FEDERAL SUPPLY CLASS

RATIONALE

AS5419/4 HAS BEEN REAFFIRMED TO COMPLY WITH THE SAE FIVE-YEAR REVIEW POLICY.

Type “K” thermocouple conductors are typically used as extension leads for aerospace application. These wires are only to be used in a matched pair and procured under AS5419. Thermocouple extension wires are calibrated for use together in fabricating thermocouples. If each leg of the thermocouple extension wire is from a different lot, recalibration of the thermocouple pair will be required.

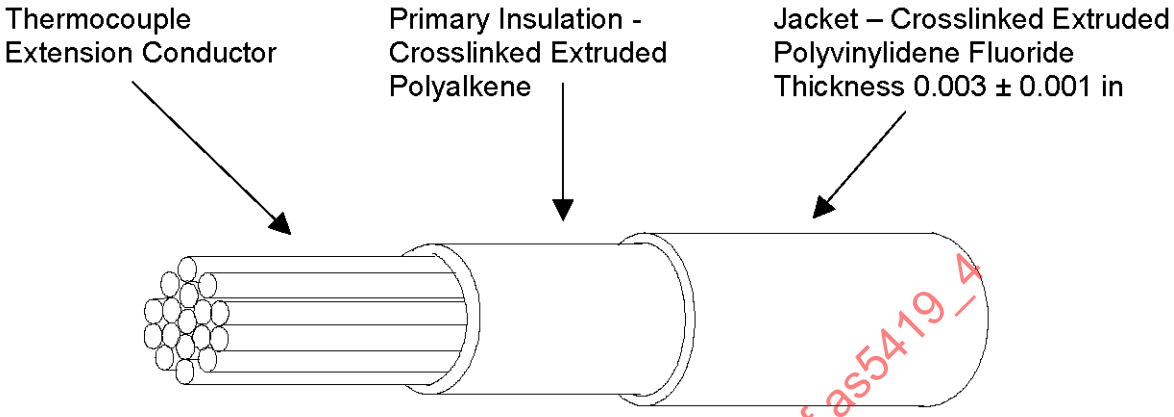


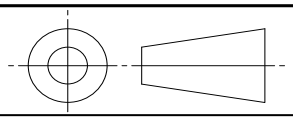
FIGURE 1 - Wire, Thermocouple, Crosslinked Polyalkene Insulated
Component wire insulation system must conform to the similar wire type designated in Table 1 of AS5419. Manufacturers must be qualified to AS81044/12 to produce this product.

TABLE 1 - KP CONSTRUCTION DETAILS

TABLE 1A - KP CONSTRUCTION DETAILS, INCH-POUND UNITS

Part number[1]	Wire size	Stranding (Number of strands x AWG of strands)	Diameter of stranded conductor (in)		Finished Wire Resistance (ohms/1,000 ft) at 20 °C		Finished Wire Diameter (in)	Finished Wire Weight (lb/1,000 ft) (max)
			(min)	(max)	(min)	(max)		
ML-22KPS-9 ML-22KPH-9	22 “	19 X 34 “	0.029 “	0.033 “	546.7 “	604.3 “	0.047 ± 0.002 “	3.1 “
ML-20KPS-9 ML-20KPH-9	20 “	19 X 32 “	0.037 “	0.041 “	339.2 “	375.0 “	0.055 ± 0.002 “	4.6 “
ML-18KPS-9 ML-18KPH-9	18 “	19 X 30 “	0.046 “	0.051 “	217.0 “	240.0 “	0.065 ± 0.002 “	7.0 “
ML-16KPS-9 ML-16KPH-9	16 “	19 X 29 “	0.052 “	0.058 “	169.7 “	187.7 “	0.072 ± 0.003 “	8.9 “
ML-14KPS-9 ML-14KPH-9	14 “	19 X 27 “	0.065 “	0.073 “	107.6 “	119.0 “	0.089 ± 0.004 “	13.9 “

THIRD ANGLE PROJECTION



ISSUED 2003-02 REAFFIRMED 2014-01

CUSTODIAN: AE-8/AE-8D

AEROSPACE STANDARD

WIRE, THERMOCOUPLE, CROSSLINKED POLYALKENE INSULATED NICKEL/CHROMIUM (KP); NICKEL/ALUMINUM/MANGANESE (KN) THERMOCOUPLE EXTENSION, LIGHT WEIGHT, 150 °C

AS5419/4
SHEET 1 OF 5

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TABLE 1B - KP Construction Details, SI Units

