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25 January 1944

NRL Report No. R-2220  
Problem S148R-C.

Navy Department

Report on

FR-2220

Captured Japanese Cable

Naval Research Laboratory

Anacostia Station

Washington, D. C.

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**SEARCH RADAR SECTION**

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Jack S. Hayes  
Signature of Custodian

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1. INTRODUCTION.

In compliance with the request of BuShips confidential letter C-EF 37/L11-1 (335) to the Naval Research Laboratory, dated 3 November 1943, a number of samples of Japanese cable from captured equipment received at this laboratory have been examined. It is the purpose of this report to describe and discuss briefly the uses of such cable. The samples chosen are representative of the kinds of cable available.

2. ABSTRACT.

Twelve samples of cable were prepared for examination as shown in the photographs of Plates 1 and 2. The construction of each cable type was determined by dissection, and cross-sectional diagrams were drawn for each type. Simple chemical tests were used to identify some of the materials. There are only two samples of high frequency line (Samples No. 5 and No. 6). Sample No. 5 is of interest because three round holes have been extruded from the solid dielectric to lower the capacitance of the cable. Sample No. 6 is an r-f shielded balanced line used to carry 50 watts c.w. at 67 Mc. The other samples are various kinds of power cable whose several uses are mentioned in the following discussion.

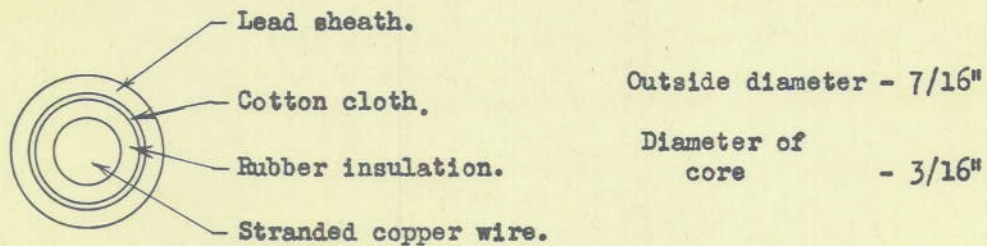
3. DESCRIPTION OF CABLE SAMPLES.

For each sample a cross-section of the cable is shown and a brief discussion as to its size, use and age is given. In no case could the exact age be given, but it can often be estimated from the date of manufacture of the equipment in which it is used, or from the date of capture. Plates 1 and 2 are photographs of the cables examined; in these photographs, the identification numbers correspond to the sample numbers used in the following paragraphs. It should be noted that since the two photographs were taken from different distances, the apparent sizes of the cables in the two pictures are not comparable. The actual size of each cable is given in the following paragraphs. The cross-section diagrams are drawn twice actual size.

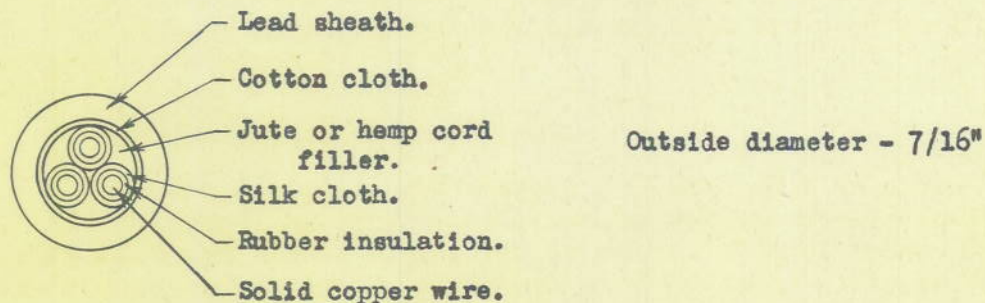


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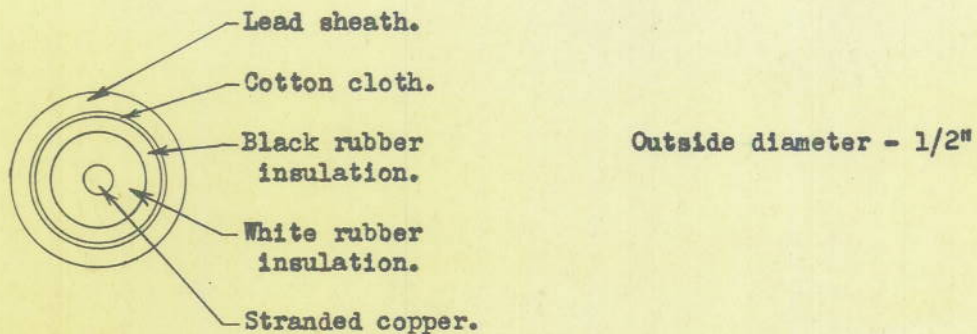
3-1. Sample 1. This sample was taken from a Japanese radar transmitter C.E.E. No. 211, captured on Guadalcanal, and was used to carry power to the tube filaments. The transmitter was manufactured in January 1942. The single conductor core consists of 30 strands of No. 20 copper wire.



