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American National Standard

for Material Handling –

Unit Loads and Transport Packages– Two-Dimensional Symbols

ANSI MH10.8.3M-1996

ANSI American National Standards Institute
11 West 42nd Street
New York, New York
10036

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Secretariat

Material Handling Institute

Approved July 15, 1996

American National Standards Institute, Inc.

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Contents

Page

Foreword iii

1 Scope and purpose 1

2 Normative references 1

3 Definitions 2

4 Message format 6

5 Applications 15

6 Technical issues – Symbologies 17

7 Examples 23

Tables

1 Format Header table showing recommended separators 8

2 Maximum symbol width using 12 data columns 19

Figures

1 Enveloping structure 6

2 Placement of MaxiCode symbol on label 18

3 Orientation of PDF417 symbol on label 20

4 MaxiCode encoding example of Sortation and Tracking data 24

5 PDF417 encoding example of ASC X12 856 data 26

6 PDF417 encoding example of a simple LTL bill of lading ASC X12 204 data (one item) 28

7 Sample of domestic “Ship From” and “Ship To” portions of a shipping label 28

8 Example of PDF417 encodation of “Ship From” and “Ship To” data in ASC X12 segment format 29

9 Sample of international “Ship From” and “Ship To” portions of a shipping label 30

10 Example of PDF417 encodation of “Ship From” and “Ship To” data in UN/EDIFACT segment format 30

11 Sample shipping label segments using Application Identifiers 31

12 Example of PDF417 encoding Application Identifier data 31

13 Sample shipping label segments using Data Identifiers 32

14 Example of PDF417 encoding Data Identifier data 33

15 Example of combination of “01” and “03” Formats in PDF417 and carrier sortation symbol in MaxiCode 35

16 Example of combination of “01” and “03” Formats in PDF417 and linear bar code used for sortation 37

17 Example of combination of “01” and “06” Formats 38

This is a preview of "ANSI MH10.8.3M-1996". Click here to purchase the full version from the ANSI store.

Page

18 Example of combination of “03” and “05” Formats in PDF417 and carrier bar code 40

19 Example of combination of “03” and “05” Formats in PDF417 with carrier symbol in MaxiCode....41

20 Example of combination of “03” and “06” Formats in PDF417 with “Ship From” and “Ship To” 43

21 Example of combination of “04” and “06” Formats 45

22 Example of combination of “01,” “03,” and “05” Formats 47

23 Example of combination of “01,” “03,” and “06” Formats 48

24 Example of combination of “03” and “06” Formats 49

25 Sample location of transportation (4A) and customer (4b) labels 50

26 Sample bill of lading with PDF417 encoding an ASC X12 “204” 51

Annexes

A Subset of ASCII/ISO 646 (Table of hexadecimal and decimal values)....52

B User guidance for PDF417 symbols in shipping/receiving applications 53

C Philosophy of headers, trailers, and separators 59

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Foreword (This foreword is not part of American National Standard ANSI MH10.8.3M-1996.)

This standard for two-dimensional symbols with unit loads and transport packages was developed by Subcommittee 8 of the ANSI Accredited Standards Committee MH10 (ASC MH10.8), administered by the Material Handling Institute. In 1993, this subcommittee published a revision to the ANSI MH10.8M identifying specific linear symbologies (bar code symbols) to use between trading partners. ANSI MH10.8.3M is not a replacement for ANSI MH10.8M, but is intended to be used with it when implementing two-dimensional symbols.

As the development of the linear symbol standard began drawing to a close, it was recognized that the new two-dimensional symbols held promise for material handling applications, especially in the areas of shipping, transportation, and receiving. Two-dimensional symbols are able to encode hundreds of characters in the same area that linear symbols are able to encode a dozen or so characters. Two-dimensional symbols have error correction features; a significant improvement over the simple error detection features of linear symbols. Instead of delaying the adoption of ANSI MH10.8M-1993, *Bar Code Symbols on Unit Loads and Transport Packages*, the ANSI MH10 Subcommittee 8 agreed to begin working on this standard immediately.

While two-dimensional symbols have been tested and proven over three years of implementation in various application settings, many end users have delayed implementation until such time as a national standard was developed for data structure and syntax.

Specific 2D symbologies and data syntaxes were selected to address specific business process needs. This selection avoids a situation where different market segments adopt differing structures, syntaxes, and symbologies. Suppliers serving multiple market segments should not be faced with the added costs of supporting multiple standards.

The structure and the syntax of the message was developed to be applicable to other high-capacity encodation methods such as radio-frequency identification and smart cards.

The committee decided that a fair selection process needed to be undertaken. The symbology selection process was based on numerous criteria evaluated in 1993 through 1995 including:

– Whether the symbology met the ANSI Patent Policy, as described in *ANSI Procedures for the Development and Coordination of American National Standards*;

– Whether the symbology provided error correction in the symbology's standard form;

– Whether the symbology had a public specification for the symbology with graded quality section;

– Whether the symbology was capable of encoding the ASCII 128 character set;

– The maximum message length supported by a single symbol in binary, numeric, alphanumeric, and ASCII modes;

– Whether the symbology had the ability to encode a message that was spread over multiple symbols;

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– Whether the symbology had demonstrable marking devices and reading devices;

– Whether the symbology had commercially available multi-sourced printers;

– Whether the symbology had commercially available handheld readers;

– What the effective working distance was for the handheld readers;

– Whether the symbology had been implemented in existing scanning equipment;

