

Western Electric

Components
Wire

GENERAL BULLETIN

WIRE

J1 WIRE

Solid, tinned conductors, two cotton braids, asphaltic impregnation. Obtainable in 18, 20, 22, and 24 gauges; singles only; black only.

KS-13385 WIRE

This hookup wire is designed for use at operating voltages of 600 volts rms or less and temperatures not exceeding 185F. This wire consists of solid or stranded tinned copper conductor insulated with a polyvinyl chloride covered with a cotton braid and a coat of lacquer.

It can be obtained in AWG conductor sizes 22, 20, 18, 16, 14, 12, 10 and 8 stranded and numbers 22, 20, 18, 16 and 14 solid in singles, pairs, triples, quads or other combinations. It is furnished in various colors designated by colored thread in the outer part. The order should include reference to KS-13385 and specify the quantity, feet, gauge and numbering, conductors, color and whether solid or stranded. For color combinations consult our nearest distributor.

P2 WIRE

Designed primarily for high grade transmission circuits and for general use where a shielded wire is required. Tinned enameled conductors, double cellulose acetate yarn, single cotton and lacquer coated. The wires are covered with a braided shield of tinned copper wires with a 22 gauge tinned copper wire running longitudinally under the shield for grounding purposes. The braided shield is covered with a paper tape and a gray cotton braid. Both the cotton braid and the braided shield may be readily pushed back in terminating the wires. Obtainable in 22 gauge; single, pair, and triple, and in a variety of colors. For color combinations please consult our nearest distributor.

KS-7133 CABLE CORDAGE

(See page 14 in microphone accessories section.)

CABLE

LEAD COVERED CABLE FOR INSIDE CONSTRUCTION

Western Electric lead covered cable possesses several ad-

vantages of material benefit to users. It makes use of the most suitable designs and materials to secure and maintain high quality cable construction. The design is such as to insure ease of handling without tendency to buckle. Manufacture is controlled to keep moisture content to a minimum. Sheathing and insulation are of uniform thickness and have a maximum of mechanical ruggedness as a protection against damage.

These cables are ideally suited for inter-studio relay circuit and speech input equipment wiring.

TYPE "OUA" LEAD COVERED CABLES

Conductors: No. 22 A. W. gauge — tinned.

Insulation: Enamel, double cotton, lacquered, each pair distinguishable from every other pair.

Core: Not impregnated.

Sheath: Pure lead.

Conductor Resistance: Not greater than 96 ohms per mile of cable at 68 degrees Fahrenheit.

Insulation Resistance: Not less than 20 megohm miles at 60 degrees Fahrenheit.

Dielectric Strength: Insulation between conductors and between conductors and sheath capable of withstanding a-c potentials having maximum instantaneous values of 700 and 1415 volts, respectively.

Intended for interior construction.

Code	Actual Number of Pairs	Number of Good Pairs	Mean Outside Diameter (Inch)	Thickness of Sheath (Inch)	Approx. Lbs. per Foot
OUA6	6	6	0.33	0.040	0.21
OUA11	11	11	.41	.043	.30
OUA16	16	16	.47	.045	.38
OUA20	21	21	.51	.047	.46
OUA26	26	26	.57	.049	.53
OUA31	31	31	.60	.050	.58
OUA41	41	41	.69	.053	.71
OUA51	51	51	.75	.056	.86
OUA76	76	76	.89	.061	1.1
OUA101	101	101	1.01	.065	1.4

TYPE "BUA" LEAD COVERED CABLES

Conductors: No. 22 A. W. gauge — tinned.

Insulation: Double cellulose acetate yarn, single cotton, lacquered, each pair distinguishable from every other pair.

Core: Not impregnated.

Sheath: Pure lead.