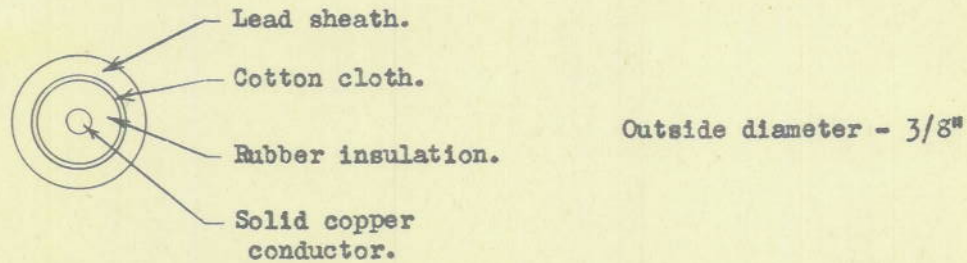
3-2. Sample 2. This power cable was taken from a large reel which was captured on Attu Island in May 1943. Each conductor is No. 17 solid copper wire.



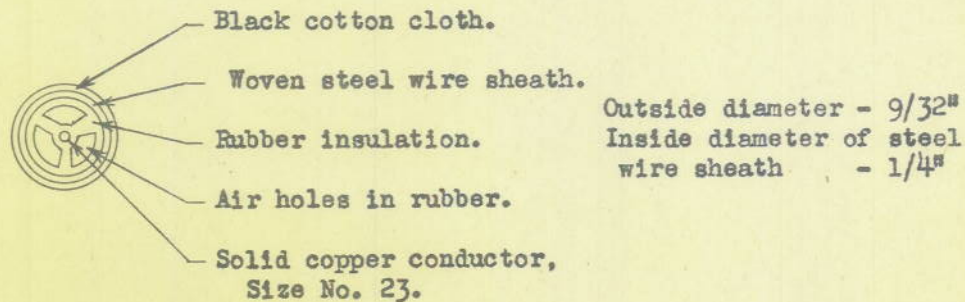
3-3. Sample 3. The high voltage cable was used in the Guadalcanal radar transmitter (manufactured in January 1942) to carry plate voltage at a potential of 6 kv. The stranded core, which is size No. 11, is made up of seven strands of No. 20 copper wire.



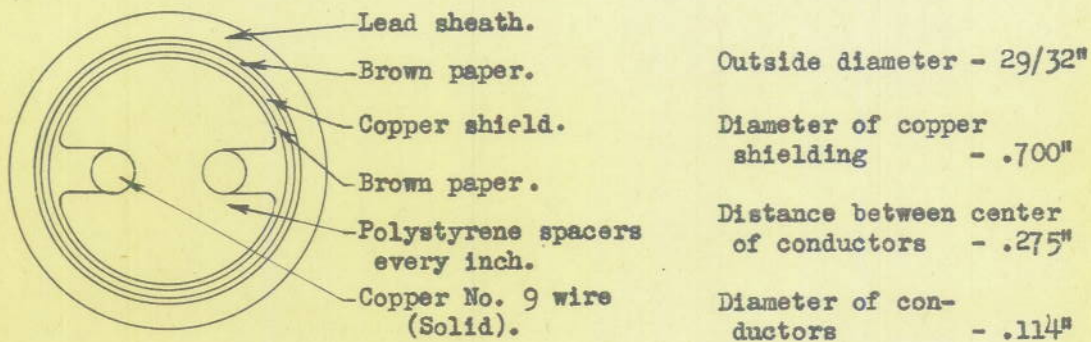
3-4. Sample 4. This sample was used to carry 600 volts in the Guadalcanal radar transmitter. The solid copper conductor is size No. 14.



