

# REVISIONS

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# ENGINEERING PRODUCT SPECIFICATION

## CENTRONICS<sup>®</sup>

SPEC. NO. 80002189-9001

REV A  
DATE April 5, 1984

PAGE 2 OF 12

### TABLE OF CONTENTS

	<u>Page</u>
1.0 SCOPE . . . . .	4
1.1 DEFINITION OF TERMS USED . . . . .	4
2.0 APPLICABLE DOCUMENTS . . . . .	4
2.1 FUNCTIONAL SPECIFICATIONS . . . . .	4
3.0 REQUIREMENTS . . . . .	4
3.1 OPERATION . . . . .	4
3.2 VENDORS . . . . .	4
3.3 RIBBON CHARACTERISTICS . . . . .	4
3.3.1 Material . . . . .	4
3.3.2 Threads . . . . .	5
3.3.3 Weave . . . . .	5
3.3.4 Count . . . . .	5
3.3.5 Caliper . . . . .	5
3.3.6 Edging . . . . .	5
3.3.7 Tensile Strength . . . . .	5
3.4 RIBBON DIMENSIONS . . . . .	5
3.4.1 Width . . . . .	5
3.4.2 Length . . . . .	5
3.5 RIBBON WELD . . . . .	5
3.5.1 Seal . . . . .	5
3.5.2 Joint Thickness . . . . .	5
3.5.3 Joint Width . . . . .	6
3.5.4 Joint Angle . . . . .	6
3.5.5 Tensile Strength . . . . .	6
3.5.6 Weld Quality . . . . .	6
3.6 INK . . . . .	6
3.6.1 Color . . . . .	6
3.6.2 Adverse Effects . . . . .	6
3.6.3 Smear . . . . .	6
3.6.4 Fading . . . . .	6
3.7 INKED RIBBON . . . . .	7

# ENGINEERING PRODUCT SPECIFICATION

**CENTRONICS®**

SPEC. NO. 80002189-9001

REV A  
DATE April 5, 1984

PAGE 3 OF 12

## TABLE OF CONTENTS

Page

3.7.1	Degree of Inking . . . . .	7
3.7.2	Ribbon Life . . . . .	7
3.8	LOT NUMBER . . . . .	7
3.9	RIBBON CASSETTE ASSEMBLY . . . . .	7
3.10	CASSETTE . . . . .	7
3.10.1	Material . . . . .	7
3.10.2	Dimensions . . . . .	7
3.10.3	Torque and Ribbon Speed . . . . .	8
3.10.4	Color Detection Tabs . . . . .	8
4.0	PACKAGING . . . . .	8
4.1	BOX . . . . .	8
4.2	INSTRUCTIONS . . . . .	8
4.3	CASSETTE . . . . .	8
5.0	RIBBON COLOR QUALIFICATION & END OF LIFE DETERMINATION	9
5.1	EQUIPMENT USED . . . . .	9
5.2	PROCEDURE . . . . .	9
5.2.1	Print Sample Generation (Rundown Test) . . . . .	9
5.2.2	Data Acquisition From Color Samples . . . . .	9
5.3	COLOR AND END OF LIFE (E.O.L.) REQUIREMENTS . . . . .	10
5.3.1	Qualification . . . . .	10
5.3.2	"Initial" Data . . . . .	10
5.3.3	"End of Life" Data . . . . .	10
6.0	MECHANICAL LIFE . . . . .	12
7.0	MINIMUM USEABLE LIFE OF RIBBON . . . . .	12
8.0	RIBBON CASSETTE ASSEMBLY ACCEPTANCE AND QUALIFICATION	12

# ENGINEERING PRODUCT SPECIFICATION

**CENTRONICS**<sup>®</sup>

SPEC. NO. 80002189-9001

REV A  
DATE April 5, 1984

PAGE 4 OF 12

## 1.0 SCOPE

This specification covers the requirements for nylon all black and multi-color ribbons used by Centronics 355 Series matrix printers and the method used to determine the end of the useable life.

