

The Wire-Wrap Connection

CooperTools now include wrapping bits and sleeves for virtually limitless applications

The proper selection of bits and sleeves is vital to good wrapping. Selection charts are provided in this catalogue. In addition, your Cooper Tools Wire-Wrap distributor and Wire Wrap specialists are ready to advise you.

Intimate contact of bare wire and terminal corners

During the wrapping process, the wire is pulled from the wire slot by the rotation of the bit around the terminal. The wire is drawn over the wrap radius that intersects the bit face and the wire slot, placing tension on the wire in the process. This tension causes stretch of the wire.

As the wire is wrapped under mechanical tension, the sharp corners of the terminals penetrate into the surface of the wire and an intimate and large surface of contact is established. As the turns of wire are hooked at each corner of the terminal, the mechanical tension produced by the wrapping bit remains stored in the wrapped wire and a permanent gas-tight connection is established.

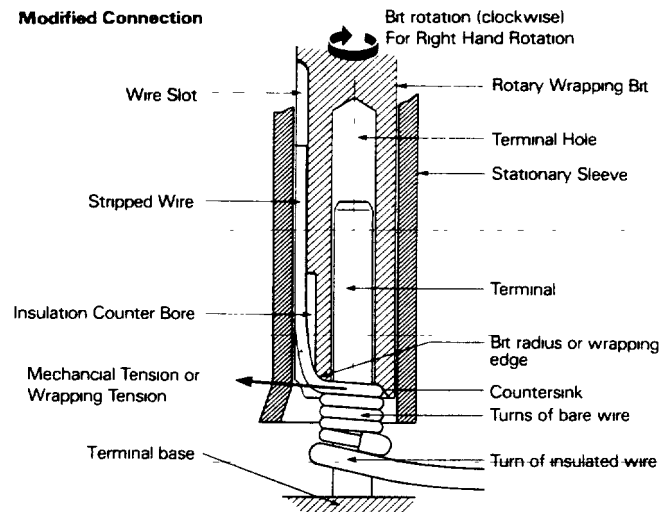
After the wrapping operation, the terminal that has been twisted in the direction of wrapping will slightly untwist and some relaxation will occur in the wire material. After some hours, when the connection is stabilized, the compression between wire and terminal corners is from 50 000 psi (35 Kg/mm²) to 100 000 psi (70 Kg/mm²), depending on the wire diameter and on the wire material.

Four turns of wire, i.e. 16 contact points provide a surface of contact equivalent to the cross section of the wire.

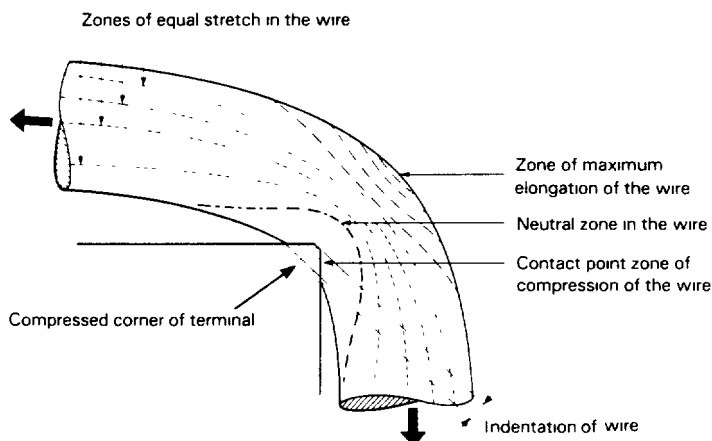
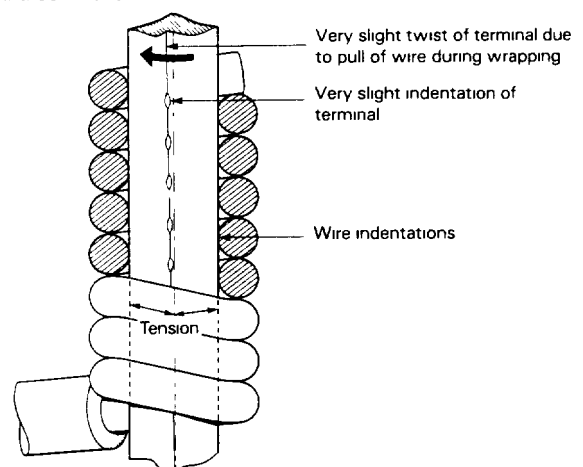
The electrical resistance of a wire wrapped connection is in the range of 1 milli ohm, which is less than the electrical resistance of inch one of length of the wire used to establish the connection.

When the connection ages solid state diffusion at the interface corners and wire will often increase the conductivity of the connection.

