

NYLEZE®/155 (NZ155)

TYPICAL PROPERTIES

This data is typical of 18 AWG copper, heavy build insulation only. It is not intended to be used to create specification limits.

THERMAL

Thermal Endurance (N,J,I,A*)
20,000 hr Life: >160°C

Thermoplastic Flow (N,J,I,PD*)
Min: 200°C
Typical: 230°C

Heat Shock (20% 3x) (N*,J,I)
1/2 hr @ 175°C min: no cracks

Solderability (N*,J,I,PD)
@ 400°C (750°F): 4 seconds (flux-recommended)

Overload (N,PD*): 0.9 OFM (70 sec)
Overload Figure of Merit

Stress Relief Temp (PD*): 130°C

MECHANICAL

Mandrel Flexibility (N,J,I,PD*)
After Elongation min: 20% 3x OK
typical: 30% 1x OK

After Snap min: 3x OK
typical: 1x OK

Unilateral Scrape (N*,I)
Avg of 3 sides min: 1150 gms
typical: 1500 gms

* Procedure followed to determine published value.
Procedures referenced:
N = NEMA = National Electrical Manufacturers Association
J = JIS = Japanese Industrial Standards
I = IEC = International Electrotechnical Commission
A = ASTM = American Society for Testing and Materials
PD = Phelps Dodge Procedure

ELECTRICAL

Dielectric Breakdown (N*,J,I)
@ RT: 8.5 kV
@ 105°C: 6.0 kV

Insulation Resistance (A,PD*)
@ RT: 5×10^{11} ohms
@ 155°C: 2.8×10^9 ohms

High Voltage Continuity (N,J,I,PD*)
NEMA @ 1500 V DC: 5 faults/100 feet max
Typical @ 3000 V DC: 0-1 faults/100 feet

CHEMICAL

Resistance to Solvents (N,J,I,PD*)
After 24 hrs @ RT: Pass,
Solvents Including:
Xylene,
50/50 Cellosolve/Xylene,
Perchloroethylene,
1% NaOH,
28% Sulfuric Acid,
Freon TMS



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MW 80-C (Single)
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MW 80-C (Single)
POLYURETHANE OVERCOATED WITH POLYAMIDE, SINGLE FILM INSULATED ROUND COPPER
MAGNET WIRE FOR SOLDERABLE APPLICATIONS THERMAL CLASS 155

INSULATING MATERIALS	The conductor shall be coated with a dual film. The underlying insulation is based on polyurethane resins (1.4.2). The superimposed coating is based on polyamide resins (1.4.2).
THERMAL CLASS	155°C when tested in accordance with Part 1, para. 1.8 and Part 3, para. 3.58.1.
GENERAL REQUIREMENTS	See Part 1.

Properties	Test Procedure, See Part 3, Paragraph	Requirements										
DIMENSIONS	3.2.1.1	See Table S (MW 80-C)										
ADHERENCE AND FLEXIBILITY	3.3.1	No cracks visible in the film coating										
ELONGATION	3.4	Not less than value in Table S (MW 80-C)										
HEAT SHOCK	3.5	No cracks visible in the film coating after conditioning at 175°C										
SPRINGBACK	3.7.1	Not greater than value in Table S (MW 80-C)										
DIELECTRIC STRENGTH	3.8.3	Not less than value in Table S (MW 80-C)										
CONTINUITY	3.9	The number of discontinuities shall not exceed 15										
SOLDERABILITY	3.13	Covered with continuous film of solder after immersion as follows: <table style="margin-left: 40px;"> <tr> <td>14-19 AWG</td> <td>10 seconds at 430°C</td> </tr> <tr> <td>20-23 AWG</td> <td>8 seconds at 430°C</td> </tr> <tr> <td>24-29 AWG</td> <td>6 seconds at 390°C</td> </tr> <tr> <td>30-36 AWG</td> <td>5 seconds at 390°C</td> </tr> <tr> <td>37-44 AWG</td> <td>4 seconds at 390°C</td> </tr> </table>	14-19 AWG	10 seconds at 430°C	20-23 AWG	8 seconds at 430°C	24-29 AWG	6 seconds at 390°C	30-36 AWG	5 seconds at 390°C	37-44 AWG	4 seconds at 390°C
14-19 AWG	10 seconds at 430°C											
20-23 AWG	8 seconds at 430°C											
24-29 AWG	6 seconds at 390°C											
30-36 AWG	5 seconds at 390°C											
37-44 AWG	4 seconds at 390°C											