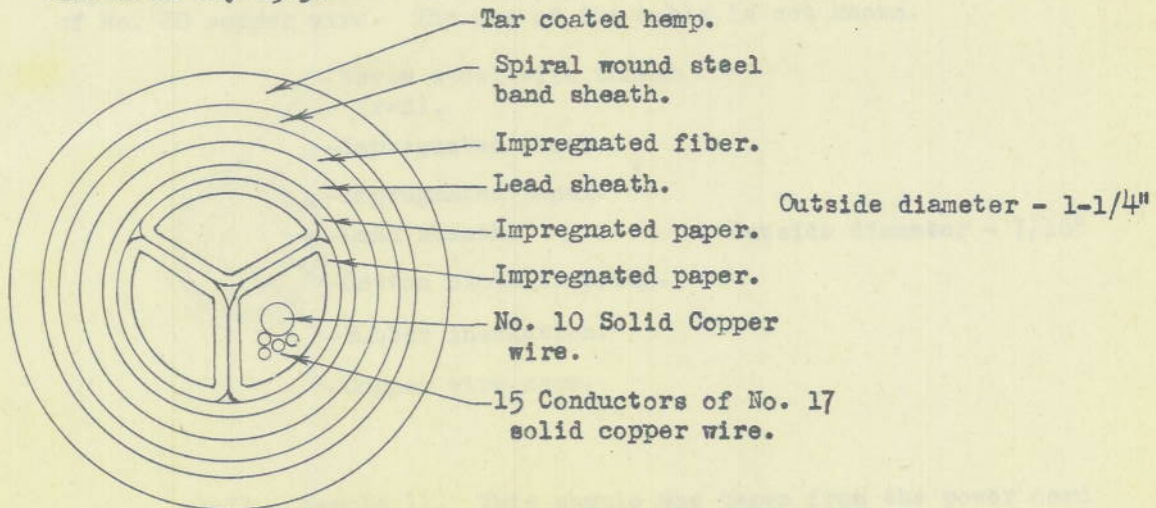
3-5. Sample 5. The cloth covered coaxial line is used to carry video and pulse signals between the various units of the Guadalcanal radar. The estimated impedance of the line is 100 ohms. The capacitance of the cable has been decreased by extruding three holes in the otherwise solid rubber dielectric. These holes are in a symmetrical position around the center conductor, which is No. 23 solid copper wire.



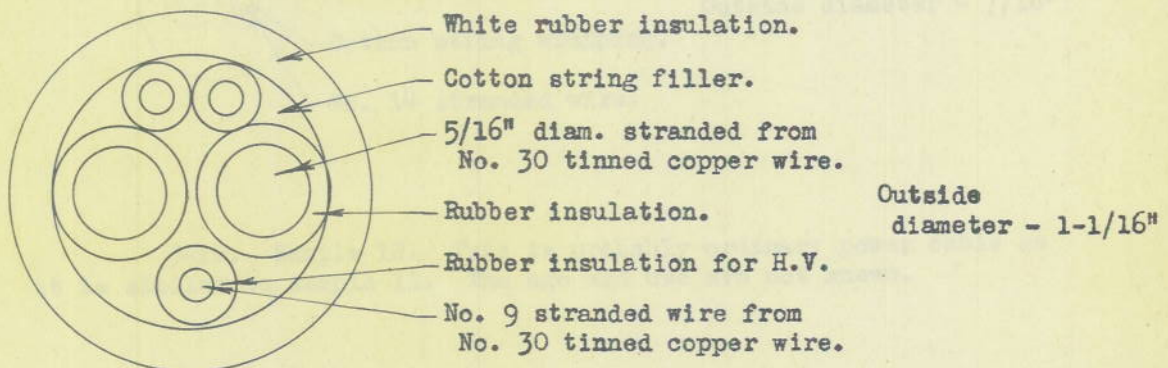
3-6. Sample 6. The shielded balanced wire line is used to carry r-f power to the antenna of the Japanese Radio Navigational Aid (C.E.E. No. 3266). The equipment was captured on Kiska Island in August 1943 and was probably manufactured in January 1943. The cable is used at a frequency of 67 Mc and a cw power output of 50 watts. The characteristic impedance of the line is approximately 115 ohms.



