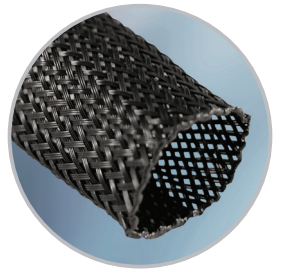
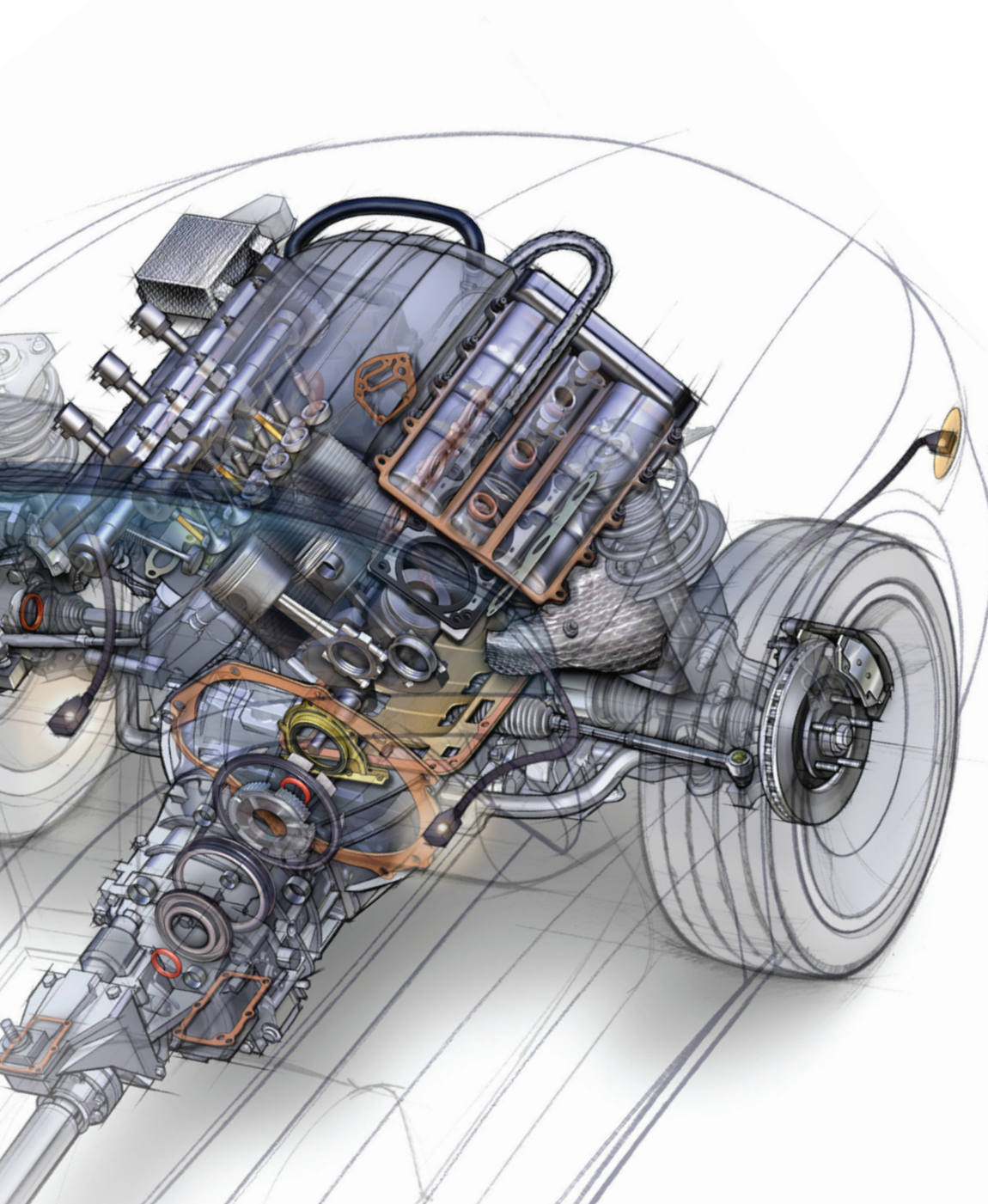
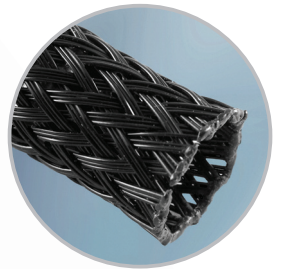


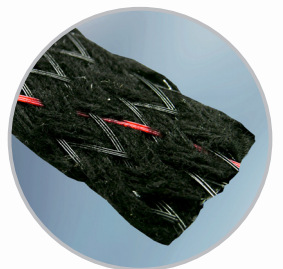
Boundary Sample Limits



FlexFit®



FlexGuard®



QuietSleeve®

INTRODUCTION

Goal of the boundary sample limits document:

This document defines the level of acceptance of the product delivered on spools or in cut parts based on the product intended function and specification. The samples presented in the present document are illustrative of standard production.

