

## **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 decision for bag sizes should be made by the bakery and the bag supplier.

### **1. Determination of the bag formats**

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

#### **1.1 Abbreviations**

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

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

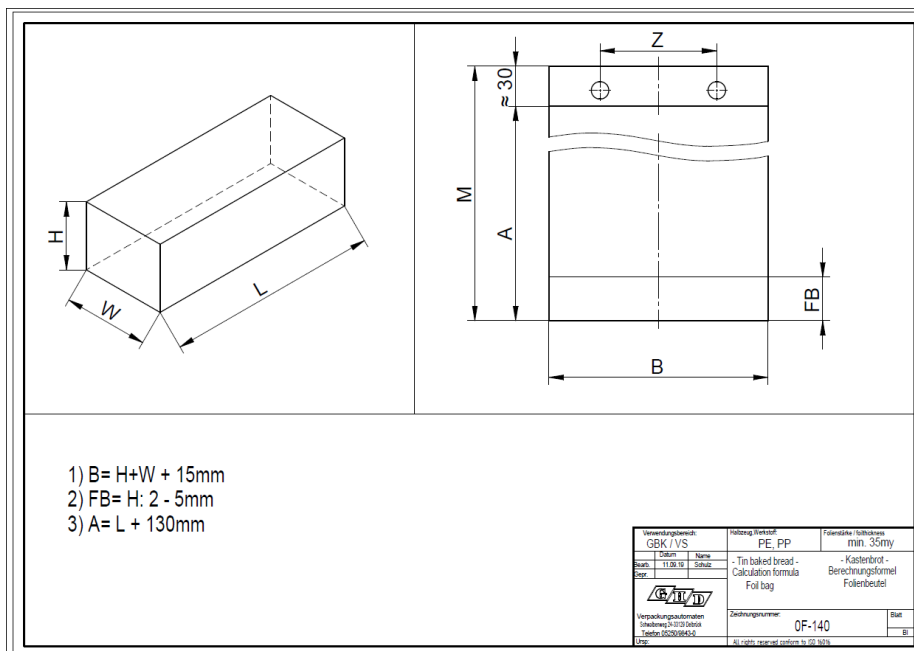
Consider in any case YOUR product related tolerances. The smaller the range of tolerances, the smaller the bag, less packaging costs, the more tight the package, the better the appearance of the package, the products keep in position, less air inside the bag which might create a longer shelf-life and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

Your calculations need to be based on the foreseeable dimensions.

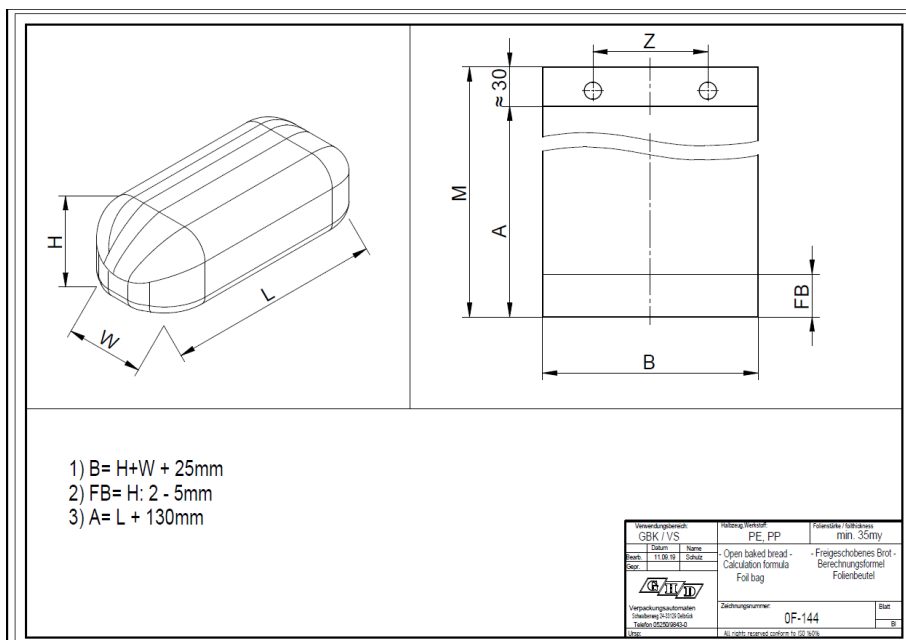
See: <https://www.ghd.net/en/service/faq>

=> How can I determine the size of bags?

