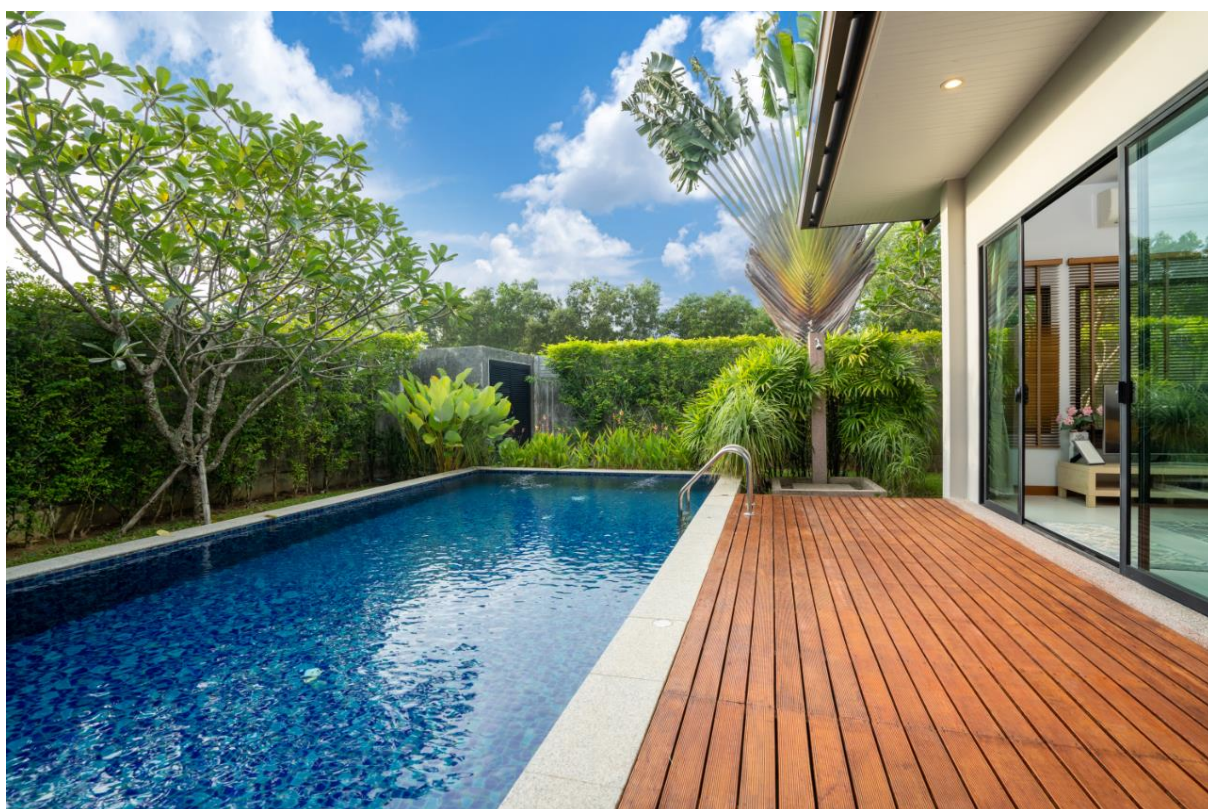


TECHNICAL SPECIFICATIONS

Rollers for Aluminium Sliding Windows



Le sens de l'ouverture



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1. Our company's present and future goals

Ferco is specialized in the production of multipoints locks for PVC and aluminium sliding windows.

FERCO is a leader on his market with 70% global market share. Our first range of multipoints, OPTIMIS, is an entry-level product while SLIDE LOCK is our latest premium range of products. Our main objective is to offer rollers as a complementary product. This way we can propose our clients a full range of products on this market segment.

