TECHNICAL GUIDE

SPARK FR

DICKSON CONSTANT

18 September 2019 edition

DICKSON®
solar fabrics

USES AND LIMITATIONS OF THIS GUIDE

This Technical Guide summarises the expertise developed by Dickson-Constant with input from other specialists in the textile sector. Its aim is to facilitate the use of our product.

The machines and tools mentioned in this guide as well as similar equipment and suggested settings can be used to manufacture solar protection devices using SPARK FR fabric.

The information in this guide is based on tests made by our manufacturers in compliance with standard techniques. It may be revised in the future subject to technical advances in machinery.

It is the responsibility of each manufacturer to carry out their own tests (prototypes) to ensure proper use of the fabric and the smooth functioning of the whole system. They must provide their customers with all warranties for the finished product.

Dickson shall not be held responsible for quality-related complaints arising from manufacturing defects that may result from the use of the equipment and machines suggested in this guide.

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Appendix - “Technical Sheet for Manufacturing” summary sheet

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1 - MAIN FEATURES

SPARK FR – DESCRIPTION

SPARK FR is a 100% polyester solution-dyed fabric infused with a fire-retardant primer that meets the high standards required by the most demanding national and European regulations.
Both sides of the fabric are similar.
SPARK FR benefits from the remarkable weathering qualities of solution-dyed yarn to guarantee colourfastness when exposed to sun and rain.
Infused with a special primer, it is both flame-retardant and water-resistant.

It is available in nine plain colours.
These colours are remarkably UV-resistant, making the fabric particularly suitable for outdoor applications.

SPECIFICATIONS

- **Composition:** 100% solution-dyed polyester; high-tech waterproof and **FLAME-RETARDANT** coating
- **Weight:** 335 g/m²
- **Width:** 120 cm
- **Warranty:** 5 years

For more information, please see the Technical Factsheet for this product.

- The solar factors of SPARK FR fabric are mentioned in our technical-commercial brochures. Please contact Dickson for more information or technical support.

2 - DELIVERY

a) Packaging

The canvas is wrapped around a tube and protected by plastic packaging. At one end, the length of the part receives two labels, one being glued entirely on the long side, the other being "on horseback" on the long side and the side of the part, for better visibility at all angles.

b) Labelling - Traceability

Each piece is identified by two labels. The product's reference number, length, width and the position of any flaws are detailed on the label.

A unique serial number appears on the label: it identifies the part perfectly and allows its whole manufacturing process to be traced. It allows for an analysis of any potential faults. It is required in order to process any claim.

c) Handling

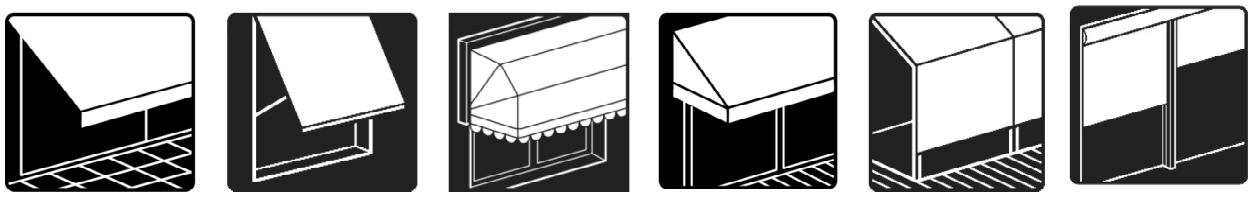
The fabric must be laid horizontally during transport. Do not drag the fabric on the floor, even in its cardboard box. Avoid accidental impacts (from lifting forks, for example) and any unnecessary pressure (pallet risers). Do not fold the fabric under any circumstances.

d) Storage

Store the fabric at a temperature of between 5°C and 40°C and away from sunlight. Position the roll horizontally and not vertically. Do not fold the fabric under any circumstances.

3 - END USE

SPARK FR fabric is mainly intended for folding-arm awnings, drop-arm awnings, Dutch canopies, fixed awnings, veranda blinds and vertical blinds including with a zip guide system.



The manufacturer is responsible for ensuring that the fabric can be used for the selected application, by creating one or more prototypes, and, after verification, that it complies with the applications recommended by Dickson-Constant.

The fabric should never be folded, regardless of the application.

4 - PRE-CUTTING

a) Batch identification

For a given colour, the manufacturing process can create minute visual differences, barely detectable by a trained eye, and dependent on the angle of observation.