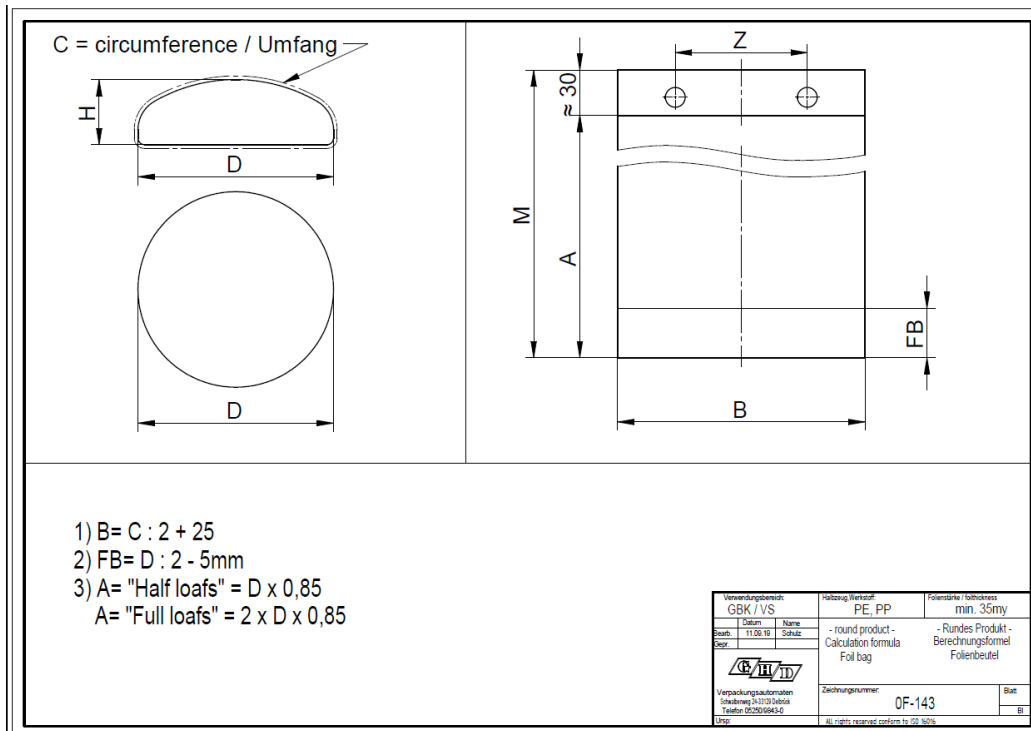
### 1.3 Tin bread



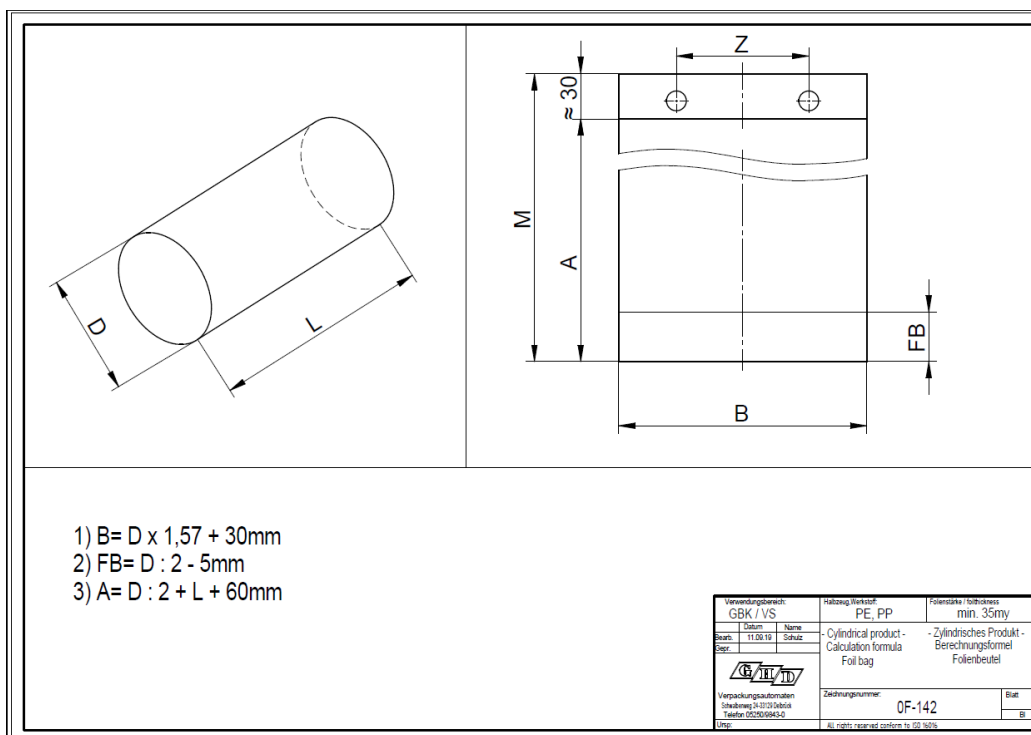
### 1.4 Open baked bread



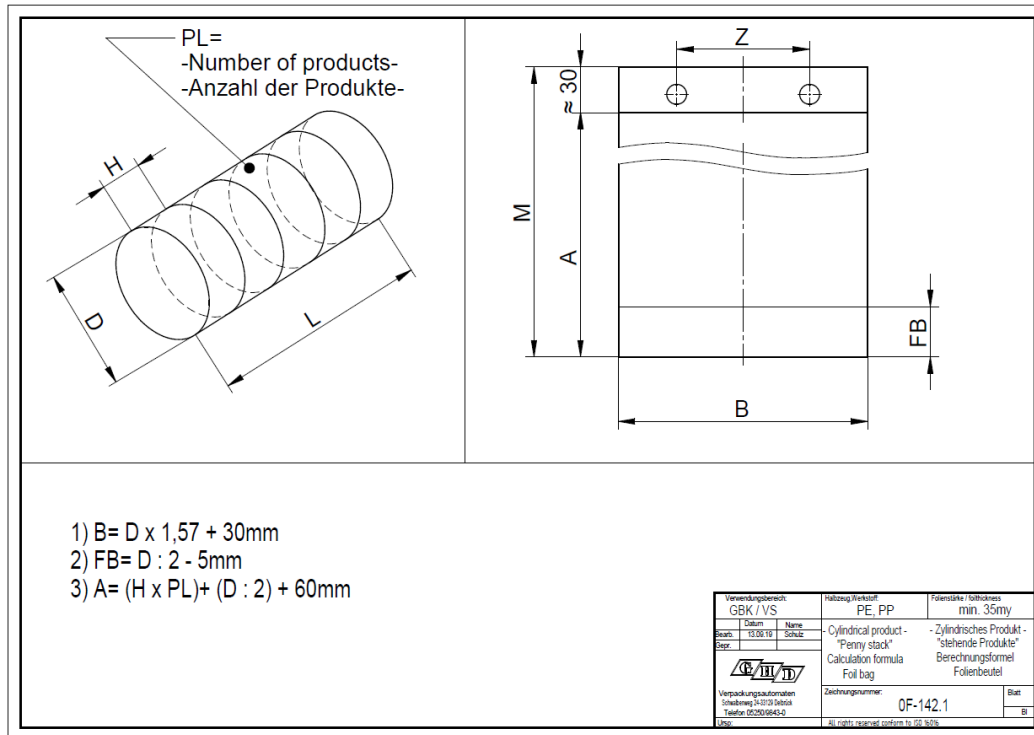
## 1.5 Round bread



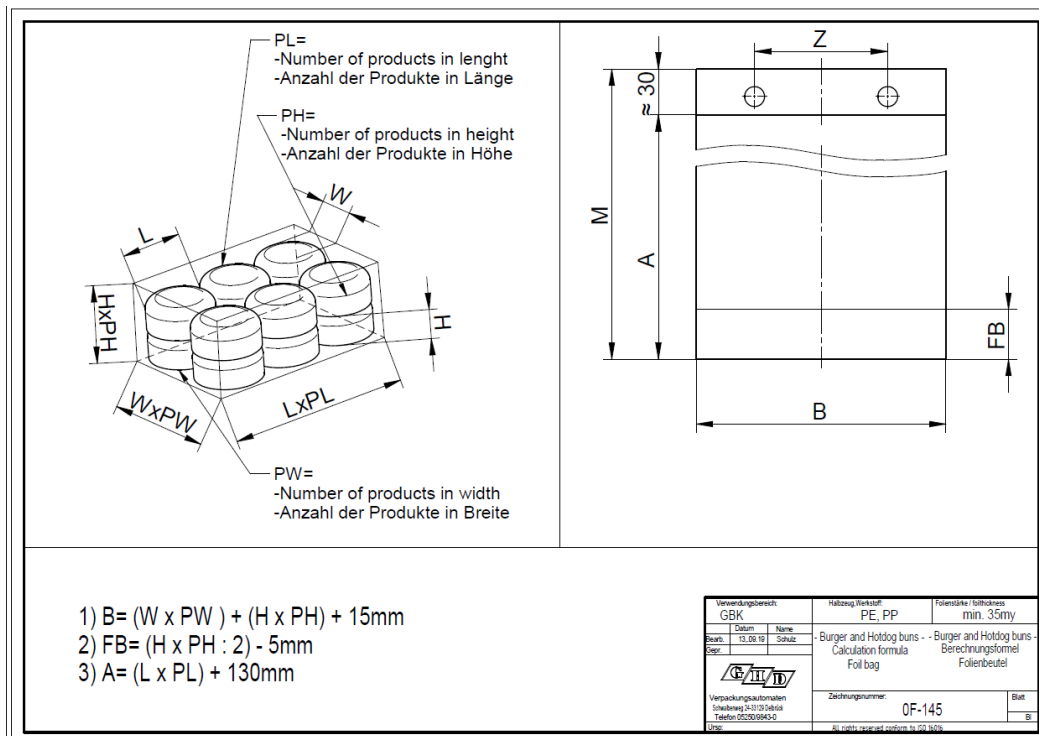
## 1.6 Cylindric bread



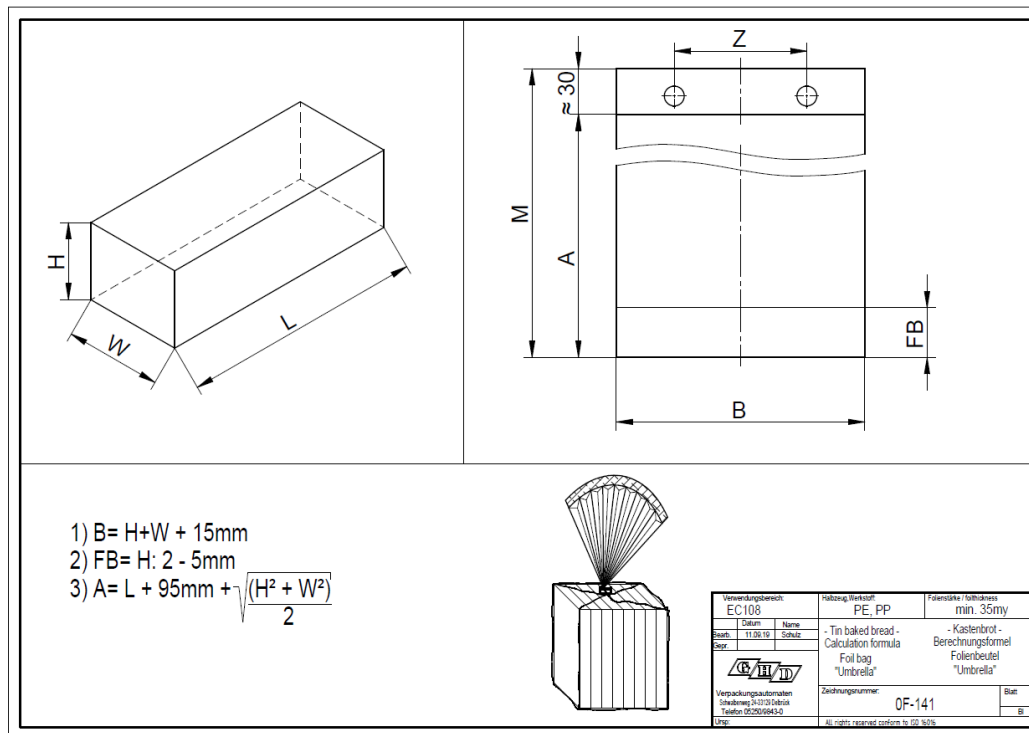