Part number[1]	Wire size	Stranding (Number of strands x AWG of strands)	Diameter of stranded conductor (mm) (min)	(max)	Finished Wire Resistance (ohms/km) at 20 °C (min)	(max)	Diameter (mm)	Weight (kg/km) (max)
ML-22KPS-9 ML-22KPH-9	22 “	19 X 34 “	0.737 “	0.838 “	1793.6 “	1982.6 “	1.19 ± 0.05 “	4.6 “
ML-20KPS-9 ML-20KPH-9	20 “	19 X 32 “	0.940 “	1.04 “	1112.9 “	1230.3 “	1.40 ± 0.05 “	6.8 “
ML-18KPS-9 ML-18KPH-9	18 “	19 X 30 “	1.17 “	1.30 “	711.9 “	787.4 “	1.65 ± 0.05 “	10.4 “
ML-16KPS-9 ML-16KPH-9	16 “	19 X 29 “	1.32 “	1.47 “	556.8 “	615.8 “	1.83 ± 0.08 “	13.2 “
ML-14KPS-9 ML-14KPH-9	14 “	19 X 27 “	1.65 “	1.85 “	353.0 “	390.4 “	2.26 ± 0.10 “	20.7 “

[1] The color shall be white only.

Notes
Electromotive Force (EMF) designator = Type KPS conductor from ANSI/MC96.1 with standard limits
= Type KPH conductor from ANSI/MC96.1 with special limits
Example: Size 20 standard EMF limits - ML-20KPS-9; Size 20 special EMF limits - ML-20KPH-9
These wires comply with the sealing range requirement for firewall connectors as specified in MIL-DTL-5015, MIL-DTL-38999, and MIL-C-83723 (superseded by MIL-C-26482 and MS3470 which are inactive for new design) except that 20 awg wire is not compatible with minimum sealing range of MIL-DTL-38999 16 awg contacts and 14 awg wire is not compatible with the minimum sealing range of MIL-C-83723 (superseded by MIL-C-26482 and MS3470 which are inactive for new design) and MIL-DTL-38999 12 awg contacts.

TABLE 2 - KN CONSTRUCTION DETAILS

TABLE 2A - KN CONSTRUCTION DETAILS, INCH-POUND UNITS

Part number[1]	Wire size	Stranding (Number of strands x AWG of strands)	Diameter of stranded conductor (in) (min)	(max)	Finished Wire Resistance (ohms/1,000 ft) at 20 °C (min)	(max)	Diameter (in)	Weight (lb/1,000 ft) (max)
ML-22KNS-5 ML-22KNH-5	22 “	19 X 34 “	0.029 “	0.033 “	228.2 “	252.3 “	0.047 ± 0.002 “	3.1 “
ML-20KNS-5 ML-20KNH-5	20 “	19 X 32 “	0.037 “	0.041 “	141.5 “	156.5 “	0.055 ± 0.002 “	4.6 “
ML-18KNS-5 ML-18KNH-5	18 “	19 X 30 “	0.046 “	0.051 “	90.5 “	100.2 “	0.065 ± 0.002 “	7.0 “
ML-16KNS-5 ML-16KNH-5	16 “	19 X 29 “	0.052 “	0.058 “	70.6 “	78.2 “	0.072 ± 0.003 “	8.9 “
ML-14KNS-5 ML-14KNH-5	14 “	19 X 27 “	0.065 “	0.073 “	44.9 “	49.7 “	0.089 ± 0.004 “	13.9 “

FIGURE 2B - KN Construction Details, SI Units

Part number[1]	Wire size	Stranding (Number of strands x AWG of strands)	Diameter of stranded conductor (mm) (min)	(max)	Finished Wire Resistance (ohms/km) at 20 °C (min)	(max)	Diameter (mm)	Weight (kg/km) (max)
ML-22KNS-5 ML-22KNH-5	22 “	19 X 34 “	0.737 “	0.838 “	748.7 “	827.8 “	1.19 ± 0.05 “	4.6 “
ML-20KNS-5 ML-20KNH-5	20 “	19 X 32 “	0.940 “	1.04 “	464.2 “	513.5 “	1.40 ± 0.05 “	6.8 “
ML-18KNS-5 ML-18KNH-5	18 “	19 X 30 “	1.17 “	1.30 “	296.9 “	328.7 “	1.65 ± 0.05 “	10.4 “
ML-16KNS-5 ML-16KNH-5	16 “	19 X 29 “	1.32 “	1.47 “	231.6 “	256.6 “	1.83 ± 0.08 “	13.2 “
ML-14KNS-5 ML-14KNH-5	14 “	19 X 27 “	1.65 “	1.85 “	147.6 “	163.1 “	2.26 ± 0.10 “	20.7 “

[1] The color shall be green only.