4.604



ASP-6259-2, Assoc. with TESTING PROCEDURES, GENERAL

**STANDARD ABBREVIATIONS
ALPHABETICAL LIST**

Effective January 1, 1935

ABB.	MEANING	ABB.	MEANING
ac	Alternating current.	meg.	Megohms.
amp.	Ampere.	mf	Mid-frequency.
ampl.	Amplifier.	mf	Microfarads.
AWG	American Wire Gauge (B & S)	N	Correction value (to be added).
B & S	Brown & Sharpe (Now Obsolete - use AWG).	n	Any number.
c	Capacity.	Fdb	Power level in db relative to .006 watts.
cps	Cycles per second.	P	Power.
db	Decibels.	PA	Public Address.
dc	Direct Current.	PCR	Normal ("Perfect Condition Reading").
E	Voltage - RMS value.	r	Resistance.
emf	Electromotive force.	RMS	Effective ("root-mean-square").
f	Frequency.	T	Transmission Ratio, in db.
G	Conductance.	Tg	Gain, in db.
G	Ohms.	Tl	Loss, in db.
H	Henry's.	V	Volts.
HF	High frequency.	W	Watts.
I	Current - RMS value.	x or X	Reactance.
i	Current - instantaneous value.	z or Z	Impedance.
j	$\sqrt{-1}$	k	Voltage amplification factor.
K	Kilo - (1000).	h	Micro - (One millionth).
KC	Kilocycles.	μh	Micro-micro.
l	Self-inductance.	φ	Phase angle.
Lf	Low frequency.	∠	Phase angle.
log	Logarithm to base 10.	Ω	Ohms (Formerly "Megohms").
log ⁻¹	Antilogarithm to base 10.	ω	Ohms (Now obsolete - use Ω).
M	Milli- (1/1000th).	zmf	Cycles-per-second.
m	Mutual inductance.	~	

NOTES:-

1. - On drawings, capital letters may be employed instead of the small letters shown above.

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STANDARD ABBREVIATIONS	ELECTRICAL RESEARCH PRODUCTS INC., NEW YORK	
ASP-6259		

1. Wire Table (Solid Wire)

Size (B & S gauge)	Bare Wire		Rubber Covered		Current Capacity National Electrical Code, Rule 18			
	Area (circular mils)	Diam. (inches)	Resistance per 1000 Ft. at 20°C = 68°F (ohms)	Single Double Braid	Overall diam. (inches)	Total area of cross-section (sq. in.)	Table A rubber insulation (amperes)	Table C in other than rubber or varnished cloth (amperes)
18	1.268	0.036	6.082	S.B.	0.198	0.031	3	5
16	1.624	0.040	6.385	S.B.	0.209	0.034	6	10
14	2.083	0.051	4.016	S.B.	0.222	0.039	15	20
12	4.107	0.064	2.525	S.B.	0.239	0.045	20	25
10	6.530	0.081	1.588	S.B.	0.280	0.053	35	50
8	10.490	0.102	0.959	S.B.	0.286	0.064	35	50
	16.510	0.128	0.628	S.B.				

2. Conduit Sizes for Numbers of Wires

Size of Conductor (B & S gauge)	Number of conductors								
	1	2	3	4	5	6	7	8	9
14	1 1/8"	1 1/4"	1 1/2"	1 3/4"	1 7/8"	2"	2 1/8"	2 1/4"	2 3/8"
12	1 1/4"	1 1/2"	1 3/4"	2"	2 1/8"	2 1/4"	2 3/8"	2 1/2"	2 5/8"
10	1 1/2"	1 3/4"	2"	2 1/8"	2 1/4"	2 3/8"	2 1/2"	2 5/8"	3"
8	1 3/4"	2"	2 1/8"	2 1/4"	2 3/8"	2 1/2"	2 5/8"	3"	3 1/8"
6	2"	2 1/8"	2 1/4"	2 3/8"	2 1/2"	2 5/8"	3"	3 1/8"	3 1/4"
5	2 1/8"	2 1/4"	2 3/8"	2 1/2"	2 5/8"	3"	3 1/8"	3 1/4"	3 3/8"
4	2 1/4"	2 3/8"	2 1/2"	2 5/8"	3"	3 1/8"	3 1/4"	3 3/8"	3 1/2"
3	2 3/8"	2 1/2"	2 5/8"	3"	3 1/8"	3 1/4"	3 3/8"	3 1/2"	3 5/8"
2	2 1/2"	2 5/8"	3"	3 1/8"	3 1/4"	3 3/8"	3 1/2"	3 5/8"	4"
1	3"	3 1/8"	3 1/4"	3 3/8"	3 1/2"	3 5/8"	4"	4 1/8"	4 1/4"

NOTE: The KS-6531 Cable (#19 BC twisted pair lead sheathed) is approximately .25" in overall diameter. It accordingly may be considered the same as a #10 BRC in estimating required conduit size.

