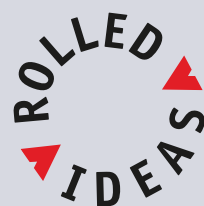


***Compression limiters – make plastic stronger.***





#### What compression limiters provide:

Plastic components are fixed into or onto the vehicle or component using screws.

Compression limiters ensure that the normal force of the screw is limited with respect to the plastic component's permissible load, and in doing so, they protect the components from damage.

Compression limiters are developed according to the demands placed on them. As such, only limited costs arise for special tools. Compression limiters can be molded in place or inserted after injection molding. Installation can take place manually or automatically.

As the production takes place in a self-developed special forming process, **Vogelsang compression limiters** offer an affordable alternative to tubular or machined parts.

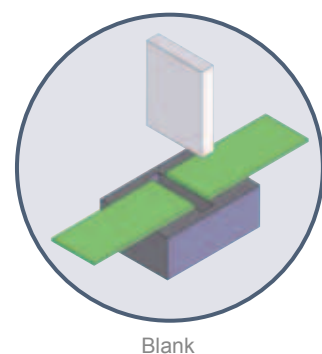
 **compression limiter®**

***Compression limiters: Your strength.***

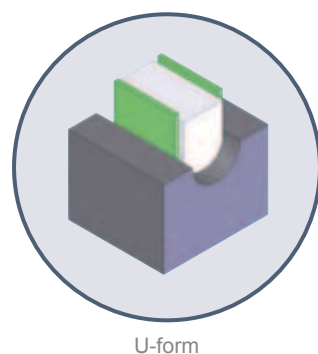


There are many ways of achieving your objective. Success though, is a matter of taking the right route.

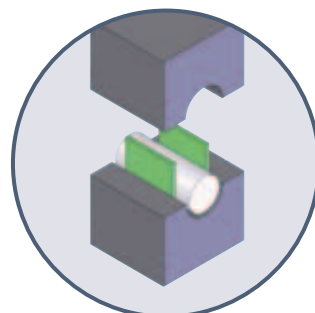
The route we take is the wrapping process. To ensure that we are meeting your needs quickly, we have thoroughly thought through this process and have completely refined it. Many of the machined parts, deep drawn parts and tube sections that are currently used can simply be replaced through designs that are more flexible and less expensive. Many companies are amazed at what there is still to discover in their production departments and that production still takes place using the wrapping method.



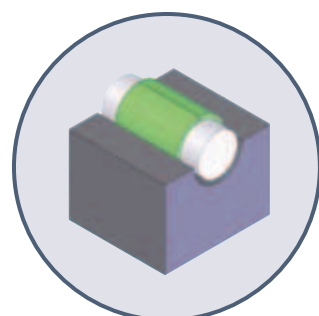
Blank



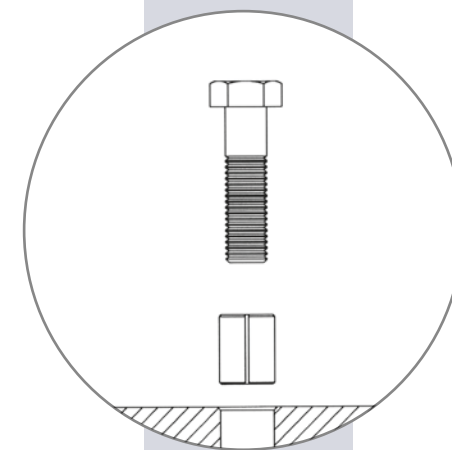
U-form



Wrap

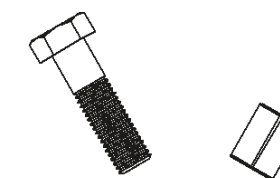


Wrapped product

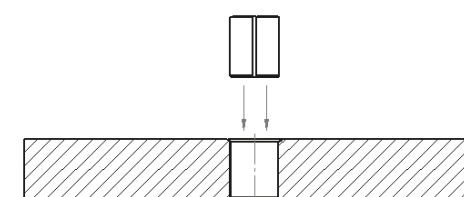
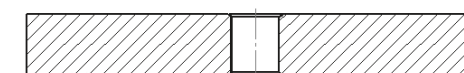


#### How the system works

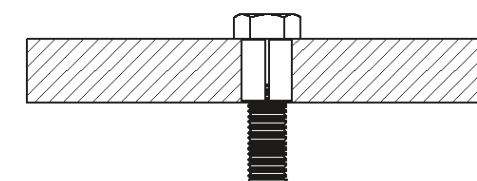
A lot of plastic components are used in the automotive sector, which have to be screwed into the car. As the normal forces of screws in a tightened state can exceed the permissible surface pressure of plastic, we recommend that compression limiters are used.



Detail drawing



Compression Limiter before installation



Security screw and compression limiter in an installed state

***The wrapping process: Getting things on the right track.***

***Security, and how it works in practice.***



Installation example

#### The problem

Plastic components without compression limiters are destroyed during fastening as a result of the necessary screwing forces.

#### The solution

Compression limiters are non-threaded inserts designed to protect plastic parts from loads created by the tightening of bolts. The load causes compression, which can lead to cracking and creep due to tightening torque. Vogelsang offers an extensive line of cost saving compression limiters. Multiple design options in our compression limiters combined with our dedicated team allows your product to incorporate different shapes, materials, features and overall cost saving.



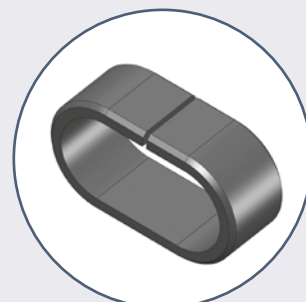
## Insertion parts

#### Features and benefits

- units are inserted later
- open slot
- absorbs thermal dimensional variations
- prevention against loss is guaranteed through a defined oversize
- flange is not destroyed



Compression limiter  
not bevelled



Compression limiter  
in an oval shape



Compression limiter  
with an interlocking lock



Compression limiter  
with bevels

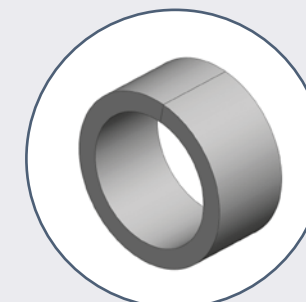


Compression limiter  
with a recess

## Injection molded parts

#### Features and benefits

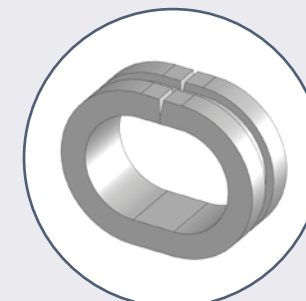
- units are inserted into the tool in advance
- slot closed on the inside/outside, or both
- narrow length and diameter tolerances



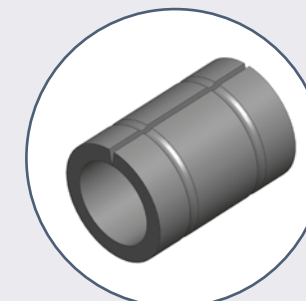
Compression limiter  
round



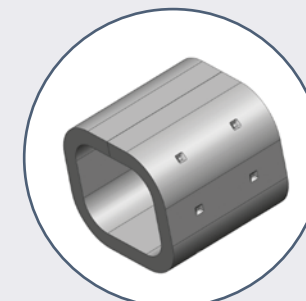
Compression limiter  
in an oval shape



Compression limiter  
oval with an outer groove



Compression limiter  
round with an outer groove



Compression limiter  
with quadrangular stamping

## Compression limiters - The product variants.



## Application

→ Everywhere plastic components are fixed into or onto a vehicle or component by means of screws.

## Advantages for you

### Compression limiters

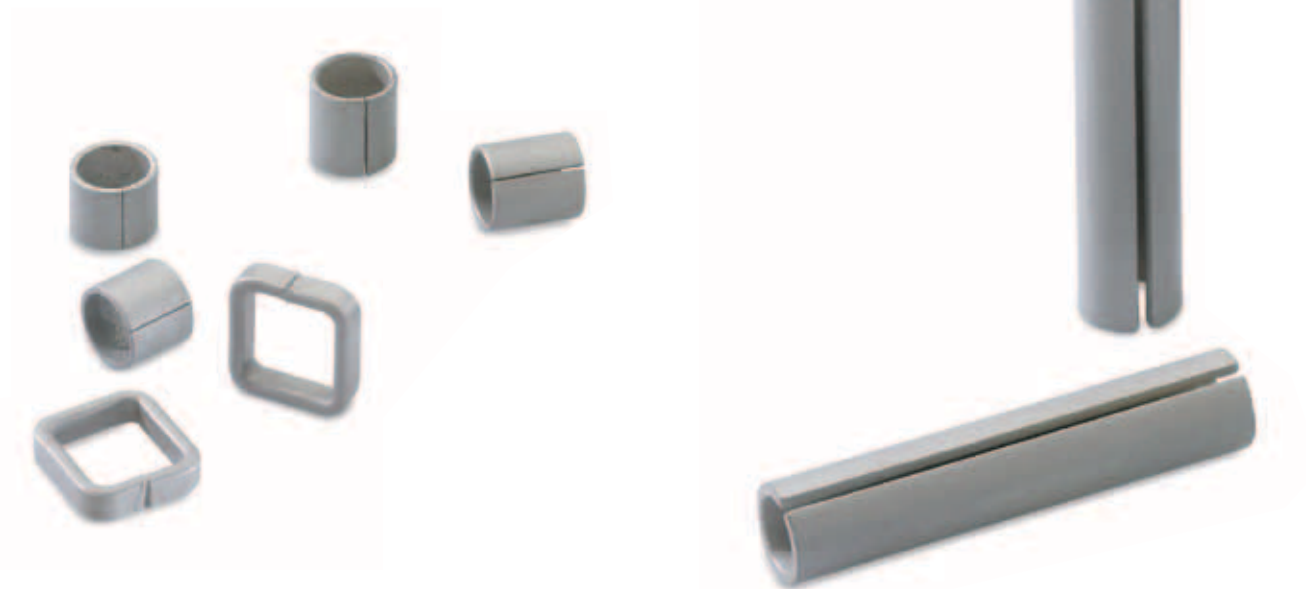
- protect plastic components from damage by absorbing the necessary screwing forces.
- are the inexpensive alternative to tubular or machined parts.
- can be installed with little effort.
- are optionally molded in place or inserted after injection molding.
- can be inserted automatically or manually.
- tightly controlled process tolerances.

## Product design

Based on the respective application, we arrange the geometry and the material along with you:

- Outer diameter
- Inner diameter
- Material thickness
- Length
- The installation aids that are required (e.g. bevels)

At the same time, almost every geometric shape can be implemented.



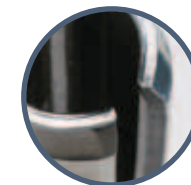
## Technical data

Guidance notes concerning the design.

Length	up to 80 mm	
Length tolerance	≤ 30 mm	≥ 0,1 mm
	> 30 mm	≥ 0,2 mm
Outer diameter	up to 30 mm	
Diameter tolerance	≤ 10 mm	≤ 0,1 mm
	> 10 mm	≤ 0,15 mm
Wall thickness	0,5 – 3 mm	
Material	standard quality cold rolled low carbon steel; any strip material is possible	
Material quality	up to 70 Mpa yield stress, others on request	
Corrosion protection	according to customer requirements	
Edge design	sharp edges, bevels, radii, combinations are possible	
Shape Design	according to technical requirements	

**Can't find your solution?  
We'll find one for you.**

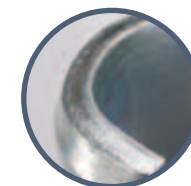
## The extra benefit



### Enclosed slot edges are available on request

Enclosed slot edges offer a distinct advantage: The edges are on the transition from the bevel to the slot below the surrounding diameter. This way, the compression limiter is inserted into the bore hole without a scraping action.

As such, possible damages are avoided.



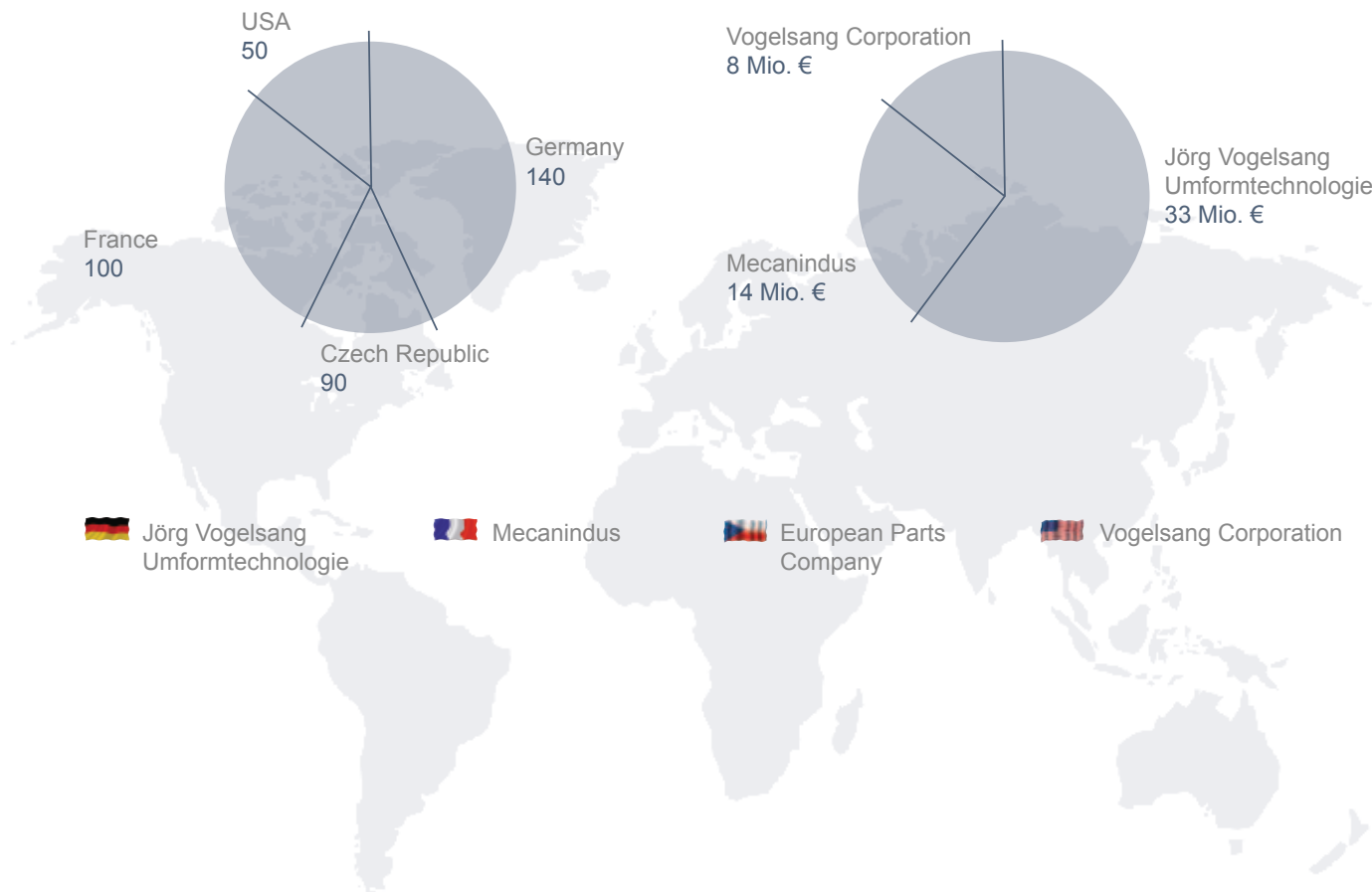
### 100 % control plus\*

Besides the many advantages that the compression limiter offers you, no compression limiter leaves our premises without a 100% check of the dimensions and sorting accuracy. Quality is good, inspection is better.

**Customized to your requirements.**

Number of employees

Foreign sales



Everything on board in time

We are known for the inexpensive and fast way that we handle all of our orders. Thanks to our sophisticated logistics concept, a punctual delivery is always assured. We are there when and where you need us. In addition, we offer many additional services, e.g. packaging according to customer requirements, reliable stock management and much more besides.

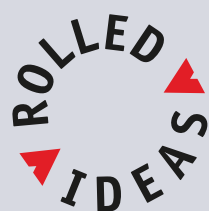
Key data:

Number of customers:	2.000
Number of products / variants:	5.000
Factory area:	55.000 m²
Delivered items:	> 1 billion pcs. per year
Material consumption:	15.000 t
Industrial certifications:	ISO TS 16949 ISO TS 14001
Automotive sales:	80 %

Production range

- Spring pins
- Coiled spring pins
- Tension bushings
- Automotive chassis components
- Compression limiter®
- Automotive spring pins®
- alignment dowel pins
- centering bushing

**You can rely on a wide range.**



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