

adic

**Barcode
Specification**

Copyright © 1997 ADIC/GRAU Storage Systems GmbH&Co.KG
All rights reserved.

This document may be reproduced or transmitted neither in extracts nor completely in any form and with any means (neither electronically nor mechanically, including photocopying and recording), except with approval on the part of ADIC/GRAU Storage Systems.

ADIC/GRAU Storage Systems reserves the right to correct, to update or to change the information contained in this document.

DAS is a registered trademark of ADIC/GRAU Storage Systems GmbH
AML/2 is a registered trademark of ADIC/GRAU Storage Systems GmbH
AML/E is a registered trademark of ADIC/GRAU Storage Systems GmbH
AML/J is a registered trademark of ADIC/GRAU Storage Systems GmbH
Scalar 1000 is a trademark of ADIC.
Other trademarks are the property of the relevant owners.

Document number: DOC S00 005
First published: October 13, 1999

Contents

1 Barcodelabels in the AML-System

1.1	General Requirements.....	7
1.1.1	Types of Barcode	7
1.1.2	Information contents of the Barcode	8
1.1.3	Printing Quality	8
1.1.4	Geometry of the Barcode	9
1.1.5	Label Material	9
1.1.6	Quality Inspection	9
1.1.7	Barcode Length (Number of Characters).....	9
1.2	SONY 2/5 Barcode	10

2 Barcodelabels in the Scalar 1000

3 Specification of the Types of Media

3.1	Cassette type:	13
	3480, 3490, 3590, 9840, D3	
3.1.1	Standard Barcode “Code 39”	13

3.1.2	Standard Barcode “STK-Code”	14
3.1.3	Standard Barcode “Code 128”	15
3.1.4	Additional Media Identifiers	16
3.1.5	Extended Barcode	17
3.2	Cassette Type:	19
	DLT	
3.2.1	Standard Barcode “Code 39” (Adhesive Labels)	19
3.2.2	Standard Barcode “Code 39” (Insert Labels)	20
3.2.3	Standard Barcode “Code 39”	21
	with media identifier (Insert Labels)	
3.2.4	Standard Barcode “STK-code” (Insert Labels)	22
3.2.5	Extended Barcode	23
3.3	Cassette Type:	25
	AIT	
3.3.1	Standard Barcode “Code 39”	25
3.3.2	Standard Barcode “Code39” with checksum	26
3.4	Cassette Type:	27
	Optical Disk	
3.4.1	Standard Barcode “Code 39”	27
3.4.2	Extended Barcode	28
3.5	Cassette Type:	29
	8mm	
3.5.1	Standard Barcode „Code 39“	29
3.5.2	Extended Barcode	30
3.6	Cassette Type:	31
	4mm	
3.6.1	Standard Barcode „Code 39“	31
3.6.2	Extended Barcode	32
3.7	Cassette Type:	33
	CD Caddy	
3.7.1	Standard Barcode „Code 39“	33
3.7.2	Extended Barcode	34
3.8	Cassette Type:	35
	VHS	
3.8.1	Standard Barcode “Code 39”	35
3.8.2	Extended Barcode	37
3.9	Cassette Type:	39
	D2, DTF, BetaCAM	
3.9.1	Standard Barcode “Code 39”	39

3.9.2	Extended Barcode	41
-------	------------------------	----

4 Specification of the Label Position

4.1	Cassette Type 1: Tape Cartridges.....	43
4.2	Cassette Type 2: Optical Disk	44
4.3	Cassette Type 3: CD Caddy	45

1 Barcodelabels in the AML-System

1.1 General Requirements

Reliable reading of barcodes is guaranteed only if the specification of the ANSI MH10.8-1983 standard and the additional requirements named in this document are complied with.

1.1.1 Types of Barcode

The following types of barcode are supported:

- Code 39
- STK Code (special form of Code 39)
- Code 128
- SONY 2/5 (only for AML/2 and AML/E).

Other types of Barcode may be used only in agreement with the Product Engineering department of the ADIC/GRAU Storage Systems.

1.1.2 Information contents of the Barcode

- The code contains only useful characters (no check characters).
- The number of characters without start/stop characters is:
 - 6 (standard)
 - 1 to 16 (useful characters possible in principle).
- Allowed characters:
 - numbers
 - uppercase letter
 - special characters such as blank, asterisk, underscore, etc., are not allowed.
- The reading direction of the barcode should be the same for all labels within an AML-System.
- The preferred reading direction is from below to above.
- Reserved volters.
These volters may not be used for barcodes:
 - FREI00
 - NOREAD
 - 0000000000000000
 - XXXXXXXXXXXXXXXXXX
 - 000000
 - XXXXXX

1.1.3 Printing Quality

- Background reflection: at least 25%
- Print contrast: at least 75%
- Good edge sharpness
- Intermediate spaces or idle zones may not contain any black marks (dots).
- Bars may not contain any white areas (dots).
- Preferred printing method:
thermal transfer printing, resolution 300 dpi.

1.1.4 Geometry of the Barcode

- Ratio: at least 2.2
- Module: at least 250 µm
- Printing tolerance: ± 57 µm
- Idle zone: at least 2 mm, if possible >5mm
 - for camera system AML/2 at least 5 mm
- Width of the barcode: if possible, at least 10 mm

1.1.5 Label Material

- The barcodelabels must consist of stable material (e.g. mixture of polypropylene and polyester or comparable).
- The barcodelabels must be wipe resistant.
- For protection against damage of the barcode due to contact by persons or gripper, this must be protected with a plastic laminate (25 µm polyester or comparable).

1.1.6 Quality Inspection

Agreement with specifications can be tested and documented with the *Ergilaser 3000 High Density* barcode measuring instrument from the Laetus company.

Note

Should barcodelabels deviating from these specifications be used, the Product Engineering department must previously check the technical suitability of these barcodelabels.

1.1.7 Barcode Length (Number of Characters)

The following code lengths are possible for the individual media types:

Type of media	Standard code length	Optional code length
D2 / DTF / BetaCAM	6 characters	16 characters
3490	6 characters	16 characters
VHS	6 characters	16 characters
8mm	6 characters	14 characters
CD Caddy	6 characters	10 characters
Optical Disk	6 characters	9 characters
DLT	6 characters	9 characters
4mm	6 characters	8 characters
AIT	6 characters	8 characters

1.2 SONY 2/5 Barcode

The SONY 2/5 interleaved is a modification of the "2 from 5 interleaved" standard barcode. The barcode consists of 58 characters which are coded according to the standard code 2 from 5 interleaved. The structure of the barcode is as follows:

1 byte	40 byte	8 byte	8 byte	1 byte
MODE	ID&TITLE	SOM	DURATION	CHECKSUM

The ID&TITLE is converted into ASCII characters according to the table below. Every two characters result in one ASCII character.

