GHD GEORG HARTMANN
MASCHINENBAU GMBH

Packing machines and slicers
for the baking industry
Special machinery

Technical description ”BAGS and CLOSURES”

Breads and bakery products are very different in their shape, ingredients, surfaces, tolerances and baking methods. In addition to the baked goods, the packaging materials are also very different and often have tolerances.
Accurate specific consideration is therefore required for each product and packaging scheme to achieve optimal packaging results.

The following description should be used as technical guidance for the usage of GHD Hartmann packaging machines. It should be understood as general information and guidance, not as fixed values. The final decission for bag sizes should be made by the bakery and the bag supplier.

1. Determination of the bag formats

GHD Hartmann offers a variaty of determinations for the bag size related to the individual products.

1.1 Abbreviations

Abbreviation	Description
L	Length of the product
W	Width of the product
H	Height of the product
D	Diameter of the product
C	Circumference
LF	Filling height
G	Product weight
PW	Number of packed products in width
PL	Number of packed products in length
PH	Number of packed products in height
PL	Number of penny packed products per bag
HF	Flowpackage height
WF	Flowpackage or bag width
OF	Flowpackage or bag overall length

R	Distance between product and closure
S	Closure position from package bottom side
A	Length of the bag
M	Overall length of the bag
B	Width of the bag
FB	Bottom fold
FS	Side fold
N	Thickness of the packaging material
K	Approx. total thickness of the single empty bag
P	Height of the bag stack
Q	Length of the tear-off tab
T	Distance between top of the tear-off tab and the wicket hole
U	Perforation length
V	Diameter or wicket hole
J	Wicket rod diameter
Z	Distance between center of the wicket holes
Y	Height wicket

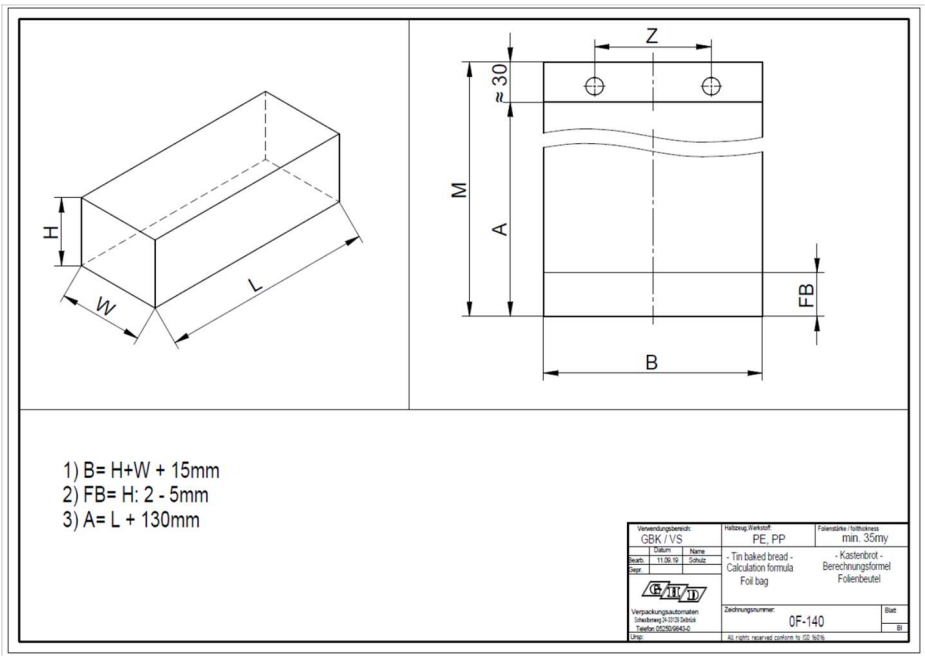
1.2 Bag dimensions – GHD Hartmann calculator

GHD Hartmann offers a bag size calculator for an easy determination of bag sizes and wicket sizes. Dimensions are shown in metric dimensions and imperial dimensions.

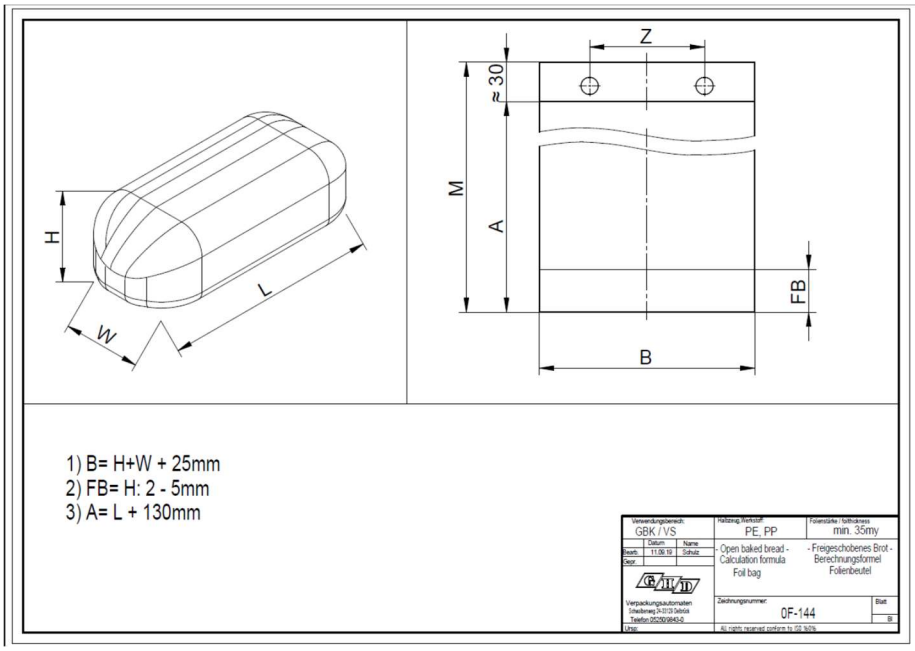
Consider in any case YOUR product related tolerances. The smaller the range of tolerances, the smaller the bag, less packaging costs, the more tight the package, the better the appearance of the package, the products keep in position, less air inside the bag which might create a longer shelf-life and easy tray loading. Less tolerances are POSITIVE in any case.
Your calculations need to be based on the forseeable dimensions.

See: https://www.ghd.net/en/service/faq
=> How can I determine the size of bags?