To avoid any visual differences, the panels intended for the same blind will have to be cut ideally from the same roll, and at least from the same batch.

In order to identify the batch, note that each part is identified by a label; the matriculation number of the part is in the top right corner; the batch number to which the part belongs is the first 5 alphanumeric characters.

In our example

- the matriculation number is: M7451A202
- the batch number is: M7451

b) Which side should face the sun and which should face the inside?

Both sides of SPARK FR can face either outwards, towards the sun, or inwards.

However, once you have decided which way the fabric will face, it is important to select the same side for each panel.
Two contiguous panels should always face the same side towards the sun. They must be cut in the same direction relative to the unrolling of the piece.

c) Direction (warp or weft?)

For all winding awnings and solar protection uses, establish the maximum dimensions in relation to the guide system and roller tubes, which can affect tension (and need to be adjusted to optimise winding quality). Use a large-diameter roller tube to limit folds and faults.

The conventional direction for SPARK FR manufacture is the warp direction; in other words, the SPARK FR warp is oriented in the direction of the advance of the blind; the weft is oriented in the cross direction (horizontal).
The other manufacturing direction is technically possible; however, it is not advisable because the main tension in the direction of the advance is then in the least resistant direction of the canvas. If the manufacturer requires this manufacturing direction, it is recommended that they test the manufacture beforehand on a prototype.

Once the cutting direction has been selected, apply to all canvases used on the same site to prevent unsightly mismatching.

d) Dimensions

Our experience shows that large installations (above 600cm width x 400cm) are possible with two arms. Beyond this, the creation of a prototype may be necessary to check the technical feasibility and the manufacture and assembly settings. In particular, a number of upper arms will be necessary. Dickson is at your service to help you with this process.

e) Guidance systems

The SPARK FR fabric is suitable for any type of system: blind with arms, but also vertical blinds with cable guide, profile or continuous side ("zip"). When creating a continuous lateral guide, it is important to pay special attention to the desired size of the final product and take it into account in the cutting plan. This requires highly precise measurements, down to the last millimetre.

5 - CUTTING

a) Procedure

Ultrasonic cutting is recommended for SPARK FR fabric to prevent fraying. This technique simultaneously cuts and cauterises the fabric.

A possible alternative is laser cutting, although particular care must be taken to prevent fraying.

Other hot cutting techniques can achieve acceptable cauterisation; it is up to the manufacturer to ensure the quality of tools.

b) Suggestions for appropriate machines

Suggested ultrasonic-cutting machine manufacturers: SMRE (SM 400.TA), JENTSCHMANN (ScreenCut), ASCO (BX cutting table), or MATIC (M1 Ultimate or M2).

M1 ULTIMATE (ultrasonic cut and crush-cut in 2 directions, glass table up to 300x600 cm)

Suggested generator manufacturers: Calemard (G3-C), NOVUS (3,150W), DelphinUS; there are also many portable generators on the market.

A portable hot-cutting machine, for example HSG-O (SODIFA-ESCA), is worth considering: it makes non-rectilinear cutting easier.

c) Parameters

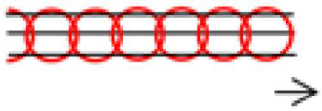
Ultrasonic knife-cutting typically requires an ultrasound frequency of around 40 Hz; the product rolling rate is generally between 20 and 25 m/min.
The operator must ensure that the fabric is cut perfectly square. This is essential to avoid winding problems once the product has been installed.

You will find the essential cutting technique information in the appended Product Manufacturers' Guide.

6 - PANEL ASSEMBLY; HEMS AND SLEEVES

The assembly of polyester fabrics is traditionally done by sewing, or by bonding with thermo-reactive adhesive tapes; assembly by liquid glue is quite rare.
NB: for gluing assembly, the WIDTH of the assembly is fundamental: 18 mm is standard; 10mm may be insufficient (check on the machine); 25 mm may be suitable for structures placed under the most stress.

a) Sewing

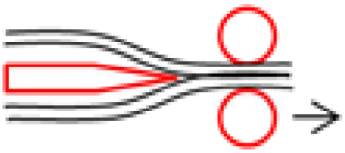


To make assemblies, hems, sleeves, sewing is suggested as a priority. A thread of type Serafil 30, Saba 35, Rasant 25, Serafil WR (Amann), or Gütermann 80 will be used. Needle may be SES or R (Schmetz).