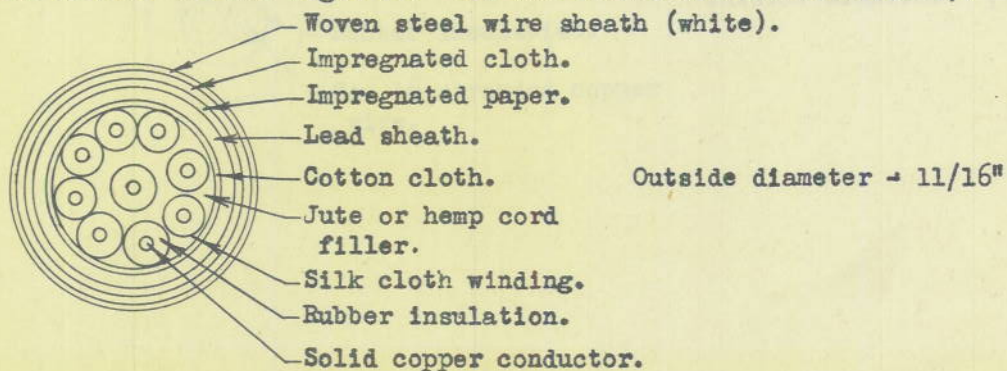
3-7. Sample 7. This cable is probably used as underground power cable. The sample was taken from a large reel captured on Attu Island in May 1943.

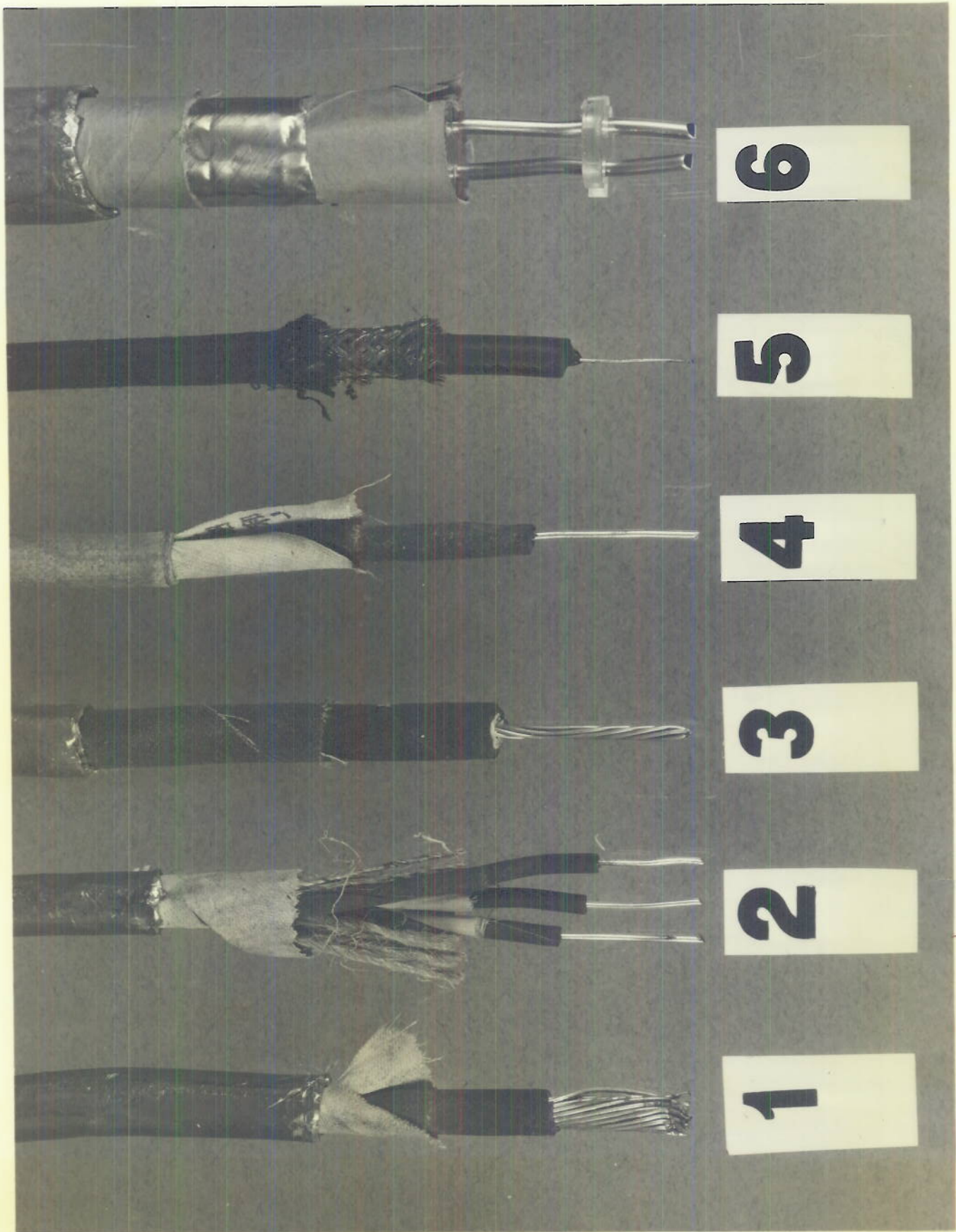


3-8. Sample 8. The cable was probably used to carry power from a power supply unit to a communications transmitter. The large wires are for the filament power and the small are for B plus and bias voltages. Approximately 50 feet of this was captured on Attu Island in May 1943. On each end of the cable was a multi-prong plug molded of the same type of rubber as the outer covering of the cable and integral with it.



