

ICS 35.040

***Vornorm*****UIM – Unverwechselbare Identifikations-Marke –  
Anwenderstandard für kleinste Produktmarkierungen mit Hilfe von  
Matrix-Symbologien**

UIM – The unique identification mark –  
Application requirements for very small items using matrix symbols

UIM – La marque d'identification unique –  
Exigences d'application pour les objets miniatures avec codage matricielles

Gesamtumfang 20 Seiten

Normenausschuss Informationstechnik (NI) im DIN

## Vorwort

DIN V 66401 wurde vom Arbeitsausschuss NI-31 "Automatische Identifikation und Datenerfassungsverfahren" im Normenausschuss Informationstechnik (NI) erarbeitet.

Eine Vornorm ist das Ergebnis einer Normungsarbeit, das wegen bestimmter Vorbehalte zum Inhalt oder wegen des gegenüber einer Norm abweichenden Aufstellungsverfahrens vom DIN noch nicht als Norm herausgegeben wird.

Zur vorliegenden Vornorm ist kein Entwurf veröffentlicht worden. Erfahrungen mit dieser Vornorm sind erbeten

- vorzugsweise als Datei per E-Mail an [ni@din.de](mailto:ni@din.de) in Form einer Tabelle. Die Vorlage dieser Tabelle kann im Internet unter [www.din.de/stellungnahme](http://www.din.de/stellungnahme) abgerufen werden;
- oder in Papierform an den Normenausschuss Informationstechnik (NI) im DIN, 10772 Berlin (Hausanschrift: Burggrafenstr. 6, 10787 Berlin).

Durch DIN V 66401 wird die eindeutige Identifikation kleinster Produkte möglich gemacht.

DIN V 66401 basiert bezüglich der für die Vornorm relevanten Matrix-Symbologien und Datenstrukturen auf den entsprechenden Internationalen Normen.

DIN V 66401 legt diejenigen anwendungsspezifischen Parameter für die Markierung kleinster Produkte fest, die in den betreffenden ISO/IEC-Normen nicht detailliert spezifiziert sind.

Darüber hinaus legt DIN V 66401 unter anderem physikalische Minimaldimensionen für das Aufbringen und das Lesen von unverwechselbaren Seriennummern nach dieser Vornorm fest.

DIN V 66401 stellt die Interoperabilität mit den Internationalen Normen für das Verpackungswesen sicher.

DIN V 66401 wurde auf Englisch verfasst, um so die Vornorm unmittelbar für Normungsaktivitäten auf internationaler Ebene nutzen zu können und sie auch für nicht deutschsprachige Experten sofort anwendbar zu machen.

Der NI-31 sieht keinen Bedarf für eine deutsche Sprachfassung, da durch die Einbindung in das europäische und internationale Marktgeschehen ohnehin die englische Sprache die Vertragssprache ist und die der deutschen Vornorm zugrunde liegenden Papiere in englischer Sprache auch von den deutschen Marktteilnehmern angewendet werden.

Der NI-31 hat weiterhin festgestellt, dass die repräsentative deutsche Fachöffentlichkeit über genügend englische Sprachkenntnisse verfügt und ein entsprechend abgegrenzter Anwenderkreis für DIN V 66401 besteht.