Double stitch for hem

Dürkopp-Adler sewing machine

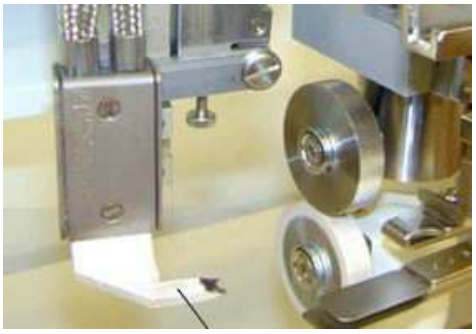
b) Hot-iron welding



Hot-iron welding can be used to assemble fabric without hot-melt adhesive tape, of type **GLUETEX AU110, AU130** or similar.
DOREY can also supply a **34000 (3M)** tape that is also suitable.

The **T300 Flex machine (MILLER WELDMASTER) distributed by DOREY** must be set to an overlap width of **25mm**. Linear velocity must be equal to **3-4 m/min**, with a temperature of **380°C**, **2 bars** of pressure and **101%** tension.

MILLER hot-iron machine (Triad)



PFAFF hot-iron machine (8403)

Portable **MILLER WELDMASTER (TRIAD or SPEC)** machines may be used for this process, supplied by **DOREY**. Overlap width is **25 mm** as standard (25 mm pressure cylinder), with linear speed of around 5 m/min, a maximum iron temperature of **430°C**, and **2 bars** of pressure. Apply **101%** elongation to avoid folds.

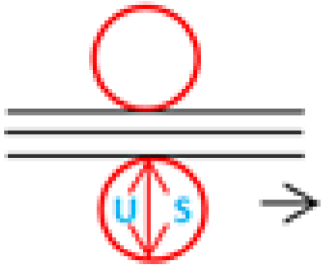
c) Hot-Air Welding

Hot-air welding requires precision setting but gives excellent results when assembling SPARK FR fabric: it requires the use of a hot-melt tape of type **GLUETEX AU130 (or AU110)**.
DOREY can also supply a **34000 (3M)** tape that is also suitable.
The most frequently used widths are 18 mm and 22 mm.

The **CS-112 (MILLER WELDMASTER/DOREY)** machine may be used; the overlap width will generally be **25 mm**, the linear speed from **3 to 4 m/min**, an air flow rate of **8 L/min at the injector** (injector/cylinder distance **10 mm**, injector height **7 mm**) **with a temperature of 510 °C**, cylinder pressure of **2.5 - 3.5 bars**, and elongation of **0.1 cm / 100 cm (0.1%).**

DOREY can also offer you a machine of type **SM-216-SA (SMRE)**.

d) Ultrasound welding



Ultrasonic welding is another possible fabric welding method. **Jentschmann** offers the machine: **Ultrasonic Bonding System Weldsonic TWIN** (two heads: one ribbed and one smooth).

It requires the use of a hot-melt tape of type **GLUETEX AU130 (or AU110),** or similar. **GLUETEX AU111** may also be used.

Settings depend a lot on the age of the machine. A newer machine generally has less amplitude than an older machine.

Settings (for a new machine):

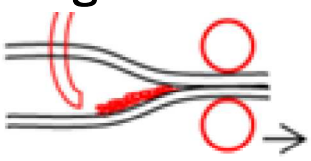
Speed	Pressure	Elongation	Power rate
12 m/min	1.2 bars (head 1) 1.6 bars (head 2)	1009/1009 (head 1) 1012/1012 (head 2)	95%

Ultrasonic head of a Jentschmann Weldsonic machine 2796-2-20

Special requirements for "edge-to-edge" assembly

The Jentschmann ultrasonic machine is compatible for use with an "ultra seam" tape type US AU110 NA 21 available in 21-mm width.
It is equipped with a silver-colored or gold-colored central tape.
This tape allows the two panels to be welded edge to edge (without excess).

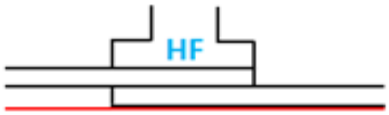
e) Assembly by liquid glue



This technique is rarely used for SPARK FR; however, it gives good results. Contact your machine manufacturer.
MILLER, SMRE (machine SM.216.SA), or DOREY, authorised distributor for France, can support the manufacturer.