## 1.1 DEFINITION OF TERMS USED

- A. Ribbon - Nylon material holding the ink.
- B. Cassette - The container used to hold and dispense the ribbon.
- C. Ribbon Cassette - The cassette with the ribbon.
- D. Ribbon Guide - A plastic guide which snaps on the nose piece of the print head.

## 2.0 APPLICABLE DOCUMENTS

### 2.1 FUNCTIONAL SPECIFICATIONS

80002181-9001	Engineering Product Spec, Orion
80002182-9001	Engineering Product Spec, 355 Mechanism
80002195-9001	Engineering Product Spec, 355 18 Wire Head
80002188-9001	Engineering Product Spec, 355 Print Quality
	Centronics Engineering Standard 001

## 3.0 REQUIREMENTS

### 3.1 OPERATION

Each ribbon cassette will be supplied with a plastic ribbon guide. This guide will be snapped onto the front of the head after the cassette is in place for a "clean hands" installation.

### 3.2 VENDORS

Ribbon cassette assemblies will be supplied by CDCC approved vendors only.

### 3.3 RIBBON CHARACTERISTICS

#### 3.3.1 Material

Nylon 6/6

# ENGINEERING PRODUCT SPECIFICATION

**CENTRONICS®**

SPEC. NO. 80002189-9001

REV A  
DATE April 5, 1984

PAGE 5 OF 12

## 3.3.2 Threads

Warp 40D/34F  
Fill 40D/34F

## 3.3.3 Weave

Plain crossweave

## 3.3.4 Count

Warp  $344 \pm 4$  threads/inch  
Fill  $117 \pm 4$  threads/inch  
Round 281 Min

## 3.3.5 Caliper

$0.004 \text{ in} \pm 0.00025 \text{ in}$  ( $0.10 \pm 0.006 \text{ mm}$ )

## 3.3.6 Edging

### 3.3.6.1 Edge

Cut and fused.

### 3.3.6.2 Depth

1 to 2 threads

## 3.3.7 Tensile Strength

33 lbs per 0.5 in (15 Kg per 12.7 mm)

## 3.4 RIBBON DIMENSIONS

### 3.4.1 Width

$1.000 \text{ in}$  ( $25.4 \text{ mm}$ )  $\pm 0.015 \text{ in}$  ( $\pm 0.38 \text{ mm}$ )

### 3.4.2 Length

70 yards (64 m)  $\pm .5$  yards endless

## 3.5 RIBBON WELD

### 3.5.1 Seal

Ultrasonic sealed

### 3.5.2 Joint Thickness

$0.004 \text{ inches} \pm .0004 \text{ in}$  ( $0.10 \text{ mm} \pm 0.010 \text{ mm}$ )

# ENGINEERING PRODUCT SPECIFICATION

**CENTRONICS**<sup>®</sup>

SPEC. NO. 80002189-9001

REV A  
DATE April 5, 1984

PAGE 6 OF 12

## 3.5.3 Joint Width

0.018 in  $\pm$  006 in (0.45mm  $\pm$  0.15mm)

## 3.5.4 Joint Angle

30°  $\pm$  3° with the ribbon edge

## 3.5.5 Tensile Strength

5.5 lbs per 0.335 in (2.5 Kg per 8.5mm)

## 3.5.6 Weld Quality

No frayed or loose threads at weld site. Weld offset not to exceed .010 to .015 inches (0.25 to 0.38mm).

## 3.6 INK

Type to be approved by Centronics.

### 3.6.1 Color

- A. Black
- B. Yellow, magenta, cyan, black
- C. Red, green, blue, black
- D. Reserved
- E. Reserved
- F. Reserved
- G. Reserved
- H. Reserved

### 3.6.2 Adverse Effects

Ink will not adversely effect the printer mechanism or plastic parts in any way.

### 3.6.3 Smear

Ink will not smear with normal handling of printed material.

### 3.6.4 Fading

Printed material will not show marked fading when exposed to fluorescent light or sunlight.