LSB	MSB									
	0	1	2	3	4	5	6	7	8	9
0	SP	*	4	>	H	R	Un-def.	f	p	z
1	!	+	5	?	I	S	]	g	q	{
2	"	,	6	@	J	T	Res.	h	r	Un-def.
3	#	-	7	A	K	U	Un-def.	i	s	}
4	\$	.	8	B	L	V	'	j	t	
5	%	/	9	C	M	W	a	k	u	Un-def.
6	&	0	:	D	N	X	b	l	v	Un-def.
7	'	1	;	E	O	Y	c	m	w	Res.
8	(	2	<	F	P	Z	d	n	x	Res.
9	)	3	=	G	Q	[	e	o	y	Sep.

Explanation of the abbreviations:

- **MSB** = Most Significant Byte
- **LSB** = Last Significant Byte
- **Undef.** = Undefined
- **Res.** = Reserved
- **Sep.** = Separator

Structure of the barcode

- The ID&TITLE area of the barcode consists of two parts:
 - tape identifier
 - tape title.
- The “tape identifier” field is separated from the “Tape title” field by the separator (value 99).
- The length of the ID&TITLE area is 40 characters “2 from 5 interleaved”, this corresponds to 20 ASCII characters.
Undefined or reserved values are not supported.
 - Because of the long length of the barcode, it cannot always be guaranteed that the entire barcode is in the area of the scanning beam. Therefore only the area from the start character to the separator is evaluated.
 - The tape identifier is extracted from the barcode, converted according to the above table and output in ASCII characters. The length of the barcode (tape identifier) can be configured between 3 and 16 ASCII characters).
- Only barcodes with a uniform length within a system can be read!
I.e. variable barcode lengths in SONY 2/5 code is not possible.

2 Barcodelabels in the Scalar 1000

Please refer to the Operator Guide (Chapter 6 “Preparation of Media”) for descriptions and explanations of types of barcode and specifications in the Scalar 1000-System.

3 Specification of the Types of Media

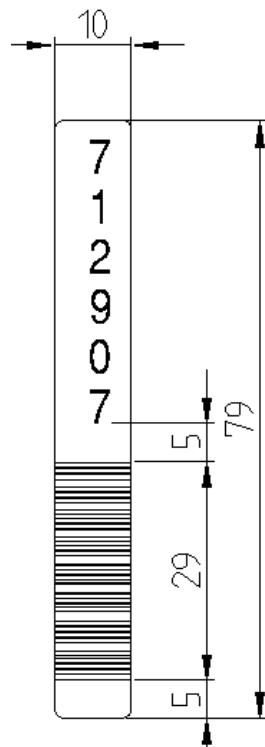
3.1 Cassette type: 3480, 3490, 3590, 9840, D3



3.1.1 Standard Barcode "Code 39"

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 chars.	1:2.5 to 1:3	AML 2/E/J Scalar 1000



Different labels of the type:

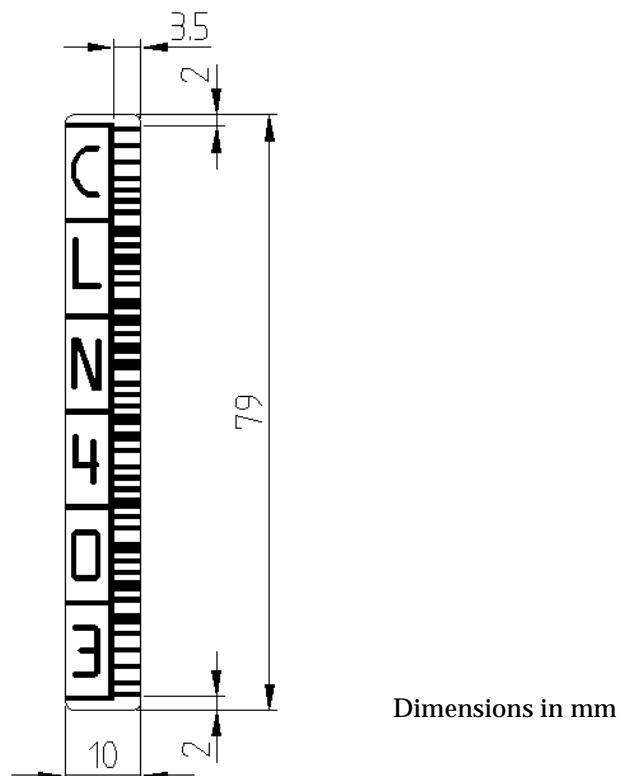
Resource	Designation
171 000 058	Code 39 - 79x10 black/ white
171 000 053	Code 39 - 79x10 colored

Dimensions in mm

3.1.2 Standard Barcode “STK-Code”

Barcode characteristics:

Code type	Code length	Ratio	System
STK-code	6 chars.	1:2	AML 2/E/J Scalar 1000



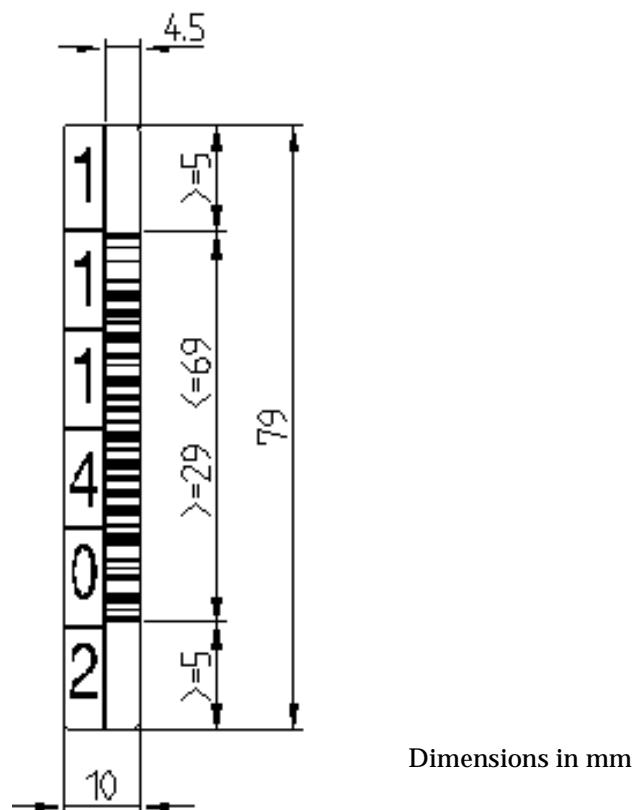
Different labels of the type:

Resource	Designation
171 000 066	Tri Optic Code 39 - 79x10 multicolored

3.1.3 Standard Barcode “Code 128”

Barcode characteristics:

Code type	Code length	Ratio	System
Code 128	6 chars.	---	AML 2/E/J



Different labels of the type:

Resource	Designation
171 000 062	Code 128 - 79x10 black/white COMPAREX
171 000 057	Code 128 - 79x10 single-colored or multicolored COMPAREX