## 1.7 Penny Pack



## 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.

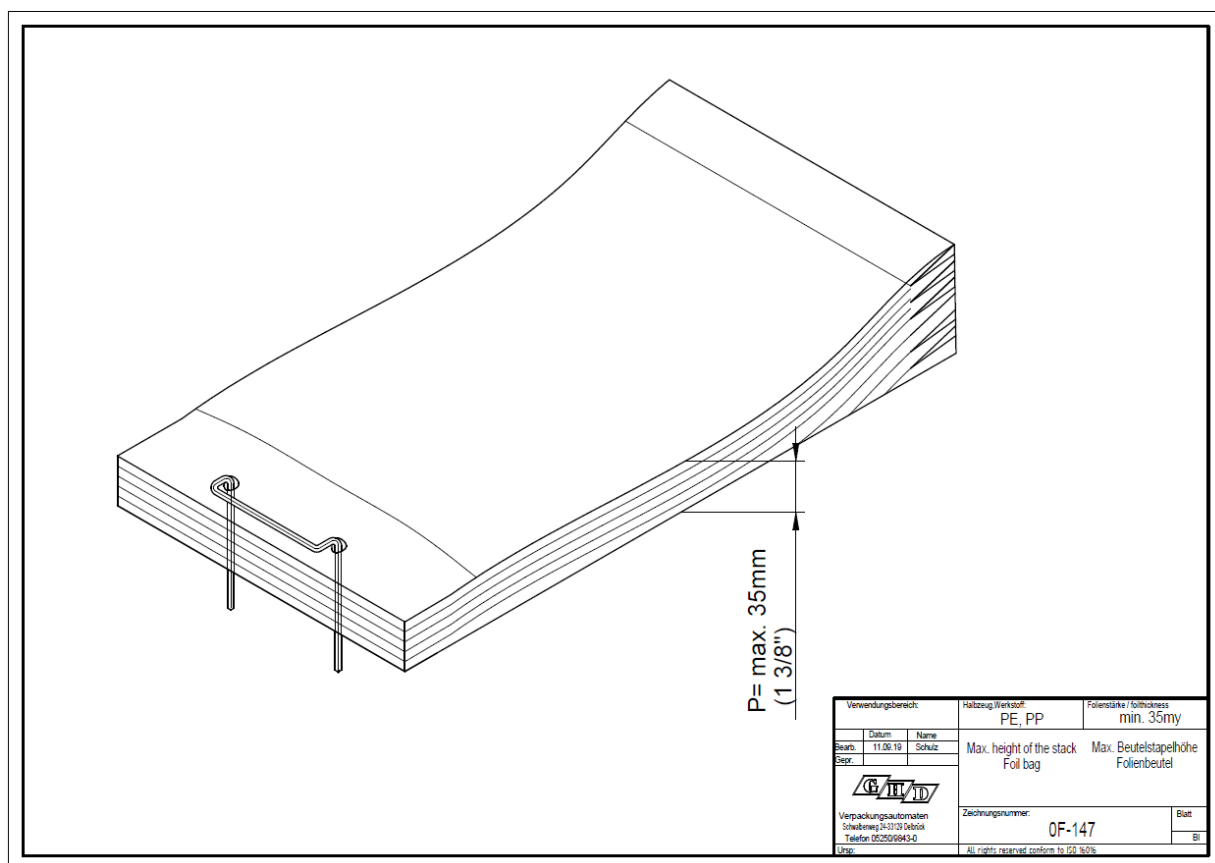
Consider the folding height, especially if paper bags are used!

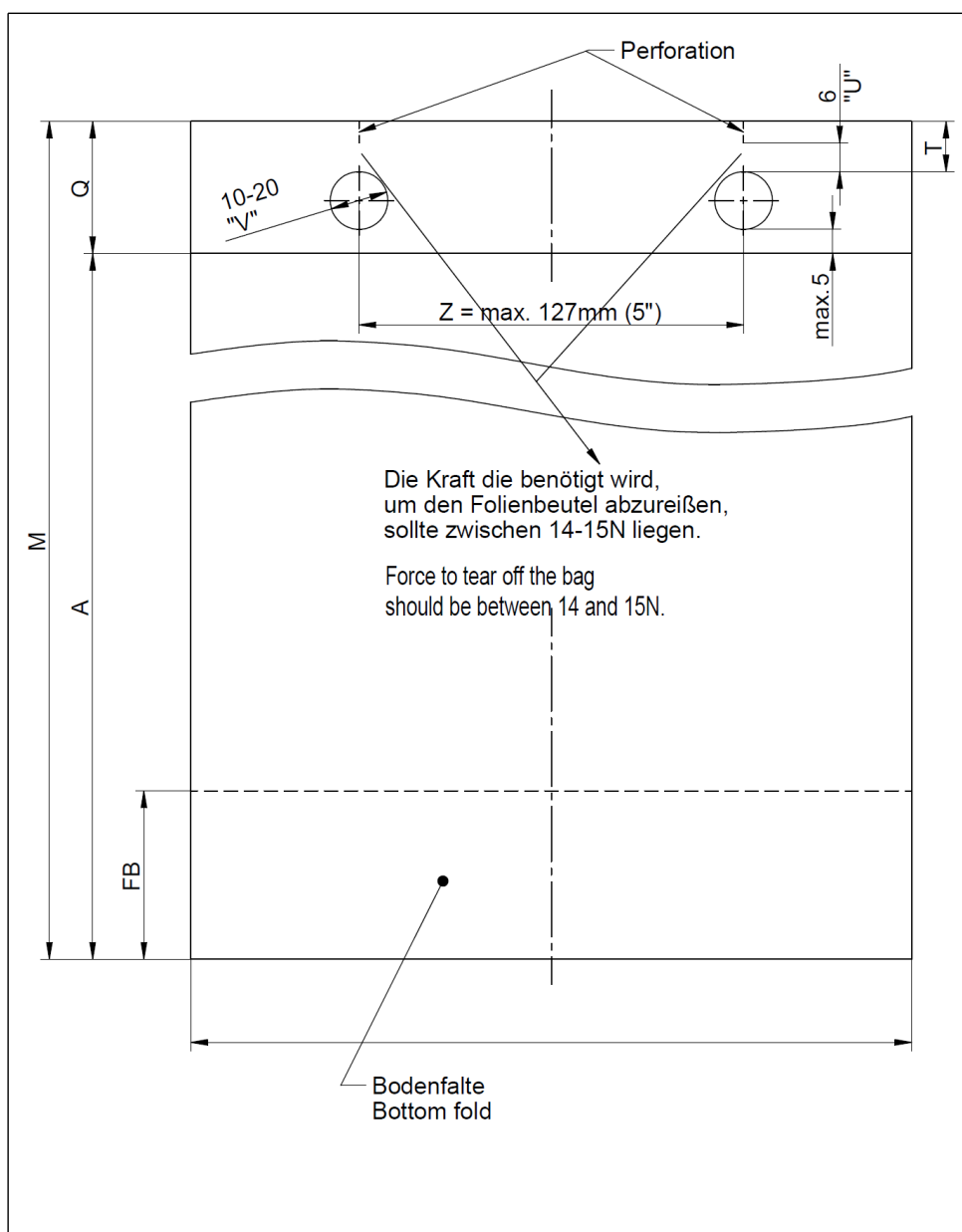
For example: With a foil material thickness of 35 µm the bag height is min. 70 µm. A stack height of 35 mm might contain up to max. 500 bags in theory.


