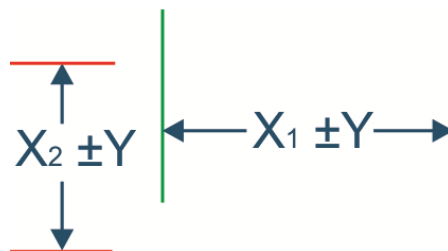




**Equipment for paragliding
Tolerance regulation for paraglider-processing**

**Requirements for safety relevant properties for Tolerances of
sewn materials**





Tolerance regulation for paraglider-processing


PMA-D-003

Ausgabe:	23.02.2018
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Implementation

20.02.2018

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1 Introduction

This directive was adopted by the

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in collaboration with independent experts.

This directive contains, in section 6, provisions for fabric engineering test characteristics and it's processing.

This directive is **not valid** for a paraglider already used in the context with the manufacturer's inspection.

2 Background

There is no tolerance regulation for textile products in the EN Standards or for the paraglider industry itself, which can lead to incorrect testing and incorrect declarations of conformity.

In almost all areas of testing according the EN Standards,, some tolerances have been implemade. Only in the production sector of paragliders has this not yet been achieved.

Also there are no specifications of tolerances for the declaration of conformity.

2.1 General considerations

The processing of textile materials is basically not possible without tolerances due to a high proportion of manual sewing.

In addition, textile material is changing with use. Both shrinkage and elongation can be observed depending on how and where the materials are processed and the paraglider is used

These change processes are known and are largely kept by checking/service instructions in certain limits. Without tolerance values after production, however, it is almost impossible to certify compliance of the series product with the tested product, or to confirm in the periodical checking the further airworthiness of the air sports equipment.

Tolerances are a given circumstance in the textile industry and therefore must be defined according to the state of the art.

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3 Scope

This directive defines the tolerable and state-of-the-art manufacturing tolerances.

4 Normative references

The following documents, which are cited in part or as a whole, are necessary for the application of this document. For dated references, only the related edition applies. For undated references, the last edition of the referenced document (including all amendments) applies.

- EN 926-1:2016 Paragliding equipment – Paragliders – Part 1: Requirements and test methods for structural strength
- EN 926-2:2013 Paragliding equipment – Paragliders – Part 2: Requirements and test methods for classifying flight safety characteristics
- NfL II 91/09 - Notice of airworthiness requirements for hang gliding and gliding sails (LTF 91/09)

5 Terms

For the purposes of this document, the terms of DIN EN 926 1, DIN EN 12491, DIN EN 1651: 2017 and the following terms shall apply:

5.1 Fabric:

Textile fabric for the manufacture of paraglider. The fabric is usually made of nylon 6.6 (nylon).

5.2 Span wise bands:

Additional bands in span that control the profile of the paraglider. The straps set the width of the cell to relieve the bottom sail.

5.3 Diagonal Rippen:

In addition, bands that run diagonally from the bottom sail to the top sail within a cell of the paraglider. The diagonal ribs ensure a more stable profile formation.

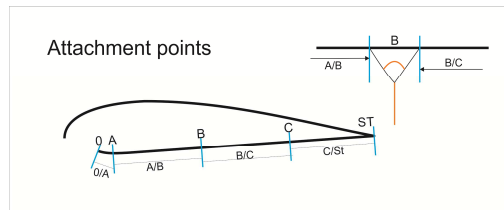
5.4 Profil:

Each semi wing consists of set of profiles, formed by the shape of cell walls. The profile has upper and bottom surface. The distance between the front and back part of each profile is called are chord. The mail characteristics of a profile are chord length, maximal profile thickness and its position.

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5.5 Attachements

Points and places where the lines directly contact the fabric. Mostly on the bottom sail, on Singel-Skin paragliders also directly on the profile ribs (Flairs)



5.6 Lines

Braided flexible plastic textile in one or more layers. The lines are attached to the numerous attachment points at the connection of cell walls with the bottom surface of the wing. Which are mounted in an overall construction in one or more levels between the linen locks on the risers and the attachment points on the fabric of the paraglider.

5.7 Trimm:

Factory angle of attack for normal flight (EN 926-2: 2013 - 3.9) without operation of the accelerator (EN 926-2: 2013, point 3.5) or trimmer (EN 926-2: 2013, point 3.5) by the pilot

6 Tolerances for production

1mm is the smallest unit to be maintained for all tolerance information even if a smaller percentage value is calculated.

6.1 Fabric

There is a general tolerance in the fabric processing of $\pm 1\%$. This applies to the individual seams as well as the entire structure of the paraglider fabric in all dimensions.

Described as in 5.1 to 5.5

6.2 Line

There is a general tolerance in the linen processing of $\pm 0,5\%$. This applies to the individual line and also to the overall line length.

Described as in 5.6

6.3 Trimm

There is a general trim tolerance of $\pm 1\%$ in all dimensions.

Described as in 5.7



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