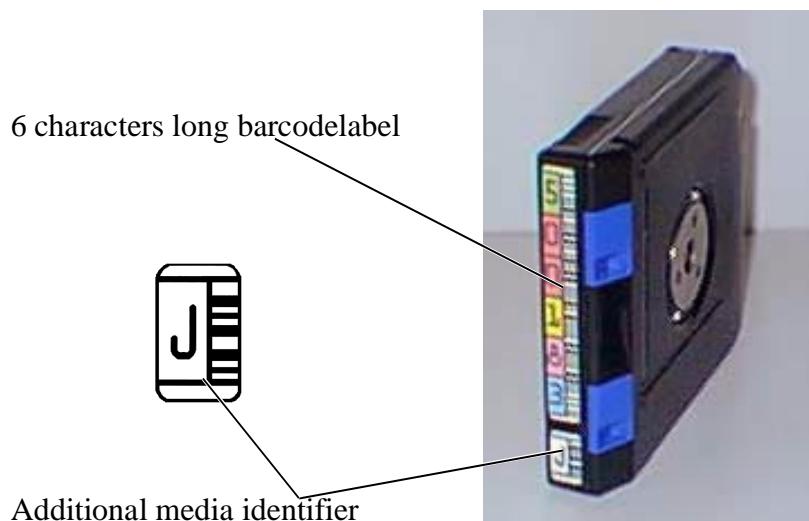
3.1.4 Additional Media Identifiers

Information

Each cassette in the relevant system must have an external label which shows a machine-readable barcode and a user-readable volser. The external label consists of six characters for the volsers and possibly a seventh character for the type of media. A volser can contain 6 characters of uppercase letter A-Z and numbers 0-9.

The additional seventh character can be used for identifying the type of media. The type of medium is a separate, single character after the volser label.

Example of an additional media identifier:



Defining the seventh character:

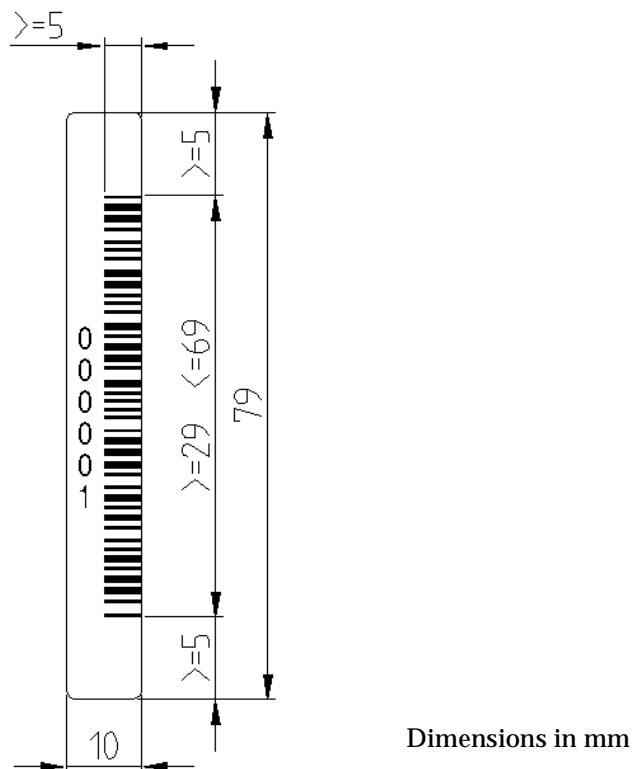
7th character	Identification of the cassette
A	SD-3 10GB
B	SD-3 25GB
C	SD-3 50GB
D	SD-3 cleaning cas.
E	3490E
J	3590 10GB
M	NCTP

7th character	Identification of the cassette
R	9840
U	9840 cleaning cas.

3.1.5 Extended Barcode

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6-16 chars.	1:2.5	AML 2/E/J



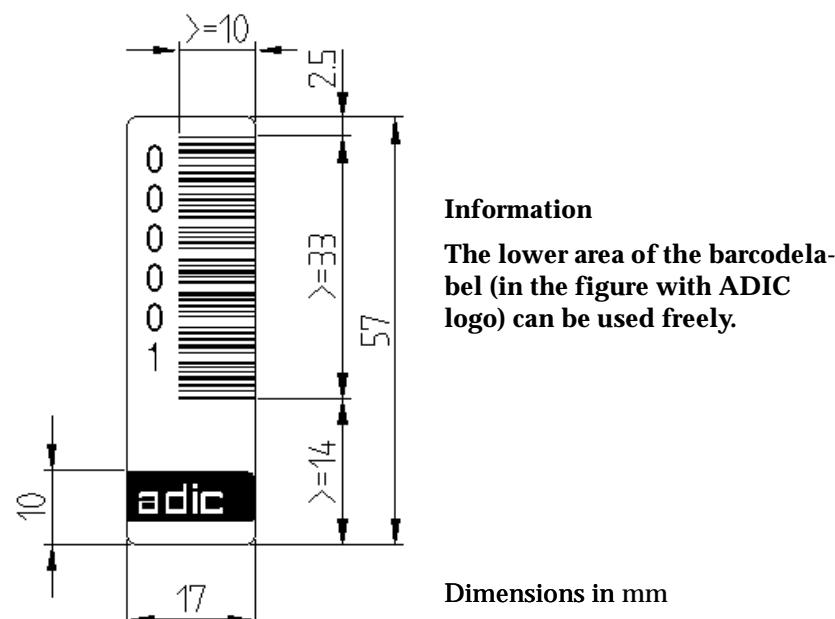
3.2 Cassette Type: DLT



3.2.1 Standard Barcode “Code 39” (Adhesive Labels)

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 chars.	1:2.5 to 1:3	AML 2/E/J Scalar 1000



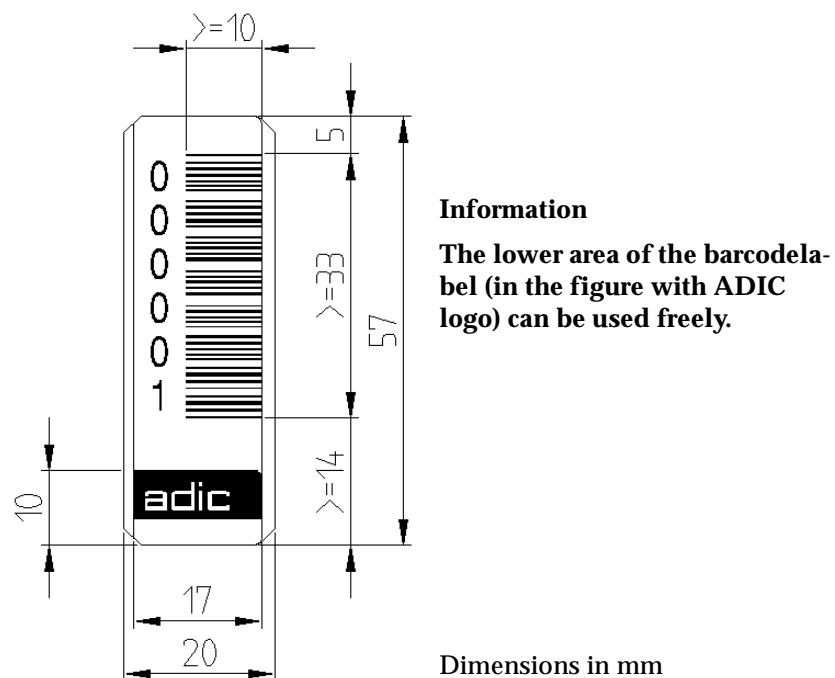
Different labels of the type:

Resource	Designation
171 000 061	Code 39 - 57x17 black/white
171 000 056	Code 39 - 57x17 single- or multicolored

3.2.2 Standard Barcode “Code 39” (Insert Labels)

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 chars.	1:2.5 to 1:3	AML 2/E/J Scalar 1000



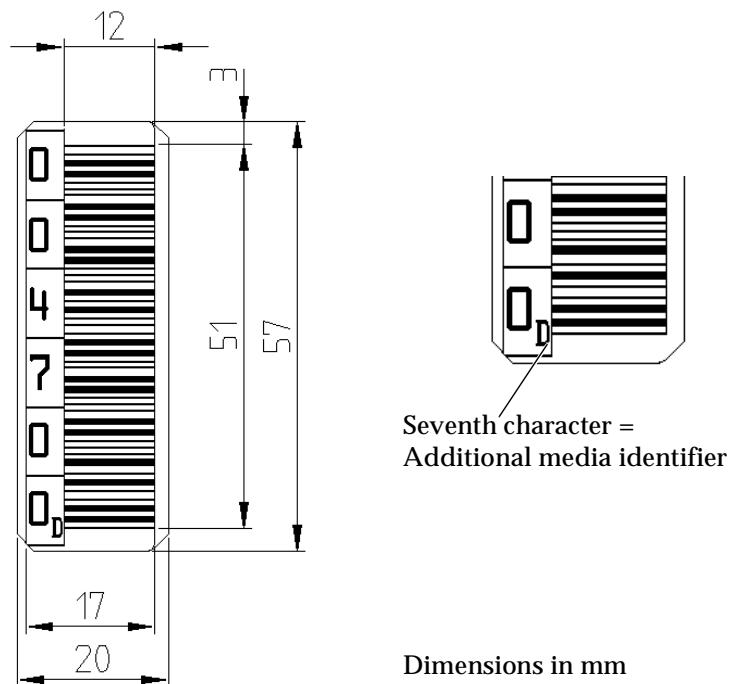
Different labels of the type:

Resource	Designation
171 000 088	Code 39 - 57x20 1/0-colored, black (Insert Label)

3.2.3 Standard Barcode "Code 39" with media identifier (Insert Labels)

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	7 chars.	1:2.5 to 1:3	Scalar 1000



Dimensions in mm

→ See "Additional Media Identifiers" on page 16..
The media type for DLT cassettes is contained in the volsers starting from the 7th character.

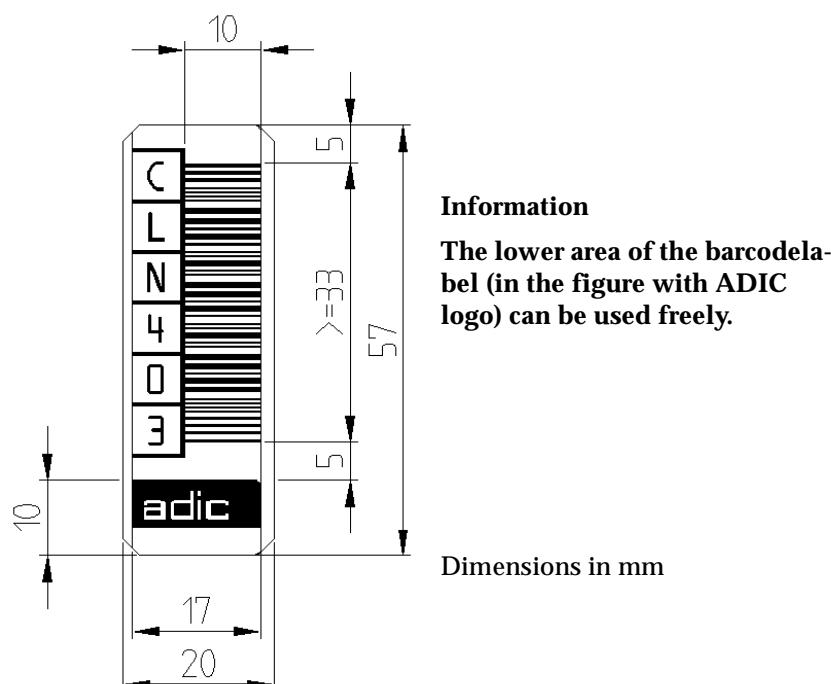
Defining the seventh character:

7th character	Identification of The cassette
C	DLT CompacTape III
D	DLT CompacTape IV
E	DLT CompacTape IIIXT

3.2.4 Standard Barcode “STK-code” (Insert Labels)

Barcode characteristics:

Code type	Code length	Ratio	System
STK-code	6 chars.	1:2	AML 2/E/J



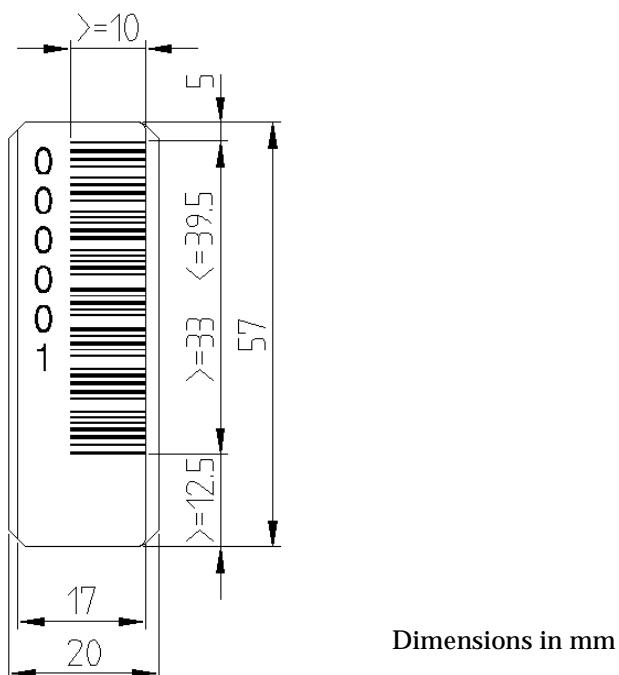
Different labels of the type:

Resource	Designation
171 000	STK-code - 57x20 DLT black/white (Insert Label)
171 000	Tri Optic STK-code - 57x20 DLT multicolored (Insert Label)