Consider bag tolerances!

The Wicket sizes depend on the products – see paragraph 3)

### 2.1 Plastic bags



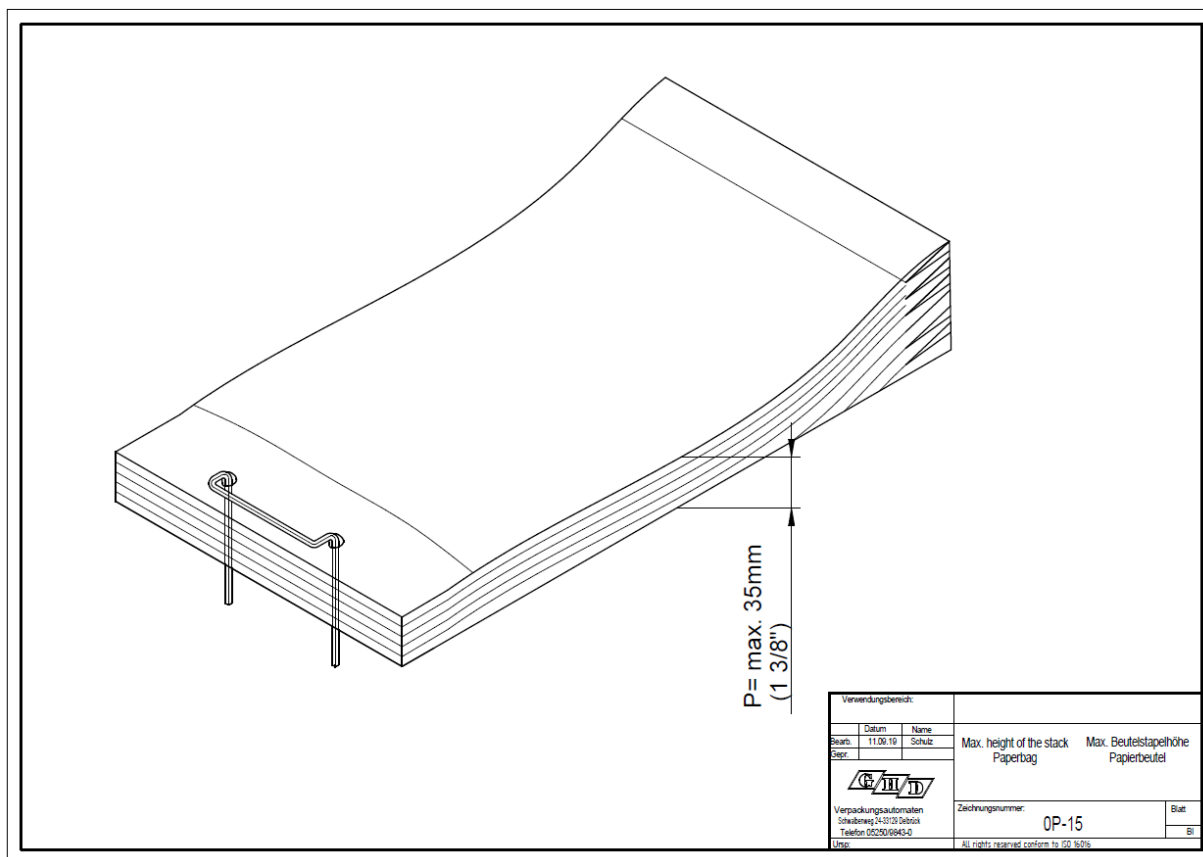


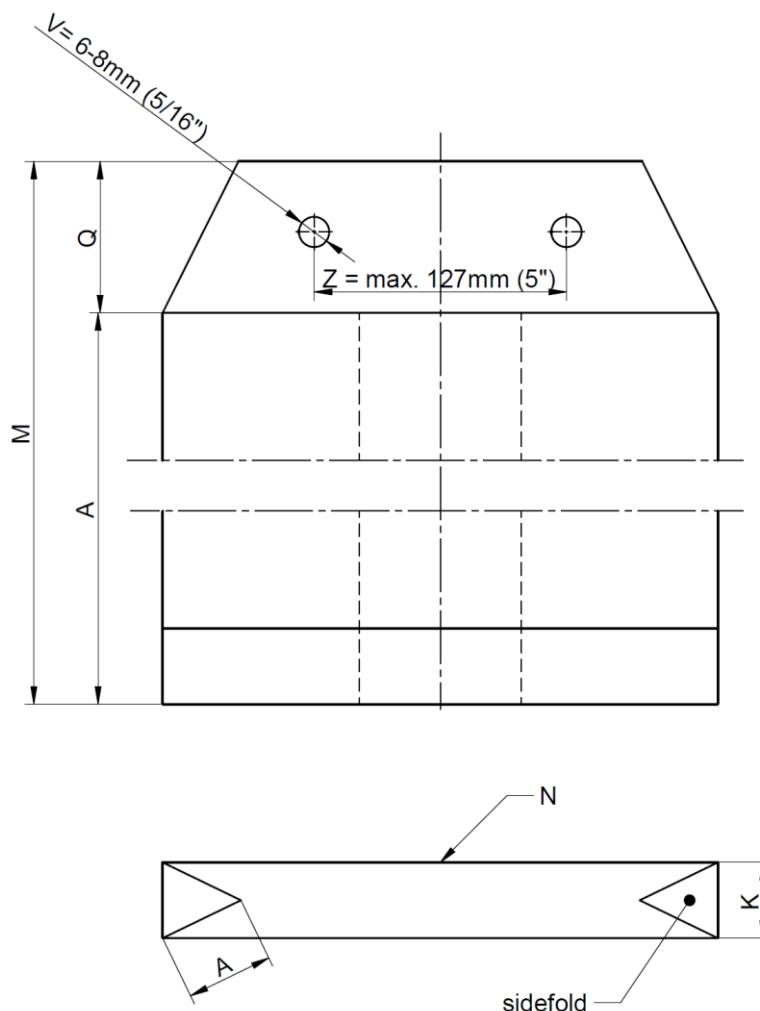
Verwendungsbereich:				Zul. Abw.: Allgemein- Toleranzen DIN7168-m		Maßstab:1:		Oberfläche:	
						Halbzeug,Werkstoff: PE, PP		Folienstärke min. 35my	
					Datum	Name		Benennung: foil bag with bottom fold Folienbeute mit Bodenfalte	
				Bearb.	13.09.19	Schulz			
				Gep.					
				 Verpackungsautomaten Schwalbenweg 24-33129 Delbrück Telefon 05250/9843-0					
						Zeichnungsnummer:		Blatt	
						0F-146			
Zust.	Änderung	Datum	Name	Urspr:		All rights reserved conform to ISO 16016			
						BI			




Packing material:	prepared bags from Polyethylene (PE), Polypropylene (PP), laminated materials.
Foil thickness:	35 µm (25 – 40 µm)
Notes:	<p>a) For sealing: Consider the sealing properties of the material</p> <p>b) Bag edges lengthwise: Consider the sealing quality. If spreading the bag for automatic loading, the sealing needs to be stable.</p> <p>c) Perforated films: 120 mm before the bag opening, the bag must not be perforated. Not for perforated seals. Possibly limited usability for automatic bag openings. Send bag to GHD for evaluation.</p>
Closures:	Clip, Schutte Clipps®, Kwik-Lok®, Thurne/ plastic 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.: <b>Allgemein- Toleranzen</b> DIN7168-m		Maßstab: %		Oberfläche:	
					Datum	Name		Halbzeug, Werkstoff: <b>paper gauge - Papier / Papierstärke: 40-50g/m<sup>2</sup></b>	
				Bearb.	13.09.19	Schulz		Benennung:	
				Gepr.				<b>Paperbag</b>	
								<b>Papierbeutel</b>	
				Verpackungsautomaten Schwalbenweg 24-33129 Delbrück Telefon 05250/9843-0		Zeichnungsnummer:		Blatt	
						<b>0P-014</b>		Bl	
Zust.	Änderung	Datum	Name	Urspr:		All rights reserved conform to ISO 16016			

