

TECHNICAL REPORT

RAPPORT TECHNIQUE



Packaging of components for automatic handling –
Part 7: Introduction of a bulk blister pack for miniaturized components

Emballage de composants pour opérations automatisées –
Partie 7: Introduction d'une plaquette thermoformée en volume pour des
composants miniaturisés



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PACKAGING OF COMPONENTS FOR AUTOMATIC HANDLING –**Part 7: Introduction of a bulk blister pack for miniaturized components****FOREWORD**

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IEC TR 60286-7, which is a technical report, has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
40/2648/DTR	40/2676/RVDTR

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60286 series, published under the general title *Packaging of components for automatic handling*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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INTRODUCTION

Purpose of this Technical Report

This Technical Report includes the practical experience made during pilot projects and a proposal for standardization of the interface between the package and automatic assembly systems as well as requirements to the properties of the package itself.

Patent situation

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning a “magazine for portion-wise receiving individualized electronic components which are present in bulk”¹.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences free of charge with applicants throughout the world for claims related to the items described in this Technical Report. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from:

ASM Assembly Systems GmbH & Co.KG, Munich(DE)

Rupert-Mayer-Straße 44, 81379 München

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¹ German Patent: DE102016125495, published 28.06.2018

United States Patent Application: US 2018/0184555 A1

PACKAGING OF COMPONENTS FOR AUTOMATIC HANDLING –

Part 7: Introduction of a bulk blister pack for miniaturized components

1 Scope

This part of IEC 60286 contains information about the introduction of an innovative bulk blister packing system for miniaturized components, for example chip type components of size 1005 (metric) and smaller. It includes a proposal for standardization of the interface between the packaging and automatic assembly systems and requirements to the properties of the packaging.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

packaging

product made of any material or any nature to be used for the containment, protection, and structured alignment for automatic assembly, handling and delivery

[SOURCE: IEC 60286-3:2019, 3.1.3]

3.2

packing

operations involved in the preparation of goods for containment, protection, and structured alignment for automatic assembly, handling, and delivery

3.3

blister pack

type of packaging in which components are packed, consisting of domes of plastic

EXAMPLE The example is shown in Figure 1.

4 Existing bulk feeding systems and challenges

4.1 Challenges of miniaturized components

Progressing miniaturization of components has caused an increasing mismatch between packaging volume and component size, where the volume of components became just a small percentage of the total packaging volume in the case of tape and reel packaging.

In addition, to enable a smooth pick and place process of such components, tight tolerances of pocket sizes are needed, which are technically difficult to achieve and increase costs.

As an alternative, bulk packaging and feeding systems had been developed in the past.

4.2 Limitations of existing bulk feeding systems

Existing bulk feeding systems are based on linear feeders, which show various constraints:

- tight dimensional tolerances of components required;
- variation of component thickness is critical;
- cubical components cannot be handled;
- difficult cleaning processes;
- risk of mixed components.

5 Bulk blister pack

5.1 General conception

5.1.1 Packaging style

Blister with seven pockets, five filled with components, one empty pocket and one smaller size pocket for orientation (Figure 1 and Figure 4).

The small pocket is for mechanical orientation and indicates the end of the strip. The first pocket is intentionally empty to avoid accidental loss of components during handling.

NOTE The smaller size pocket can be used for provision of test samples, for example for inspection.

5.1.2 Component pockets

The dimensions and maximum filling level of pockets are designed such, that the volume is aligned to the maximum capacity of bulk feeders.

The dimensions and maximum filling level of pockets shall be specified such, that packed components will not be damaged during transport and handling.

5.1.3 Sealing

The complete circumference of pocket shall be sealed strongly enough to prevent accidental loss of components during transportation and handling, but not exceed 15 N when pulled off in a 180° direction. The seal tape shall be not sticky, so that the packed components do not attach to the seal.

5.1.4 Identification and labelling

5.1.4.1 Information on label on top

The label on top contains the same information as in the matrix code on the bottom side, and provides the minimum content described below:

- manufacturer identification;
- manufacturer part number;
- quantity;

NOTE The quantity information on the label is the total quantity of components contained in the blister packaging. The filling quantity of the component pockets is the same in all five pockets.

- lot code.

Additional information can be given as appropriate, also in human readable form.

Details can be found in IEC 62090.

5.1.4.2 Information on label on bottom

A label is placed on the first filled pocket with information identical to that on the bar code on top (see 5.1.4.1), but in the form of a 2D-matrix code.

5.2 Outline and dimensions

5.2.1 Outline

The structure of a typical bulk blister pack is shown in Figure 1.