3.2.5 Extended Barcode

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 - 9 chars.	1:2.5	AML 2/E/J



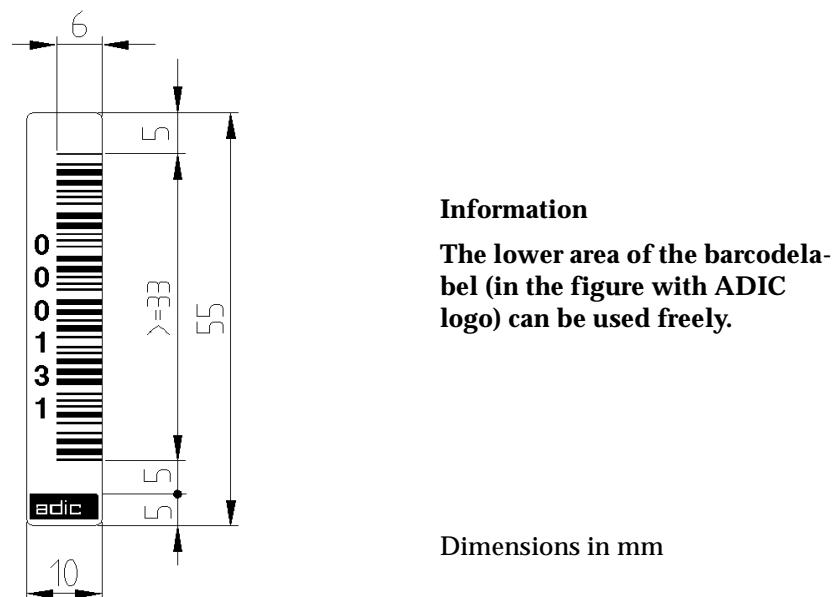
3.3 Cassette Type: AIT



3.3.1 Standard Barcode “Code 39”

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 chars.	1:2.5 to 1:3	AML 2/E/J Scalar 1000



Different labels of the type:

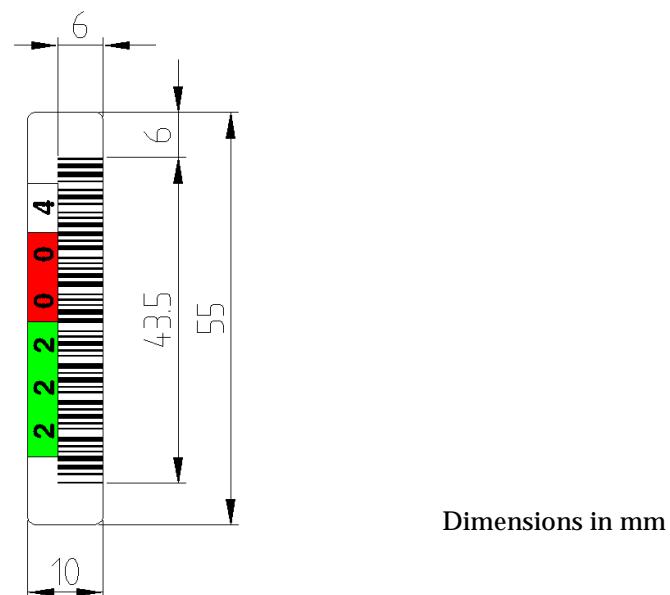
Resource	Designation
171 000 087	Code 39 - 55x10 black/white

3.3.2 Standard Barcode “Code39” with checksum



Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 chars. + checksum (over die 6 chars. as 7th character)	1:2.5	Scalar 1000



Different labels of the type:

Resource	Designation
171 000 086	Code 39 with checksum 55x10 colored

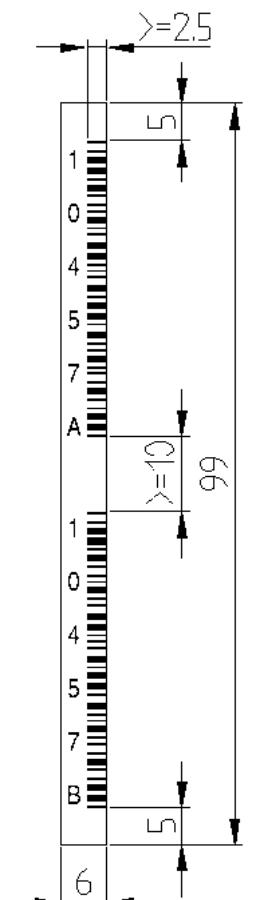
3.4 Cassette Type: Optical Disk



3.4.1 Standard Barcode “Code 39”

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 chars.	1:2.5 to 1:3	AML 2/E/J



Different labels of the type:

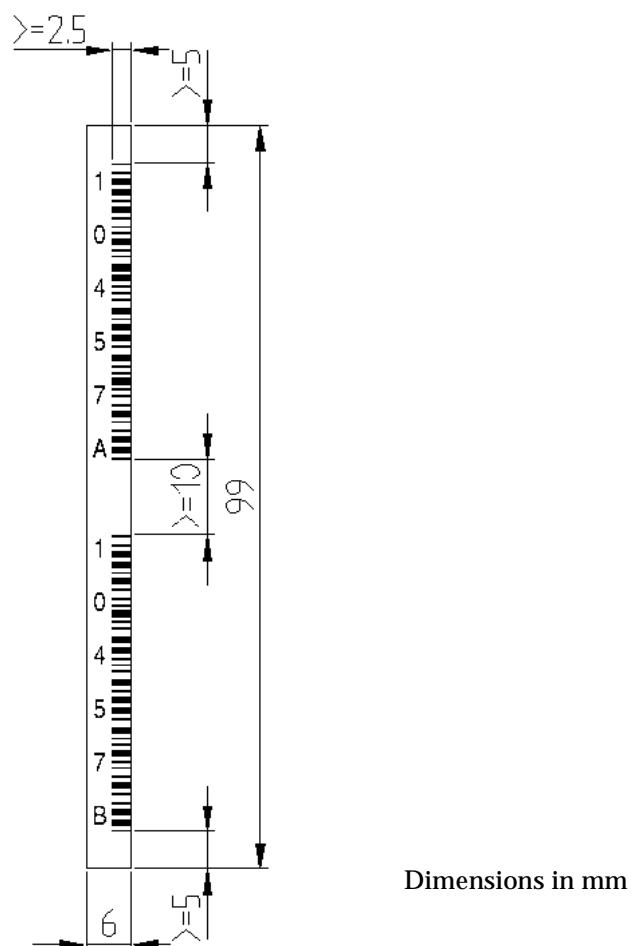
Resource	Designation
171 000 052	Code 39 - 99x6 black/white

Dimensions in mm

3.4.2 Extended Barcode

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 - 9 chars.	1:2.5	AML 2/E/J



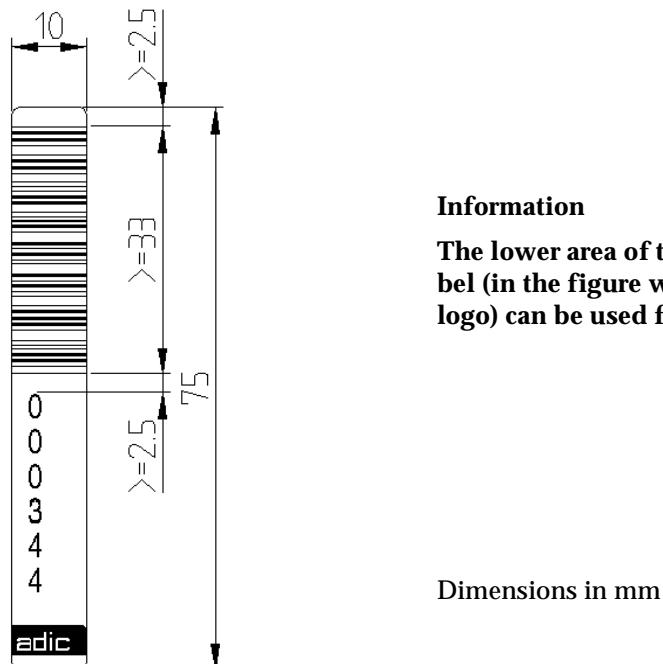
3.5 Cassette Type: 8mm



3.5.1 Standard Barcode „Code 39“

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 chars.	1:2.5 to 1:3	AML 2/E/J