Please visit our website for more information : <https://www.g-u.com/en/DE.html>

2. Specific issues

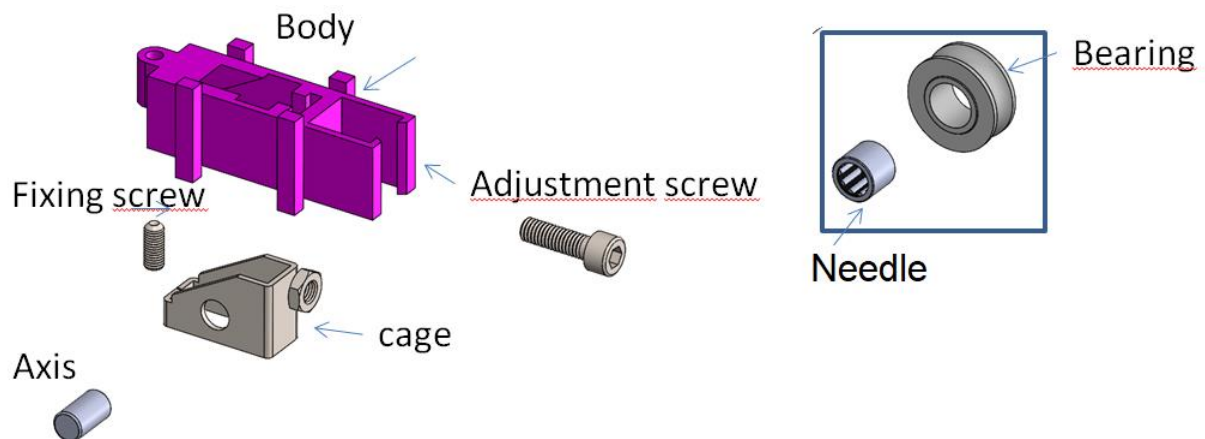
Sliding windows rollers encounters two main issues :

2.1 Compatibility with aluminium extrusion profiles

The environment is constantly evolving so it becomes difficult to find an existing roller for an old profile. In parallel, developing a roller this year have to take into account the future environment : the roller needs to be adapt on the most recent profiles. The system has to be modular to take this constraint into account.

2.2 Fragility of the rolling system

Year after year, dust can amass on the rolling rail and lead to premature wear of the roller. The quality of the bearing is a major concern to ensure the durability of the product.



Example of design, picture for information purpose only : single-roller adjustable

3. Domestic market & FERCO's sale estimates

3.1 The market (insérer photos des types) non cotractuel

The estimates of our market is **4 millions** of rollers per year on the four types of rollers stated below :

- Simple Adjustable Roller (One wheel roller with height ajustement)
- Simple Non Adjustable (One wheel roller without height ajustement)
- Double Ajustable Roller (Two wheels with height ajustement)
- Double Non Adjustable Roller (Two wheels without height ajustement)

FERCO's target is to offer the 4 types of rollers.

3.2) VOLUMES

Our business plan is based on the following estimates per types :

VOLUMES BY TYPE		
SRA	Simple Roller Adjustable	112 000
SR	Simple Roller Non Adjustable	448 000
DRA	Double Roller Adjustable	115 200
DR	Double Roller Non Adjustable	115 200
DRH	Double Roller Heavy Weight +300kg	9 600
		800 000

The progression of our total sales is planned on three years, as followed :

Year 1 : 240 000 units

Year 2 : 400 000 units

Year 3 : 600 000 units

Year 4 : 800 000 units

The following table shows the repartition by type of rollers :

			30	50	75
POTENTIEL CHARIOTS PAR TYPE			Année 1	Année 2	Année 3
SRA	Simple Roller Adjustable		33 600	56 000	84 000
SR	Simple Roller Non Adjustable		134 400	224 000	336 000
DRA	Double Roller Ajustable		34 560	57 600	86 400
DR	Double Roller Non Ajustable		34 560	57 600	86 400
DRH	Double Roller Heavy		2 880	4 800	7 200
DNRL	Double Charge Lourde Non Réglable		0	0	0
TOTAL	1240000		240 000	400 000	600 000