Liquid glue machine SM-216-SA

f) High-frequency welding



This welding method is little used for SPARK FR fabric; a GLUETEX AU130, AU110 or similar hot melt adhesive tape is required.

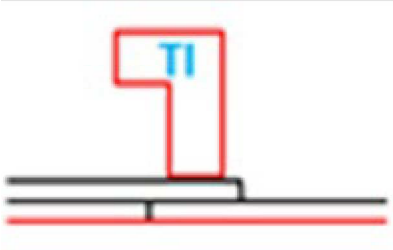
For 120/140 cm-long and 15 mm-wide welding, a FORSSTROM TX-TD 300-400 machine with 2.5 kg/cm2 of pressure is optimal. FORSSTROM TX 200-800 models also give very good results.

FIAB also offers excellent machines for high-frequency welding.

High-frequency 22 kW MATRELEC machine

An "aluminium" electrode provides very significant benefits compared to a "brass" electrode, because its conductivity is higher. Forsstrom HF machines were previously equipped with a "brass" electrode as standard. Today, "aluminium" electrodes have become the Forsstrom standard.

g) Thermal-pulse welding



For this method, the machines used (up to 600 cm) may be bought from **MATIC (ARES and HERA ranges), TECHNO, or ASCO (IL315, 420, 580 ...)**
To weld SPARK FR, **it is necessary to use a hot-melt adhesive tape:**

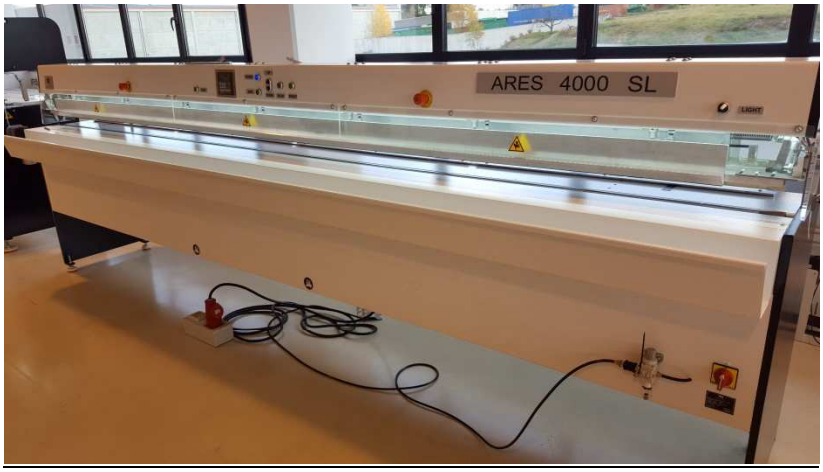
- GLUETEX AU110, AU130, or similar, on any machine brand
- FIXMATIC for MATIC machines
- AC100 (pre-positionable) for ASCO machines

When using any of these machines, stay within a moderate temperature range (the more the product is heated, the more likely it is to be deformed). Maintain

pressure at **3 to 6 bars**, with a welding time of **3-8 seconds**, and a cooling time often much higher than the welding time.

Some settings on the ARES 4000 SL machine, defined in collaboration with MATIC, and the IL 580 machine in collaboration with ASCO:

Machine	Electrode	Adhesive tape	Overlap	Temperature	Heating time	Cooling time
4000 SL	4000 x15	FIXMATIC	15 mm	168°C	8 sec	20 sec
IL 580	5800 x 12	AC-100	12 mm	130°C	3 sec	15 sec



ARES thermal pulse machine (4000 SL)

Basic assembly technical information can be found in the Product Manufacturers' Guide (appendix).

7 - QUALITY CONTROL ON ASSEMBLY

The quality of the assembly must be evaluated as follows:

- Assembly of the product under the specific operating conditions established by the manufacturer: machine, width, temperature, pressure and speed; if applicable, the reference of the adhesive tape.
- Cutting of enough test pieces, at least 30 cm-long and 50 mm-wide in a direction perpendicular to the assembly point.
- Traction on test pieces according to standard EN 13934 until breakage.

INSTRON "3000 series" dynamometer (Dickson Quality Laboratory)

- Examination of the test strip: if it breaks elsewhere than at the assembly point, or loses lamination in its thickness, this is important and often positive information

- Recording of the strength and lengthening of the test strip up to breakage

- Comparison of the breakage force with the table below:

➢ 50 daN/5cm	limit; requires optimisation
➢ 60 daN/5cm	acceptable in general
➢ 70 daN/5cm	satisfactory
➢ 80 daN/5cm	excellent

8 - PRINTING

SPARK FR can be printed on both sides.