Figure 1 – Typical bulk blister pack (structure)

The mechanism of a typical bulk blister pack is shown in Figure 2.

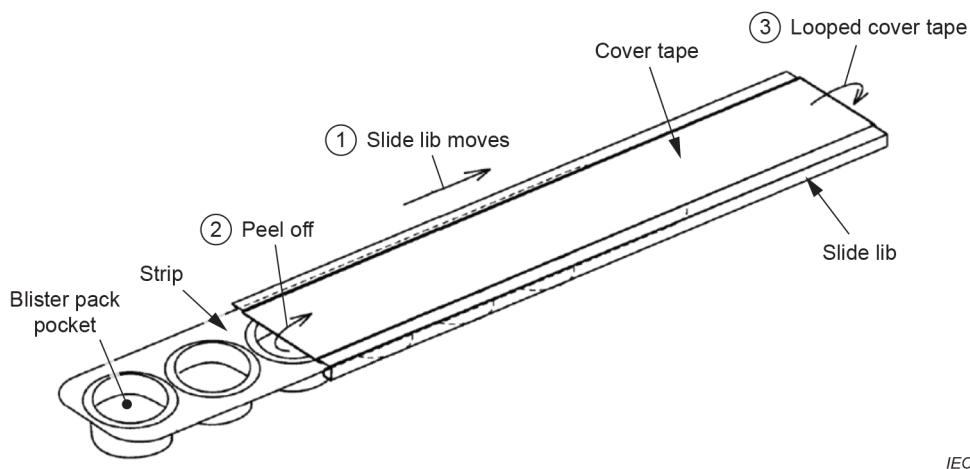
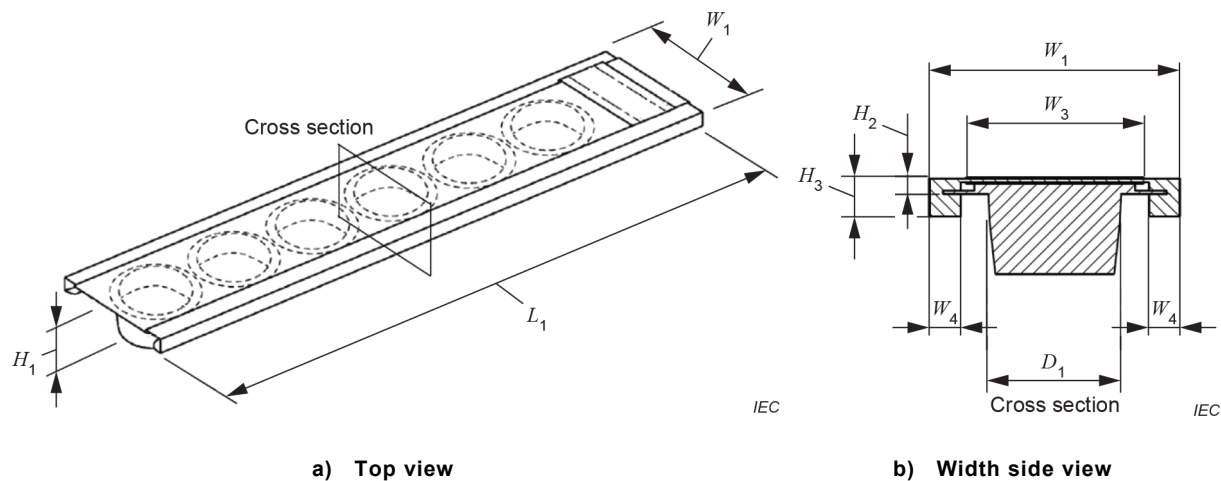


Figure 2 – Typical bulk blister pack (mechanism)

5.2.2 Dimensions

The dimensions of a typical bulk blister pack are shown in Figure 3 and Figure 4.

NOTE It is possible that the slide lid does not cover the blister strip completely.



Key

L_1	Length = 169 mm \pm 1 mm
H_1	Height = (13,7 \pm 1) mm
W_1	Width = 35,8 mm \pm 1 mm
W_3	Width of cover tape = 28,0 mm max. (considering seal runout)
W_4	Width of rim of the slide lid = 2,7 mm to 5,0 mm
D_1	Diameter of pocket = ϕ 19 mm \pm 0,2 mm
H_2	Height of pass line = 2 mm \pm 0,2 mm
H_3	Thickness of slide lid = 4,0 mm to 6,0 mm

Figure 3 – Typical bulk blister pack (overall dimensions)