Forecast for information purpose only as the business plan is dependent of manufacturer's offer

4. Rollers Norms and mechanical resistance requests

The proposition made by the supplier should necessarily respect the following norms. **The supplier should bring the proof before any cooperation that he is capable of respecting these norms.**

		1	2	3	4	5
		Resistance	Weigth	Corrosion	NA	Application
EN 13126-15	Simple Roller	25000	100	5		1
EN 13126-15	Double Roller	25000	200	5		1

The rollers should imperatively respect the norms thereafter. The first norm **(EN 13126-15)** states the rules regarding mechanical resistance of the rollers. The second norm **(EN 1670)** states the rules regarding corrosion resistance.

Please refer to these two norms for the test methodology to use as well as the criteriae to respect to obtain the grades.

Our product should hold the following resistances shown in the table :

Regulatory Framework			
NORM EN 13126-15			
Dynamic Test	Simple Roller	100 kg	25000 cycles (GR3)
	Double Roller	200kg	25000 cycles (GR3)
Static Test	Simple Roller	100 kg	240 h
	Double Roller	200kg	240 h
Regulatory Framework			
NORM EN 1670 CORROSION			
Salt Sray	Simple Roller	240 h	
	Double Roller	480 h (GR5)	

We highly recommend you to buy the two norms before any further action.

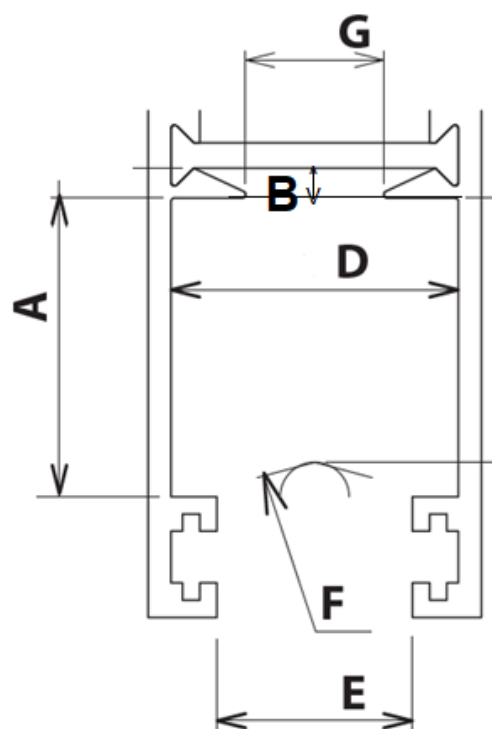
Also, we invite you to test your own products for the purposes of the norms so as to demonstrate the resistance of your productions for the purposes of our objectives.

In any cases, the supplier will provide approval certification from European laboratory in order to approve the final product according to both norms above.

5. Specific environment & rollers dimensions

We aim at adapting our rollers on a whole range of recent aluminium profiles. For this purpose, the supplier will provide a range which fits the **different profiles dimensions** shown in the table thereafter **(dimensions A ;D)**

We don't have the rollers' volume needed for dimensions A and D yet, for this reason **we ask the supplier to provide his annual minimal order quantity (MOQ)** that FERCO would need to buy per dimension (A and/or D).



	min	max	
Width	19 mm	38 mm	D
Height	21 mm	27 mm	A
Length	100 mm	160 mm	
Roller shape	angle =130°		F
Crimping hammer	15 mm		G
Hammer Height	0 mm	7 mm	B
Rollers diam ∅	18 mm	25 mm	
Vertical adjustment range	*-2,5 mm	* + 2,5 mm	