In general, ink resistance to sun and rain exposure is time-limited. A print, even if initially acceptable, may change unfavourably within months. The printer is responsible for the resistance of the print over time.
Once the fabric has been processed, SPARK FR's original characteristics (including fire retardance) can no longer be guaranteed by Dickson.

Various techniques are available on the market; as tests were still on-going at the time of publication, contact Dickson for the results of our most recent tests.

PAINTING

This is a method that presents several levels of complexity, ranging from a simple painting of the frame based on previously drawn outlines, to screen printing by means of finely open frames, or the use of stencils based on the dimensions of the pattern to be affixed. This is the intermediate case that is most frequently implemented. In all cases, the following general instructions must be followed:

- Spread the acrylic canvas over a solid and flat support.
- Smooth the fabric to avoid creases.
- Carry out the drawing on the canvas using a chalk adapted to the textile, using a stencil, or a frame.
- Use a stiff brush of 12-15 mm
  - *Paint the outline of the drawing over the chalk line with the paint*
  - *Press any stencils onto the fabric, and work by going from the stencil to the canvas which will prevent drips under the stencil*
- Pressing firmly; run short and lateral strokes, to create a clean outer edge
- Fill the drawing with the paint. Press firmly to get the paint into the fabric. Press firmly to get the paint into the fabric.
- To avoid "piercing" with the paint, the first layer can be coloured a shade close to the acrylic fabric or be made of a transparent lacquer
- Allow the first layer to dry perfectly. While the first layer forms a seal at the edge of the drawing (or the meeting of the stencil and the canvas), apply the second layer using a less stiff brush.
- Apply as many layers of paint as needed until the colour of the canvas no longer appears. Allow the paint to dry between each coat.

- If using a stencil, remove it after the last application, and before the paint dries, to leave a clean edge. Otherwise, the paint applied at the edge of the stencil may stick to it
- Allow the final layer to dry for 24 hours before exposing it to the climate

Some recommendations relating to "painting":

- The most used paints are of acrylic or acrylic-polyurethane type; these are offered by GUITTET *www.guittet.fr*
- *Drying time can be accelerated by using a hair dryer*
- *SPARK FR fabrics have been treated to be water repellent. This treatment will tend to "repel" the paint, and to hold it to the surface of the fabric; it is therefore necessary to apply strong pressure to introduce the paint between the fibres*
- *It is recommended to test a sample of fabric before working on the item to be sold.*

HOT TRANSFER PRINTING

This process is similar to the removal of a hot decal by means of a press; it is suitable for SPARK FR; its adhesiveness over time is limited (in the order of 2 years); CHEMICA (www.chemica.fr) and SEF (www.sef-france.com) can be approached for further information and optimisation of aging resistance.

INKJET PRINTING

Inkjet printing is not always recommended due to its very pale rendering on polyester.

If the inkjet technique cannot be avoided, due to equipment reasons, printing with "UV", "latex" or “eco-solvent” inks is possible; the rendering remains average and the resistance to friction is limited. The rendering can be approved by applying a first white layer "all-over" which will accentuate the rendering of the final print layer. Contact Dickson for the results of our most recent tests.

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9 - INSTALLATION

a) Installation direction (oriented towards or away from the sun)

As mentioned in paragraph I, SPARK FR has two similar sides.
Either side may be turned towards the sun.
Side selection should reflect the manufacturer's requirements.
However, if two SPARK FR fabrics of the same colour are to be installed immediately next to each other, the manufacturer and installer shall jointly ensure that the two fabrics have been produced/fitted in the same direction with respect to the direction of the fabric on the roll.
This will prevent possible optical differences between the two awnings.

b) Contact with other parts of the system

SPARK FR fabric must be protected from rubbing against the structure on which it is installed. Tension must be maintained to prevent any points of contact with the various parts of the structure. In this regard, the coated side must be particularly cared for.