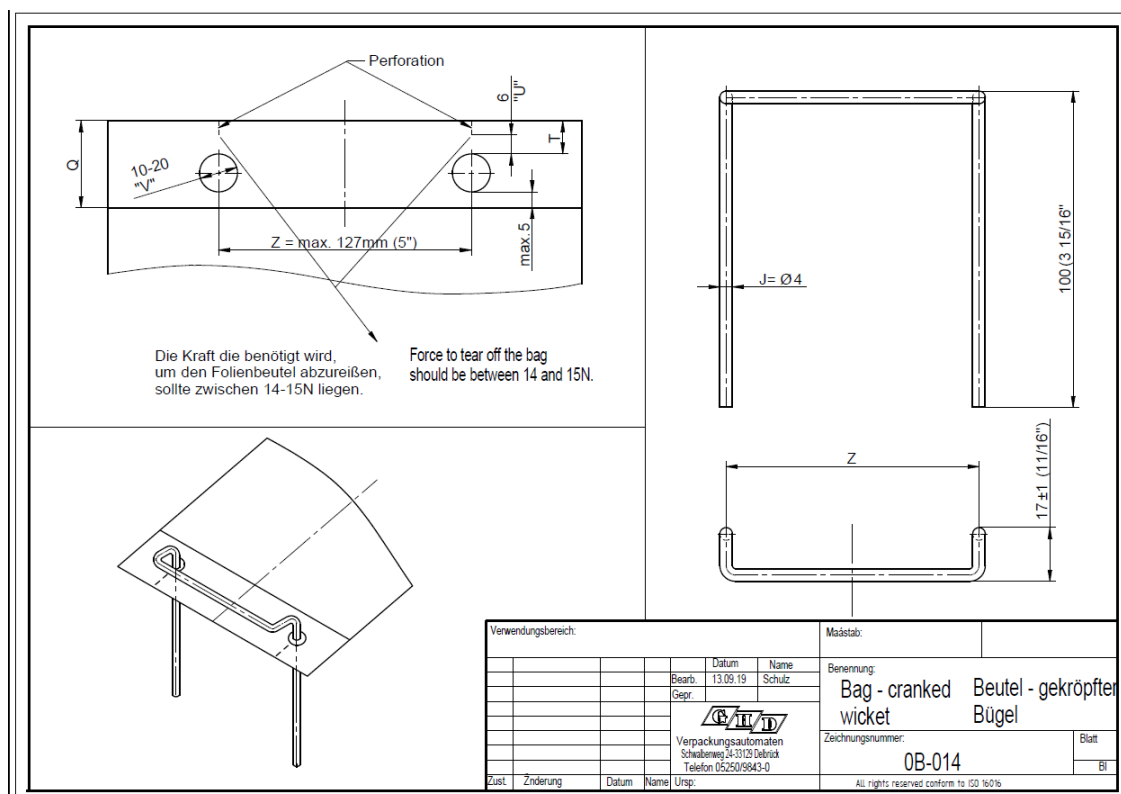
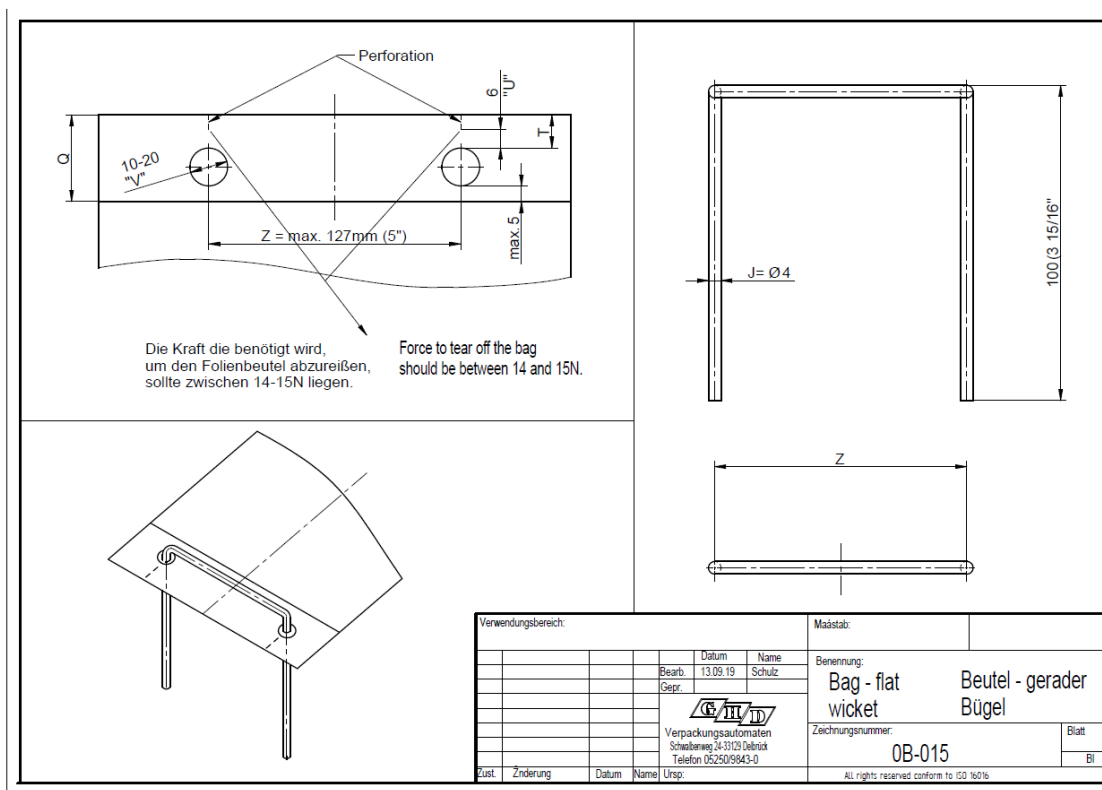