6. Raw materials

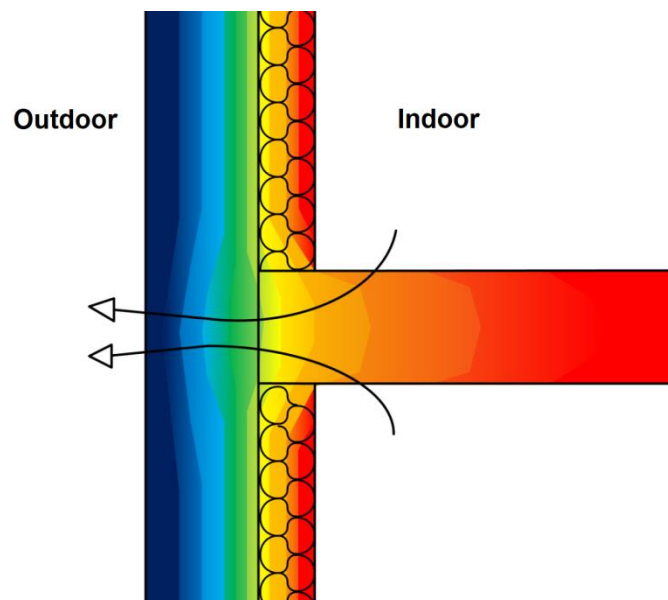
You can use any raw materials for your products if you meet the technical specifications, however in the aluminium application we bring your attention on the following details :

In Europe, main customers paid attention to not provoke any thermal break as the aluminium application we bring your attention on the following details :

- In Europe, main customers paid attention that the roller should not provoke any thermal break in contact with the aluminium profile

On the contrary, in certain area worldwide, customers are not concerned with this issue. This thermal break issue is not defined by specific norms until today.

Consequently, the raw material in contact with the aluminium profile should not be made from metal raw material. Or you have to prove that your roller don't provoke a thermal break between aluminium profile and the roller.



Principle of a thermal break

There is no regulatory framework dealing with this point. Nevertheless, our market requires that the rollers avoid the forming of thermal breaks.

7. Product identification

The FERCO trademark displayed hereafter should be present **regardless of what format you use** on every product. along with the quality timestamp



No other logo, especially those from the supplier, should appear on the end products and packaging.

8. Quality requirements

Given the fact that Ferco is a leader on the European market, we ask our manufacturers very high level of quality and guaranteed delivery conditions.

- PPM target

The supplier defect rate should be below **50 PPM**

- Delivery Rate Target

The supplier should ensure a delivery rate of 98%

- Spare parts

Spare parts should be available **10 years after** the end of serial production

For your information, this kind of product usually has a lifetime of 10 years.

- Product warranty

10 years under normal conditions usage as Ferco company offers a 10-year warranty to all customers.

- Supplier issue management

In case of defect detected by our customer or by Ferco, the supplier will receive an « 8D report » in order to fill it according to our standards. This process will be explained to the supplier on demand .

Each 8D report will be charged up to **200€** if suppliers' responsibility is engaged in order to support quality improvements.

In case of issue at Ferco customer which need a replacement of the whole product, all costs including spare parts will be charged to the suppliers up to **30€/hour**.

- PPAP submission

Before any start of production, Ferco company requests PPAP submission according to his standard and documentations templates. Usually, we request dimensional report on 5 units per version and capability on critical dimensions. Templates will be forwarded in case of partnership.

- Production Control Plan

Ferco requests his suppliers to follow critical criteriae with SPC or other industrial standards which ensure $CP/CPK > 1,33$

For example, the key dimension of the profiles (see Chapter5) which are A and D should be guaranteed 100% correct in order to avoid any customer claim during assembly of windows.

- Financial responsibility

The supplier will be charged for all the costs linked to defective rollers

- Initial samples control procedure & report
 - 100% of the dimensions and specifications from the layer should be correct
 - The control report for the initial samples will be sent to the supplier
- Process capability
 - The supplier should be able to provide the proof that his process capability index meets the following standard : $Cpk > 1,33$
- GO/NO-GO gage

All equipments to ensure quality of the product are included in the offer. No claim will be approved if quality equipments is missing to ensure the expected quality.

- Design and process modification during lifetime

In case of any future modification on the product, process and sources, the supplier must submit a new PPAP to Ferco company.