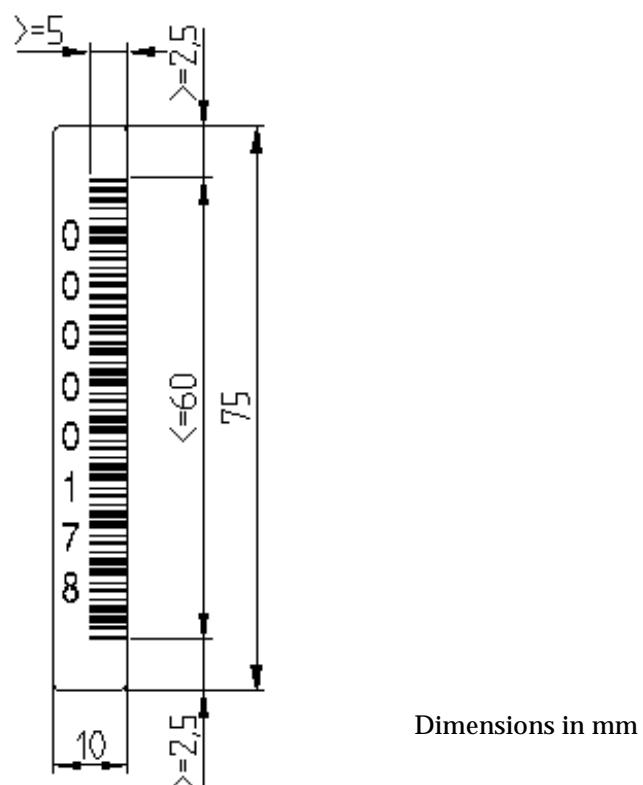
Different labels of the type:

Resource	Designation
171 000 059	Code 39 - 75x10 black/white
171 000 054	Code 39 - 75x10 single- or multicolored

3.5.2 Extended Barcode

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6-14 chars.	1:2.5	AML 2/E/J



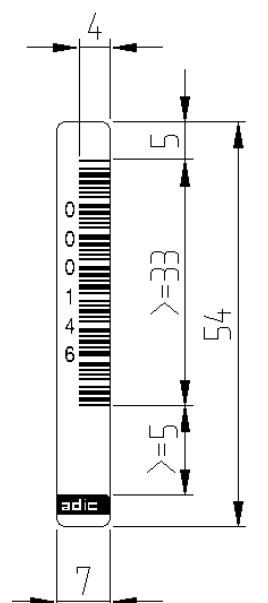
3.6 Cassette Type: 4mm



3.6.1 Standard Barcode „Code 39“

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 chars.	1:2.5 to 1:3	AML 2/E/J



Information

The lower area of the barcode label (in the figure with ADIC logo) can be used freely.

Dimensions in mm

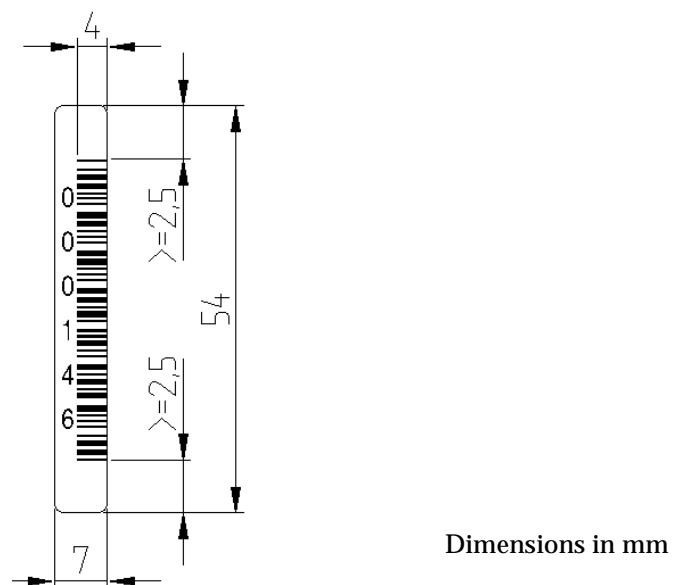
Different labels of the type:

Resource	Designation
171 000 060	Code 39 - 54x7 black/white
171 000 055	Code 39 - 54x7 single- or multicolored

3.6.2 Extended Barcode

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 - 8 chars.	1:2.5	AML 2/E/J



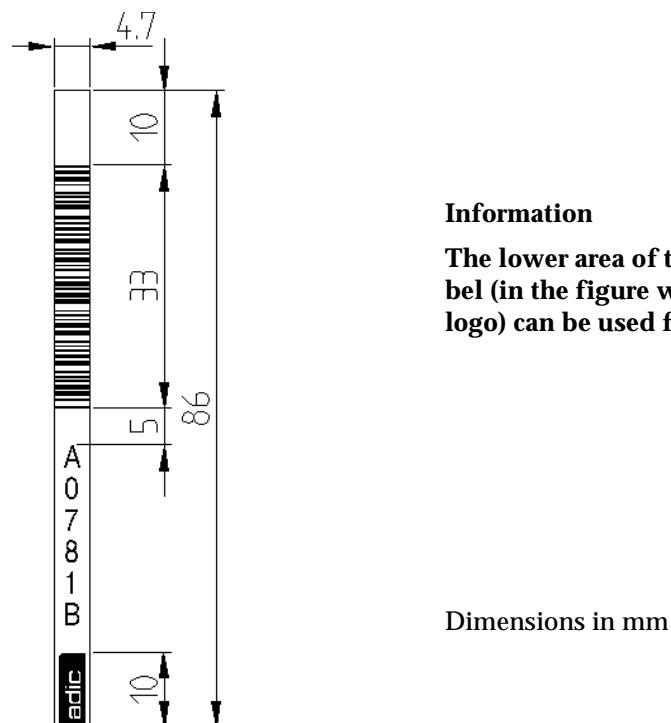
3.7 Cassette Type: CD Caddy



3.7.1 Standard Barcode „Code 39“

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6 chars.	1:2.5 to 1:3	AML 2/E/J



