



# Auto ID Solutions

a division of Product Development Laboratory, Inc.

## Certificate of Barcode Evaluation

Certificate Date: 06/12/2004

Certificate Number: 1020112

### CUSTOMER INFORMATION:

ABC Printing Company  
225 3rd Street  
Boston, MA 02132

Purchase Order #: 27667  
Submitted by: Bob Barker

### GENERAL INFORMATION:

PARAMETER	RESULT/VALUE
Technician:	Jeff Beaudoin
Barcode Symbology	Code 128
Barcode Size	2.73.
Barcode: Encodation:	GCC003081556006491610063860574
Bar Color:	Black (Inkjet)
Space Color:	White (Cardstock)
Color Combination:	Acceptable
Printing Method:	UV Inkjet
Printing Direction:	Ladder
# of Samples:	1
# of Inspections per Barcode:	10

### BAR CODE SAMPLE:



### RESULTS OF EVALUATION:

	GRADE	MINIMUM ACCEPTABLE	RESULT
ISO/ANSI Overall Grade	<b>0.9/D</b>	≥2.0/C	<b>Out of Tolerance</b>

THE BAR CODE(S) EVALUATED WERE FOUND TO BE OUT OF TOLERANCE. IF UNCORRECTED, THESE PROBLEMS COULD RESULT IN THE BAR CODES NOT SCANNING AND RESULT IN REJECTED PRODUCT.

TWO FACTORS WERE DETERMINED TO BE THE CAUSE THE BARCODES TO BE OUT OF TOLERANCE.

1. **BAR CODE DECODABILITY WAS BELOW THE MINIMUM LEVEL AS PER THE SPECIFICATION. DECODABILITY IS A CALCULATION OF THE DIMENSIONAL ACCURACY OF THE BARS AND SPACES. IT COMPARES THE INSPECTED BAR AND SPACE WIDTH TO THE IDEAL BAR AND SPACE WIDTH.**
2. **A NON-FACTOR ISSUE THAT SHOULD BE WATCHED IS THE INKJET PRINT HEAD HEIGHT ABOVE THE CARD. THIS CARD HAS STRIATIONS WHERE THE PRINT HEAD DRAGGED ACROSS THE WET INK. THIS CAN CAUSE DEFECT ISSUES.**

WHEN THE BAR CODE WAS EXAMINED WITH THE MEASURING MICROSCOPE, IT WAS DISCOVERED THAT THE SMALL BARS ARE ROUGHLY 0.008"-0.011" WHILE THE SMALL SPACES 0.014"-0.015". IT IS NORMAL TO PRINT THE BARS SMALLER THAN THE SPACES TO INCREASE THE READABILITY, BUT IN THIS CASE THE DIFFERENCES ARE TOO LARGE. IT SHOULD BE POSSIBLE TO CORRECT THIS AND ACHIEVE A HIGH PERCENTAGE (98%+) OF 'C' GRADE OR BETTER BAR CODES. WHEN INSPECTING BAR CODES DURING A PRODUCTION RUN, UV INKJET DOES HAVE SIGNIFICANT VARIATION FROM CARD TO CARD.

NOTES: EACH BAR CODE VERIFIER INSTRUMENT REPORTED SIMILAR RESULTS. THIS INCREASES THE VALIDITY OF THE FINDINGS. NORMAL DEVIATIONS OCCUR DUE MOSTLY TO EACH VERIFIER SCANNING DIFFERENT AREAS OF THE BAR CODE SAMPLE(S).

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## RECOMMENDATIONS:

1. INCREASE THE BAR CODE WIDTH.
2. INCREASE THE AMOUNT OF INK APPLIED TO THE CARD.
3. EXPERIMENT WITH MODIFYING THE BAR CODE FONT. THIS ISSUE IS COMMON WITH UV INKJET PRINTING ON PHONE AND GIFT CARDS.
4. CONTROL THE PRINT HEAD HEIGHT TO ELIMINATE INK DRAG BY THE PRINT HEAD.
5. INCREASE THE FREQUENCY OF PRINT HEAD CLEANING.