PERIODIC CONFORMANCE TESTS

THERMOPLASTIC FLOW	3.50	Median not less than 200°C with heavy film insulated 18 or 36 AWG
SOLUBILITY	3.51	A specimen of heavy film insulated 18 or 36 AWG immersed in xylene shall not soften sufficiently to expose the bare conductor
DIELECTRIC STRENGTH AT RATED TEMPERATURE	3.52	Heavy film insulated wire shall average not less than 3825 volts for 18 AWG or 1725 volts for 36 AWG
SCRAPE RESISTANCE	3.59	Lowest "grams-to-fall" load for any one of the three tests and the average of the three tests shall not be less than the values in Table S (MW 80-C)

MW 80-C (Single)
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Table S (MW 80-C)
POLYURETHANE OVERCOATED WITH POLYAMIDE, SINGLE FILM INSULATED ROUND COPPER
MAGNET WIRE FOR SOLDERABLE APPLICATIONS THERMAL CLASS 155

AWG Size	Bare Wire Diameter, Inches †			Insulation †		Elongation, Minimum Percent	Scrape, Grams to Fail		Springback, Maximum Degrees per Turn	Dielectric Strength, Minimum Breakdown Volts	AWG Size
				Minimum Increase in Diameter, Inches	Maximum Overall Diameter, Inches		Average	Minimum			
	Minimum	Nominal	Maximum								
14	0.0635	0.0641	0.0644*	0.0016	0.0666	33	840	715	42	3175	14
15	0.0565	0.0571	0.0574*	0.0015	0.0594	33	780	665	46	3075	15
16	0.0503	0.0508	0.0511*	0.0014	0.0531	33	735	625	50	3000	16
17	0.0448	0.0453	0.0455*	0.0014	0.0475	32	690	585	54	2925	17
18	0.0399	0.0403	0.0405*	0.0013	0.0424	32	645	550	58	2850	18
19	0.0355	0.0359	0.0361*	0.0012	0.0379	31	600	510	62	2775	19
20	0.0317	0.0320	0.0322*	0.0012	0.0339	30	560	475	66	2700	20
21	0.0282	0.0285	0.0286*	0.0011	0.0303	30	525	445	53	2625	21
22	0.0250	0.0253	0.0254*	0.0011	0.0270	29	490	415	58	2575	22
23	0.0224	0.0226	0.0227*	0.0010	0.0243	29	460	390	62	2500	23
24	0.0199	0.0201	0.0202*	0.0010	0.0217	28	430	365	67	2425	24
25	0.0177	0.0179	0.0180*	0.0009	0.0194	28	400	340	72	2375	25
26	0.0157	0.0159	0.0160*	0.0009	0.0173	27	380	325	76	2300	26
27	0.0141	0.0142	0.0143	0.0008	0.0156	27	355	300	50	2250	27
28	0.0125	0.0126	0.0127	0.0008	0.0140	26	335	285	55	2175	28
29	0.0112	0.0113	0.0114	0.0007	0.0126	26	310	265	61	2150	29
30	0.0099	0.0100	0.0101	0.0007	0.0112	25	295	250	66	2075	30
31	0.0088	0.0089	0.0090	0.0006	0.0100	24	...	...	...	1875	31
32	0.0079	0.0080	0.0081	0.0006	0.0091	24	...	...	...	1675	32
33	0.0070	0.0071	0.0072	0.0005	0.0081	23	...	...	...	1500	33
34	0.0062	0.0063	0.0064	0.0005	0.0072	22	...	...	...	1350	34
35	0.0055	0.0056	0.0057	0.0004	0.0064	21	...	...	...	1200	35
36	0.0049	0.0050	0.0051	0.0004	0.0058	20	...	...	...	1075	36
37	0.0044	0.0045	0.0046	0.0003	0.0052	20	...	...	...	975	37
38	0.0039	0.0040	0.0041	0.0003	0.0047	19	...	...	...	850	38
39	0.0034	0.0035	0.0036	0.0002	0.0041	18	...	...	...	775	39
40	0.0030	0.0031	0.0032	0.0002	0.0037	17	...	...	...	700	40
41	0.0027	0.0028	0.0029	0.0002	0.0033	17	...	...	...	625	41
42	0.0024	0.0025	0.0026	0.0002	0.0030	16	...	...	...	575	42
43	0.0021	0.0022	0.0023	0.0002	0.0026	15	...	...	...	500	43
44	0.0019	0.0020	0.0021	0.0001	0.0024	14	...	...	...	450	44

*This maximum bare wire diameter shall be permitted to be exceeded; see 1.6.7.2.
† For metric equivalent, see Table 1-1.