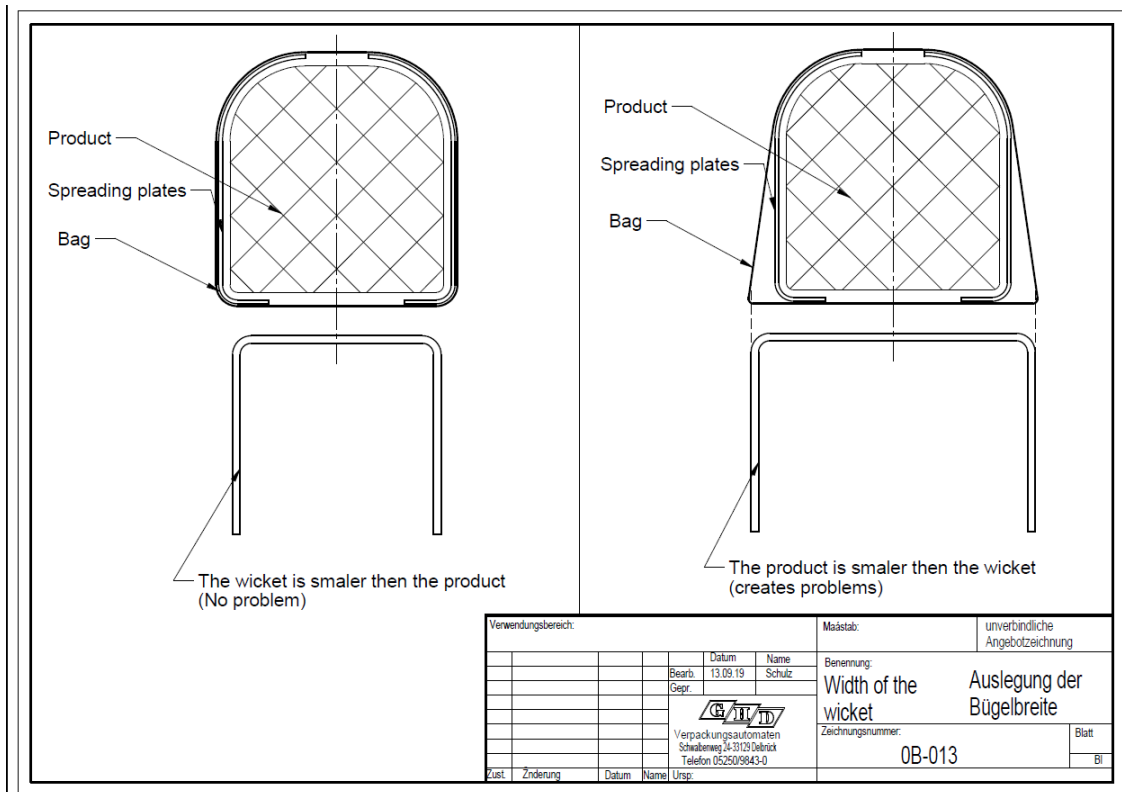
- Packing material: prepared bags from paper or laminated papers with plastic vision opening.
- Paper quality: 40 -50 g /m<sup>2</sup> (0.036 – 0.046 ounces/inch<sup>2</sup>)
- Notes: a) Paper bags could NOT be closed with Kwik-Lok<sup>®</sup> closures inside GHD Hartmann packaging machines type GBK 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 a very tight closure application.
- Closures: Clip, Thurne/ plastic tape

### 3. Determination of the wicket size

The wicket design and the wicket 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").





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:

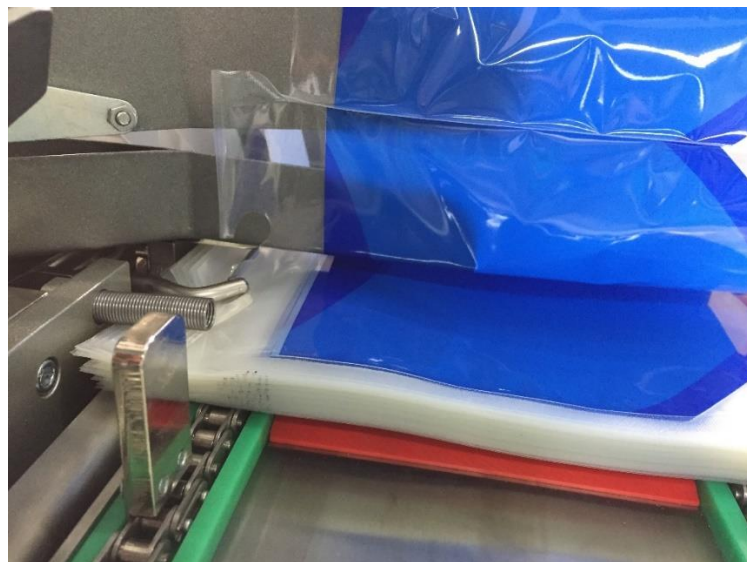


If the wicket is TOO wide, you could see the bracket on both sides outside the spreading plates.

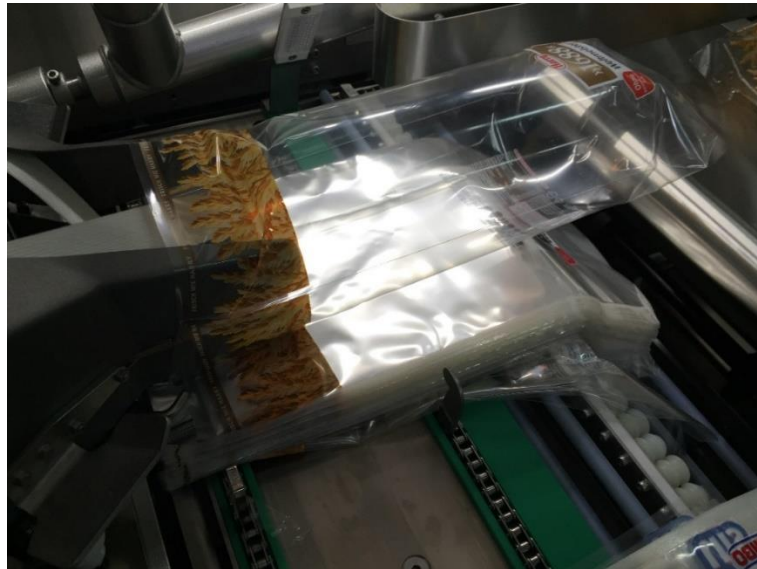




That creates the following effect: The bag is **RIPPED OFF** from the wicket. The bag is nearly ripped of the stack by entering with the spreading plates; the bag is more loose and is not under control.



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 counterforce 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 vary slightly. This could become an issue in both directions.

That could easily be 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 process, 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.

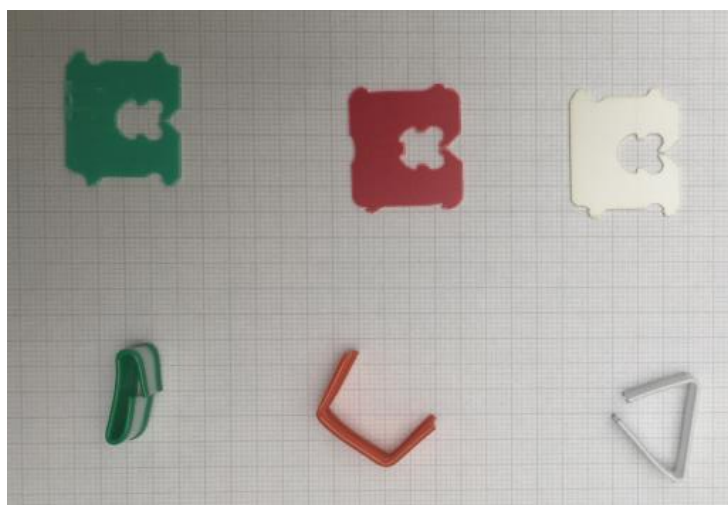
Note: The cardboard sheets on the top and bottom side of the bag stack need to be removed before feeding into the packaging machines. Any rubber washers at the bottom side need to be removed as well. The machine is only fed with bags organized by the wicket.



