.29 (.725/.720)	18.9 (.75)	12.83/12.70 (.505/.500)	13.5 (0.53)	17.40/17.15 (.685/.675)	0.38 (.015)
#2 2" X 1" Df	Blue Green Red	25.53/25.27 (1.005/.995)	28.2 (1.11)	49.15/49.02 (1.935/1.930)	50.3 (1.98)	57.15/56.64 (2.250/2.230)	0.64 (.025)
#3 2" X 1" Sf	Blue Green Red	27.89/27.76 (1.098/1.093)	29.3 (1.15)	49.15/49.02 (1.935/1.930)	50.3 (1.98)	57.15/56.64 (2.250/2.230)	0.64 (.025)
#8 0.687" X 4" Df	Blue Green Red	17.5 (.687)	22.2 (.875)	11 Ref. .437 Ref.	101.6 (4.00)	117.5 (4.675)	- -
#9 2" X 2" Sf	Blue Green Red	51.05/50.55 (2.010/1.990)	52.3 (2.06)	48.90/48.80 (1.925/1.920)	50.3 (1.98)	58.75/58.25 (2.313/2.293)	0.75 (.030)
#10 2" X 2" Df	Blue Green Red	45.70/45.30 (1.800/1.783)	47.0 (1.85)	48.90/48.80 (1.925/1.920)	50.3 (1.98)	58.75/58.25 (2.313/2.293)	0.75 (.030)

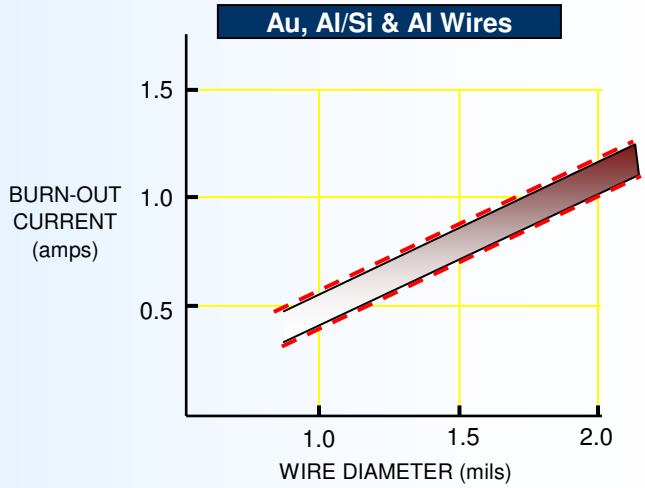
For Large Al wire - 3.0 mil above

SIZE	COLOR	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
#55	Blue Green Red Yellow	25	31	10	50	58	3
#88	Blue Green Red Yellow	25	31	10	50	88	3
4" X 1"	Blue Green Red Yellow	17.2	22.5	11	98	118	2.65

*Other color can be met per Customer Specification.

Continuous Current Long Lengths

The current carrying capacities of fine Au, Al / 1%Si and pure Al wires are very similar. The burn-out (fusing) current for relatively long lengths of 1 mil (25 µm) diameter wire is approximately 0.5 amp.