- **Certification of Approval**

Supplier should submit **each year** a proof that his product respect the two norms mentioned in Chapter 4.

- **Product Blueprint**

Blueprint of the rollers and any details should be provided before any serial production is started. The format of those blueprints should be available **in 2D and 3D** including all mesures and tolerances :

.IGES

.STEP

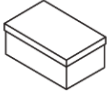
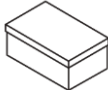
If you have any questions regarding the quality requirements specifications please contact :
m.ekici@ferco.fr

- Le processus EI est déjà connu, 100% des côtes et spécifications conformes au plan sur présentation des échantillons + capabilité établie avec Cpk 1.33 sur 30 pièces.
- Le rapport type EI est transmis à chaque fournisseur.

9. Packaging

We would like an offer for these two packagings stated below :

Rollers will be in bulk supplied in a carton box without any plastic bags

OPTION 1		
Number of rollers per box	MOQ	
40 per box	200	
OPTION 2 : industrial packaging		
Number of rollers per box	MOQ	
400 in bulk	400	

Total weight should never exceed 10kg/box

The packaging should ensure the protection of the goods in case of fall from a height of 1 meter on a concrete ground.

We will define if mixed references in a carton and/or pallet is allowed or not.

7. Packaging Labelling

Please see below an excerpt of our Logistics Manual to respect the guidelines needed for the labelling of our products.

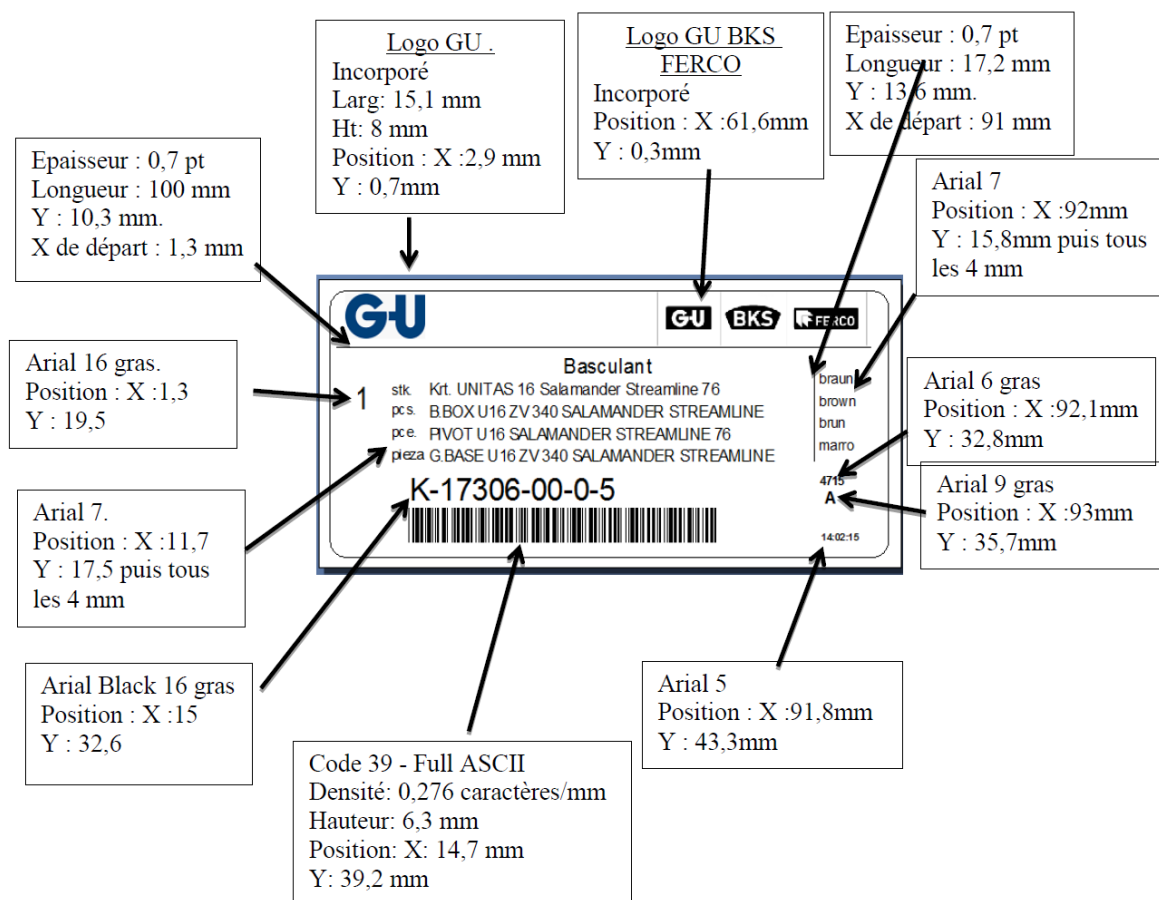
No other logo than GU trademarks & FERCO should appear on the boxes or individual bags