#### **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.



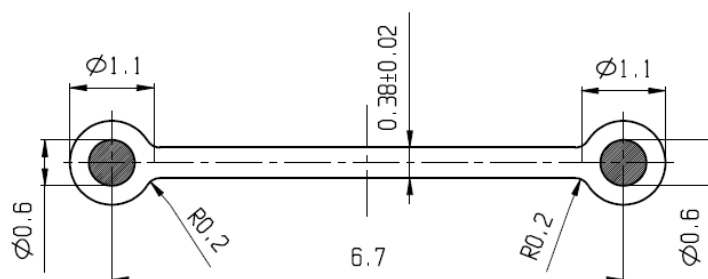
### 5.1 Clip closure

(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

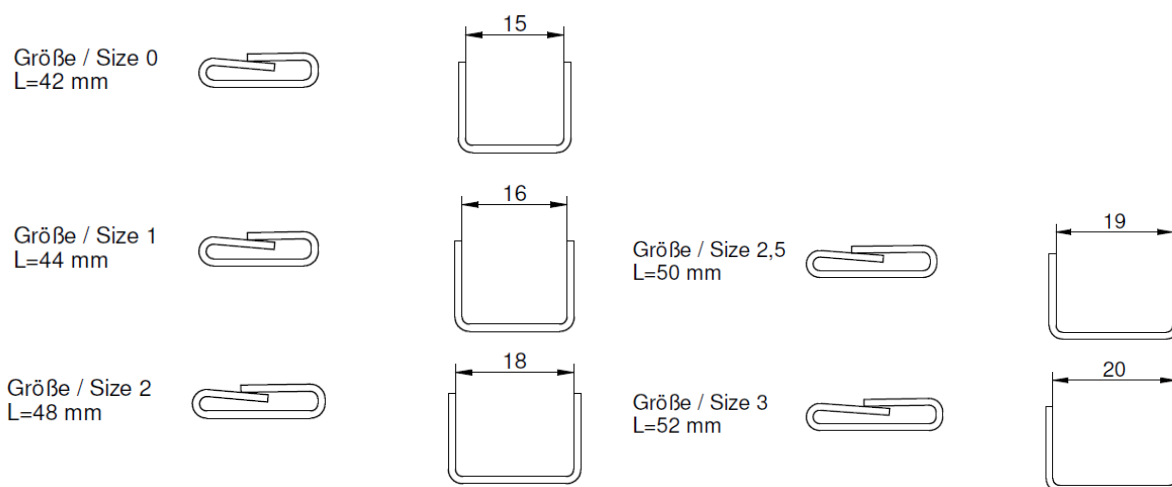




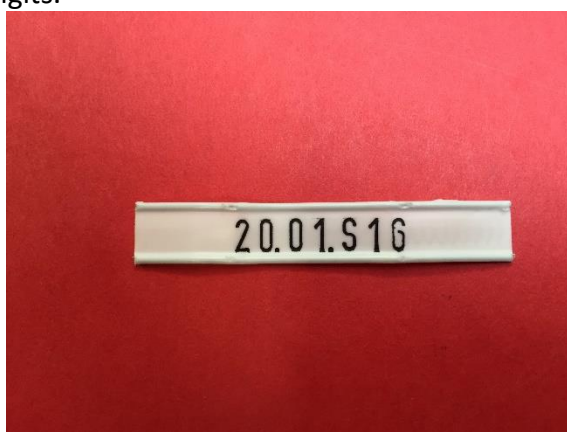
Dimension for standard-materials:



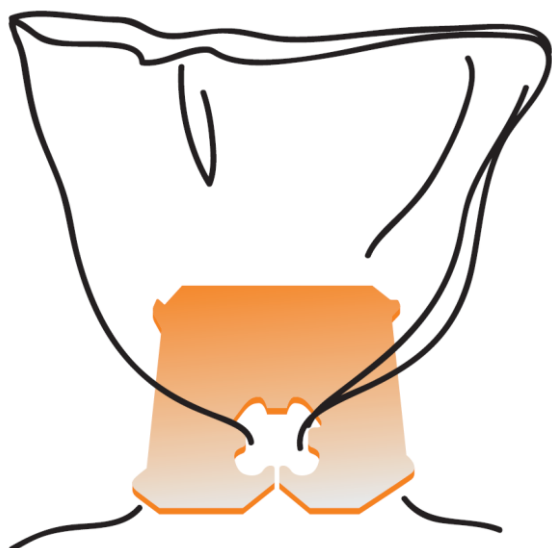
Depending of the product specifications and the related amount of packaging material, the clip length could be pre-selected



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 Clips® (or similar)



Schutte Clips® or Kwik-Lok® closure with/without print. The most often used version is the Kwik-Lok® Type J-NRP or Schutte Clips® 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.

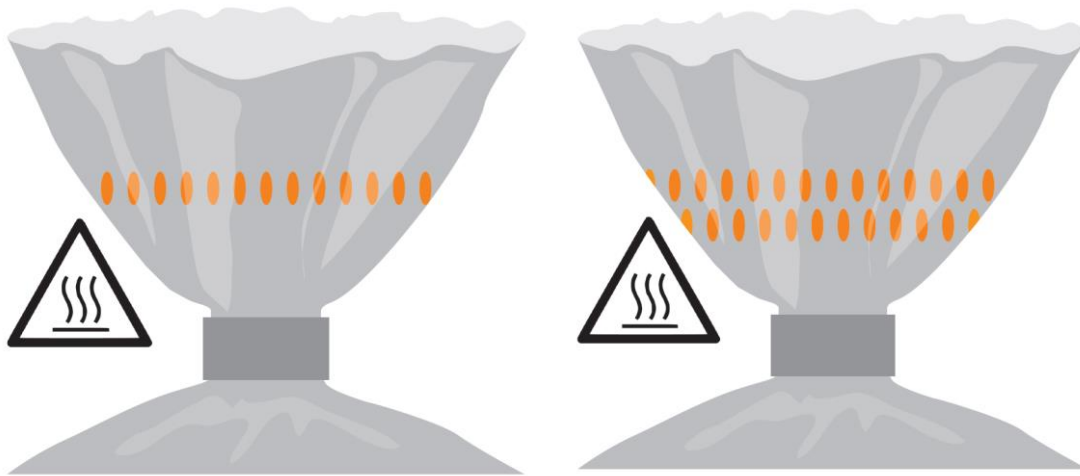
Without metal. With or without print, the adaption of Kwik-Lok® printers is possible





## 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 Clips®/ Kwik® -Lok a tamper proof sealing is possible. It could be switch on/ off and could be supplied as either 1-row tamper proof sealing or 2-row tamper proof sealing.



Clip and perforate sealing (Tamper proof sealing)

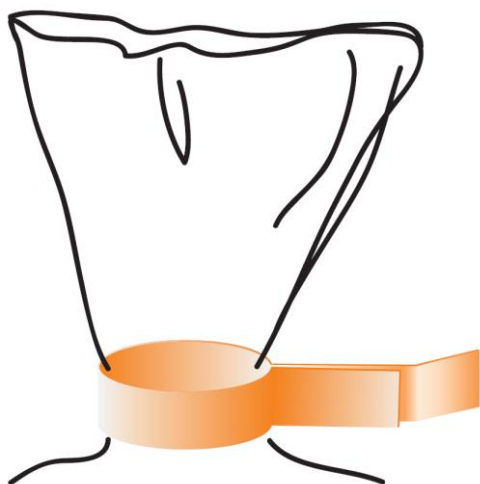
### 5.3 Quality closure / Hot needle through the clip closure

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/ off. 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.

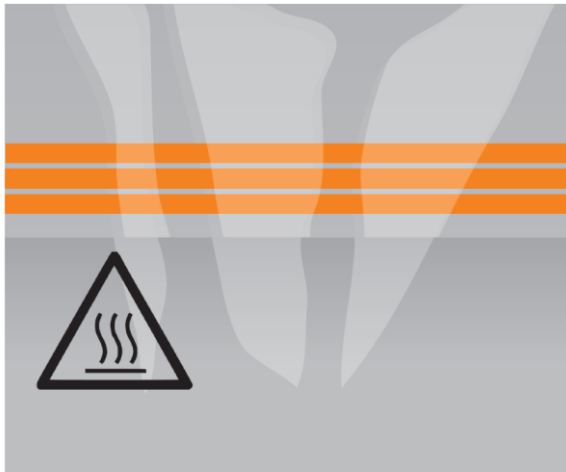


Not very easy to handle, due to the dependence of sticking qualities and aged tape materials. Printing on the closure is possible, sometimes a reclosing of bags might be possible as well. No metal included.

### 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.

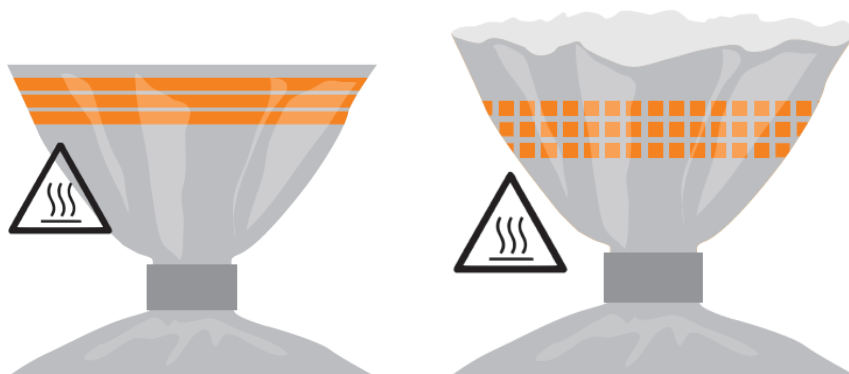


The handling depends on the product specification and height of the bags. The distance between products and sealing position depends on the product height. The bag material needs to be investigated for sealing results. Permanent head sealing or pulsed heated sealing with sealing bars.



## 5.6 Closure application with **ADDITIONAL SEALING** of the rouché

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



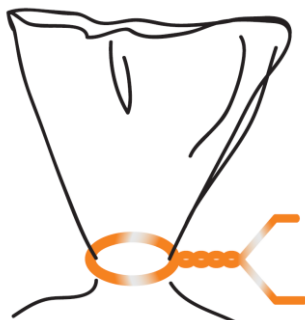
### 5.7 Umbrella packaging

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 rouché folding. This is a different appearance in packaging and packages.



### 5.8 Twister

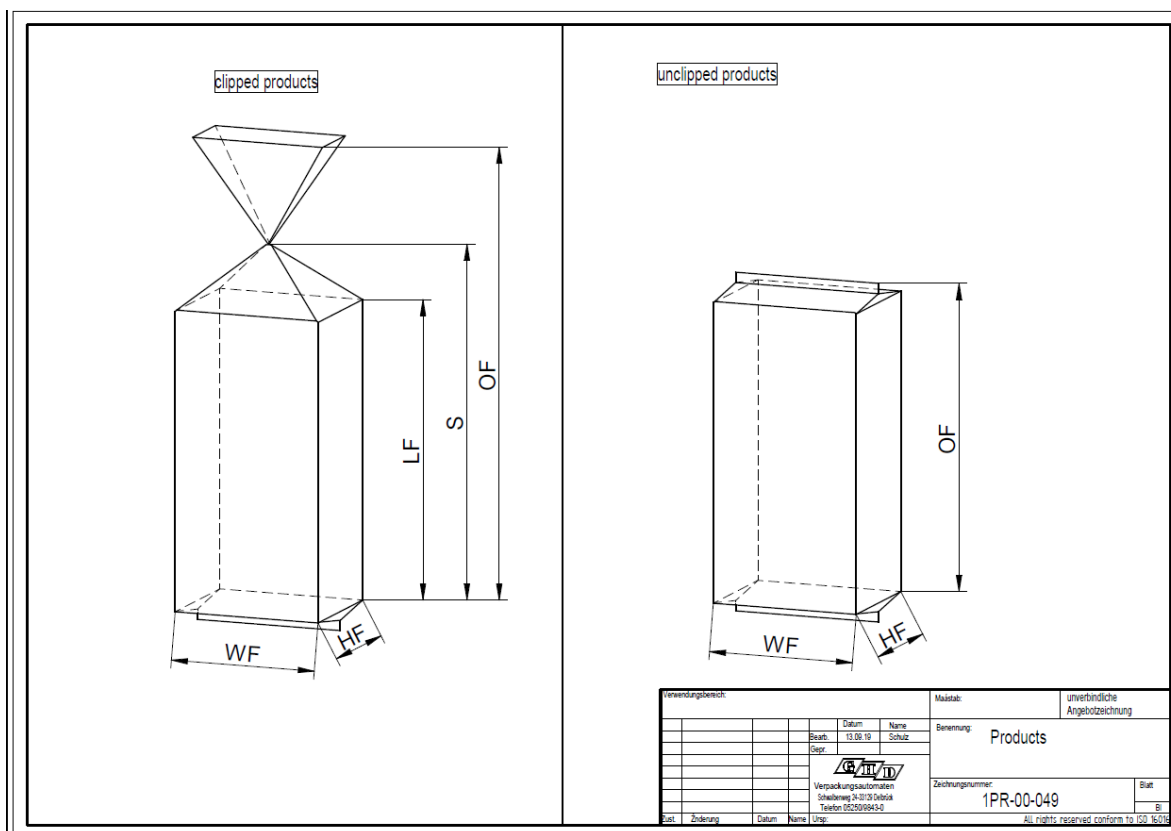
Twister closures need to be applied outside the GHD Hartmann packaging equipment at a local supplied unit. The open bags could be transported to that closing unit. The disadvantage is that products or grouped products might lose their packaging pattern during the transport before the closure application.



## 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 rouché 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!

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 Schwalbenweg 24  
 D-33129 Delbrück

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 Fax: +49 (0) 52 50 / 98 43 - 562  
 E-mail: [info@ghd.net](mailto:info@ghd.net)  
 Web: <http://www.ghd.net>

## **6. Appendices:**

### **Bag suppliers (for example only)**

#### **Foil bags**

##### **LEEB GmbH & Co. KG**

Woringer Straße 14

DE-87700 Memmingen

Germany

Tel.: +49 8331 / 8201-0

Fax: +49 8331 / 8201-55

E-Mail: [info@leeb.de](mailto:info@leeb.de)

Web: [www.leeb.de](http://www.leeb.de)

##### **Schur®Star Systems GmbH**

Liebigstrasse 7

DE-24941 Flensburg

Germany

Tel.: +49 461 99 750

Fax: +49 461 98 191

Web: [www.schur.com](http://www.schur.com)

##### **Lietpak**

A.Mickevicius str. 165

Cekoniskes Settlement

LT-14207 Vilnius District

Lithuania

Tel.: +370 524 91000

Fax: +370 524 90272

E-Mail: [lietpak@lietpak.lt](mailto:lietpak@lietpak.lt)

Web: [www.lietpak.com](http://www.lietpak.com)

**Amerplast Ltd.**

Vestonkatu 24

P.O. Box 33

FI-33731 Tampere

Finland

Tel.: +358 10 214 200

Fax: +358 10 214 2241

E-Mail: [info@amerplast.com](mailto:info@amerplast.com)

Web: <https://amerplast.com/>

**Riba Verpackungen GmbH**

Brückenkampstraße 20

59077 Hamm

Germany

Tel.: +49 2381 4079 0

Fax: +49 2381 4079 34

Web: <https://ribapackaging.com/>

**Paper bags**

**WEBER Verpackungen GmbH & Co. KG**

Westerhaar 38

DE-58739 Wickede/Ruhr

Germany

Tel.: +49 2377 / 8099-0

Fax: +49 2377 / 8099-20

E-Mail: [info@die-tuetenmacher.de](mailto:info@die-tuetenmacher.de)

Web: [www.die-tuetenmacher.de](http://www.die-tuetenmacher.de)

**Polyden Folienfabrik GmbH**

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DE-91217 Hersbruck

Germany

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Fax: +49 9151 / 7302-125

E-Mail: [info@polyden.de](mailto:info@polyden.de)

Web: [www.polyden.de](http://www.polyden.de)

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Dunholme, Lincoln

England LN2 3QF

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Fax.: +44 1522 730 372

E-mail: [info@brayfordplastics.com](mailto:info@brayfordplastics.com)

Web: <http://www.brayfordplastics.com>

**Clip band suppliers (for example only)**

**SCHUTTE bagclosures**

Brouwerstraat 8

NL-5400 AJ Uden

Netherlands

Tel.: +31 413 – 264 776

Fax: +31 413 – 266 145

Herr Hans Den Roojen - Mobil: 0031 / 413264776

Web: <http://www.schutte.nl>

E-Mail: [schutte@schutte.nl](mailto:schutte@schutte.nl)

**Clip - Technik Vertriebs GmbH**

Wiescher Str. 11

42277 Wuppertal

Germany

Tel.: +49 202 / 3177970

E-Mail: [cliptechnik@t-online.de](mailto:cliptechnik@t-online.de)

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Fax: +49 7557 – 910 48

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