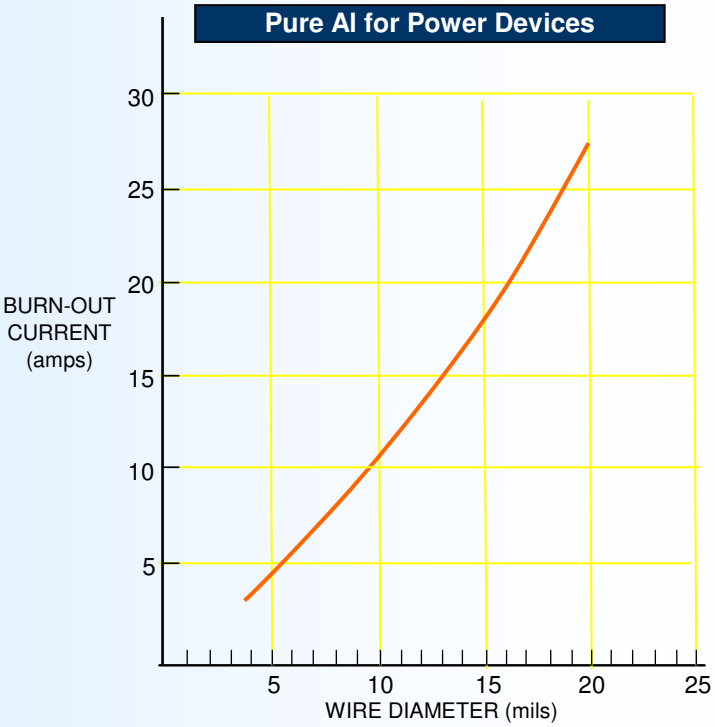


Continuous Current Long Lengths

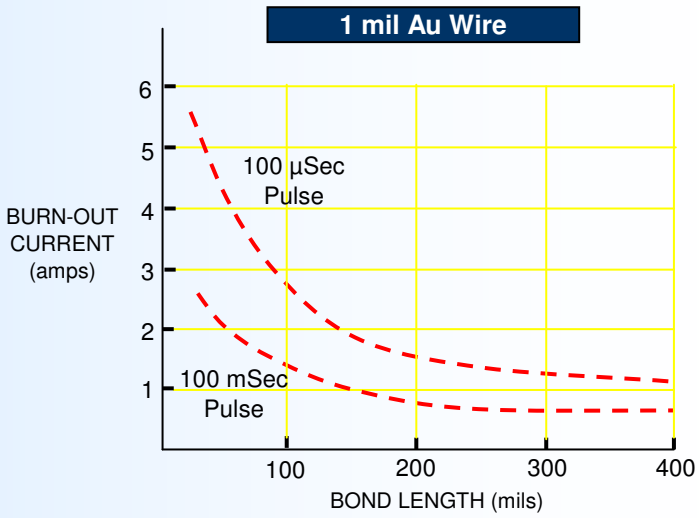
For safety in most applications it is recommended that the design maximum current should not exceed approximately one third of the burn-out value.

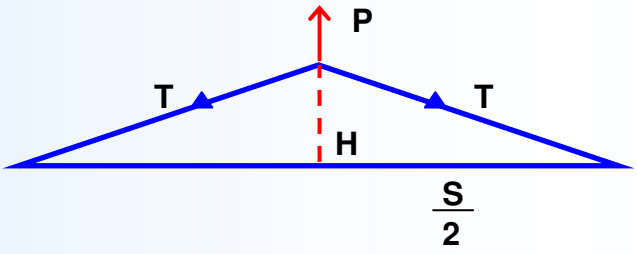
Design Rule

$$\text{Design maximum} = \frac{\text{Burn-out value}}{\sqrt{10}}$$

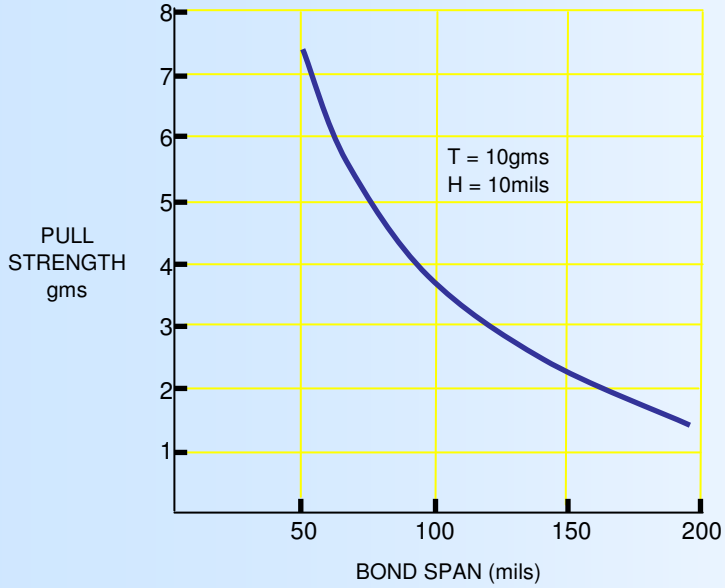


Pulse Current 25% Duty Cycle Short Lengths 1 mil Au Wire



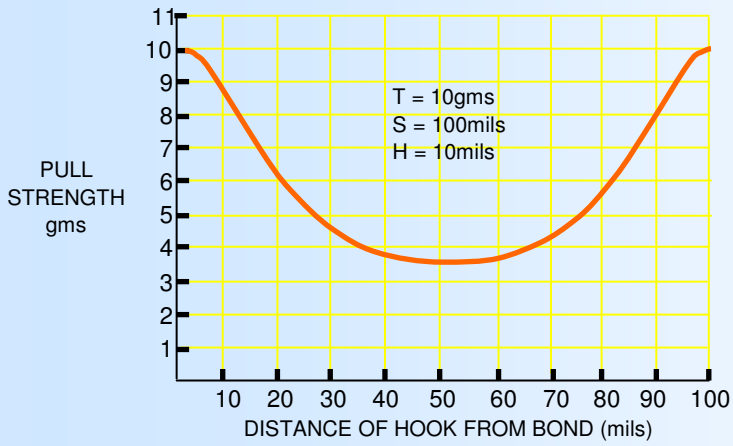


$$P = 2T \frac{H}{\sqrt{H^2 + \frac{S^2}{4}}}$$



Where:

P = Pull Strength
H = Loop Height
S = Bond Span
T = Tension In Wire/Bond



The graphs illustrate the independent influences of loop height, bond span and hook position on the theoretical pull strength measured for the simplified wire bond geometry shown above.