# ENGINEERING PRODUCT SPECIFICATION

**CENTRONICS®**

SPEC. NO. 80002189-9001

REV A  
DATE April 5, 1984

PAGE 7 OF 12

## 3.7 INKED RIBBON

### 3.7.1 Degree of Inking

Will be sufficient to attain the initial density and end of life density as called out in Section 5.3 without weeping or shedding of ink in the cassette or on the printer during use.

### 3.7.2 Ribbon Life

Ribbon life is defined by measuring the reflectance of printed bars with a spectrophotometer. The readings shall be as shown in Section 5.3, Table 1.

## 3.8 LOT NUMBER

Lot numbers will be shown as follows:

9 01 10 5 (Example)  
year month day coater no.

## 3.9 RIBBON CASSETTE ASSEMBLY

- A. Ribbon weld to be inside the cassette.
- B. Ribbon cassette assembly to be marked with the appropriate designations provided by CDCC.
- C. Shelf life to be twelve (12) months from date of delivery to CDCC at -40°F to 151°F (-40°C to 67°C) and 5 to 95% R.H. without ink depletion or running.
- D. Black ink stripe will be at the bottom for color ribbons.

## 3.10 CASSETTE

### 3.10.1 Material

ABS or equivalent qualified by CDCC.

### 3.10.2 Dimensions

Width - 3.50 in (89mm)  
Length - 19.25 in (489mm)  
Thickness - 1.25 in (31.8mm)  
Knurled Knob - .25 in (6.4mm) diameter  
.44 in (11.2mm) height

# ENGINEERING PRODUCT SPECIFICATION

**CENTRONICS**<sup>®</sup>

SPEC. NO. 80002189-9001

REV A  
DATE April 5, 1984

PAGE 8 OF 12

## 3.10.3 Torque and Ribbon Speed

Torque of the cassette drive will be 150 +0 -15 gr/cm. The ribbon speed can be operated up to 13 inches per second.

## 3.10.4 Color Detection Tabs

- A. The cassettes will have three tabs located and dimensioned by Centronics Drawing No U21174001.
- B. Tabs will be removed by the vendor in the sequences shown in the table below to define the type of ribbon in the cassette.

	<u>    Tabs</u>	<u>    Ribbon Type</u>
	<u>Removed (0)</u>	
1.	1-1-1	All Black
2.	1-1-0	Yellow, Magenta, Cyan, Black
3.	1-0-1	Red, Green, Blue, Black
4.	1-0-0	Reserved
5.	0-1-1	Reserved
6.	0-1-0	Reserved
7.	0-0-1	Reserved
8.	0-0-0	Reserved

## 4.0 PACKAGING

### 4.1 BOX

- A. Cassettes will be sealed in polyethylene envelopes.
- B. Cassettes will be individually boxed.
- C. Packed (T.B.D.) boxed cassettes per carton.

### 4.2 INSTRUCTIONS

The ribbon installation instructions will be printed on the polyethylene envelopes.

### 4.3 CASSETTE

The cassette will have a plastic tab inserted at the top to captivate the ribbon during shipping.



# ENGINEERING PRODUCT SPECIFICATION

**CENTRONICS**<sup>®</sup>

SPEC. NO. 80002189-9001

REV A

DATE April 5, 1984

PAGE 9 OF 12

## 5.0 RIBBON COLOR QUALIFICATION & END OF LIFE DETERMINATION

### 5.1 EQUIPMENT USED

- A. Perkin-Elmer Lambda 3B Photospectrometer with external integrating sphere, Model 3600 Computer and Model 660 Thermal Printer interfaced by RS-232 data cables.
- B. Software used will be Perkin-Elmer Programs "IFL3" for data acquisition on floppy discs and "Color" to translate the data to hard copy.
- C. 358 printer (print quality must meet 80002188-9001).
- D. Paper, premium white, Moore 14110P or Equivalent.
- E. Test Program (PROM) "D366".
- F. Centronics Std Programmable Data Source.