3-9. Sample 9. This nine conductor cable was taken from a large reel captured on Attu Island in May 1943. There is no indication as to what the use might be. All the conductors are size No. 17.

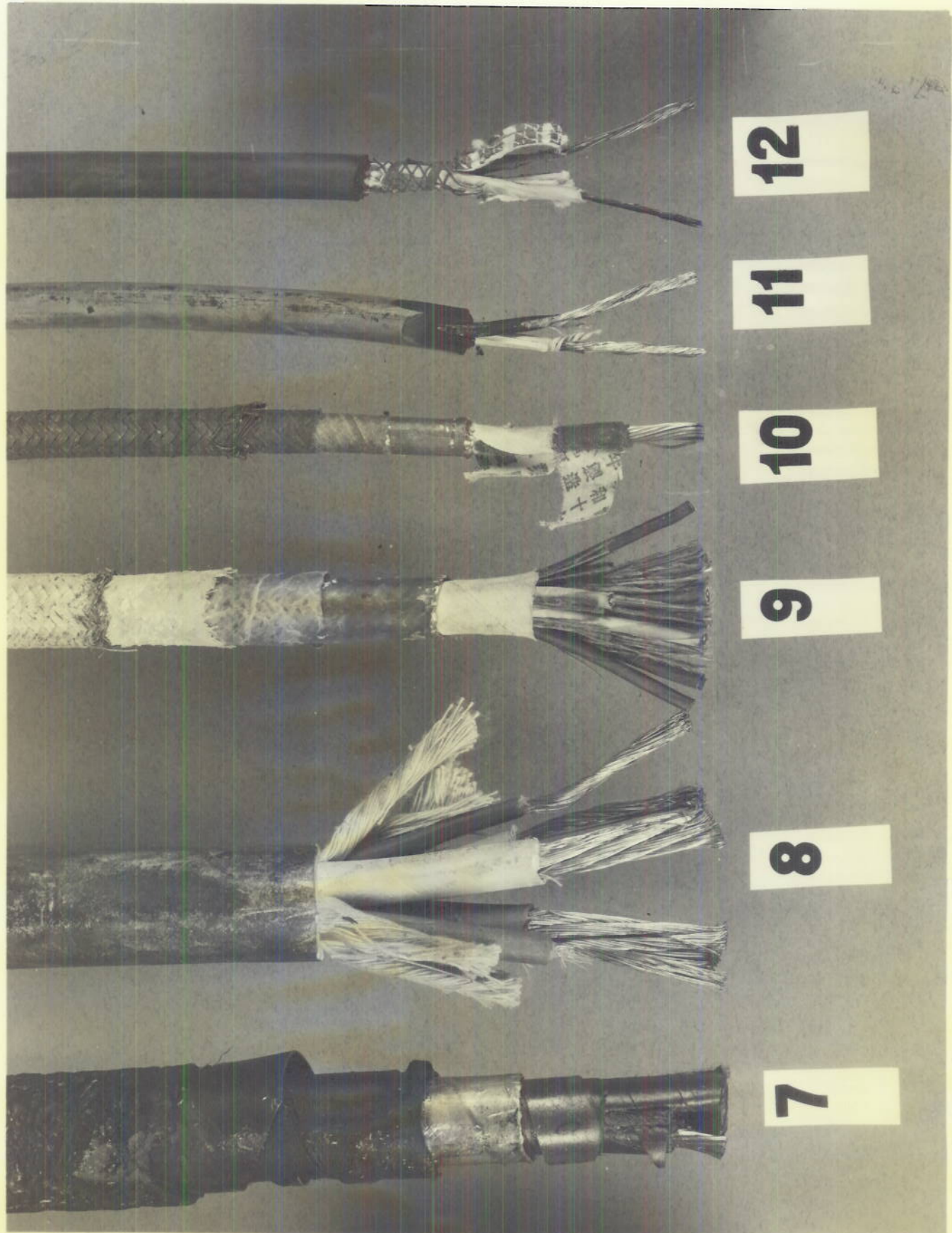




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**PLATE I**



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**PLATE 2**