The graphs emphasize the importance of geometry in the application and interpretation of pull strength tests.

For a more comprehensive analysis of the wire pull strength test the reader is referred to the A.S.T.M. Standards F-458 and F-459 and by further inquiry to our company.

QUALITY POLICY

Cebu Chip Connections, Inc. recognizes the total value of utmost satisfaction of our customers, stakeholders, employees and other interested parties.

The management and staff of Cebu Chip Connections, Inc. have committed themselves to comply with the requirements and continually improve the effectiveness of the Quality Management System. Everyone who works for or on behalf of CCC is expected to ensure ownership for quality by putting the customer first in everything we do. Our QMS is our main tool in achieving the total value to providing the Highest Quality of Bonding Wires to our customers. These total values are ensured through:

- Six (6) Sigma consistency in all product quality and performance;
- Meet all commitments to customers on time;
- Quick and effective resolutions to customer issues in a manner of driving problems to root cause and eliminate recurrence;
- Involving everybody in continual improvement and process innovations;
- Developing and empowering people through effective training programs;
- Building strong relationships in our supplier chain and development processes.

It is the task of management to take the lead in this quality concept. This concept must be translated to all employees of Cebu Chip Connections, Inc., and reinforced by management to ensure understanding and commitment to all organizational levels.

ENVIRONMENTAL POLICY

Cebu Chip Connections, Inc. recognizes the importance and total value of protecting and preserving the Environment through our commitment to be environmental friendly at all times, manage our operational processes in an environmentally responsible manner. We will manufacture our Bonding Wire products by designing and operating our machineries and facilities to make efficient use of resources and to prevent pollution and contaminations.

These total values of commitment are ensured through:

- Identifying, assessing and managing all significant and non-significant Environmental Impact that may result from our operational activities, to be integrated into our decisions;
- Complying all applicable Legal and other Requirements;
- Ensuring employees understanding of their roles and responsibilities as outlined in the CCC' s Environmental Management System and develop employees to have the skills, knowledge and resources necessary to perform these duties;
- Improving our performance by setting environmental objectives and targets, monitoring our performance and initiating corrective and preventive actions when necessary;
- Holding our suppliers, sub-contractors and other interested parties to the same level of our environmental standards;
- Reporting environmental incidents and take immediate action to mitigate Environmental Impacts;
- Working cooperatively with the government, customers, suppliers and other interested parties to develop programs that contribute to improving our environmental performance; and
- We will strive for continual improvement of our environmental management system and performance.

This Environmental Policy shall be communicated and disseminated to all levels of employees within the organization and externally to the public, customers, suppliers, sub-contractors and other interested parties upon request.

TÜV CERT

CERTIFICATE

The TÜV CERT Certification Body of TÜV Industrie Service GmbH

TÜV Rheinland Group

certifies in accordance with TÜV CERT procedures that

CEBU CHIP CONNECTIONS

CEBU CHIP CONNECTIONS, INC.

MEZ 1, LAPU-LAPU CITY, 6015 CEBU, PHILS.

has established and applies a quality management system for

PRODUCTION AND DISTRIBUTION OF BONDING WIRES

An audit was performed, Report No. 053982

Proof has been furnished that the requirements according to

DIN EN ISO 9001:2000

are fulfilled.

The certificate is valid until 2008 - 05 - 23

Certificate Registration No. 01 100 053982

TÜV Rheinland Group

TÜV CERT

CERTIFICATE

The TÜV CERT Certification Body of TÜV Rheinland Industrie Service GmbH

certifies in accordance with TÜV CERT procedures that

Cebu Chip Connections, Inc.

5th St., Block B-6, Mactan Economic Zone 1, Lapu-Lapu City, Cebu 6015, Philippines

has established and applies an environmental management system for

Production and Distribution of Bonding Wires

An audit was performed, Report No. 021251

Proof has been furnished that the requirements according to

ISO 14001:2004

are fulfilled.