## Contents

|                     | Page                                                                                                                      |
|---------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>1</b>            | <b>Scope ..... 4</b>                                                                                                      |
| <b>2</b>            | <b>Normative references ..... 4</b>                                                                                       |
| <b>3</b>            | <b>Terms and definitions ..... 5</b>                                                                                      |
| <b>4</b>            | <b>Unique Identification Mark (UIM) ..... 6</b>                                                                           |
| <b>4.1</b>          | <b>Symbologies for Unique Identification Marks ..... 7</b>                                                                |
| <b>4.1.1</b>        | <b>Module sizes – X-dimensions..... 7</b>                                                                                 |
| <b>4.1.2</b>        | <b>Quiet zone ..... 7</b>                                                                                                 |
| <b>4.1.3</b>        | <b>Print quality ..... 7</b>                                                                                              |
| <b>4.2</b>          | <b>The unique data element ..... 7</b>                                                                                    |
| <b>4.2.1</b>        | <b>Construction of a unique data element..... 7</b>                                                                       |
| <b>4.2.2</b>        | <b>Data Identifiers (DI)..... 8</b>                                                                                       |
| <b>4.2.3</b>        | <b>System Identifier (SI)..... 8</b>                                                                                      |
| <b>4.2.4</b>        | <b>Issuing Agency Codes (IAC) and Company Identification Codes (CIN) ..... 8</b>                                          |
| <b>5</b>            | <b>Human readable information attached to UIM..... 8</b>                                                                  |
| <b>Annex A</b>      | <b>(informative) Minimum sizes of a Unique Identification Mark..... 9</b>                                                 |
| <b>A.1</b>          | <b>Size of a UIM with DI “25S” and a serial number ..... 9</b>                                                            |
| <b>A.2</b>          | <b>Size of a UIM with DI “25T” and a lot or batch number ..... 9</b>                                                      |
| <b>A.3</b>          | <b>Size of a UIM with System Identifier “+” and a product code combined with serial<br/>number or lot number ..... 10</b> |
| <b>Annex B</b>      | <b>(informative) Data Matrix symbols ..... 11</b>                                                                         |
| <b>B.1</b>          | <b>Data Matrix formats ..... 11</b>                                                                                       |
| <b>B.2</b>          | <b>Black or white print ..... 11</b>                                                                                      |
| <b>B.3</b>          | <b>Symbol sizes ..... 11</b>                                                                                              |
| <b>B.3.1</b>        | <b>Square format ..... 11</b>                                                                                             |
| <b>B.3.2</b>        | <b>Rectangular format..... 12</b>                                                                                         |
| <b>Annex C</b>      | <b>(informative) QR Code..... 13</b>                                                                                      |
| <b>C.1</b>          | <b>Symbol sizes ..... 13</b>                                                                                              |
| <b>C.2</b>          | <b>QR symbol sizes ..... 13</b>                                                                                           |
| <b>Annex D</b>      | <b>(informative) Capacity and symbol sizes of UIMs ..... 15</b>                                                           |
| <b>D.1</b>          | <b>Capacity and symbol sizes of UIMs with a serial number..... 15</b>                                                     |
| <b>D.2</b>          | <b>Capacity and symbol sizes of UIMs with a lot number..... 15</b>                                                        |
| <b>D.3</b>          | <b>Capacity and symbol sizes of UIMs with SI “+”, combined product and serial or lot<br/>number..... 15</b>               |
| <b>D.4</b>          | <b>Relation of symbol sizes and module sizes ..... 16</b>                                                                 |
| <b>Annex E</b>      | <b>(informative) Unique Identification Mark using Application Identifiers (AI) ..... 18</b>                               |
| <b>Annex F</b>      | <b>(informative) System considerations..... 19</b>                                                                        |
| <b>Bibliography</b> | <b>..... 20</b>                                                                                                           |

## 1 Scope

The purpose of the specification of a Unique Identification Mark (UIM) is to get a common base for marking of small items and item identification in open systems in order to obtain uniqueness for tracking and tracing of such items.

This prestandard specifies the parameters for smallest matrix symbols and defines short data elements and the rules to provide uniqueness.

The aim is to facilitate the automatic identification of very small products.

Symbol parameters are defined in a way that any Unique Identification Mark built according to this prestandard is ready for use by anybody from labeller to final user throughout a supply chain.

The characteristic features for a UIM according to this prestandard are

- a) matrix symbology;
- b) a unique data element;
- c) the physical marking parameters.

This prestandard enables the generation of unique serial numbers, unique batch/lot numbers and unique product codes and therefore is a supplement to the international standards for product packages.

The use of the relevant ISO/IEC standards secures global compatibility.

This prestandard is suitable for national and international use in all cases where unique marking on very small surfaces is required. Potential application areas are precision mechanics and optics, electronics or health care, independent of any specific industry or region.

Unique Identification Marks are typically in use with surgical instruments, probes and laboratory pipes, test stripes, primary packages, small plastic and metal parts, etc.

This prestandard supports openly accessible solutions and avoids special closed system applications.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, the latest edition of the referenced document (including any amendments) applies.