MW 80-C (Heavy)**POLYURETHANE OVERCOATED WITH POLYAMIDE, HEAVY FILM INSULATED ROUND COPPER
MAGNET WIRE FOR SOLDERABLE APPLICATIONS THERMAL CLASS 155**

INSULATING MATERIALS	The conductor shall be coated with a dual film. The underlying coating is based on polyurethane resins (1.4.2). The superimposed coating is based on polyamide resins (1.4.2).
THERMAL CLASS	155°C when tested in accordance with Part 1, para. 1.8 and Part 3, para. 3.58.1.
GENERAL REQUIREMENTS	See Part 1.

Properties	Test Procedure, See Part 3, Paragraph	Requirements	
DIMENSIONS	3.2.1.1	See Table H (MW 80-C)	
ADHERENCE AND FLEXIBILITY	3.3.1	No cracks visible in the film coating	
ELONGATION	3.4	Not less than value in Table H (MW 80-C)	
HEAT SHOCK	3.5	No cracks visible in the film coating after conditioning at 175°C	
SPRINGBACK	3.7.1	14-30 AWG—not greater	
	3.7.2	Larger than 14 AWG—not greater than 5°	
DIELECTRIC STRENGTH	3.8.2	9 AWG—not less than value in Table H (MW 80-C)	
	3.8.3	10-44 AWG—not less than value in Table H (MW 80-C)	
CONTINUITY	3.9.2	14-44 AWG—the number of discontinuities shall not exceed 5	
SOLDERABILITY	3.13	Covered with continuous film of solder after immersion as follows:	
		14-19 AWG	10 seconds at 430°C
		20-23 AWG	8 seconds at 430°C
		24-29 AWG	6 seconds at 390°C
		30-36 AWG	5 seconds at 390°C
		37-44 AWG	4 seconds at 390°C

PERIODIC CONFORMANCE TESTS

THERMOPLASTIC FLOW	3.50	Median not less than 200°C with heavy film insulated 18 or 36 AWG
SOLUBILITY	3.51	A specimen of heavy film insulated 18 or 36 AWG immersed in xylene shall not soften sufficiently to expose the bare conductor
DIELECTRIC STRENGTH AT RATED TEMPERATURE	3.52	Heavy film insulated wire shall average not less than 3825 volts for 18 AWG or 1725 volts for 36 AWG
SCRAPE RESISTANCE	3.59	Lowest "grams-to-fail" load for any one of the three tests and the average of the three tests shall not be less than the values in Table H (MW 80-C)

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Table H (MW 80-C)
POLYURETHANE OVERCOATED WITH POLYAMIDE, HEAVY FILM INSULATED ROUND COPPER
MAGNET WIRE FOR SOLDERABLE APPLICATIONS THERMAL CLASS 155