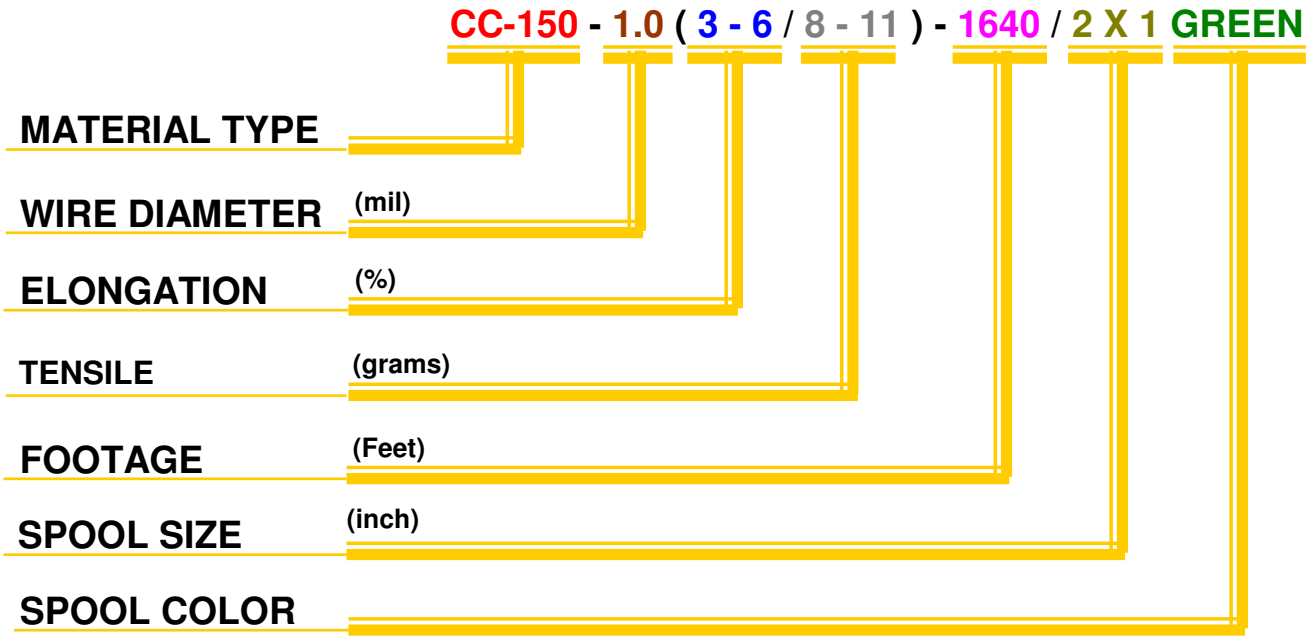
The certificate is valid until 2008-07-31.

Certificate Registration No. 01 104 021251

TÜV Rheinland Group

BONDING WIRES PART NUMBER SYSTEM
HOW TO ORDER

EXAMPLE OF CUSTOM PART NUMBER



REFERENCE GUIDE:

MATERIAL TYPE
Au (Gold) . . . . . Page 4
Al (Aluminum) . . . Page 9 & 11

WIRE DIAMETER
Au (Gold) . . . . . Page 5
Al (Aluminum) . . . Page 9 & 11

ELONGATION and BREAKLOAD
Au (Gold) . . . . . Page 5
Al (Aluminum) . . . Page 9 & 11

FOOTAGE
Au (Gold) . . . . . Page 6
Al (Aluminum) . . . Page 9 & 11

SPOOL SIZE
Au (Gold) . . . . . Page 6
Al (Aluminum) . . . Page 12

SPOOL COLOR
Au (Gold) . . . . . Page 6
Al (Aluminum) . . . Page 12

PLEASE SPECIFY YOUR PREFERRED PART NUMBER HERE FOR SAMPLE/ORDER REQUEST:

1. ____ - ____ (____ / ____) - ____ / ____ ____
2. ____ - ____ (____ / ____) - ____ / ____ ____
3. ____ - ____ (____ / ____) - ____ / ____ ____

REMARKS: _____

PLEASE FILL IN YOUR CONTACT INFORMATIONS:

COMPANY NAME : _____
ADDRESS : _____
_____
YOUR NAME : _____
Tel no. : _____
Fax no. : _____
E-mail Address : _____

● PLEASE FIND OUR CONTACT INFORMATION ON THE BACK PAGE ●

C.C.C. BONDING WIRE

Certified to ISO 9001 & ISO 14001

Website: www.cccbondingwire.com

CEBU CHIP CONNECTIONS

MEZ 1, Lapu-lapu City, Cebu 6015 Philippines

Tel: 6332-340-3251 Fax: 6332-340-3240

E-mail: cebuchip@cccbondingwire.com

CUSTOM CHIP CONNECTIONS

2019 Fisher Street, Huntsville, Alabama 35803 U.S.A.

Tel: 256-881-1396 Fax: 256-880-2166

E-mail: jrubino@chipconn.com

Nationwide and Worldwide Sales Representation.

Contact us for the name and number of your local representative.