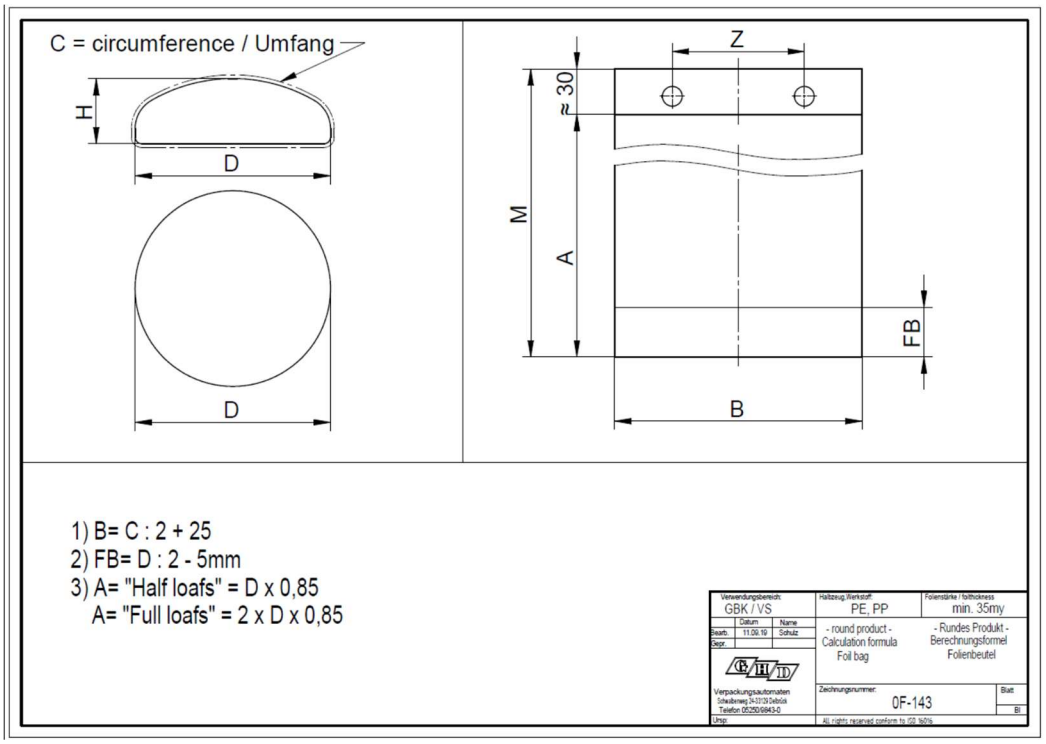
1.3 Tin bread



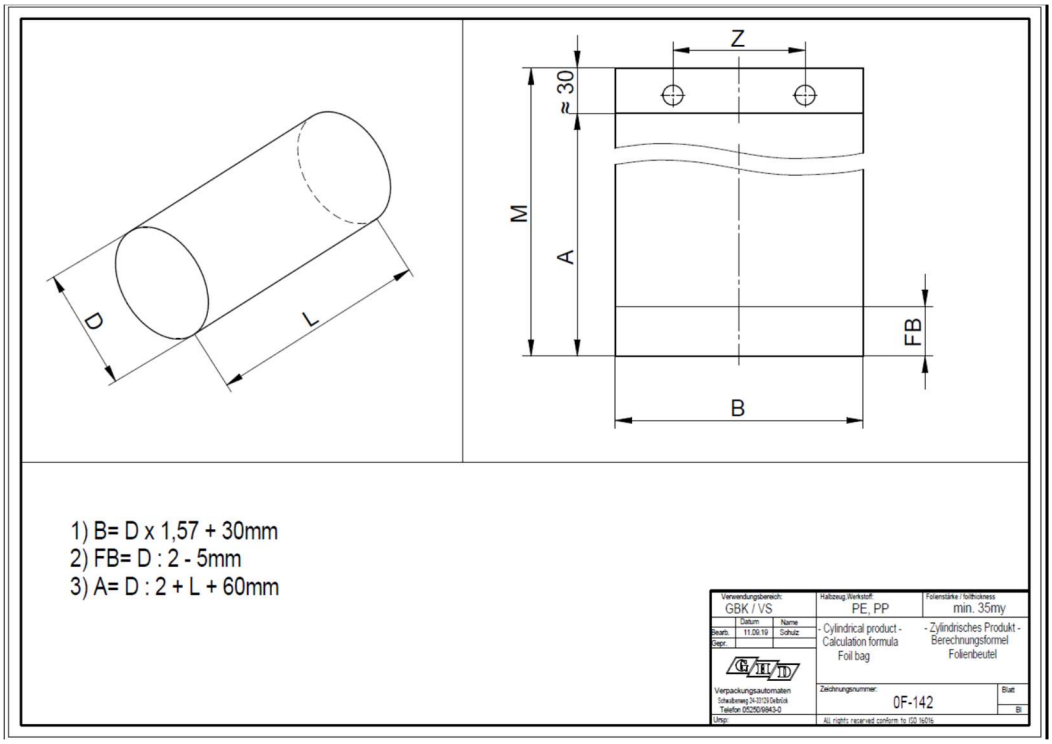
1.4 Open baked bread



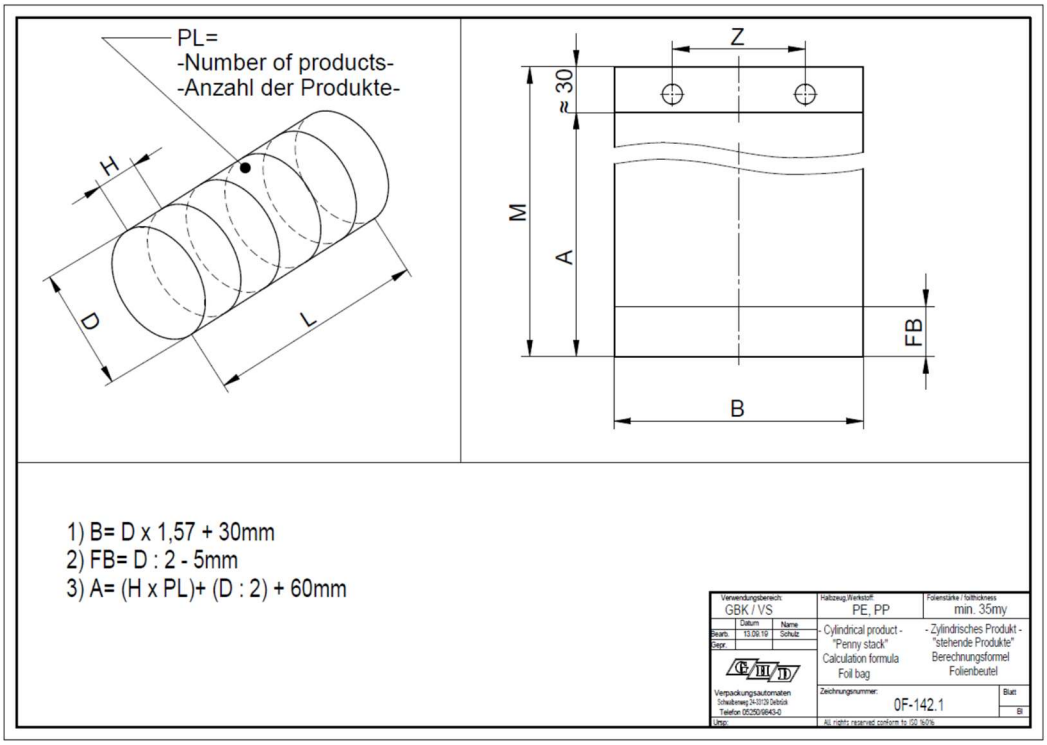
1.5 Round bread



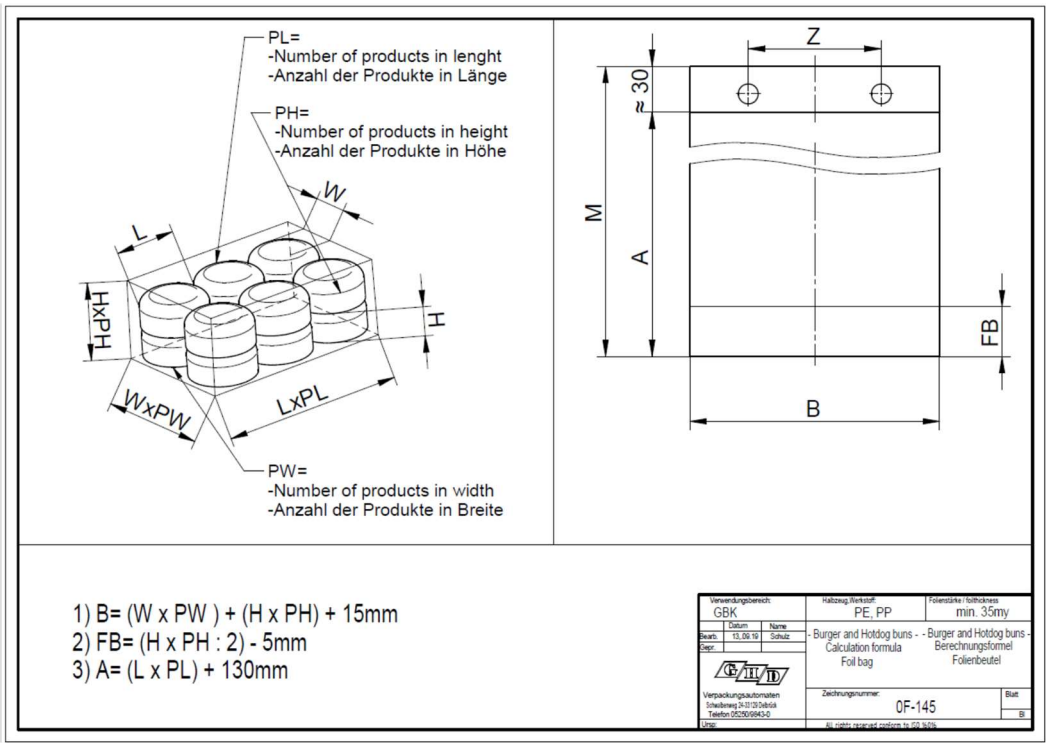
1.6 Cylindric bread



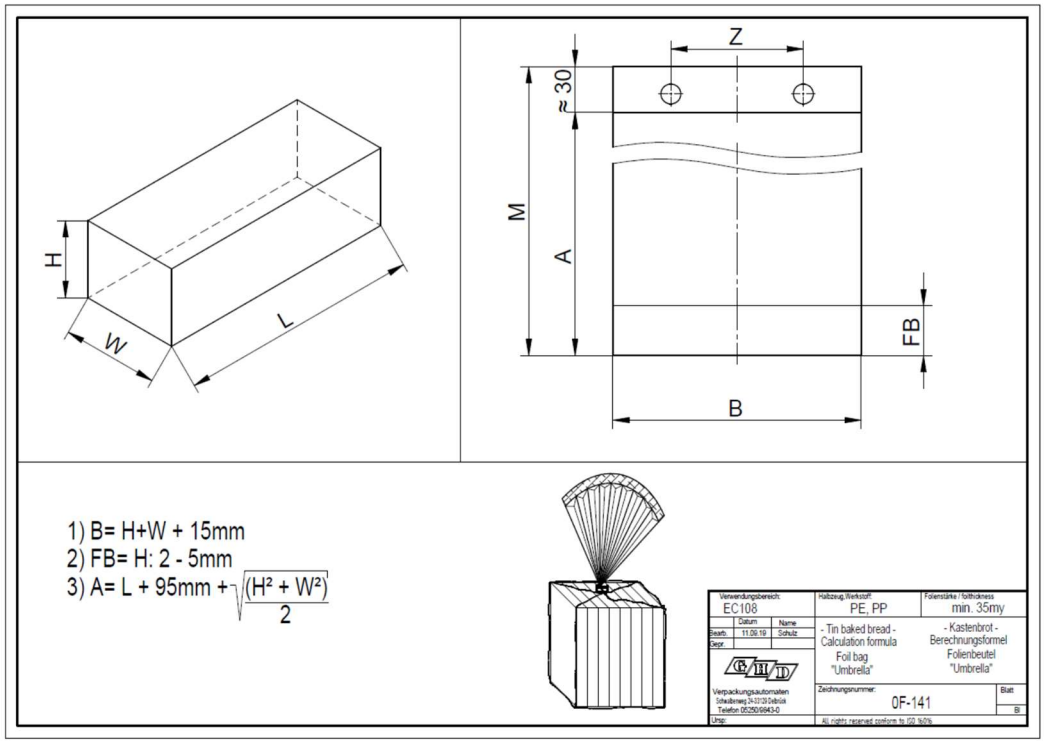
1.7 Penny Pack



1.8 Autoload loading of grouped products



1.9 Umbrella

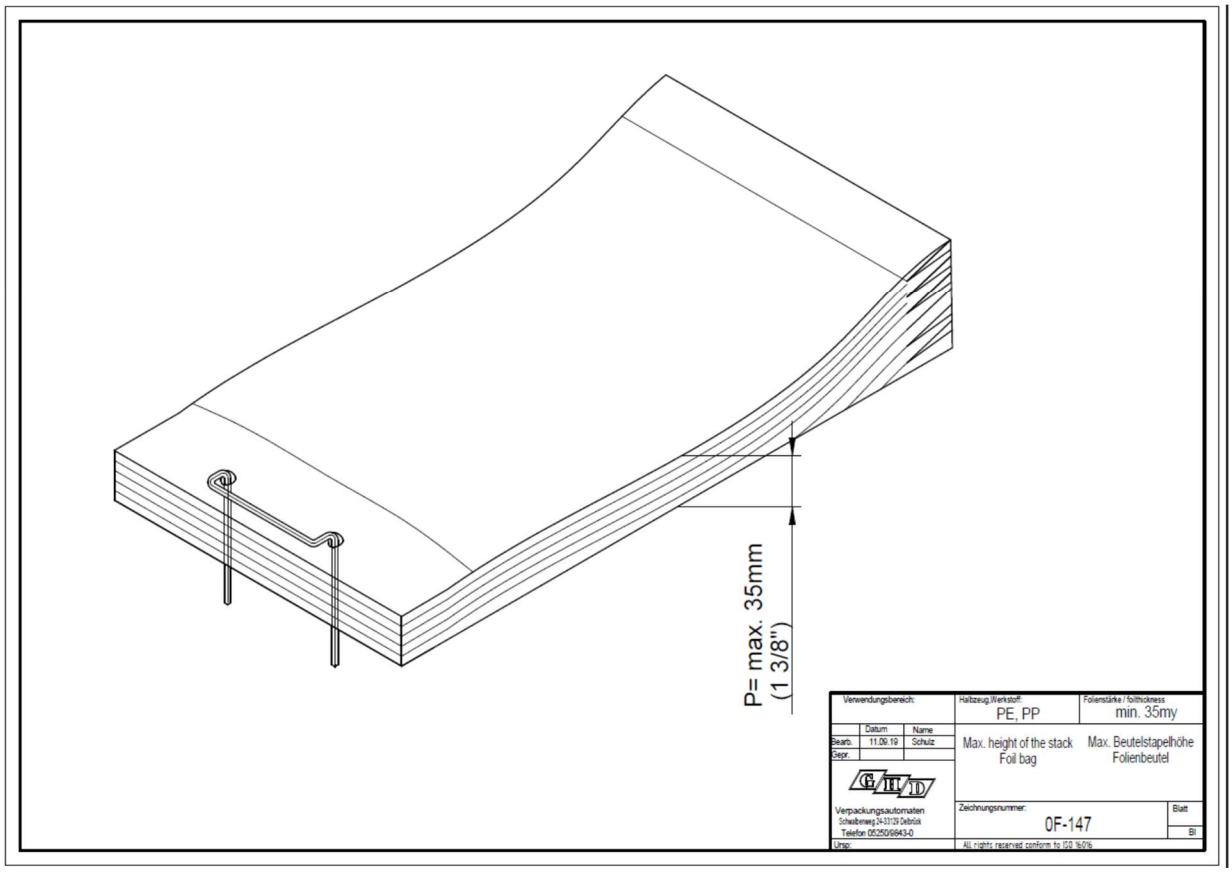


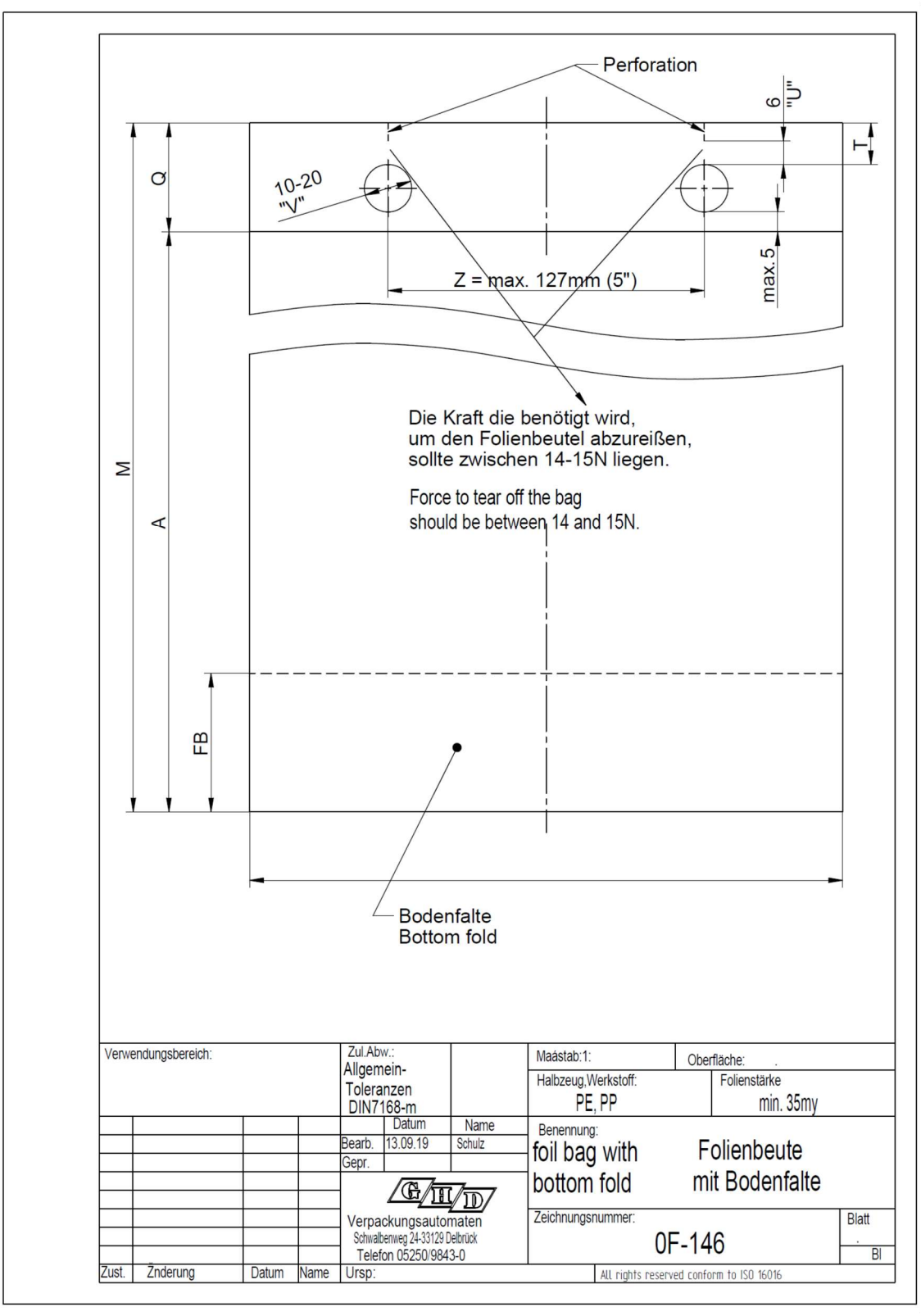
Notes: a) For sealing: Consider the sealing properties of the material

2. Bag stack sizes

The bag stack should not be higher than 35 mm (1 3/8“) to be automatically fed into GHD Hartmann packaging machines of the type GBK or VS. Some EC -type closing units are equipped with manual bag tables. The recommendations are valid as well.
Consider the folding height, especially if paper bags are used!
For example: With a foil material thickness of 35 µm the bag height is min. 70 µm. A stack height of 35 mm might contain up to max. 500 bags in theory.
Consider bag tolerances !
The Wicket sizes depend on the products – see paragraph 3)