AWG Size	Bare Wire Diameter, Inches †			Insulation †		Elongation, Minimum Percent	Scrape, Grams to Fail		Springback, Maximum Degrees per Turn	Dielectric Strength, Minimum Breakdown Volts	AWG Size
	Minimum	Nominal	Maximum	Minimum Increase in Diameter, Inches	Maximum Overall Diameter, Inches		Average	Minimum			
14	0.0635	0.0641	0.0644*	0.0032	0.0682	33	1490	1270	42	5700	14
15	0.0565	0.0571	0.0574*	0.0030	0.0609	33	1400	1190	48	5550	15
16	0.0503	0.0508	0.0511*	0.0029	0.0545	33	1310	1115	50	5400	16
17	0.0448	0.0453	0.0455*	0.0028	0.0488	32	1230	1045	54	5275	17
18	0.0399	0.0403	0.0405*	0.0028	0.0437	32	1150	980	58	5125	18
19	0.0355	0.0359	0.0361*	0.0025	0.0391	31	1070	910	62	5000	19
20	0.0317	0.0320	0.0322*	0.0023	0.0351	30	1000	850	66	4850	20
21	0.0282	0.0285	0.0286*	0.0022	0.0314	30	940	800	53	4725	21
22	0.0250	0.0253	0.0254*	0.0021	0.0281	29	880	750	58	4625	22
23	0.0224	0.0226	0.0227*	0.0020	0.0253	29	820	700	62	4500	23
24	0.0199	0.0201	0.0202*	0.0019	0.0227	28	770	655	67	4375	24
25	0.0177	0.0179	0.0180*	0.0018	0.0203	28	720	615	72	4250	25
26	0.0157	0.0159	0.0160*	0.0017	0.0182	27	675	575	76	4150	26
27	0.0141	0.0142	0.0143	0.0016	0.0164	27	635	540	50	4050	27
28	0.0125	0.0126	0.0127	0.0016	0.0147	26	595	510	55	3950	28
29	0.0112	0.0113	0.0114	0.0015	0.0133	26	560	480	61	3825	29
30	0.0099	0.0100	0.0101	0.0014	0.0119	25	525	450	66	3725	30
31	0.0088	0.0089	0.0090	0.0013	0.0108	24	...	...	...	3450	31
32	0.0079	0.0080	0.0081	0.0012	0.0098	24	...	...	...	3175	32
33	0.0070	0.0071	0.0072	0.0011	0.0088	23	...	...	...	2925	33
34	0.0062	0.0063	0.0064	0.0010	0.0078	22	...	...	...	2675	34
35	0.0055	0.0056	0.0057	0.0009	0.0070	21	...	...	...	2475	35
36	0.0049	0.0050	0.0051	0.0008	0.0063	20	...	...	...	2275	36
37	0.0044	0.0045	0.0046	0.0008	0.0057	20	...	...	...	2100	37
38	0.0039	0.0040	0.0041	0.0007	0.0051	19	...	...	...	1925	38
39	0.0034	0.0035	0.0036	0.0006	0.0045	18	...	...	...	1775	39
40	0.0030	0.0031	0.0032	0.0006	0.0040	17	...	...	...	1625	40
41	0.0027	0.0028	0.0029	0.0005	0.0036	17	...	...	...	1500	41
42	0.0024	0.0025	0.0026	0.0004	0.0032	16	...	...	...	1375	42
43	0.0021	0.0022	0.0023	0.0004	0.0029	15	...	...	...	1250	43
44	0.0019	0.0020	0.0021	0.0004	0.0027	14	...	...	...	1175	44

* This maximum bare wire diameter shall be permitted to be exceeded; see 1.6.7.2.

† For metric equivalent, see Table 1-2.

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MW 80-C (Triple)
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MW 80-C (Triple)
POLYURETHANE OVERCOATED WITH POLYAMIDE, TRIPLE FILM INSULATED ROUND COPPER
MAGNET WIRE FOR SOLDERABLE APPLICATIONS THERMAL CLASS 155

INSULATING MATERIALS	The conductor shall be coated with a dual film. The underlying coating is based on polyurethane resins (1.4.2). The superimposed coating is based on polyamide resins (1.4.2).
THERMAL CLASS	155°C when tested in accordance with Part 1, para. 1.8 and Part 3, para. 3.58.1.
GENERAL REQUIREMENTS	See Part 1.

Properties	Test Procedure, See Part 3, Paragraph	Requirements										
DIMENSIONS	3.2.1.1	See Table T (MW 80-C)										
ADHERENCE AND FLEXIBILITY	3.3.1	No cracks visible in the film coating										
ELONGATION	3.4	Not less than value in Table T (MW 80-C)										
HEAT SHOCK	3.5	No cracks visible in the film coating after conditioning at 175°C										
SPRINGBACK	3.7.1	Not greater than value in Table T (MW 80-C)										
DIELECTRIC STRENGTH	3.8.3	Not less than value in Table T (MW 80-C)										
CONTINUITY	3.9	The number of discontinuities shall not exceed 3										
SOLDERABILITY	3.13	Covered with continuous film of solder after immersion as follows: <table style="margin-left: 40px;"> <tr> <td>14-19 AWG</td> <td>10 seconds at 430°C</td> </tr> <tr> <td>20-23 AWG</td> <td>8 seconds at 430°C</td> </tr> <tr> <td>24-29 AWG</td> <td>6 seconds at 390°C</td> </tr> <tr> <td>30-38 AWG</td> <td>5 seconds at 380°C</td> </tr> <tr> <td>37-44 AWG</td> <td>4 seconds at 390°C</td> </tr> </table>	14-19 AWG	10 seconds at 430°C	20-23 AWG	8 seconds at 430°C	24-29 AWG	6 seconds at 390°C	30-38 AWG	5 seconds at 380°C	37-44 AWG	4 seconds at 390°C
14-19 AWG	10 seconds at 430°C											
20-23 AWG	8 seconds at 430°C											
24-29 AWG	6 seconds at 390°C											
30-38 AWG	5 seconds at 380°C											
37-44 AWG	4 seconds at 390°C											