Modified Connection



Standard Connection



Solderless Wrapping Bits and Sleeves

(1) Wire Size	(3) Wrap Type		Bit Part No	Sleeve Part No	(2) Wire Type	(6) Terminal Diagonal		(7) Terminal Hole Depth	(4) Maximum Insulation Diameter	Minimum No. of Turns of Insulation	Effective Radius
	in	mm				Minimum	Maximum				
AWG						"/mm	"/mm	"/mm	"/mm		"/mm
18	040	1.02	M	504908	A, O	061/1 56	074/1 88	1 00/25 4	0 70/1 78	1	151/3 84
20	032	0.81	S	507356	A, O	042/1 07	074/1 88	1 00/25 4	059/1 50	9/10	121/3 07
			M	26495	A, O	042/1 07	074/1 88	1 00/25 4			150/3 81
			S	18633	A, O	059/1 50	091/2 31	1 00/25 4			147/3 73
20-22			M	519904	A, O	054/1 37	069/1 75	1 00/25 4	070/1 78	3/4	142/3 61
22	025	0.64	S	505413	A, O	049/1 24	074/1 88	1 00/25 4			119/3 02
			M	504939	A, O	049/1 24	074/1 88	1 00/25 4	052/1 32	1	131/3 33
			M	26498	A, O	049/1 24	074/1 88	1 00/25 4	059/1 45	1	135/3 43
			M	26699	A, O	049/1 24	074/1 88	1 00/25 4	059/1 45	1-1/4	135/3 43
			S	37014	A, O	061/1 55	076/1 93	1 00/25 4			125/3 17
			S	18632	A, O	061/1 55	066/2 18	1 00/25 4			125/3 17
			S	18635	A, O	088/2 49	123/3 12	1 00/25 4			142/3 61
22-24			S	500131	A, O	054/1 37	074/1 88	1 00/25 4			112/2 84
24	020	0.51	S	502134	A, O	024/0 61	044/1 12	1 00/25 4			084/2 13
			M	505415	O	024/0 61	044/1 12	1 00/25 4	044/1 12	1	098/2 49
			M	506991	A	047/1 19	067/1 70	1 00/25 4	041/1 04	9/10	100/2 54
			M	504155	O	049/1 24	069/1 75	1 13/28 5	050/1 27	9/10	119/3 02
			M	26262	A, O	054/1 33	074/1 88	1 13/28 8	046/1 17	9/10	117/2 97
			S	512058	A, O	055/1 40	074/1 88	1 00/25 4			105/2 67
			S	37013	A, O	055/1 40	074/1 88	1 00/25 4			105/2 67
			S	26589	A, O	055/1 40	074/1 88	1 50/38 1			114/2 90
			S	509301	A, O	059/1 50	067/1 70	1 00/25 4			087/2 21
			S	20420	A, O	073/1 85	092/2 34	1 00/25 4			105/2 67
24-26			M	519070	A, O	054/1 37	074/1 88	1 13/28 8	046/1 17	9/10	117/2 97
26	016	0.41	S	505279	A, O	023/0 58	039/0 99	0 75/19 1			068/1 73
			M	506445	A, O	023/0 58	039/0 99	0 75/19 1	031/0 79	1-1/4	074/1 88
			M	506420	A, O	028/0 71	044/1 12	0 75/19 1	044/1 12	1-1/8	098/2 49
			M	509405	A, O	034/0 86	051/1 29	1 00/25 4	034/0 86	1	086/2 18
			S	528412	O	031/0 79	038/0 97	0 41/10 4			086/2 18
			M	502118	A, O	053/1 35	069/1 75	1 00/25 4	041/1 04	9/10	111/2 82
			S	504910	A, O	058/1 47	074/1 88	1 00/25 4			105/2 67
			M	517104	O	054/1 33	068/1 47	1 00/25 4	041/1 05	1	100/2 54
			M	506781	A, O	059/1 50	069/1 75	1 00/25 4	041/1 04	9/10	111/2 82
28	013	0.33	M	509278	O	031/0 79	034/0 86	0 75/19 1	030/0 76	9/10	067/1 70
			M	501389	A°, O°	033/0 84	036/0 91	0 75/19 1	036/0 91	9/10	087/2 21
			S	508748	A, O	034/0 86	037/0 94	0 75/19 1			063/1 60
			S	506633	O	041/1 04	044/1 12	0 75/19 1			066/1 68
			M	505412	A, O	056/1 42	063/1 60	1 00/25 4	035/0 89	9/10	104/2 64
			S	505373	A, O°	066/1 68	069/1 75	1 00/25 4			105/2 67
			M	511304	O	066/1 68	069/1 75	1 00/25 4	038/0 97	9/10	100/2 54
30	010	0.25	M	501097	A, O	026/0 66	031/0 79	0 75/19 1	027/0 69	9/10	068/1 73
			S	500352	O	029/0 74	031/0 79	0 75/19 1			067/1 70
			M	511208	O	031/0 79	034/0 86	0 75/19 1	023/0 58	1-1/2	061/1 55
			M	507063	O	031/0 79	034/0 86	0 75/19 1	023/0 58	9/10	061/1 55
			M	511440	A	031/0 79	034/0 86	0 75/19 1	027/0 69	1-1/8	064/1 63
			M	519936	A	031/0 79	038/0 97	0 75/19 1	028/0 71	1	068/1 73
			S	500353	A°, O	032/0 81	035/0 89	0 75/19 1			061/1 55
			M	507573	A	033/0 84	036/0 91	0 75/19 1	023/0 58	1-1/4	061/1 55
			M	507502	A°, O°	041/1 04	044/1 12	0 75/19 1	027/0 69	1-1/4	071/1 80
			M	501381	A	060/1 52	063/1 60	1 00/25 4	027/0 69	1	107/2 72
			M	501194	A	066/1 68	069/1 75	1 00/25 4	027/0 69	9/10	069/2 26

A = Alloy wire O = OFHC wire A° = Alloy if terminal diagonal at low end O° = OFHC if terminal diagonal at low end NOTE Tin plated wire should be considered as Alloy in bit selection