Technical Product Specification - AL78

Date: 7/22/2016 | Number: AL78 | Rev No: 3

Purpose	The purpose of this Technical Product Specification is to define the specifications for AL78.
Manufacturer	NExT Aerospace a Division of Niles International, 310 North Pleasant Ave, Niles OH 44446
Description	Niles product designation AL78. The designation of the foil refers as follows:

Identification of Niles Product

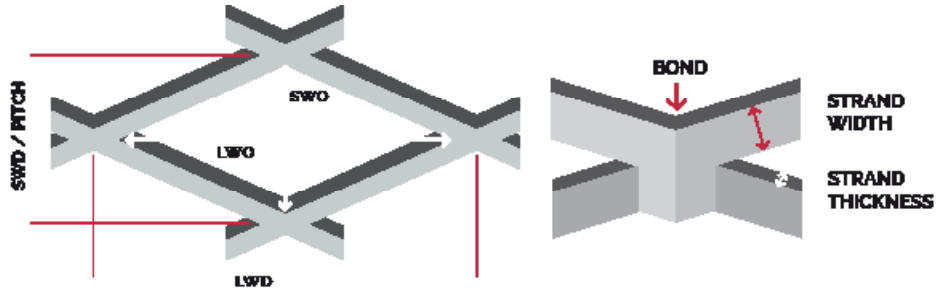
Nomenclature: SWD x LWD x strand width x material thickness.

Product Designation	Niles Product Code	Supplier Material Code
1.340mm x 2.540mm x 0.160mm x 0.127mm	AL78	N/A

AL78 Nominal Specification

Item	Unit	AL78
Mesh Length (LWD)	mm	2.540
Mesh Width (SWD)	mm	1.310
Strand Width	mm	0.160
Open Area	%	55
Coverage	%	45
Overall Thickness	mm	0.224
Material Width	mm	927
Resistance (SWD - LWD)	mΩ / m²	≤4.120 - ≤1.232
Area Weight	g / m²	78

General Geometric Characteristics



LWD - Long Way Design, the length of the long axis, measured from the middle of the knot on one side to the middle of the knot on the opposite side
SWD - Short Way Design, the length of the short axis, measured from the middle of the knot on one side to the middle of the knot on the opposite side
A - Material/Strand thickness
B - Strand Width

Knot - The area where the strands intersect aka: Bond.
LWO - Long Way Opening, is the length of the opening of the longest side of the diamond. LWO does not include the strand width.
SWO - Short Way Opening, is the width of the opening of the shortest side of the diamond. SWO does not include the strand width.
Overall thickness - The actual measurement of the thickness of the mesh measured at the knot.

ECF Roll Identification

Each finished goods coil has a unique coil reference label attached to the outer packing and also one placed within the material core that has the following information:

- Weight
- Date of Manufacture
- Batch Number (see also 4.2)
- Niles Part and Work Order Numbers
- SWD Average Resistance
- Unique Coil Reference Number (see also 4.1)

Coil Identification

Each finished goods coil has a unique 10-digit reference number, i.e. 1202161445	A. 12: Year of Production B. 02: Month of Production C. 16: Day of Production D. 1445: Time of Labeling in hours and minutes – 24 hour clock system

Batch Identification

The batch number on the finished goods coil refers to a batch of raw material that was produced from a master batch of raw material or from the same single set-up and run period.	At the request of the customer a batch definition may be determined otherwise.

Properties Of Primary Material - Aluminum Foil

Raw material shall be aluminum foil 1145-0. Overall thickness 0.127mm ± 10%.
The primary raw material meets the specifications shown below:

Item	Units	Acceptance Level
		Aluminum Foil 1145-0
Area Weight	g / m²	343 ± 5%
Tensile Strength (23˚C)	N/mm²	≤ 96.5 (14ksi)
Elongation (23˚C)	%	> 3.5
Coefficient of Roughness Rz	µ	≥ 20.7 (3.0ksi)
Purity	%	> 99.45

Primary Material Roll Identification

Each coil of raw material is identified with a unique 12-digit reference number that can be easily referenced to all finished goods rolls that were produced and also to other rolls that were from a supplier's same batch. The coils are identified as follows, i.e. 120217144513.	A. 12: Year of Production B. 02: Month of Production C. 16: Day of Production D. 144513: Time of Receipt in hours, minutes and seconds – 24 hour clock system.