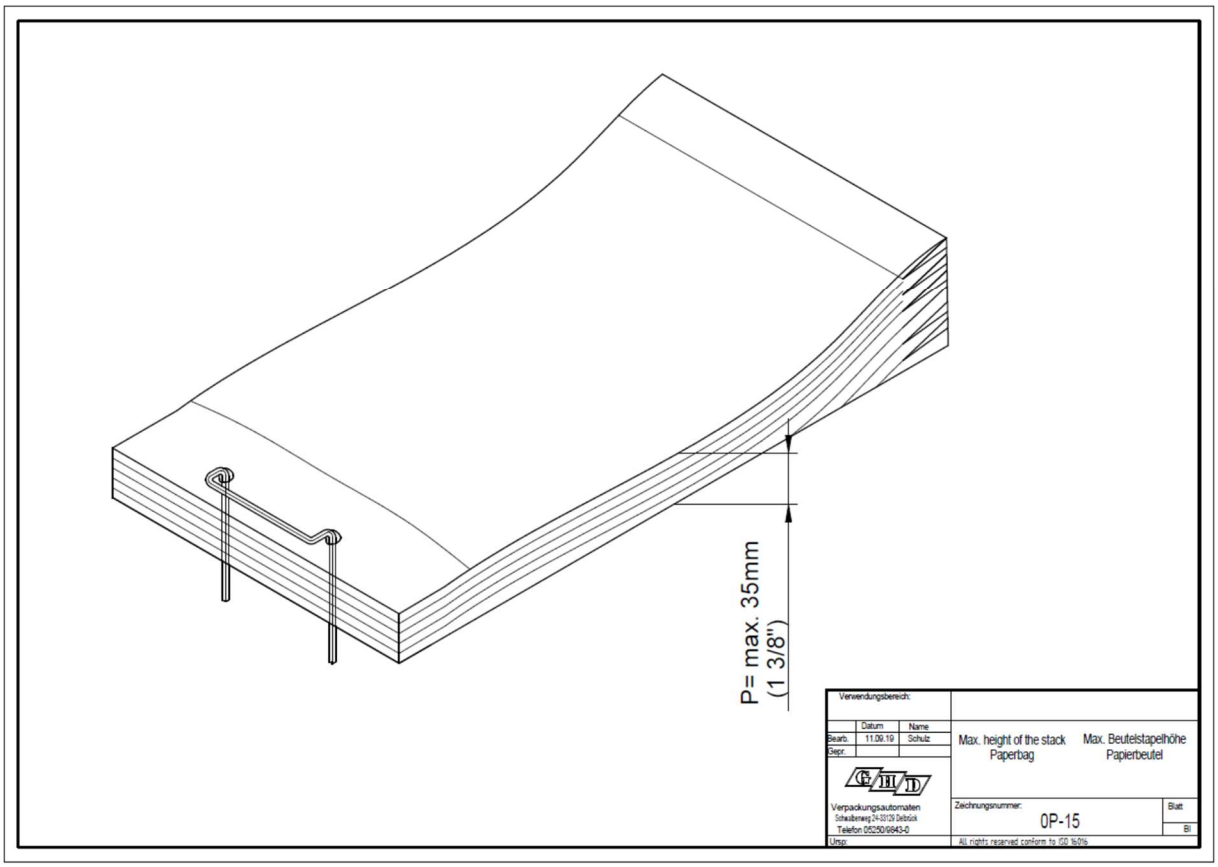
2.1 Plastic bags

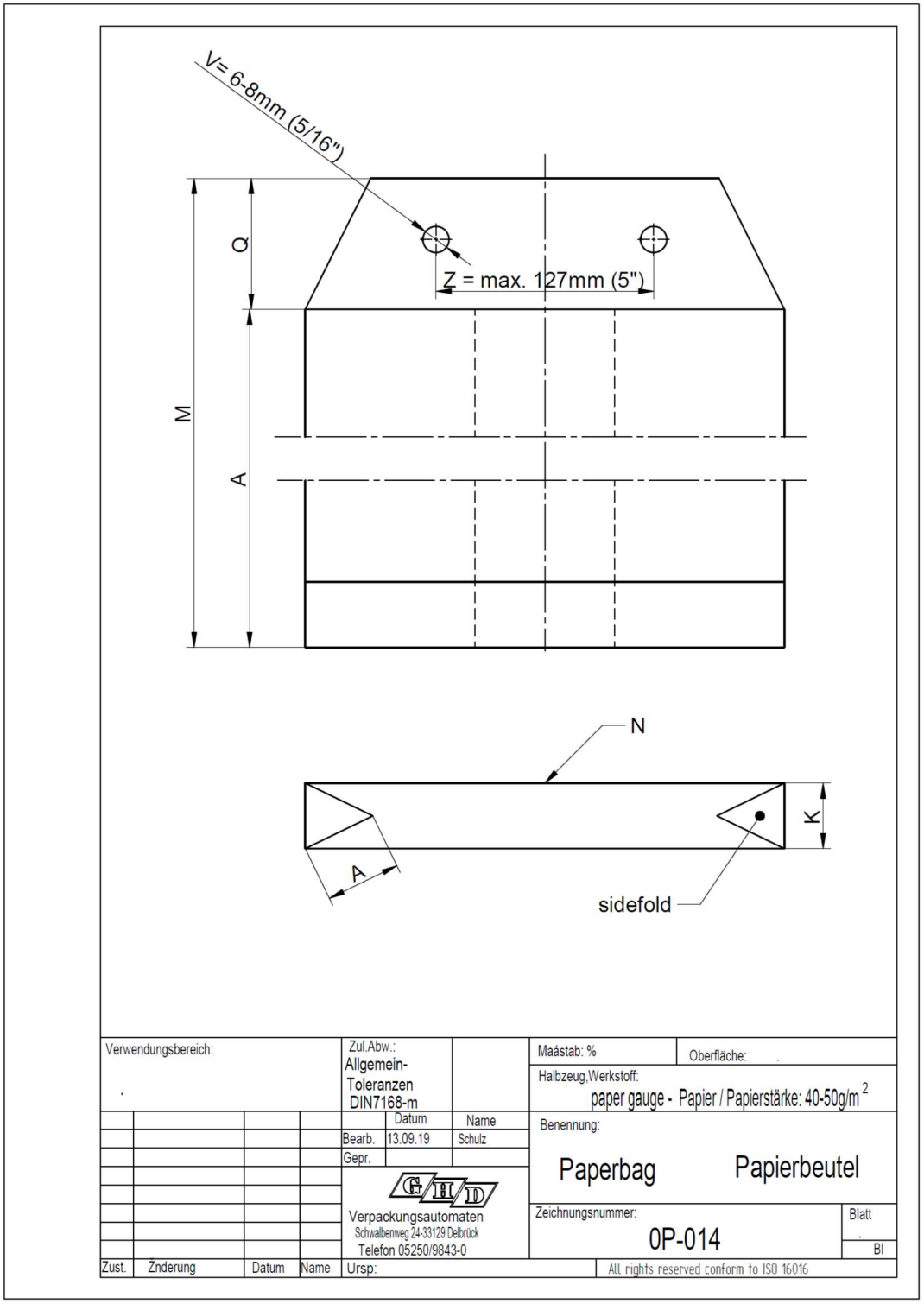



Perforation
6
"U"
T
Q
10-20
"V"
Z = max. 127mm (5")
max.5
Die Kraft die benötigt wird,
um den Folienbeutel abzureißen,
sollte zwischen 14-15N liegen.
Force to tear off the bag
should be between 14 and 15N.
M
A
FB
Bodenfalte
Bottom fold
Verwendungsbereich:
Zul.Abw.:
Allgemein-
Toleranzen
DIN7168-m
Maástab:1:
Oberfläche:
Halbzeug,Werkstoff:
PE, PP
Folienstärke
min. 35my
Datum
Name
Bearb.
13.09.19
Schulz
Gepr.
Benennung:
foil bag with
bottom fold
Folienbeute
mit Bodenfalte
Verpackungsautomaten
Schwalbenweg 24-33129 Delbrück
Telefon 05250/9843-0
Zeichnungsnummer:
0F-146
Blatt
Bl
Zust.
Änderung
Datum
Name
Ursp:
All rights reserved conform to ISO 16016

Packing material:	prepared bags from Polyethylene (PE), Polypropylene (PP), laminated materials.
Foil thickness:	35 µm (25 – 40 µm)
Notes:	a) For sealing: Consider the sealing properties of the material b) bag edges lengthwise: Consider the sealing quality. If spreading the bag for automatic loading, the sealing needs to be stable.
Closures:	Clip, Schutte Clipps®, Kwik-Lok®, Thurne/ plasic tape, sealing, Twister (local)
Quality closure:	Tamper proof 1-row, Tamper proof 2-rows and Hot needle in combination with clip closure, Schutte Clipps® or Kwik-®Lok.