## ISO/ANSI QUALITY EVALUATION (INSTRUMENT ID 10054/10056):

PARAMETER (10 SCAN AVERAGE)	MINIMUM	MAXIMUM	AS FOUND	GRADE	MINIMUM ACCEPTABLE GRADE	RESULT/VALUE
ISO/ANSI Overall Grade	1.5/C	4.0/A	1.2/D	<b>0.9/D</b>	≥2.0/C	<b>Out of Tolerance</b>
Decode	Pass	Pass	Pass	4.0/A	4.0/A	In Tolerance
Edge Determination	Pass	Pass	Pass	4.0/A	4.0/A	In Tolerance
Edge Contrast Minimum	≥15%	100%	55%	4.0/A	4.0/A	In Tolerance
Reflectance Minimum / Reflectance Maximum	≤50% Rmax	1%	9%	4.0/A	4.0/A	In Tolerance
Decodability	≥37%	100%	54%	<b>0.9/D</b>	≥2.0/C	<b>Out of Tolerance</b>
Modulation	≥50%	100%	71%	3.0/B	≥2.0/C	In Tolerance
Defects	≤25%	100%	27%	4.0/A	≥2.0/C	In Tolerance
Symbol Contrast	≥40%	100%	78%	4.0/A	≥2.0/C	In Tolerance

## ISO/ANSI QUALITY EVALUATION (INSTRUMENT ID 10067):

PARAMETER (10 SCAN AVERAGE)	MINIMUM	MAXIMUM	AS FOUND	GRADE	MINIMUM ACCEPTABLE GRADE	RESULT/VALUE
ISO/ANSI Overall Grade	1.5/C	4.0/A	1.2/D	<b>1.0/D</b>	≥2.0/C	<b>Out of Tolerance</b>
Decode	Pass	Pass	Pass	4.0/A	4.0/A	In Tolerance
Edge Determination	Pass	Pass	Pass	4.0/A	4.0/A	In Tolerance
Edge Contrast Minimum	≥15%	100%	55%	4.0/A	4.0/A	In Tolerance
Reflectance Minimum / Reflectance Maximum	≤50% Rmax	1%	8%	4.0/A	4.0/A	In Tolerance
Decodability	≥37%	100%	49%	<b>1.0/D</b>	≥2.0/C	<b>Out of Tolerance</b>
Modulation	≥50%	100%	68%	3.0/B	≥2.0/C	In Tolerance
Defects	≤25%	100%	26%	4.0/A	≥2.0/C	In Tolerance
Symbol Contrast	≥40%	100%	81%	4.0/A	≥2.0/C	In Tolerance

## QUALITY EVALUATION:

PARAMETER	AS FOUND	RESULT/VALUE
Left Quiet Zone:	>10 times 'X'	In Tolerance
Right Quiet Zone:	>10 times 'X'	In Tolerance
Bar Reflectance:	1%	In Tolerance
Space Reflectance:	76%	In Tolerance
Narrow Bar Width:	12 mil	In Tolerance
Mod Check Character:	091	In Tolerance

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## **INSTRUMENT(S) USED FOR EVALUATION:**

Manufacturer:	RJS/Printronix	Description:	ISO/ANSI Compliant Contact
Model:	Inspector D4000 Body		Barcode verification instrument
Serial #:	424418165860	Calibration Date:	11/15/2004
Instrument ID #:	10054	Calibration Due:	11/15/2005
Aperture:	6 mil	Wavelength:	660 nm
Manufacturer:	RJS/Printronix	Description:	ISO/ANSI Compliant Contact
Model:	Inspector D4000 Auto-Optic		Barcode verification instrument
Serial #:	424418165860	Calibration Date:	11/15/2004
Instrument ID #:	10056	Calibration Due:	11/15/2005
Aperture:	6 mil	Wavelength:	660 nm
Manufacturer:	Hand Held Products/PSC	Description:	ISO/ANSI Compliant Contact
Model:	Quick Check® 650		Barcode verification instrument
Serial #:	66561	Calibration Date:	11/15/2004
Instrument ID #:	10067	Calibration Due:	11/15/2005
Aperture:	6 mil	Wavelength:	660 nm
Manufacturer:	National Optic & Scientific Inst	Description:	Measuring Microscope (100X)
Model:	189	Calibration Date:	-
Serial #:	643502	Calibration Due:	-
Instrument ID #:	10065		

The instrument(s) listed on this certification have been calibrated against standards traceable to the National Institute of Standards and Technology (NIST).

Auto ID Solutions quality system compiles with applicable requirements of:

ANSI/Z540-1:1994 (Calibration Laboratories and Measuring and Test Equipment)

ISO17025:1999 (General Requirements for the Competence of Testing and Calibration Laboratories)

ISO 9001:2000 (Quality management systems, design, development, production, sales, installation, and servicing)

ISO 9002:1994 (Quality management systems, sales, installation, and servicing)

QS9000/ISO-TS16949 (Quality management systems that includes reduction of variation and defect prevention)

ISO 15426-1:2000 (Bar Code Verifier Conformance Standard – Linear Symbologies)

ISO 15416-1:2000 (Bar Code Print Quality Test Specification– Linear Symbologies)

ANSI X3.182:1990 (Bar Code Print Quality Guideline)

The user should be aware that any number of factors may cause this instrument(s) to drift out of calibration before the specified calibration interval has expired.

**Evaluation Approved By:**



Jeffrey Beaudoin  
Vice President, Operations