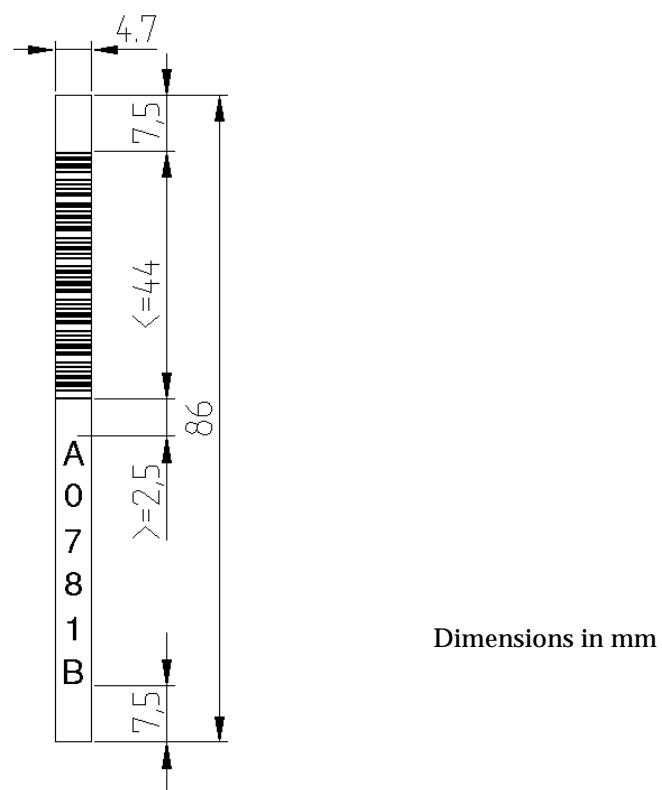
Different labels of the type:

Resource	Designation
171 000 071	Code 39 - 86x4,7 black/white
171 000 084	Code 39 - 86x4,7 single- or multicolored

3.7.2 Extended Barcode

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6-10 chars.	1:2.5	AML 2/E/J



3.8 **Cassette Type: VHS**



3.8.1 **Standard Barcode “Code 39”**

Barcode characteristics:

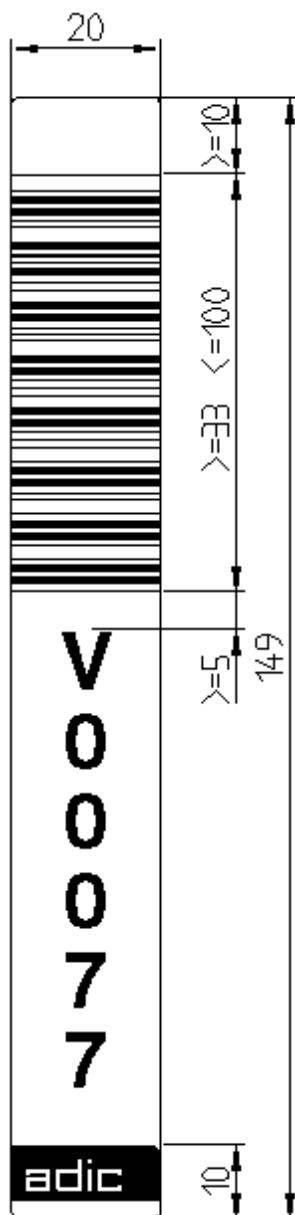
Code type	Code length	Ratio	System
Code 39	6 chars.	1:2.5 to 1:3	AML 2/E/J

Different labels of the type:

Resource	Designation
171 000 050	Code 39 - 149x20 black/white
171 000 051	Code 39 - 149x20 single- or multicolored

Refer to the following page for the illustration of the standard barcode for VHS.

Standard barcode VHS:



Information

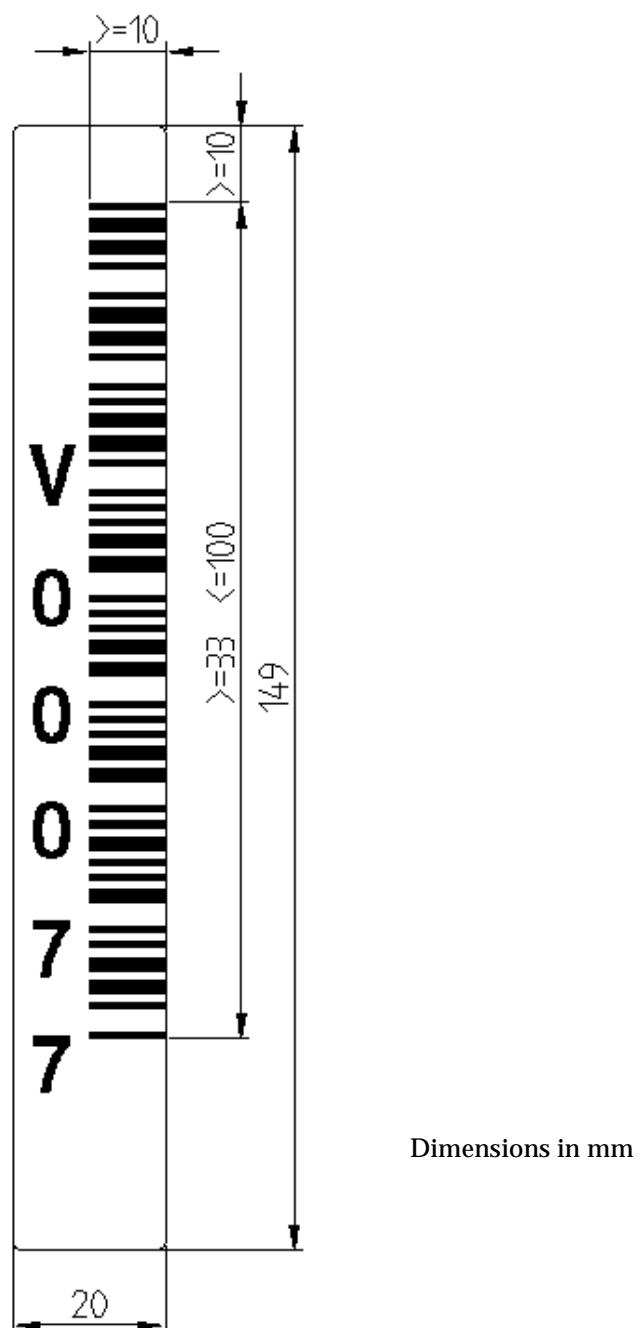
The lower area of the barcode label (in the figure with ADIC logo) can be used freely.

Dimensions in mm

3.8.2 Extended Barcode

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6-16 chars.	1:2.5	AML 2/E/J



3.9 Cassette Type: D2, DTF, BetaCAM



3.9.1 Standard Barcode “Code 39”

Barcode characteristics:

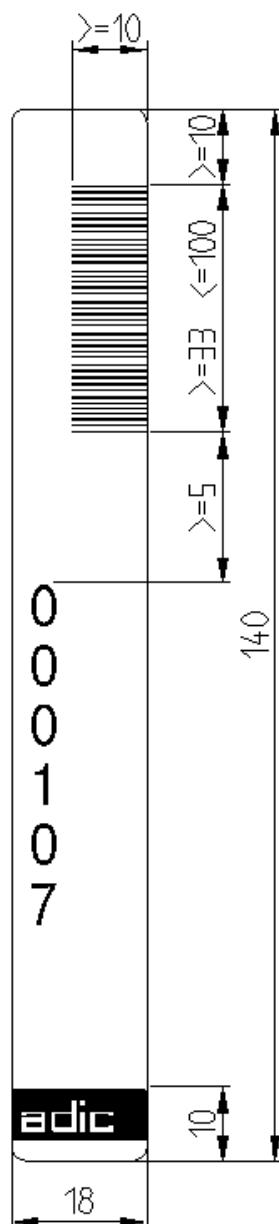
Code type	Code length	Ratio	System
Code 39	6 chars.	1:2.5 to 1:3	AML 2/E/J

Different labels of the type:

Resource	Designation
171 000 080	Code 39 - 140x18 black/white
171 000 083	Code 39 - 140x18 single- or multicolored

Refer to the following page for the illustration of the standard barcode for D2, DTF, BetaCAM.