2.2 Paper bags



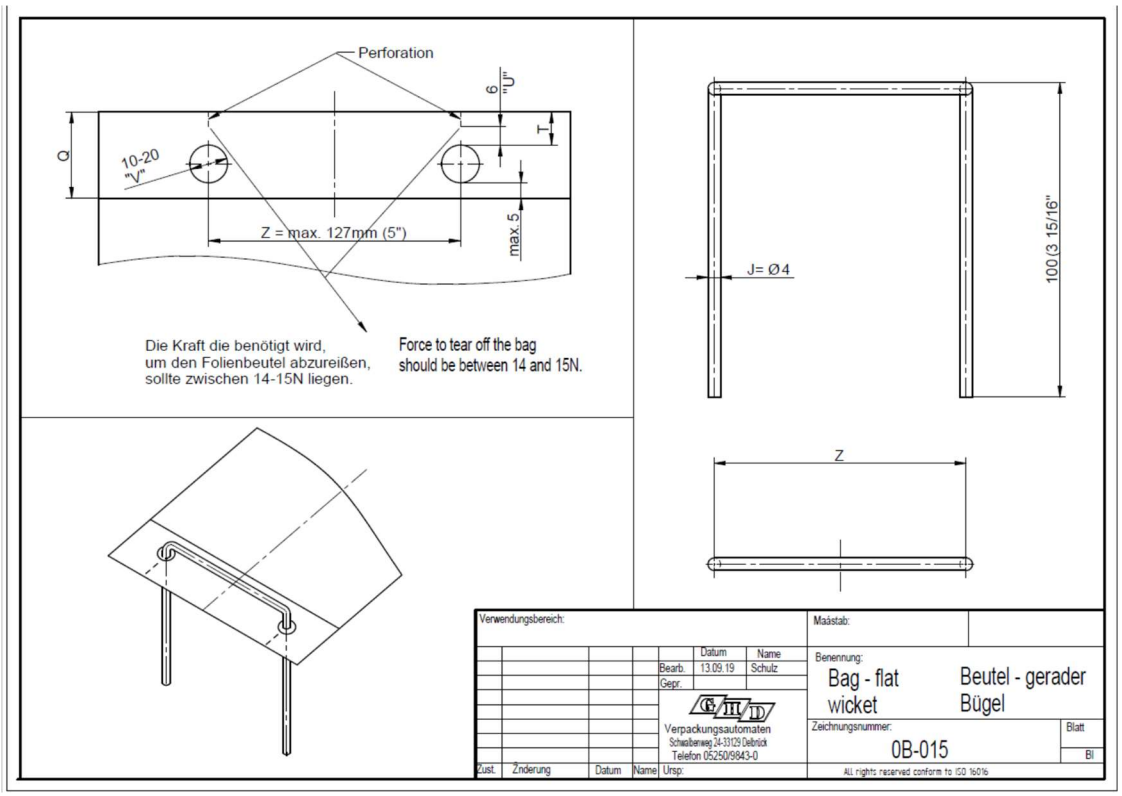


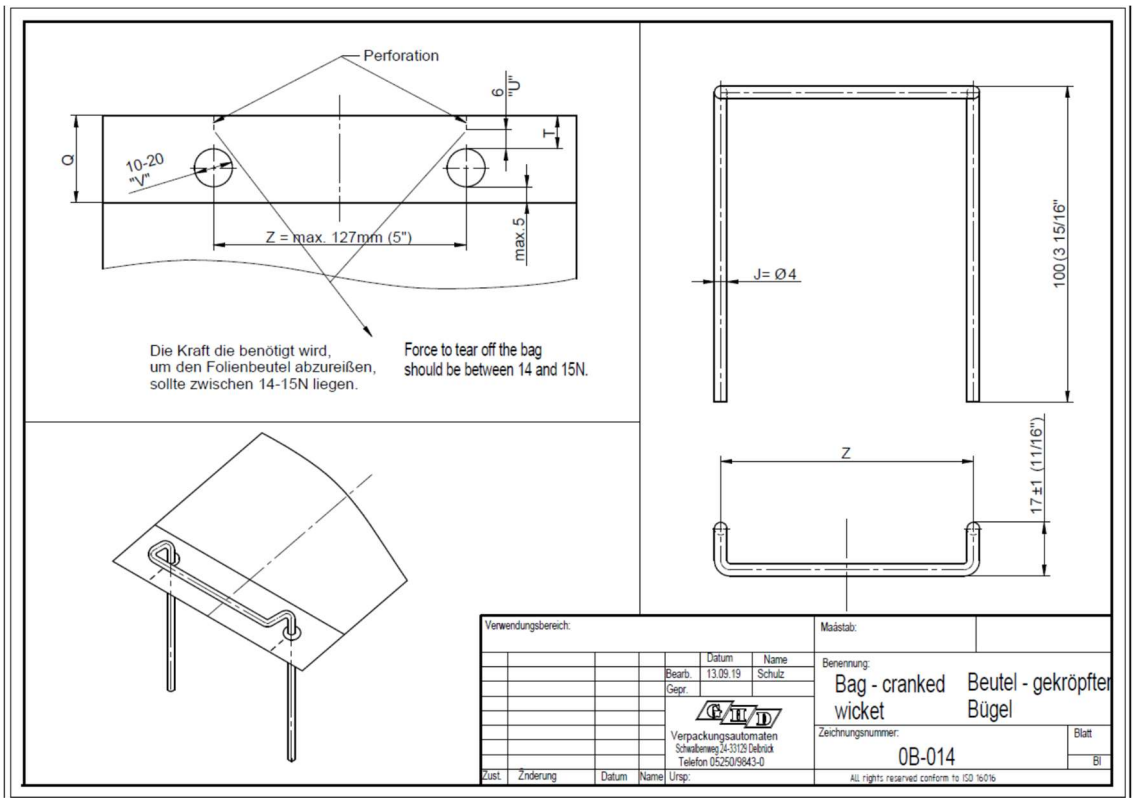
Verwendungsbereich: .				Zul.Abw.: Allgemein-Toleranzen DIN7168-m		Maástab: %	Oberfläche: .
						Halbzeug,Werkstoff: paper gauge - Papier / Papierstärke: 40-50g/m 2	
					Datum / Name		
				Bearb.	13.09.19 / Schulz	Benennung: Paperbag Papierbeutel	
				Gepr.			
				Verpackungsautomaten Schwalbenweg 24-33129 Delbrück Telefon 05250/9843-0		Zeichnungsnummer: 0P-014	Blatt . Bl
Zust.	Änderung	Datum	Name	Ursp:		All rights reserved conform to ISO 16016	

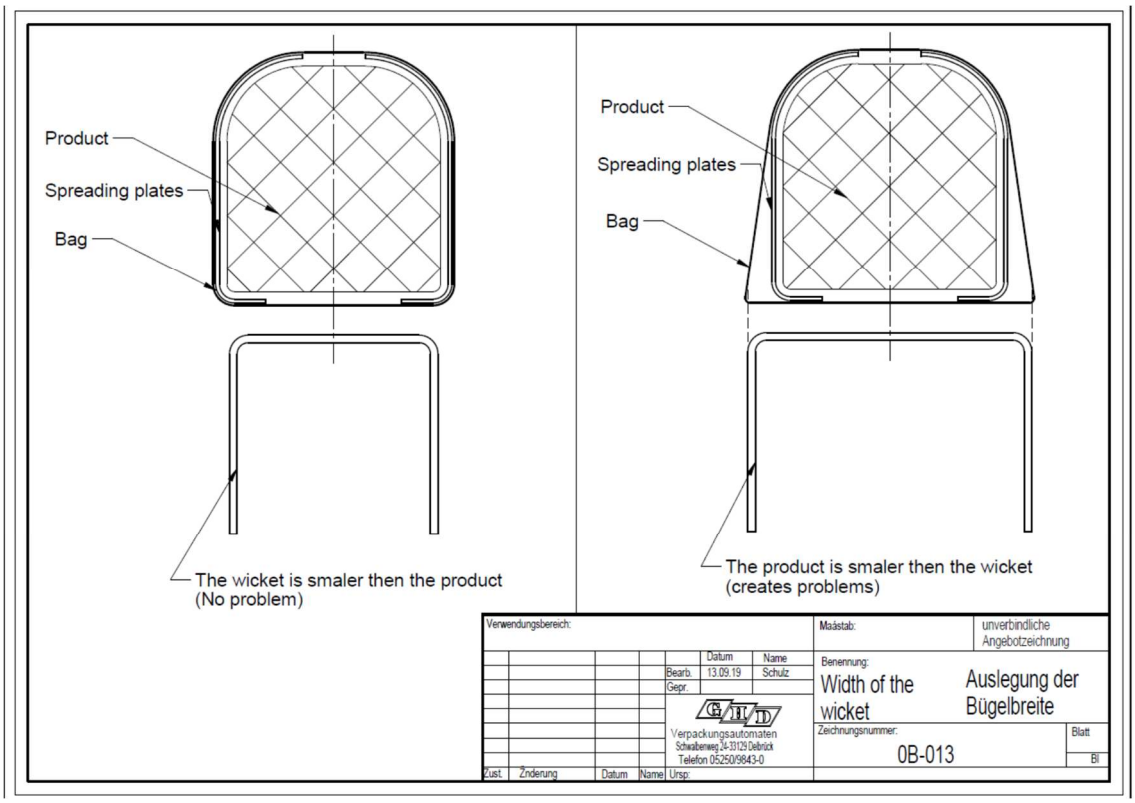
Packing material:	prepared bags from paper or laminated papers with plastic vision opening.
Paper quality:	40 -50 g /m² (0.036 – 0.046 ounces/inch²)
Notes:	a) Paper bags could NOT be closed with Kwik-Lok ® closures inside GHD Hartmann packaging machines type GBK or VS. Due to the typical sharp noses in the closures, which might damage the paper bag materials. b) Any closure is NOT applied as close to the product compared to a plastic bag due to risk of bag cracking to to a very tight closure application.
Closures:	Clip, Thurne/ plasic tape

3. Determination of the wicket size

The wicket design and the wicked sizes are important influencing factors for a smooth automated operation or easy manual loading.
Wickets are on the market as straight or cranked versions. Within GHD Hartmann automated packaging machines the wicket is rejected automatically. For this function, the bag handle can be cranked or uncranked and in any case not wider than 127 mm (5").