This precaution prevents the premature deterioration and loss of water-resistance of the fabric.

c) Roller tubes

If the finished product is a winding structure, SPARK FR fabric should be manufactured and carefully fitted around the roller tube. This tube must be of a sufficient diameter and quality to prevent sag. A large diameter is preferable for fabric winding. The fabric's tension and "end stops" must be adjusted.
The end use (folding-arm awning, pergola, etc.) must of course be taken into account to establish the dimensions and quality of the tubes.

d) Guides

If a lateral guidance system (zipper) is used, tension on the product must be limited or eliminated during manufacture; cutting must be performed by ultrasound according to the cutting plan, or very carefully with a rotating knife. Experience shows that the following steps, performed in this order, optimise the product's final appearance:

- “upper”, “lower” (ultrasound) cut
- “upper” and “lower” sewing or welding (thermal pulse, or HF, for example)
- side cuts (ultrasound)
- “zip” welding (thermal pulse, or HF, for example).

e) Poles

If SPARK FR fabric is affixed to one or more poles, or if tensioners are used, the creation of eyelets should be considered. The fabric will be reinforced by a hem (minimum of two folds); the diameter of eyelets will be 1 to 3 cm; attention should be paid to ensure that there is enough space between the eyelet and the edge of the fabric (minimum of 1 cm).
The eyelets used must be suitable for outdoor use (stainless steel) to prevent the formation of rust on the fabric; moreover, the eyelet watertightness must be guaranteed to avoid any risk of capillary rise in the water towards the fabric.

f) Profiles

To create a pergola, the manufacturer should assemble a PVC profile on one side of the SPARK FR fabric.
This assembly can be done by ultrasound (JENTSCHMANN) using hot-melt adhesive tapes AU110, AU130 (GLUETEX) or similar.
Liquid glue (MILLER WELDMASTER machines) can also be used.

g) Slope

A slight slope will be provided to clear water and to prevent it from stagnating on the canvas. For a folding-arm awning, the slope must not be less than 14°

unless the manufacturer of the entire finished system specifically recommends otherwise.
In the event of rain, and if the system is windable or retractable, be sure that the fabric is dry before winding it. If you retract it while it is wet, for fear of damage from the wind for example, unwind it again as soon as possible so it can dry.

10 – MAINTENANCE

h) "Mechanical strength" and "Colourfastness"

SPARK FR is fully compliant with standard EN 13561, paragraph 4.14.2 for fabrics.

It has one of the highest breakage resistance levels on the market for a polyester fabric and remains above 100daN/5cm (warp) and 60 daN/5m (weft), even after several years of use. SPARK FR is therefore Class 3 (best in class) as defined by standard EN 13561 in terms of this criteria.

SPARK FR fabrics generally have Class 4 colourfastness, the highest according to standard EN 13561.

Other EN 13561 standard paragraphs concern the end product as a whole (fabric, frame, motor, mounting parts, etc.); only the manufacturer of the fully finished product can attest to its full compliance with standard EN 13561, but optimal conditions are achieved when SPARK FR fabric is used.

i) Recommendations for use

Based on the features detailed in the previous paragraph, Dickson fabrics are suitable for outdoor use. You should not encounter any particular problems if you follow the detailed recommendations set out in the SPARK FR **Maintenance and Warranty Guide**.

- The frame of your pergola (or awning) must be configured in such a way that the fabric is completely taut and does not rub against or have other contact with the structure.
- Do not leave the pergola (or awning) extended in high winds.
- You may keep the pergola (or awning) open in the rain but, if wet, do not retract it for long periods. If, for various reasons, you must roll it up wet, redeploy your awning or blind at the soonest opportunity in order to dry the fabric.
- In winter, the user should ensure snow does not accumulate on the awning by retracting it if snow is forecast, or if the awning is deployed, sweeping snow off before retracting it. Snow accumulation can overload the awning and create pockets, deform the structure, and cause irreversible damage to the motor.

The fabric must be cleaned following the directions detailed in the SPARK FR **Maintenance and Warranty Guide**.

It is the installer's responsibility to ensure that the end user has received the Maintenance and Warranty Guide.

11 - WARRANTY

To be able to make a claim based on the Dickson warranty, you must have followed the detailed recommendations in this **technical guide** as well as the SPARK FR **Maintenance and Warranty Guide**. Please refer to this guide whenever necessary.

It is the installer's responsibility to ensure that the end user has received the Maintenance and Warranty Guide.

12 - QUESTIONS AND ANSWERS

Which "fire-retardant" standards are met by SPARK FR fabric?

The "fire-retardant" levels met by SPARK FR are shown on our technical data sheets. Ask your client which legislation applies to their project, and check with them if SPARK FR is compatible.

Your national craft union may be a valuable source of technical information.

Can I obtain CE marking for my complete finished product made with SPARK FR fabric?