### 5.2 PROCEDURE

#### 5.2.1 Print Sample Generation (Rundown Test)

- A. Use Spiral Test Pattern.
- B. 100% Page Density, 132 Col, 6 LPI.
- C. The Test Program (PROM) D366 will generate three solid bars of color .75 inches high by 2.0 inches long at the start of each color run and each 5K lines thereafter until 30K lines of that color are complete, then shift to the next color band and repeat printing of color bands at 5K increments, etc , until all four colors have run through 30K lines (3.96 million characters).
- D. Forms thickness control must be set for single part paper.
- E. Tests to be run at 65<sup>o</sup>-85<sup>o</sup>F (18<sup>o</sup>-29<sup>o</sup>C) and 10%-50% relative humidity.
- F. Test (rundown) is aborted if the head fails for any reason.

#### 5.2.2 Data Acquisition From Color Samples

- A. Color samples can be cut from each .75 high x 2.0 inches long color bar. They must be large enough to cover the aperture of the integrating sphere.

# ENGINEERING PRODUCT SPECIFICATION

**CENTRONICS**

SPEC. NO. 80002189-9001

REV A  
DATE April 5, 1984

PAGE 10 OF 12

- B. Prior to taking data, the Lambda 3B Photospectrometer will be calibrated to Perkin-Elmer specs.
- C. The spectral file parameters to be used with the "IFL3" and "Color" software are as follows:

Long Wavelength Limit (NM)	780
Short Wavelength Limit (NM)	380
Data Interval (NM)	1
Swoothing Width Code	0
Recording Mode	(T) Transmittance
C.I.E. Standard Source	D6500

- D. Hard copy data acquired from the "Color" program will be "Tristmulus" values, "Chromaticity" values and L.A.B. units. The "L.A.B." units will be the primary determination for color qualification.

## 5.3 COLOR AND END OF LIFE (E.O.L.) REQUIREMENTS

### 5.3.1 Qualification

A ribbon will be qualified with respect to color (including black) if its "Initial" data and "End of Life" data correspond to that shown in Table 1. (See Section 7.0 for Mechanical End of Life.)

### 5.3.2 "Initial" Data

"Initial" data is defined as the arithmetic average of the L.A.B. units taken from the three color test bands printed at the start of each ribbon color band rundown test (0 lines).

### 5.3.3 "End of Life" Data

"End of Life" data is defined as the arithmetic average of the L.A.B. units taken from the three color test bands printed at the number of lines completed in the rundown tests for that particular color as shown in Table 1.



# ENGINEERING PRODUCT SPECIFICATION

**CENTRONICS**<sup>®</sup>

SPEC. NO. 80002189-9001

REV A

DATE April 5, 1984

PAGE 12 OF 12

## 6.0 MECHANICAL LIFE

A sample of at least twelve (12) ribbons must be run to determine that the ribbon will continue to operate mechanically to a line count 25% beyond the End of Life point of the black band.

## 7.0 MINIMUM USEABLE LIFE OF RIBBON

Minimum useable life of a multicolor ribbon at 100% duty cycle is to be equal to the E.O.L. of the lightest color of the ribbon or lowest E.O.L. reading if no light color is on the ribbon, as defined in Table 1.

## 8.0 RIBBON CASSETTE ASSEMBLY ACCEPTANCE AND QUALIFICATION

- A. Must meet Initial Data requirements and useable life as defined by the end of life (E.O.L.) procedures.
- B. Must maintain print quality specification.
- C. Chaff build-up of not more than four (4) grams/ribbon.
- D. Must not adversely affect any part of the printer (ribbon rollers, print head, etc).
- E. Printer must still meet its functional specification, MTBF, enviromental, etc.
- F. Print out must remain relatively legible for the life of the ribbon. Rundown color changes must meet CDCC approval, such as black becoming blue-black as ink depletes from the ribbon.
- G. No toxic or carcinogenic materials are allowed, including packaging.