Perforation
6
"U"
T
Q
10-20
"V"
Z = max. 127mm (5")
max. 5
Die Kraft die benötigt wird,
um den Folienbeutel abzureißen,
sollte zwischen 14-15N liegen.
Force to tear off the bag
should be between 14 and 15N.
J= Ø 4
100 (3 15/16")
Z
Verwendungsbereich:
Maßstab:
Datum
Name
Bearb.
13.09.19
Schulz
Gepr.
Benennung:
Bag - flat
wicket
Beutel - gerader
Bügel
Verpackungsautomaten
Schwabenweg 24-33129 Delbrück
Telefon 05250/9843-0
Zeichnungsnummer:
0B-015
Blatt
Bl
Zust.
Änderung
Datum
Name
Ursp:
ALL rights reserved conform to ISO 16016


Perforation
6
"U"
T
Q
10-20
"V"
Z = max. 127mm (5")
max. 5
Die Kraft die benötigt wird,
um den Folienbeutel abzureißen,
sollte zwischen 14-15N liegen.
Force to tear off the bag
should be between 14 and 15N.
J= Ø 4
100 (3 15/16")
Z
17±1 (11/16")
Verwendungsbereich:
Maßstab:
Datum
Name
Bearb.
13.09.19
Schulz
Gepr.
Benennung:
Bag - cranked
wicket
Beutel - gekröpfter
Bügel
Verpackungsautomaten
Schwabenweg 24-33129 Delbrück
Telefon 05250/9843-0
Zeichnungsnummer:
0B-014
Blatt
Bl
Zust.
Änderung
Datum
Name
Ursp:
ALL rights reserved conform to ISO 16016



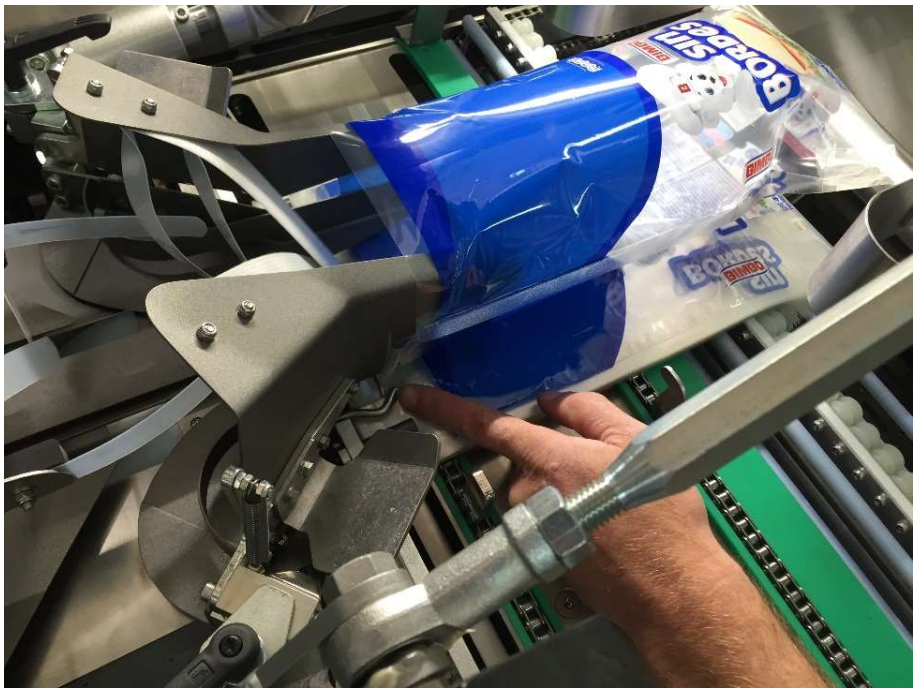
The wicket should be smaller in width than the product width or the total width of grouped products. The maximum width of the wicket should not exceed the product width.

Narrow bracket related to bag width

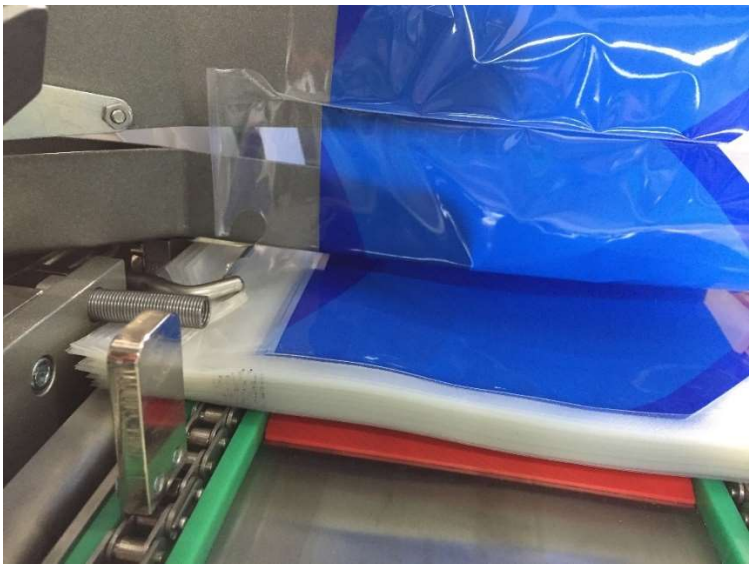
Wide bracket related to bag width

If the wicket width is not correct adjusted, you will have the following picture:
View straight downwards from the spreading plates:

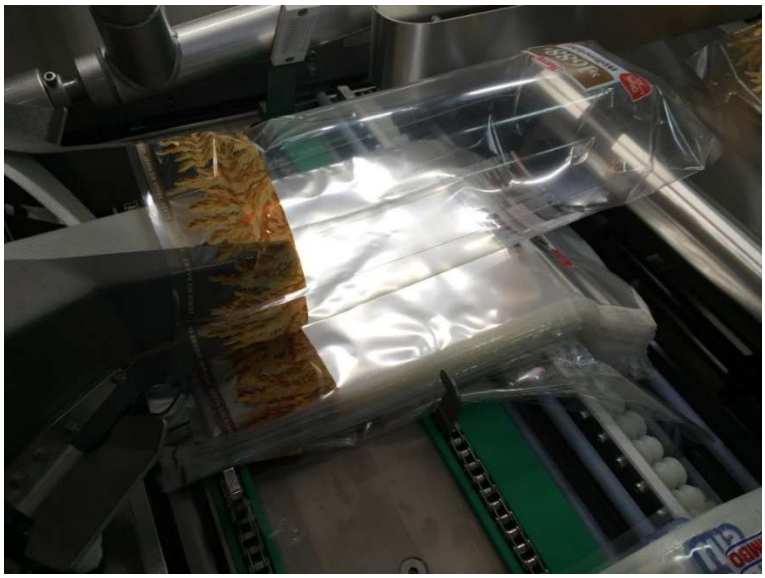
If the wicket is TOO wide, you could see the bracket on both sides outside the spreading plates.



That creates the following effect: The bag is RIPPED OFF from the wicket. The bag is nearly ripped of the stack by entering with the spreading plates; the bag is more loose and is not under control.



With narrow brackets you would keep the bag in position BEFORE inserting the bread. Consider the bag remaining fixed on the wicket/bag stack



In the automated process, the bread is inserted into the spread opened bag. If the bag is fixed on the wicket, the insert and pushing effect is overrunning the fixing point and is ripping of the bag from the bag stack WHEN the bread is reaching the bottom end of the bag.

IF the bag was loose because of a too wide wicket, the bag might get out of control: Worst case is an unproper packed bag and product rejects.

4. Counterforce for ripping off bags

The counterforce for ripping off the top positioned bag from the bag stack is another important influencing factor for a smooth automated operation or easy manual loading.
The conterforce allows a proper filling of the bag before it is released for a closure application or for a further process. During the loading sequence the bag must remain in the designated position. This is achieved by a correct adjusted counterforce for ripping of a single bag.

4.1 Perforation

The technical solution is a prepared perforation in the tear-off tab between the holes for the wicket and the outer edge of the tear-off tab. If the foil material is too weak, there is not much force required to rip the bag of. Strong foils and thick foil material create a strong counter force. The counterforce is directly related to the length of the perforation and perforation design. As well the bag material temperature may affect the counterforce.

Depending on the products and the machinery equipment the counterforce might vay slightly. This could become an issue in both directions.

That could easily checked:

Take the stack of bags, hold the stack by the wicket. The bags should be orientated with the bracket on top. Open the first bag by hand above a wash-bowl. Fill 1,5 liters (approx. 0.396 gal (US gallons)) of water into a measuring pitcher and start to fill up the first bag. 1,2 liters (approx. 0.317 gal) are the maximum allowed volume (and related ”force”) to rip of the bag. (These are approx. 12 N for paper bags) If you require more water, the bag is too stable and might create problems within the bagging process.

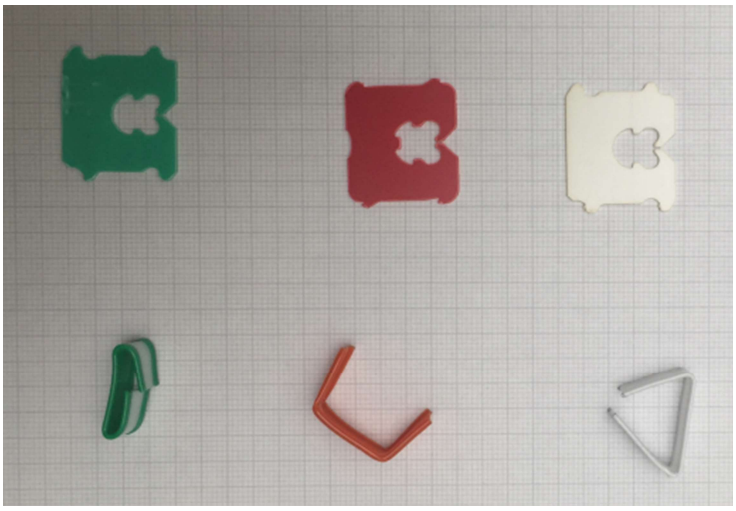
4.1 Sticking forces

Consider additional ”sticking forces” between the bags in the bag stack due to electrostatic load or missing dividing air between the individual bags.
This sticking effect is created during the production proces, shipping and conditioning before feeding into the packaging machine. At the loading procedure of the bag magazine, the operator could reduce or remove the effect by shaking the bag stack in feeding direction of the bags.