Notes

Electromotive Force (EMF) designator = Type KNS conductor from ANSI/MC96.1 with standard limits
= Type KNH conductor from ANSI/MC96.1 with special limits

Example: Size 20 standard EMF limits - ML-20KNS-5; Size 20 special EMF limits - ML-20KNH-5

These wires comply with the sealing range requirement for firewall connectors as specified in MIL-DTL-5015, MIL-DTL-38999, and MIL-C-83723 (superseded by MIL-C-26482 and MS3470 which are inactive for new design) except that 20 awg wire is not compatible with minimum sealing range of MIL-DTL-38999 16 awg contacts and 14 awg wire is not compatible with the minimum sealing range of MIL-C-83723 (superseded by MIL-C-26482 and MS3470 which are inactive for new design) and MIL-DTL-38999 12 awg contacts.

TABLE 3 - PERFORMANCE DETAILS

TABLE 3A - PERFORMANCE DETAILS, INCH-POUND UNITS

Part number[1]	Bend Testing Mandrel Diameter (in) (± 3%) Life cycle test and accelerated aging test[2]	Cold bend test	Wrap test	Test Load (lb) (± 3%) Life cycle test and accelerated aging test[2]	Cold bend test
ML-22KXS ML-22KXH	0.75 “	0.75 “	0.250 “	0.38 “	1.0 “
ML-20KXS ML-20KXH	0.75 “	0.75 “	0.250 “	0.38 “	1.0 “
ML-18KXS ML-18KXH	1.00 “	1.00 “	0.375 “	0.50 “	1.0 “
ML-16KXS ML-16KXH	1.00 “	1.00 “	0.375 “	0.50 “	1.0 “
ML-14KXS ML-14KXH	1.50 “	1.50 “	0.50 “	1.0 “	3.0 “

FIGURE 3B - Performance Details, SI Units

Part number[1]	Mandrel Diameter (mm) (± 3%) Life cycle test and accelerated aging test[2]	Cold bend test	Wrap test	Test Load (kg) (± 3%) Life cycle test and accelerated aging test[2]	Cold bend test
ML-22KXS ML-22KXH	19 “	19 “	6.4 “	0.17 “	0.45 “
ML-20KXS ML-20KXH	19 “	19 “	6.4 “	0.17 “	0.45 “
ML-18KXS ML-18KXH	25 “	25 “	9.5 “	0.23 “	0.45 “
ML-16KXS ML-16KXH	25 “	25 “	9.5 “	0.23 “	0.45 “
ML-14KXS ML-14KXH	38 “	38 “	12.7 “	0.45 “	1.36 “

[1] The letter “X” has been substituted for the letters “P” positive or “N” negative conductor types when used as a matched pair and the requirements are applicable to both positive and negative wires.
[2] Also for bend tests after immersion.

WIRE RATINGS AND ADDITIONAL REQUIREMENTS

TEMPERATURE RATING: 150 °C (302 °F)

VOLTAGE RATING: Not applicable

ACCELERATED AGING: Oven temperature, 300 °C ± 2 °C (572 °F ± 3.6 °F) for 6 hours; for identification legibility 225 °C ± 2 °C (437 °F ± 3.6 °F) for 6 hours

BLOCKING: 150 °C ± 2 °C (302 °F ± 3.6 °F)

FLAMMABILITY: 30 seconds (max); 3.0 in (76.2 mm) (max); no flaming of tissue paper

HUMIDITY RESISTANCE: 5,000 megohms for 1,000 ft (1,524 megohms for 1.0 km), min insulation resistance after humidity exposure

IDENTIFICATION: The finished wire shall be identified by a printed marking applied to the outer surface of the wire. The printed marking shall be legible, black in color, and withstand a durability test of 125 cycles (250 strokes) (min), 500 grams weight. The size of the printed characters shall be consistent with the magnitude of the surface upon which it is printed. The distance between the end of one mark and the beginning of the next shall be a maximum of 12 in. The printed marking shall be applied with the vertical axes of the print characters lengthwise on wire whose nominal diameter is 0.050 in (1.27 mm) or smaller. The vertical axes of the printed characters may be crosswise or lengthwise on wire whose nominal diameter is 0.051 in (1.30 mm) or larger.

IMPULSE DIELECTRIC TEST: Primary insulation (when test is used in lieu of spark test): 6.0 kilovolts (peak), 100% test; finished wire: 8.0 kilovolts (peak), 100% test

INSULATION RESISTANCE (min): 5,000 megohms for 1,000 ft (1,524 megohms for 1.0 km)

LIFE CYCYLE: Oven temperature, 200 °C ± 2 °C (392 °F ± 3.6 °F) for 168 hours