The commitment of Tenneco Systems Protection is to deliver cut parts without any of the hereunder referenced defects. Those unacceptable functional and aesthetic defects presented can be easily cut with scissors on spooled material delivered. If ever a spool presented a continuous unacceptable appearance, we would invite our customer to come back to us immediately.

Definition of an acceptable defect:

We consider as an acceptable defect a slight deviation coming from the manufacturing process of Tenneco Systems Protection which can not be avoided under the most stringent process conditions but which does not alter the performances or installation features of the product we deliver.

This acceptable defect is defined in accordance with the Quality Departments of each partner: Tenneco Systems Protection Systems Protection and its customer.

The pictures and drawings included hereafter serve as reference and evidence throughout the production and up to the delivery acceptance of the products. Consequently, it is necessary for the present document to be inserted both in the final control plan at the manufacturer site and at the reception step of the customer and each of its delivered site.

PRODUCT DELIVERED

Flexfit FlexGuard products are braided sleeve designed to provide mechanical protection. The complete product range offers various expansions, working temperatures and abrasion resistances.

They are used to protect wires harnesses, cables, tubes and hoses.

The products are delivered in cut lengths only with recommended standard cut lengths in 5 mm increments. The packaging is defined in accordance with GALIA standard (ODETTE).

For cut length tolerance, please review the reference drawing.

DEFECT DESCRIPTION ON THE BRAIDED SLEEVE

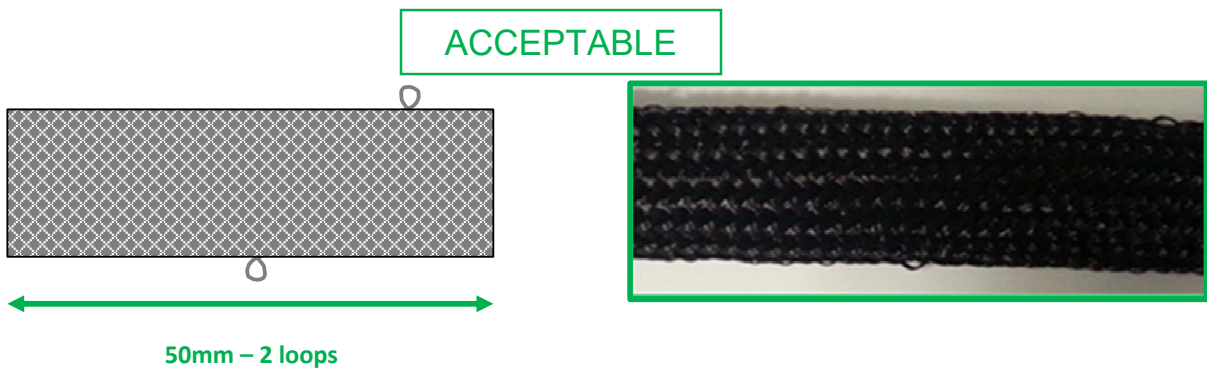
Irregularities on the braided sleeve

The outside surface of FlexFit, FlexGuard can show irregularities. It can occur during the braiding process.