YES, the use of **SPARK FR** fabric ensures compliance with chapter 4.14.2 of standard EN 13561 and with the conditions for CE marking of the finished awning.

Does SPARK FR fabric have the CE marking?

CE marking is not granted to fabrics. Only a finished awning can have CE marking, if it complies with standard EN 13561.

Is SPARK FR compliant with the wind resistance chapter of standard EN 13561?

SPARK FR is a fabric; fabrics are covered in chapter 4.14.2 of standard EN 13561 which concerns the intrinsic properties of the fabric. The other chapters, in particular “wind resistance”, apply only to complete finished awnings: fabric, frame, motor, mounting, etc.

How does standard EN 13561 apply to SPARK FR?

The standard applies to **SPARK FR** regarding age-related alteration in terms of: “Breakage resistance" and “Colourfastness"; its elongation under a constant load is also checked.

Breakage resistance: **SPARK FR** has a high initial mechanical resistance (220 daN/5cm in warp, 110 daN/5cm in weft).

Colourfastness: SPARK FR has excellent colourfastness. This is due to the use of solution-dyed polyester yarn.

What is the open weave coefficient of my SPARK FR fabric?

The open weave coefficient of **SPARK FR** is 0%, but the fabric remains resistant to water penetration, within the limit set out under “Water Column” (see Technical Data Sheets).

How can I find the gtot of my SPARK FR fabric?

This measure is usually detailed in the leaflets supplied with the product. We calculate the official precise values based on the following factors:

- spectrophotometric measurements made in an independent accredited laboratory.
- calculations in line with the recommendations of standards EN 410, EN 14500, EN 14501, EN52022-1 (formerly EN13363-1), in combination with standardised “C” glazing.

For more details, contact Dickson.

Should I choose a light or dark colour to be protected from heat?

If you are fitting your awning outside, and your priority is to be protected from heat, for example if your terrace is in a Mediterranean country, choose a dark colour. If your fabric is for vertical indoor use, in an office building, for example, choose a light colour.

Should I choose a light or dark colour to continue to enjoy the light?

If you are concerned about maintaining enough light, for example if your facade is oriented either north or east, choose a light colour instead to diffuse the light.

TECHNICAL ADVICES FOR BLIND MAKING
- SPARK FR -

DICKSON
innovative textiles for your world

Following devices, or similar equipments, and following values of process parameters, may be used to make blinds with SPARK FR. This fabric meets most of the fire-retardant requirements reglementation in the world. For each type of awning, it is needed to define maximal dimensions, depending on roller tube and drive systems which may influence strenghts (these must be adjusted to get an optimized winding). Each maker must organize his own tests to insure the correct proceeding of systems, and final product guarantee.

This document is valid for SPARK FR product manufactured in technical conditions defined on 2019, March 1st

APPLICATION	RECOMMENDED
AWNINGS	X
PERGOLA AWNINGS	X
VERTICAL ROLLER BLINDS	X

TABLE WIDTH	400 cm x 400 cm minimum
LAYING DIRECTION	WARP generally ; each part of one awning must be oriented the same way : same side looking at the sun ; same direction (direction of unwinding roll) for each part and the part beside

CUTTING	SUGGESTION					
CIRCULAR KNIFE	**TO AVOID**					
ULTRASONIC CUTTING	**Recommended ; simultaneous cutting and cauterization**					
Machine	SM.400.TA (SMRE-DOREY)	BX CUTTING TABLE (ASCO)	M1 Ultimate (MMATIC)	ScreenCut (Jentschmann		
Linear speed	25 m/min					
Axis number	2	2	2	2		
Method	cutting on table	cutting on table	cutting on table	cutting on roll		
Manual cutting	see Decoup+					
LASER CUTTING	**Possible ; simultaneous cutting and cauterization**					
Machine	3XL - 3200 (EUROLASER)					
HOT CUTTING						
Machine	ENGEL-COUPE portable "hot iron"					
Linear speed	+/- 5 m/min (manual)					