The labels on the cardboard boxes can be either standard or removable.

In any case, they must be applied at the same place on the cardboard (see drawings below)

When used standard label, the position of the label must be checked carefully. If the position does not comply with our specification, you will receive a claim from our Quality department.

Neutral sticker label
Dim: 105 mm X 48 mm



8. Patent

The product should be free of any French or European Community patent. The supplier takes responsibility of a product disrepecting this conditions.

If you have any questions regarding this specifications please contact : s.dastillung@ferco.fr

9. Product identification

- ✓ Prices are DAP , Ferco Reding 57400, in France, following incoterm 2020
- ✓ Delivery and definitive delivery time

It's PRODUCER responsibility to manage his stock in order to ensure the delivery on time and with the requested quantity.

BUYER accepts to send 12 months forecasts so that PRODUCER has clearest perspective to manage his production plan.

By taking into account temporal character of door and window market PRODUCER accepts that BUYER can modify the volume of orders one time or twice without exceeding $\pm 20\%$.

- ✓ Securing supply for BUYER's automatic production lines (see in the appendix)

Considering the serial production process of the PRODUCER and the associated potential variations which could lead to a production stoppage, BUYER is requesting PRODUCER to secure the supply by implementing a safety stock at its place. The safety stock should be up to 3 months of consumption (= (6 past months of consumption + 6 forecasted month of consumption)/12 x 3). The figure update is PRODUCER responsibility.

- ✓ Obsolete

In the case of one article becomes obsolete because of a drawing modification (and the current stock will not be consumed) or suddenly a stop of production (the forecast becomes 0 from a month to another), the related cost will be supported by the seller.

PAYMENT

Payment will be realized only if PRODUCER has fulfilled all obligations arising from the agreement at the invoice date.

Agreed payment term: **60** days from invoice

Intended logistics level:

Target: 98%

PRODUCER accepts that he will perform the best that he can to reach expected logistic level.

In order to reach this target, BUYER allows PRODUCER to constitute a safety stock up to 1 month consumption based on the forecasted yearly volume (volume /12). The management and the reassessment of this stock have to be handled by the PRODUCER (calculation based on the forecast). In case of BUYER stop the order suddenly, BUYER would be liable to buy this safety stock at agreed serial price.

Delay penalty

In case of late deliveries recur, BUYER has right to apply a delay penalty of 1% for each week in delay in a way to not exceed 10% of volume of orders.

In case of a late delivery PRODUCER, apart from delay penalty, assures to Company to realize the delivery in a shortest time by doing the best that he can (as to substitute, weekend shift etc.). In case of PRODUCER couldn't manage a special shipment, BUYER may assume the responsibility to organize the shipment. In this case the parties agree that all shipment costs will be charged to PRODUCER.

Tooling penalty

In case of PPAP submission approval delayed, BUYER has right to apply a delay penalty of 5% of the whole investment with two weeks of waiting period.