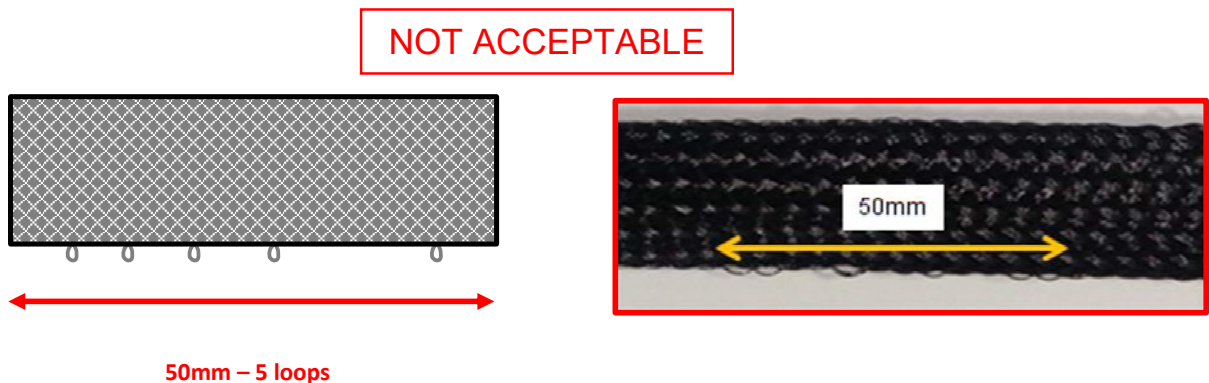
- **Loops**

Yarns exit the sleeve and create a loop or several. They are on the sleeve surface and can be seen or felt with fingers.

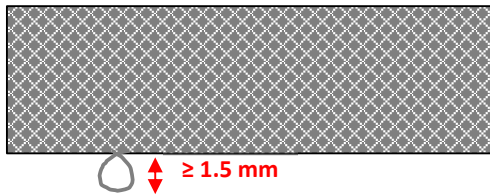
We consider that the loops are **acceptable** if there are less than 5 on a 50 mm sleeve length.



We consider that the loops are **not acceptable** because there are 5 or more on a 50 mm sleeve length.



The size of the loop can as well be considered as **not acceptable** if there is a single loop higher than 1.5mm.

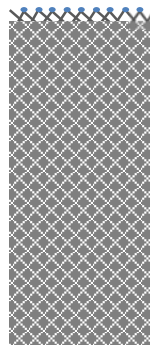


Irregularities on cut parts

The majority of Flexfit, FlexGuard products delivered to customers are in cut parts. Hot cutting process is used to cut parts and require precise setting and parameters to get a good quality of ends without fray and a straight cut.

- **End fray**

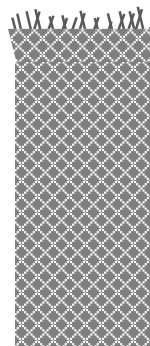
A cut part without end fray is the main criteria to qualify a good quality of cutting. So we consider parts as **acceptable** when the yarns at the ends are welded together.



ACCEPTABLE



We consider **not acceptable** parts which yarns at the end are not welded and move away



NOT ACCEPTABLE



- **Straight cut**

A cut part with a perpendicular cut is the second criteria to qualify a good quality of cutting. So we consider parts as **acceptable** when one edge is not exceeding the other from 2 to 4 mm depending on the sleeve nominal sizes.



Sleeve nominal diameter (mm)		Accepted deviation (mm)
From	To	
6	11	2
12	15	3
More than 16		4

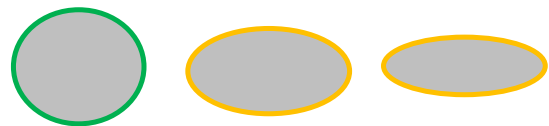
We consider parts as **non acceptable** when one edge clearly exceeding the other and is out of accepted deviation table below.



Round sleeve

For FlexGuard products and for **FlexGuard 2150 mainly**, Tenneco is eager to deliver round cut parts so that installation can be easier and faster at plants. Nevertheless some braided sleeves can be less round and even flattened. We consider them as **acceptable** because it has no impact on product main function but we tend to reduce this phenomenon to give customer satisfaction during product installation.

ACCEPTABLE



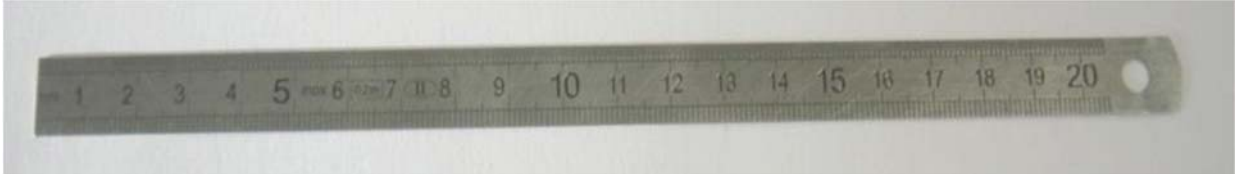
We consider **not acceptable** the cases when the sleeve is flat and when the installation on a wire harness or a tube is not possible or quite impossible.

NOT ACCEPTABLE



MEANS OF CONTROL

The quality controls present in the document were achieved with the following apparatus with a precision at 0,5 mm.



The visual quality controls in the document were made assessing the samples at the length of the arm (300 to 500 mm) or at 100 mm if the here above ruler happened to be necessary.