SEWING	SUGGESTION			
DOUBLE-LINE SEWING				
Machine	PFAFF 1420-1425 types	DüRKOPP ADLER 867		
Sewing table	ORION or HERCULES (MATIC)			
Thread	**SERAFIL 30 (Amann Group)** **SABA 35 (Amann Group)** **COATS DIABOND = bonded polyester Tex 080 UV treated** RASANT n°25WR polyester /cotton (Amann Group) TENARA M1000LTR-L-5 / M1000KTR-L5 / M1000HKTR-L5 100% oiled ePTFE / M1000XHTR (translucent yarns) TENARA M1000TR-(XX))-5 / M1000HTR-(XX)-5 (coloured yarns) SERAFIL WR (Amann Group)			
Needles	134-35 CR (2134-35 CR / DPx35 CR) reference 49-044 635-02 3 std		SES (Schmetz)	R (Schmetz)
Needle size	90-110 to 120-140 depending on thread to use			
Overlap width	22 mm			
Gap between lines	15 mm			
Speed	10 - 12 m/min			

WELDING (ADHESIVE TAPE NEEDED)	SUGGESTION					
Be careful ! Width of the welding is important : 20 mm is a classical value ; 10 mm may be not enough (to validate or not on the machine)						
HIGH-FREQUENCY WELDING						
Machine	FORSSTROM TX 800 or other devices of TX 200-800 range, or other ranges : TD …					
Tape	reference PAF - 130 (Adhesive Fabrics Inc) or reference AU 130 SK (Gluetex)				Other machines=	
Power / Frequency	8 to 20 kW / 27 MHz depending on size of welding				MATRELEC type CP	
Balance	40%					
Overlap width	25 mm					
Welding time	6 sec					
ULTRASONIC WELDING						
Machine	**Ultrasonic Bonding System Weldsonic TWIN (Jentschmann)**					
		Roll 1 : ridged			**Roll 2 = slick**	
Linear speed	12 m/min					
	Pressure	Balance	Elongation (UP)	Elongation (LOW)		
Roll 1	1.2	95	1009	1009		
Roll 2	1.6	95	1012	1012		
Tape for standard overlapping	AU111 (Gluetex) ; AU110 and AU130 also possible					
Tape for edge/edge bonding				Ultra Seam "nature silver" US AU110 NA 21 ; BE CAREFUL (1) adhesive tape has 2 different sides (2) simultaneous cutting of edges on 10 mm		
Adhesive tape width	18 mm (8 to 28 mm is available)			21 mm		
Temperature	Melting point range of the adhesive tape : 110-130°C					
HOT WEDGE WELDING						
Machine	T300 Flex (DOREY / Miller Weldmaster)			TRIAD or SPEC (DOREY / Miller Weldmaster) - portable machine		
Tape	AU 130 (Gluetex) is recommended ; AU11O (Gluetex) is possible ; 34000 (3M) also possible					
Overlap width	25 mm			25 mm		
Linear speed	3 - 4 m/min			5 m/min		
Temperature	380°C			430°C		
Pressure	2.0 bars			2,0 bars		
Elongation	101%			97,5% (roll/roll)		
HOT AIR WELDING (possible but depends of accurate parameters)						
Machine	112 Extreme (DOREY / Miller)		Air flow	8 l/min		
Tape	AU 130 (Gluetex)		Gap injector/roll	10 mm	Other machines =	
Overlap width	25 mm		Injector height	7 mm	SM 216-SA (DOREY / SMRE)	
Linear speed	3 - 4 m/min		Pressure	2.5 - 3.5 bars	Ventron (DOREY)	
Temperature	510 °C		Elongation	0.1 cm / 100 cm (0.1%)		

HOT-MELT GLUEING	SUGGESTION		
Machine	SM.210.SA (SMRE)	Seamstrong (Miller)	Markispeed 2003-1 (SCHULTE)
Total lenght	5 linear meters standard ; 2 to 18 lm if needed		
Hot-melt glue	hot-melt polyamide under normal atmosphere		
Overlap width	25 mm (10 to 30) ; glue layed on 14 mm (Schulte) or 22 mm (SMRE)		
Linear speed	8 - 9 m/min ; 15 m/min maximum		
To notice	SMRE = machine fitted with a hot--melt glueing system + (options) hot air welding + ultrasonic welding		

EDGES	SUGGESTION
HEMS	**(may be avoided)**
Width	3 cm overlap
Making	*see above recommendations for welding*

EYELETS	SUGGESTION
Size	3 cm
Minimal distance from edges	1 cm
Minimal number of layers	2

STORAGE	SUGGESTION
Roll position	horizontal - in cardboard packaging
Temperature	5 - 40 °C
Handling	with care - manual, or handling machines

NEVER FOLD A SOLAR PROTECTION FABRIC

GD 6/03/2019