Note: The cardbord sheets on the top and bottom side of the sbag stack need to be removed before feeding into the packaging machines. Any rubber washers at the bottom side need to be removed as well. The machine is only fed with bags organized by the wicket.

5. Closures

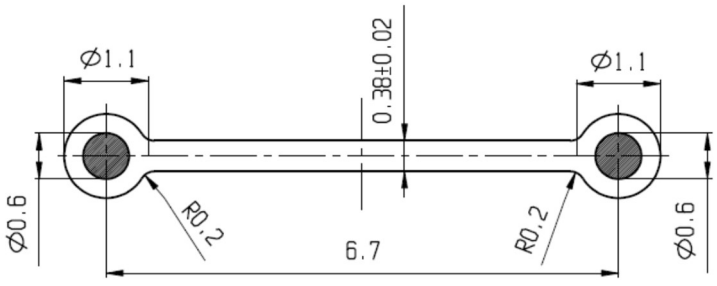
Depending on the customer demands, the GHD Hartmann machines could be supplied with one of the various closure application systems BUILT INSIDE the machine.
Not every machine could be equipped with every kind of closure application. A later exchange of the closing aggregate might be possible, but needs to be investigated in detail.



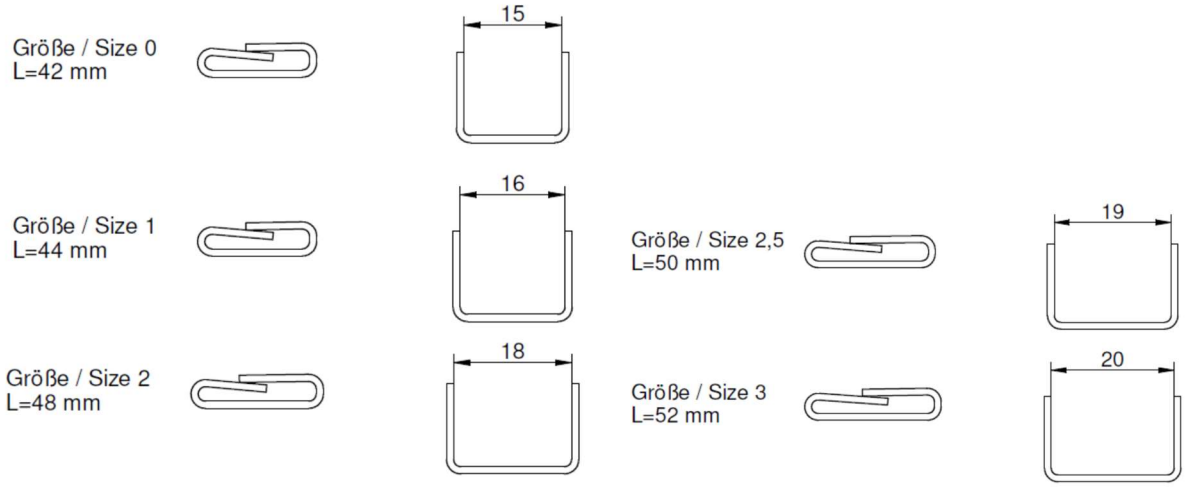
5.1 Clip closure

(GHD standard, with or without print, with bag evacuation for tight packaging (depending on machine type). Easy to handle, very good detectable, cheap, easy to re-close the bags.
Paper and plastic versions with two metal wires. Different sizes for wires

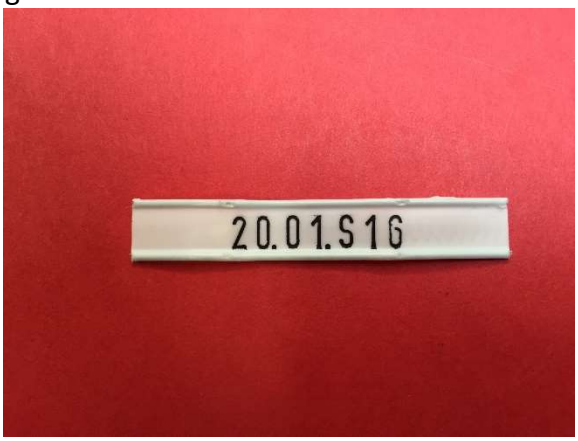
Dimension for standard-materials:



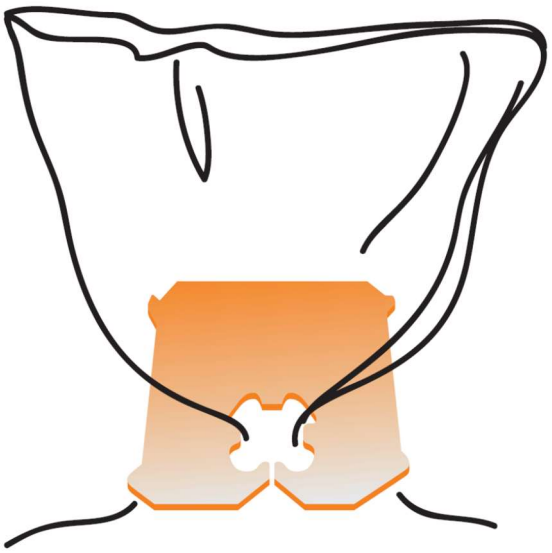
Depending of the product specifications and the related amount of packaging material, the clip length could be pre-selected



Printing on the clip closure is optional possible. GHD Hartmann offers printers with 1-row printing from 6 up to 13 figures or digits.



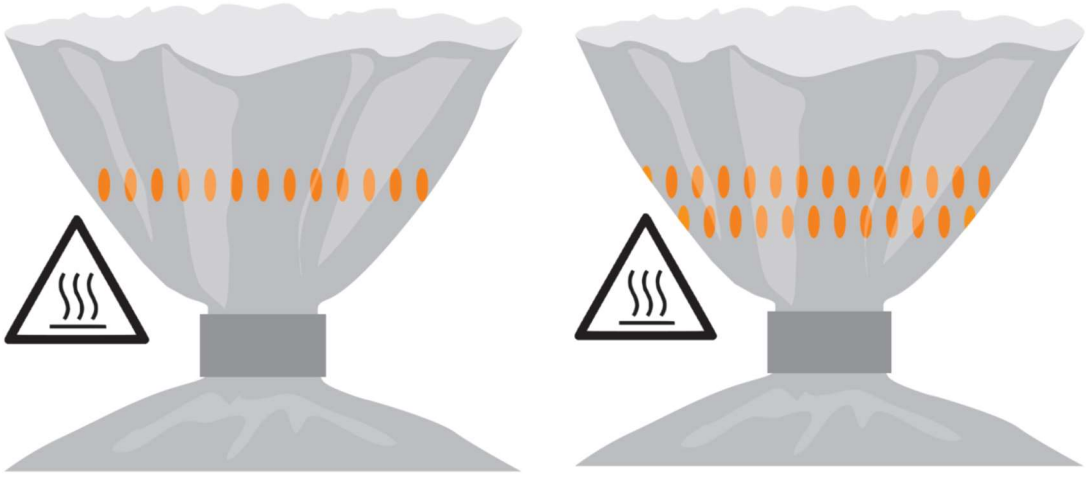
5.2 Kwik-®Lok/ Schutte Clipps® (or similar)



Schutte Clipps® or Kwik-Lok® closure with/without print. The most often used version is the Kwik-Lok® Type J-NRP or Schutte Clipps® G.
The correct opening width of the closure needs to be selected according to the amount of plastic or bag size to receive a tight closing result.
Without metal. With or without print, the adaption of Kwik-Lok® printers is possible

5.2 Quality closure / Tamper proof sealing

Within several GHD packaging machines the combination of a clip closing aggregate or an aggregate to apply a Schutte Clipps®/ Kwik® -Lok a tamper proof sealing is possible. It could be switch on/ of and could be supplied as either 1-row tamper proof sealing or 2-row tamper proof sealing.



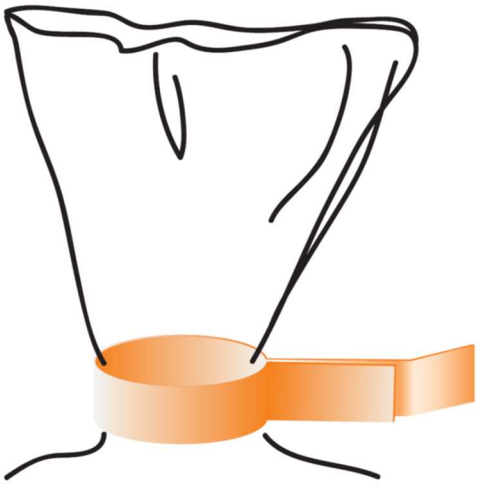
Clip and perforate sealing (Tamper proof sealing)

5.3 Quality closure / Hot needle through the clip closure

Within several GHD packaging machines the combination of a clip closing aggregate a not needle tamper proof sealing is possible. It could be switch on/ of. The clip could be reused after opening.