PERIODIC CONFORMANCE TESTS

THERMOPLASTIC FLOW	3.50	Median not less than 200°C with heavy film insulated 18 AWG
SOLUBILITY	3.51	Two specimens of heavy film insulated 18 AWG immersed in xylene shall not soften sufficiently to expose bare conductor.
DIELECTRIC STRENGTH AT RATED TEMPERATURE	3.52	Heavy film insulated wire shall average not less than 3825 volts for 18 AWG or 1725 volts for 38 AWG
SCRAPE RESISTANCE	3.59	Lowest "grams-to-fail" load for any one of the three tests and the average of the three tests shall not be less than the values in Table T (MW 80-C)

MW 80-C (Triple)
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Table T (MW 80-C)
POLYURETHANE OVERCOATED WITH POLYAMIDE, TRIPLE FILM INSULATED ROUND COPPER
MAGNET WIRE FOR SOLDERABLE APPLICATIONS THERMAL CLASS 155

AWG Size	Bare Wire Diameter, Inches†			Insulation†		Elongation, Minimum Percent	Scrape, Grams to Fail		Springback, Maximum Degrees per Turn	Dielectric Strength, Minimum Breakdown Volts	AWG Size
	Minimum	Nominal	Maximum	Minimum Increase in Diameter, Inches	Maximum Overall Diameter, Inches		Average	Minimum			
	14	0.0635	0.0641	0.0644*	0.0048		0.0700	33				1735	1475	48	7600	14
15	0.0585	0.0571	0.0574*	0.0045	0.0627	33	1620	1375	49	7400	15
16	0.0503	0.0508	0.0511*	0.0043	0.0562	33	1525	1295	53	7200	16
17	0.0448	0.0453	0.0455*	0.0041	0.0504	32	1425	1210	58	7000	17
18	0.0399	0.0403	0.0405*	0.0039	0.0452	32	1335	1135	62	6825	18
19	0.0355	0.0359	0.0361*	0.0037	0.0406	31	1255	1065	66	6650	19
20	0.0317	0.0320	0.0322*	0.0035	0.0364	30	1180	1000	70	6475	20
21	0.0282	0.0285	0.0286*	0.0033	0.0326	30	1115	945	53	6300	21
22	0.0250	0.0253	0.0254*	0.0032	0.0293	29	1045	890	58	6150	22
23	0.0224	0.0226	0.0227*	0.0030	0.0264	29	975	830	64	6000	23
24	0.0189	0.0201	0.0202*	0.0029	0.0238	28	910	770	69	5850	24
25	0.0177	0.0179	0.0180*	0.0027	0.0214	28	850	720	74	5675	25
26	0.0157	0.0159	0.0160*	0.0026	0.0193	27	795	675	80	5525	26
27	0.0141	0.0142	0.0143	0.0024	0.0173	27	735	625	55	5400	27
28	0.0125	0.0126	0.0127	0.0023	0.0156	26	690	585	60	5250	28
29	0.0112	0.0113	0.0114	0.0022	0.0142	26	645	550	65	5125	29
30	0.0099	0.0100	0.0101	0.0021	0.0128	25	605	515	70	4975	30
31	0.0088	0.0089	0.0090	0.0017	0.0114	24	...	...	...	4125	31
32	0.0079	0.0080	0.0081	0.0016	0.0103	24	...	...	...	3825	32
33	0.0070	0.0071	0.0072	0.0014	0.0092	23	...	...	...	3550	33
34	0.0062	0.0063	0.0064	0.0013	0.0082	22	...	...	...	3300	34
35	0.0055	0.0056	0.0057	0.0012	0.0074	21	...	...	...	3075	35
36	0.0049	0.0050	0.0051	0.0011	0.0067	20	...	...	...	2850	36
37	0.0044	0.0045	0.0046	0.0010	0.0060	20	...	...	...	2650	37
38	0.0039	0.0040	0.0041	0.0009	0.0054	19	...	...	...	2450	38
39	0.0034	0.0035	0.0036	0.0008	0.0048	18	...	...	...	2250	39
40	0.0030	0.0031	0.0032	0.0008	0.0043	17	...	...	...	2100	40
41	0.0027	0.0028	0.0029	0.0007	0.0039	17	...	...	...	1950	41
42	0.0024	0.0025	0.0026	0.0007	0.0035	16	...	...	...	1800	42
43	0.0021	0.0022	0.0023	0.0006	0.0032	15	...	...	...	1675	43
44	0.0019	0.0020	0.0021	0.0006	0.0028	14	...	...	...	1575	44

* This maximum bare wire diameter shall be permitted to be exceeded; see 1.8.7.2.

† For metric equivalent, see Table 1-3.