Primary Material Batch Identification

As produced by a supplier from the same master coil or from the same single set-up and run period.

Properties Of Primary Material - Aluminum Foil

Raw material shall be aluminum foil 1145-0. Overall thickness 0.127mm ± 10%.
The primary raw material meets the specifications shown below:

Mesh Inspection Characteristics				
Test	**Unit**	**Tolerance**	**Method**	**Test Method**
RAW MATERIAL THICKNESS	mΩ/m²	0.127 ± 0.013 (0.114- 0.140)	According to NTM-010	Device: Micrometer Frequency: Eight (8) - Four (4) per raw material coil at receiving and Four (4) at coil start of production
RAW MATERIAL WIDTH	mm	927 ± 4 (923 – 931)	According to NTM-040	Device: Tape Measure Frequency and n˚ of measurements: Two (2) – One (1) at Receiving of raw material and One (1) at set-up before production of a coil.
COIL LENGTH	mm	As per Customer Requirements	According to the Shop Floor Instruction Manual	Read out from in line Mesh Inspector and Measuring Wheel

AREA WEIGHT	g/m²	78 ± 6.24 (71.76- 84.24)	According to NTM-020	Device: Salter precision scale Frequency: Four (4) – Two (2) at the beginning and Two (2) at the end of each coil. Sample size: 80 x 380 (mm)
OVERALL THICKNESS	mm	0.224 ± 0.022 (0.202- 0.246)	According to NTM-030	Device: Micrometer Frequency: Four (4) - Two (2) at the beginning and Two (2) at the end of each coil.
RESISTANCE LWD DIRECTION	mΩ/m²	≤1.232	According to NTM-060	Device: Resistomat 2316 Frequency and n° of measurements: Six (6) – Three (3) at the start and Three (3) at the end of coil.
RESISTANCE SWD DIRECTION	mΩ/m²	≤4.120	According to NTM-060	Device: Resistomat 2316 Frequency and n° of measurements: Six (6) – Three (3) at the start and Three (3) at the end of coil.
SWD	mm	1.340 ± 0.130 (1.210–1.470)	According to NTM-050	Device: Master View Comparator Frequency and n° of measurements: Two (2) – One (1) at the start and One (1) at the end of each coil.
LWD	mm	2.54 ± 0.127 (2.413- 2.667)	According to NTM-050	Device: Master View Comparator Frequency and n° of measurements: Two (2) – One (1) at the start and One (1) at the end of each coil.
STRAND WIDTH	mm	0.160	According to the Shop Floor Instruction Manual	None: Machine Setting Parameter
FINISHED PRODUCT WIDTH	mm	927 ± 4 (923 – 931)	According to NTM-040	Device: Tape Measure Frequency and n° of measurements: Two (2) – One (1) at Receiving of raw material and One (1) at set-up before production of a coil.
SAMPLE RESISTANCE SWD DIRECTION SIZE: 80 X 380	mΩ	≤10.30	According to NTM-060	Device: Resistomat 2316
SAMPLE RESISTANCE LWD DIRECTION SIZE: 80 X 380	mΩ	≤3.08	According to NTM-060	Device: Resistomat 2316
SAMPLE AREA WEIGHT	grams	2.37 ± 0.19 (2.18-2.56)	According to NTM-020	Device: Salter precision scale Frequency: Four (4) – Two (2) at the beginning and Two (2) at the end of each coil. Sample size: 80 x 380 (mm)

AL78 Aluminum Foil Roll Size

Rolls will either be supplied in 50, 100, 150 or 200 meter lengths or as otherwise agreed with the customer.

General Geometric Characteristics

Each finished goods coil is wrapped in bubble wrap and shrink film to prevent oxidation and has a coil label attached to the outside of the coil with a label also inserted in the coil core.

Core Tube
The standard core tube is plastic with a 76mm ID and a length of 1000mm or as otherwise agreed with the customer.

Box Definition
Coils are normally packaged in a wooden crate (as shown below) that will prevent damage during transportation. The crate has removable sides to enable ease of removal of the coil without damage. Coils may be packaged using cardboard boxes with additional bubble wrap packaging in agreement with the customer.

Acceptance Criteria

The material supplied meets this technical product specification and, included in the dispatch documentation, each coil will have a "signed" certificate of conformance confirming this requirement.

Pricing

Description	Price per Square Meter

Amendment Table

Date	Issue	Paragraph	Reason for Amendment