– Whether the symbology was laser scannable;

– Whether the symbology had commercially available over-the-belt readers;

– Whether the symbology had commercially available over-the-belt omnidirectional readers;

– Whether the symbology had commercially available page readers;

– Whether the reading devices had autodiscrimination of linear capabilities with same scanning device;

– Whether the symbology had been implemented in existing portable data collection terminal;

– Identification of the suppliers of commercially available product;

– The size of symbols with specific element sizes, number of characters, and error correction levels;

– The maximum message length of the symbology over a single and multiple symbols;

– The maximum message length of the symbology with a single reading operation (single trigger pull);

– The effect of symbol damage to the symbology;

– The result of high-speed reading tests;

– The verifiable number of existing installations;

– Whether the symbology had been specified or recommended in existing industry conventions for the applications covered by this standard.

After extensive investigation, it was the decision of the committee that no single solution, at the time, could optimally address all application requirements. This standard therefore recommends two symbologies for the three identified applications of carrier sortation tracking, labeling, and supporting documentation.

This standard is designed to serve as a model for other high capacity encodation methods. End-users will benefit by using this standard and eliminating different message structures for different data capture methods.

This standard contains four informative annexes, which are not considered part of this standard.

Suggestions for improvement of this standard will be selcome. They should be sent to the Material Handling Institute, Inc., 8720 Red Oak Boulevard, Suite 201, Charlotte, NC 28217.

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This standard was processed and approved for submittal to ANSI by the Accredited Standards Committee on Unit Loads and Transport Packages, MH10. Committee approval of this standard does not necessarily imply that all committee or subcommittee members voted for its approval. At the time it approved this standard, the MH10 Committee had the following members:

Allan Gilligan, Chairman
John Nofsinger, Secretary (Material Handling Institute)

Organization Represented	*Name of Representative*
Air Transport Association of America	Samuel S. Elkind
Association of American Railroads	Harry A. Grosso
Association of Professional Material Handling Consultants	Hal Vandiver
ASTM	Alfred H. McKinlay
American Trucking Associations – Management Systems Council	Doug Anderson
Automatic Identification Manufacturers, Inc.	Stephen Halliday
Containerization and Intermodal Institute, Inc.	Barbara Yenynas
Electronic Industries Association	Allan Gilligan
Flexible Intermediate Bulk Containers Association	Bruce Cuthbertson
Fibre Box Association	Mary Alice Opfer
Glass Packaging Institute	Roger Fries
Graphic Communications Association	Gary Ahlquist
Industry Bar Code Alliance	Rick Bushnell
International Cargo Handling Coordination Association	George Chernowitz
Institute of Packaging Professionals	Laurie Root
International Safe Transit Association	Edward Church
National Wooden Pallet & Container Association	Samuel W. Baker
National American Wholesale Grocer's Association	Dennis Madsen
Paper Shipping Sack Manufacturers Association	Brent Dixon
Rack Manufacturers Institute	Donald Durbin
Steel Shipping Container Institute	Richard Norment Dave Core (Alt.)
The Engineered Wood Association	Kenneth R. Andreason Mark Halverson (Alt.)
The Soap & Detergent Association	Anita Kuemmel
Tea Association of the USA, Inc.	Philip Coggon
Textile Bag Manufacturers Association	Donald J. Walker
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U.S. Department of Transportation	John Dumbleton
U.S. Forest Products Laboratory	Thomas Urbanik
U.S. General Services Administration – Federal Supply Service	Roger Young
United Fresh Fruit & Vegetable Association	John McClung

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The MH10.8 Subcommittee on Coding and Labeling of Unit Load, which developed this standard, had the following participants:

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Allan Gilligan, Vice-Chairman
Craig K. Harmon, Project Editor

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American National Standard
for Material Handling –

Two-Dimensional Symbols with Unit Loads and Transport Packages

1 Scope and purpose

1.1 Scope

This standard describes the use of two-dimensional symbols in conjunction with unit loads and transport packages, to convey data between trading partners. This data includes:

– that which may be used in the sortation and tracking of unit loads and transport packages.

– that which may be used in the shipping and receiving of unit loads and transport packages.

– that which may be contained within supporting documentation, in paper or electronic form, related to unit loads or transport packages.

This standard specifies the structure, syntax, and coding of messages and data formats when using two-dimensional symbols with unit loads and transport packages.

This standard outlines the physical parameters, orientation, and placement of two-dimensional symbols required to ensure scannability and enable consistency across multiple industries and trading partners.

This standard recommends the use of a single symbology for each specific application of two-dimensional symbols with unit loads and transport packages.

This standard does not supersede or replace any applicable safety or regulatory marking or labeling requirements. The standard is to be applied in addition to any other mandated labeling requirements.

1.2 Purpose

Areas expected to benefit from this standard include shipping, sortation, tracking, transportation, and receiving of unit loads and transport packages. Implementation of this standard should result in benefits such as reduced space requirements, greater data capacity, reduced label costs, and improved data integrity.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

Copies of the following documents can be obtained from ANSI: Approved ANSI standards, approved and draft international and regional standards (ISO, IEC, CEN/CENLEC, ITU-T), and approved foreign standards (including BSI, JIS, and DIN). For further information, contact ANSI Customer Service Department at 212-642-4900 (phone), 212-302-1286 (fax) or via the World Wide Web at http://www.ansi.org.

Additional availabiilty contact information is provided below as needed.