3. Conduit Dimensions

Electrical trade size in inches	Diameter		Area of cross section of inside of conduit (sq. inches)	40% of area of cross section of inside of conduit (sq. inches)
	Outside (inches)	Inside (inches)		
1/2"	1 1/8"	1 1/4"	.305	.122
3/4"	1 1/4"	1 3/8"	.533	.213
1"	1 3/8"	1 1/2"	1.062	.444
1 1/4"	1 7/8"	2"	1.99	.812
1 1/2"	2"	2 1/8"	2.09	.812
2"	2 1/8"	2 3/8"	3.35	1.340
2 1/2"	2 3/4"	3"	4.78	1.912
3"	3 1/4"	3 1/2"	7.38	2.952
3 1/2"	3 3/4"	4"	9.88	3.952
4"	4 1/4"	4 1/2"	12.7	5.08
4 1/2"	4 3/4"	5"	15.9	6.36
5"	5 1/4"	5 1/2"	20.0	8.00
5 1/2"	5 3/4"	6"	28.9	11.56

1. Description

1.1 TA-7258 Solder is a special composition 1/8" diameter wire solder which is particularly suited for use in making soldered connections and rebuilding vacuum tube contacts operating under conditions of fairly high temperature. Its principal uses at present are:

- (a) 211, 219 and 242 type Vacuum Tube prong tips
- (b) Disc - pigtail connection of motor brushes
- (c) KS-6619 Resistor terminals (709 type Control Cabinet)

1.2 This solder is quite hard and unlike ordinary solder, retains its rigidity with increasing temperature to almost the melting point. The melting point is also higher than the ordinary solder, and at temperatures met with in use, possesses low chemical activity and low surface contact resistance. It solders well to clean brass if rosin is used as a flux, and to surfaces that have previously been tinned with ordinary solder. In the latter case, all excess of the old solder must be wiped away from both the parts to be soldered, and the soldering iron, to prevent dilution. A 115 Volt Vulcan #100 soldering iron operating at voltages from 105-125 volts is suitable for working this solder. This solder is rather expensive and should, therefore, be limited in use to the conditions mentioned above.

2. Procedure

2.1 Rebuilding Vacuum Tube Prong Contacts (Refer to E.B. "Vacuum Tubes, General", F.R. 4-14)

- (a) Remove the old solder from the prong ends using a clean hot iron and holding the tube with the base downward to prevent solder from flowing into the base. Do not sling the solder off the prongs as this is likely to injure the vacuum tube.
- (b) Make certain that the prong end and wire connection are well tinned, but that no excess of old solder remains either on the prongs or on the soldering iron.
- (c) With the vacuum tube inverted, apply the TA-7258 Solder and build it up to approximately 1/32" above the prong ends so that after trimming with a file, all prongs will have a uniform height and shape to conform with that of a new vacuum tube. The height (tube vertical, base down) is measured from the upper surface of the bayonet pin to the end of the prongs, and should be as follows:

For 211 & 242 type Vacuum Tube ... 1-11/64"
For 219 type Vacuum Tube 2-43/64"

2.2 Soldering Connections

If the connection has already been tinned with ordinary solder, remove all excess of old solder from both the connection and the iron, and resolder using the TA-7258 Solder.

If it is desired to apply the TA-7258 Solder directly to such metals as copper and brass; first thoroughly clean the parts and apply a small amount of powdered rosin or rosin in alcohol, and then using a hot iron, apply the TA-7258 Solder and make it "flow". Soldering pastes and similar fluxes are not recommended because of the probability of subsequent corrosion.

3. Merchandising

3.1 A quantity of TA-7258 Solder has been supplied to District Offices for distribution to Engineers for inclusion in their kits. This material is not carried in the Stores Division. Additional quantities may be obtained to replenish District Office supply through memorandum to the Operating Headquarters, New York (or Western Division, Los Angeles).