EN 1571, *Bar coding – Data identifiers*

EN 1572, *Bar coding – Unique identifier for transport units*

ISO 646, *ISO 7-bit Code for Information Interchange*

ISO/IEC 2382, *Information Technology — Vocabulary*

ISO/IEC 15415, *Bar Code Print Quality Test Specification – Two Dimensional Symbols*

ISO/IEC 15424, *Information technology – Automatic identification and data capture techniques – Data Carrier Identifiers (including Symbology Identifiers)*

ISO/IEC 15418, *ASC Data Identifiers and EAN.UCC Applications Identifiers and maintenance*

ISO/IEC 15459, *Automatic Identification and Data Capture Techniques – International Specification – Unique identifier for transport units – Part 1: Technical Standard, Part 2: Procedural Standard*

ISO/IEC 16022, *Bar Code Symbology Specification – Data Matrix*

ISO/IEC 18004, *Bar Code Symbology Specification – QR Code*

ISO/IEC 19762, *Information technology — AIDC techniques — Harmonized vocabulary*

ANS MH10.8.2, *Data Identifier and Application Identifier*

ANS HIBC 2, *Health Industry Supplier Labeler Standard*

### 3 Terms and definitions

For the purposes of this prestandard, the following terms and definitions apply.

#### 3.1

##### **ANS MH 10.8.2**

American National Standard Data Identifier and Application Identifier Standard, referenced by ISO/IEC 15418

#### 3.2

##### **ANS HIBC 2**

American National Standard Health Industry Supplier Labeler

#### 3.3

##### **batch**

see lot number

#### 3.4

##### **Data Identifier (DI)**

a specified character string which defines the specific intended use of the data that immediately follows. The identifier shall be an alphabetic character or an alphabetic character preceded by up to three numeric characters as defined by ANS MH10.8.2, Data Application Identifier Standard. A character (or set of characters) within a machine-readable symbol that defines the general category or specific use of the data that is encoded in the same machine readable symbol

#### 3.5

##### **Data Matrix**

an error correcting two-dimensional matrix symbology specified by ISO/IEC 16022

#### 3.6

##### **Health industry bar code (HIBC)**

a data structure for unique product marking commonly used in health care

#### 3.7

##### **Issuing Agency Code (IAC)**

code of issuer of company codes registered by NEN, the Netherlands Normalisation Institute, Delft, according to ISO/IEC 15459-1,-2

#### 3.8

##### **Labeller Identification Code (LIC)**

term for the 4 characters long Company Identification Code of ANS HIBC 2. The LIC is used in conjunction with the System Identifier “+” or following the IAC of EHIBCC (see 3.7)

**3.9****lot number**

a traceability number assigned to identify or trace a unique group of entities (also known as batch)

**3.10****matrix code**

a collection of polygonal or circular elements in a regular pattern to represent data for retrieval by a vision scanning system

**3.11****module**

smallest element of matrix symbol (see X-dimension)

**3.12****QR code**

an error correcting matrix symbology specified by ISO/IEC 18004

**3.13****quiet zone**

an area free from interfering markings, which shall surround a two-dimensional or bar code symbol and, in particular, precede the start character and follow the stop character. Also referred to as light margin or clear area

**3.14****System Identifier**

a System Identifier (SI) is a single character or a character set identifying a following string of data as a structured data set. Key system identifiers for use in open supply chains are listed in ANS MH 10.8.2

**3.15****two-dimensional (2D) symbols**

machine readable symbols that must be examined both vertically and horizontally to read the entire message. Two-dimensional symbols may be one of two types: matrix symbols and multi-row symbols. Two-dimensional symbols have error detection and may include error correction features

**3.16****X-dimension**

- 1) The specified width of the narrow elements in a bar code or matrix code symbol.
- 2) The specified width of a single element in a matrix symbol.

## **4 Unique Identification Mark (UIM)**

Unique Identification Marks enable unique identification of smallest items as single unique items or as a unique lot/batch of items.

Any UIM according to this prestandard shall consist of the following elements:

- a) A symbology according to clause 4.1. where the minimum dimensions of clause 4.1.1 apply;
- b) A unique data element according to clause 4.2., containing a data identifier according to ANS MH 10.8.2 followed by the company code and a serial number or lot/batch number.