Standard barcode D2, DTF, BetaCAM:



Information

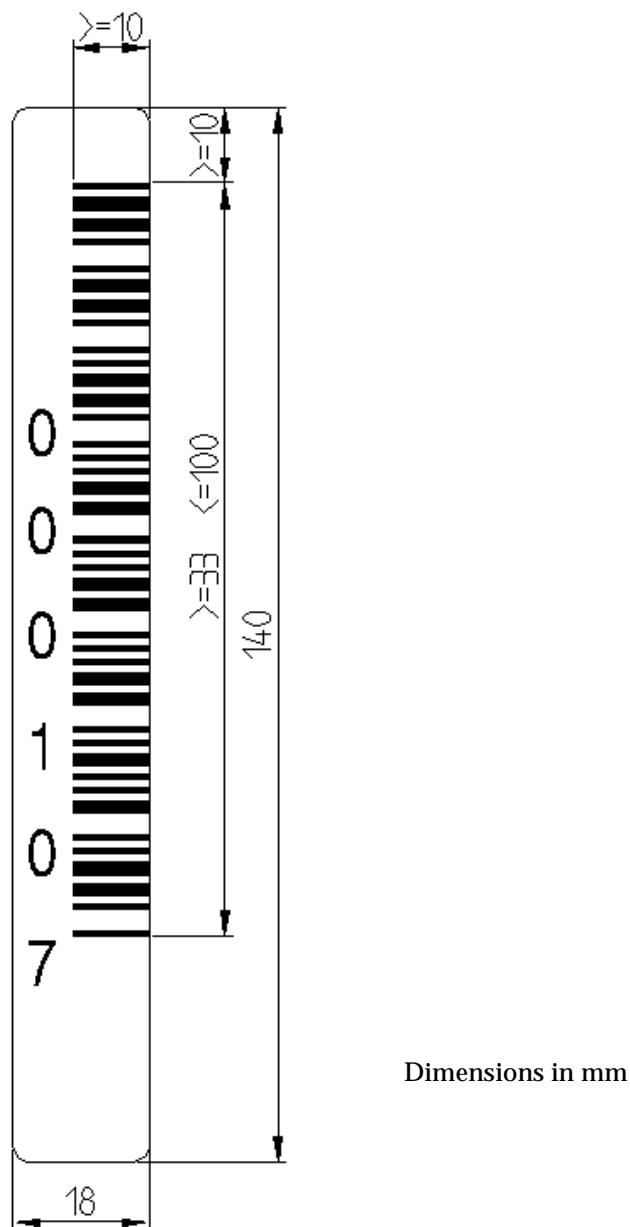
The lower area of the barcode label (in the figure with ADIC logo) can be used freely.

Dimensions in mm

3.9.2 Extended Barcode

Barcode characteristics:

Code type	Code length	Ratio	System
Code 39	6-16 chars.	1:2.5	AML 2/E/J



4 Specification of the Label Position

4.1 Cassette Type 1: Tape Cartridges

Barcode label on tape cartridges

Tape cartridges are all media with magnetic tapes, such as 3480, 3490, 3590, 9840, D3, DLT, VHS, D2, DTF, BetaCAM, 8mm, 4mm and AIT.

To guarantee reliable barcode reading in the system, the following must be observed when affixing the barcodelabels to the tape cartridges:

- The barcodelabel must be affixed parallel to the outer edge of the tape cartridge.
- The barcodelabels must be affixed the same, e.g. all barcodelabels can be aligned to the right and lower edge of the recess.
- The visible reel opening of the tape cartridge is located on the right if the plain type of the barcodelabel is legible.



Example Cartridge 3590:



Example Tape VHS:

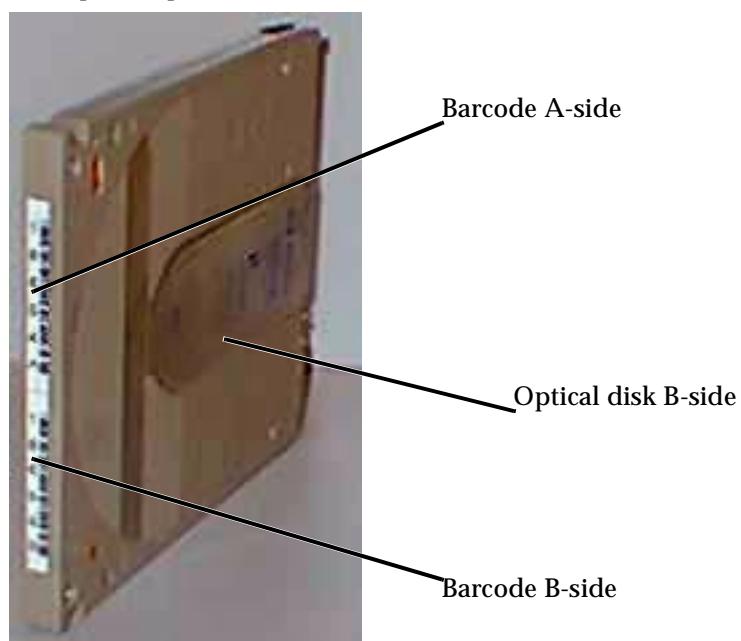
4.2 Cassette Type 2: Optical Disk

Barcode label on optical disk

To guarantee reliable barcode reading in the system, and to ensure an unequivocal assignment of the label to the relevant side, the following must be observed when affixing the barcodelabel to the optical disk:

- The barcodelabel must be affixed parallel to the outer edge of the optical disk.
- The barcodelabel must be affixed symmetrically in relation to the centre of the optical disk.
- The barcodelabels must be affixed the same, e.g. all barcodelabels can be aligned to the right and lower edge of the recess.
- The A-side of the optical disk is located on the left, if the barcode for the A-side is up, the barcode for the B-side down and the plain type of the barcodelabel is legible.

Example of optical disk:



4.3 Cassette Type 3: CD Caddy

Barcode label on CD Caddy

To guarantee reliable barcode reading in the system, the following must be observed when affixing the barcodelabels to the CD Caddy:

- The barcodelabel must be affixed parallel to the outer edge of the CD Caddy.
- The barcodelabels must be affixed the same, e.g. all barcodelabels can be aligned to the right and lower edge of the recess.
- The lid of the CD Caddy is located on the left, if the plain type of the barcodelabel is legible.

Example CD Caddy:



