

# Ground Support Equipment Clampband PAS 937 S

**30 years of high performance, high  
reliable and high-end GSE Clampbands.**

Beyond Gravity delivers GSE Clampbands for spacecraft on-ground handling and testing. The GSE Clampband is designed to connect the S/C Interface Ring to any different Test-Adapter during the AIT campaign. The main focus of the design of the GSE Clampband has been set to achieve a high product reliability and easy handling.

## Heritage

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More than 50 GSE Clampbands have been delivered to institutional and commercial customers worldwide.

## Key features

<b>S/C Interface</b>	PAS 937 S	acc. to: Ariane 5 User's Manual (Issue 5, Revision 2) Soyuz User's Manual (Issue 2, Revision 1) Vega User's Manual (Issue 4, Revision 0)
<b>Temperature</b>	-100°C to +100°C (operational)	
<b>Factors of Safety</b>	Yield/Ultimate 2/3 or 3/5	
<b>Cleanliness</b>	Class ISO 8 (ISO 14644-1)	
<b>Advantages</b>	no grease vacuum compatible temperature compensation easy application	

## Physical Properties

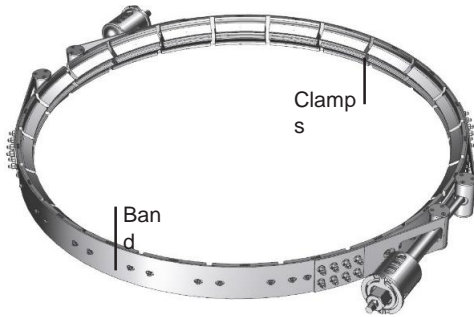
<b>Dimensions</b>	CB (Item) [L x W x H]	1010 x 1125 x 90 mm 39.8 x 44.3 x 3.6 in
	Transportbox [L x W x H]	1560 x 880 x 680 mm 61.4 x 34.7 x 27 in
<b>Item mass</b>	30 kg / 66 lbs	
<b>Item in Transportbox</b>	95 kg / 210 lbs	
<b>Transportation</b>	road, rail, sea, air compatible	

## Options

<b>Monitoring</b>	online measurement of acting band pre-load
<b>Spare Parts</b>	relevant spares included
<b>Clampband Tools</b>	application tools optional
<b>Operator Training</b>	in house or external site

## Deliverable Hardware

2 x Clampband-Half / 2 x Tapping Tool /  
 1 x Transportbox / 2 x Strain  
 Gauges (optional) / Readout Equipment (optional)  
 / Tools (optional)



Pre-Load mechanism  
 (incl. temperature compensation)

Readout Equipment



## Deliverable Documents

User Manual / Certificates / Interface Control  
 Drawing / Test Report / Proof-Load Certification



Transportbox

## Load configuration

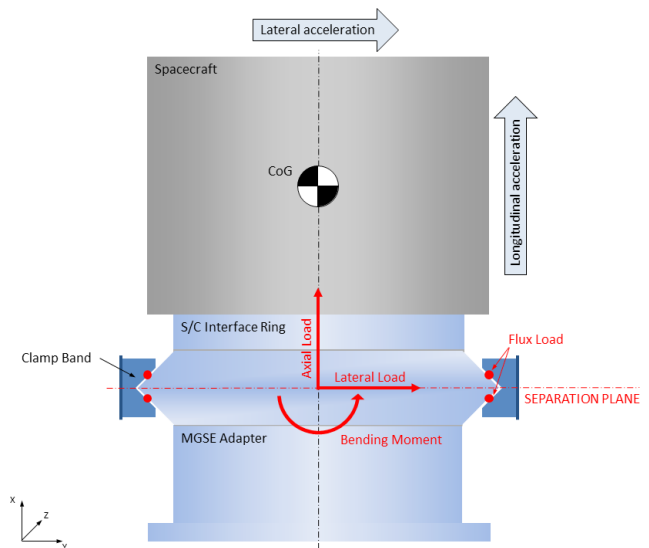
The following three load input parameters are required to determine the achievable safety factors of the Clampband:

- Axial Load [kN]
- Bending Moment [kNm]
- Lateral Load [kN]

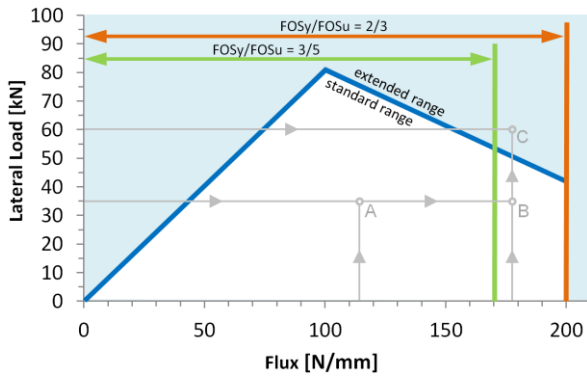
### Safety Factors:

FOS<sub>y</sub> ... Factor of Safety - Yield

FOS<sub>u</sub> ... Factor of Safety Ultimate



# Clampband Selection Diagram



### Instructions for use:

1. Calculate the Flux using Axial Load and Bending Moment.
2. Determine the intersection between flux and lateral load in the diagram.
3. The position of the intersection of flux and lateral load in the diagram provides information about the achievable safety factors of the Clampband.
4. If the point of intersection is in the white area (standard range), the load combination can be met by Beyond Gravity.
5. If the point of intersection is in the blue area (extended range), the load combination has to be checked individually by Beyond Gravity.

Formula to estimate Flux due to given loads:

$$\text{Flux [N/mm]} = 0.35 \cdot \text{Axial Load [kN]} + 1.45 \cdot \text{Bending Moment [kNm]}$$

## Examples of how the use the diagram:

Name	Unit	Example A	Example B	Example C
Axial Load	[kN]	200	300	217
Bending Moment	[kNm]	30	50	70
Flux	[N/mm]	114	178	178
Lateral Load	[kN]	35	35	60

### Example A:

The given load combination lies in the envelope of the standard range of the Clampband. The Clampband is feasible with a combination of  $FOSy/FOSu = 2/3$  and also  $FOSy/FOSu = 3/5$ .

### Example B:

The given load combination lies in the envelope of the standard range of the Clampband. The Clampband is feasible with a combination of  $FOSy/FOSu = 2/3$ .

### Example C:

The given load combination lies outside the envelope of the standard range of the Clampband. Beyond Gravity has to check the load combination individually to see if the Clampband is feasible and fulfills customer needs.