5.4 Tape / Thurn

Within some GHD packaging machines the usage of a tape for closing bags is available.



Not very easy to handle, due to the dependence of sticking qualities and aged tape materials. Printing on the closure is possible, sometimes a reclosing of bags might be possible as well. No metal included.

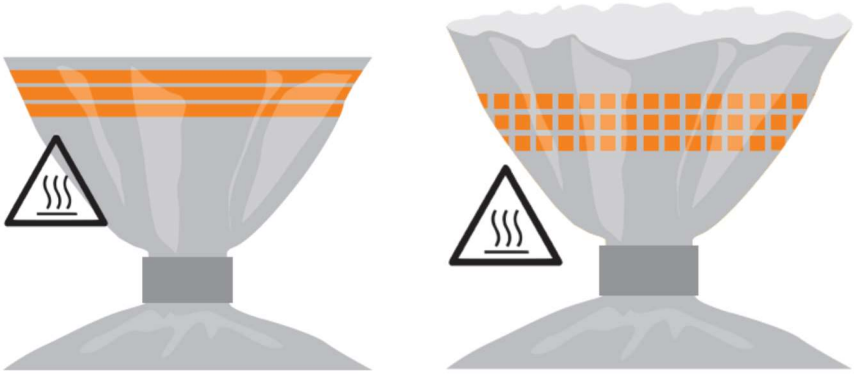
5.5 Sealing of the bag

Within some GHD packaging machines the usage of a sealing aggregate for closing the pre-manufactured bags is available. The sealing is not hermetic in general.
The tear-off tab side up to the sealing could be optional cut off and collected.

The handling depends on the product specification and height of the bags. The distance between products and sealing position depends on the product height. The bag material needs to be investigated for sealing results. Permanent head sealing or pulsed heated sealing with sealing bars.

5.6 Closure application with ADDITIONAL SEALING of the rouche

GHD Hartmann offers machines for the additional sealing of the rouch with or without cut-off the tear-of tab at a defined position. The sealing is not hermetic in general.

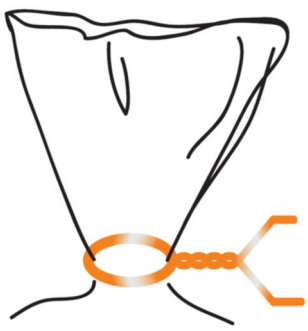


5.7 Umbrella packaging

GHD Hartmann offers a system to combine the sealing of a premanufactured bag together with the application of a Kwik-®Lok closure and the preparation of an umbrella like rouche folding. This is a diffent appearance in packaging and packages.

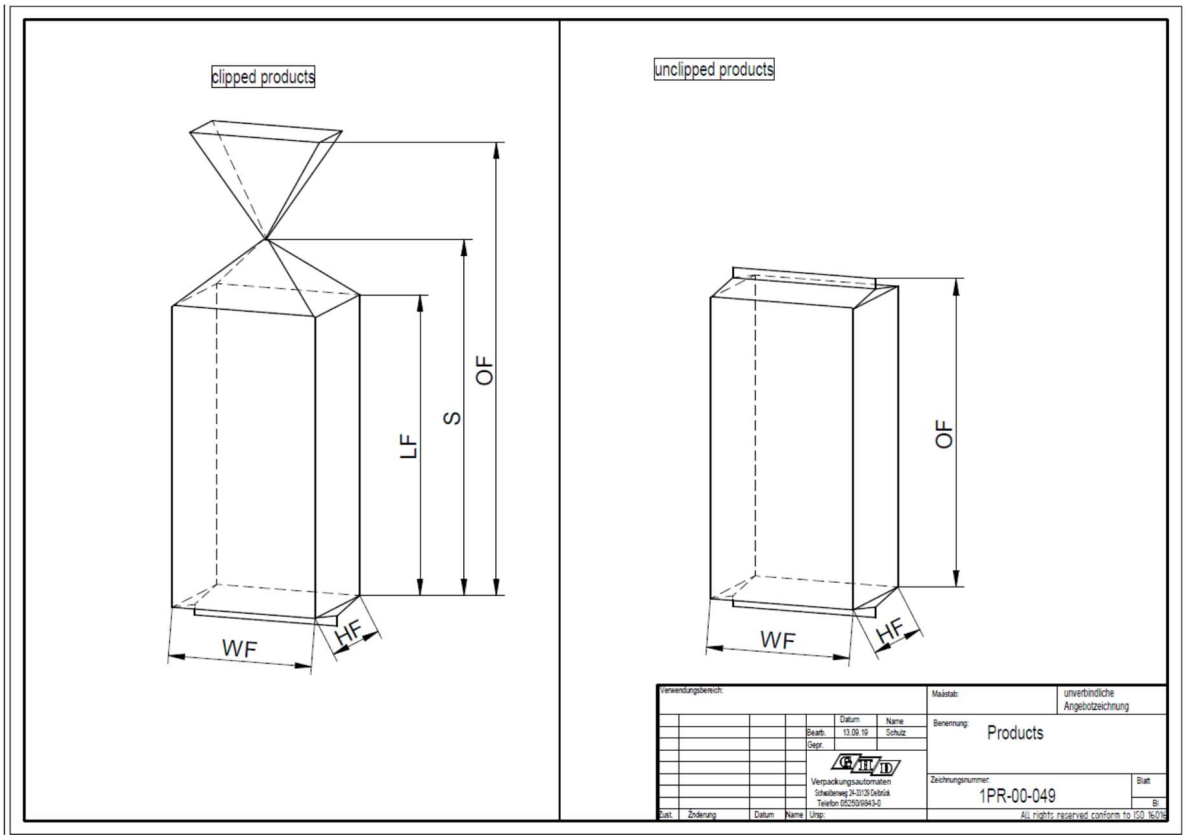
5.8 Twister

Twister closures need to be applied outside the GHD Hartmann packaging equipment at a local supplied unit. The open bags could be transported to that closing unit,. The disatvantage is that products or grouped products might loose their packaging pattern during the transport before the closure application.



5.9 Flowpack bags

Hartmann provides machines for the application of clip-closures or Kwik-Lok-closures onto a flowpack package. Depending on the type of flowpack package, the products are fed in horizontal or vertical direction. Some machines allow the choice between the application of closures or the transportation through the closure application machine without adding the closure.
Consider that the flowpack package needs to be ”nearly pressureless” and ”flat” to allow the folding of the rouche with closure application without damages.



For **further technical information** or questions please refer to the operating manual of the individual machine or contact our service team!

GHD Georg Hartmann Maschinenbau GmbH
Schwalbenweg 24
D-33129 Delbrück

Phone +49 (0) 52 50 / 98 43 - 0
Fax +49 (0) 52 50 / 98 43 - 562
e-mail: info@ghd.net
http://www.ghd.net

6. Appendicies:

Bag suppliers (for example only)

LEEB GmbH & Co. KG
Woringer Straße 14
DE-87700 Memmingen
Deutschland
Tel.: +49 (0) 8331 / 8201-0
Fax: +49 (0) 8331 / 8201-55
E-Mail: info@leeb.de
www.leeb.de

KWB Folien GmbH
Am Leveloh 7
DE-45549 Sprockhövel
Deutschland
Tel.: +49 (0) 2324 / 9747-0
Fax: +49 (0) 2324 / 9747-49
E-Mail: werk@kwb-folien.de
www.kwb-folien.de

Schur®Star Systems GmbH
Liebigstrasse 7
DE-24941 Flensburg
Deutschland
Tel.: +49 (0) 461 99 750
Fax: +49 (0) 461 98 191
www.schur.com

WEBER Verpackungen GmbH & Co. KG
Westerhaar 38
DE-58739 Wickede/Ruhr
Deutschland
Tel.: +49 (0) 2377 / 8099-0
Fax: +49 (0) 2377 / 8099-20
E-Mail: info@die-tuetenmacher.de
www.die-tuetenmacher.de

Polyden Folienfabrik GmbH
Werner-von-Siemens-Str. 14
DE-91217 Hersbruck
Deutschland
Tel.: +49 (0) 9151 / 7302-0
Fax: +49 (0) 9151 / 7302-125
E-Mail: info@polyden.de
www.polyden.de

Brayford Plastics Ltd
Horncastle Lane
Dunholme, Lincoln
England LN2 3QF
Tel.: +44 (0) 1522 530 557
Fax.: +44 (0) 1522 730 372
E-mail: info@brayfordplastics.com
http://www.brayfordplastics.commailto:info@brayfordplastics.com

Clip band suppliers (for example only)

SCHUTTE bagclosures
Brouwerstraat 8
NL-5400 AJ Uden (Holland)
Tel.: +31 (0) 413 – 264 776
Fax: +31 (0) 413 – 266 145
Herr Hans Den Roojen - Mobil: 0031 / 413264776
http://www.schutte.nl
schutte@schutte.nl

Clip - Technik Vertriebs GmbH
Wiescher Str. 11
42277 Wuppertal

Tel.: 0202 / 3177970

cliptechnik@t-online.de

K. Martin Clipbänder GmbH
Bruck 8
D-78355 Hohenfels-Liggersdorf
Tel.: 07557 – 910 47
Fax: 07557 – 910 48

Tripack-Verpackungs-GmbH
Waldsteiger Str. 14 D-88696 Owingen
Tel.: 07557 / 9289 71
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