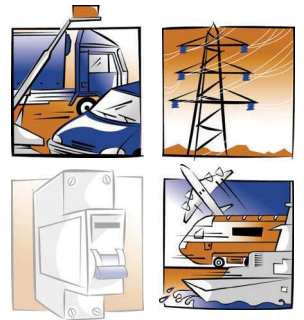


# PANEL BOARD FLEXIBLE CONNECTION



## Concept and design:

The FORISSIER Panel Board Flexible Connections are manufactured with red flat copper braids, protected by an extruded PVC which offers an electrical insulation as well as the Panel Board Flexible Connection is twisted or used in different environments (humidity, high temperature or aggressive ambient).



## The range:

Cross section area: 25<sup>2</sup> - 50<sup>2</sup> - 100<sup>2</sup> - 120<sup>2</sup> - 240<sup>2</sup>  
Standard length (mm): 250, 500, 750, 1000...  
Insulation: Black PVC 105°C

## Option:

High temperature insulation 125°C  
Low temperature insulation -50°C  
Halogen free (90°C max)  
Other colours and bicoloured

## SCOPE OF APPLICATION

- All application linked to power transportation, to replace cables and rigid bars.
  - Electrical appliances (Switchboard, Circuit breaker and Converter).
  - Transformer (Connections between the transformer and the busbars).

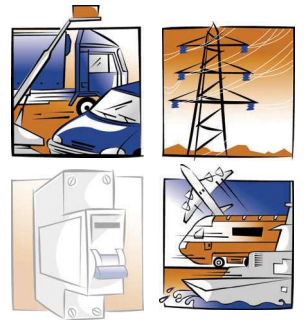
## ADVANTAGES

The issue is to connect in a short time, components into a panel board and especially when the panel board is small or when is located in an enclosed space (ex. Marine or Railway industries).

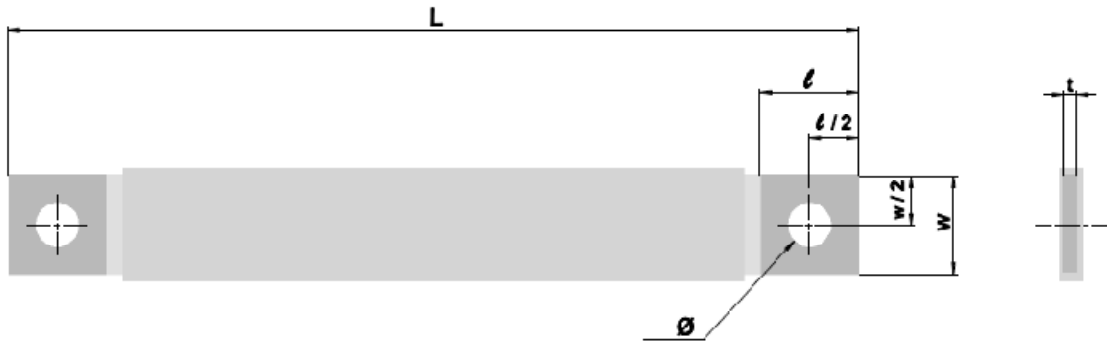
## DESIGNATION

CS	TP	100MM <sup>2</sup>	LT 1000	PVC105
Connexion	Flat braid	section	Total length	Insulation

# PANEL BOARD FLEXIBLE CONNECTION



## PRODUCT RANGE & DIMENSIONS



	25 <sup>2</sup>	50 <sup>2</sup>	100 <sup>2</sup>	120 <sup>2</sup>	240 <sup>2</sup>
<b>l (mm)</b>	25	25	30	30	35
<b>w (mm)</b>	25	25	30	30	35
<b>t (mm)</b>	3	5	6.5	7.5	11.5
<b>Ø (mm)</b>	Ø6.5 - Ø8.5 - Ø10.5 - Ø12.5				
<b>L (mm)</b>	200 - 250 - 500 - 750 - 1000 ...				

## ELECTRICAL CHARACTERISTICS

Maximum rated voltage: 1000 Vac  
 Test voltage (IEC 60439-1): 3500 Vac  
 Rated frequency: 50-60 Hz

**Operating temperature:** -40°C to +105°C

## PERMISSIBLE CURRENT IN STEADY CONDITION

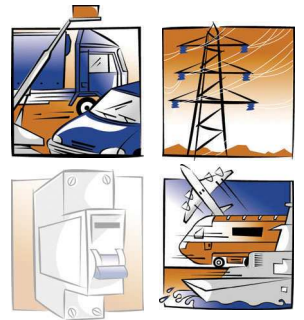
The cross section area of the braid is chosen according to the permissible rise of temperature ( $\Delta T$ ) into the electrical appliance and the nominal rated current ( $I_{max}$ ).

	25 <sup>2</sup>	50 <sup>2</sup>	100 <sup>2</sup>	120 <sup>2</sup>	240 <sup>2</sup>
<b>I max (A) at AMBIENT TEMPERATURE 35°C</b>					
<b>ΔT +35°C</b>	145	210	330	365	570
<b>ΔT +45°C</b>	165	245	380	420	655
<b>ΔT +55°C</b>	185	270	420	465	730

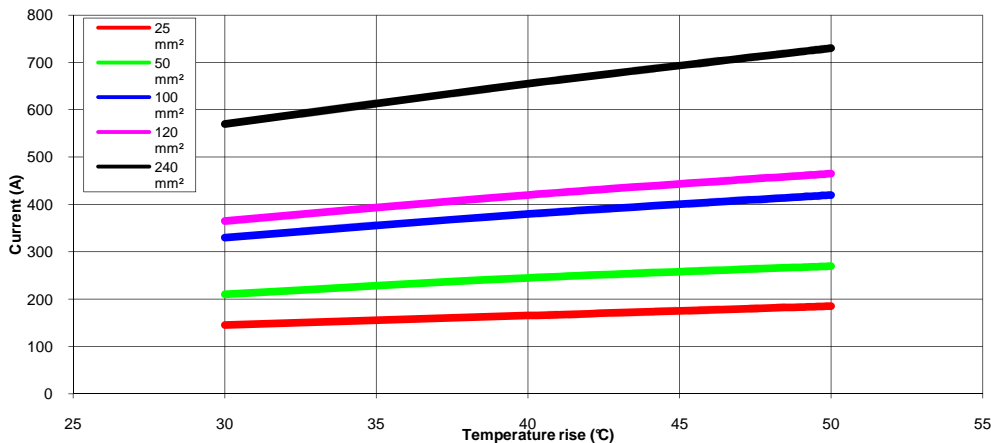
*Note 1: Ambient temperature = temperature around the connection.*

*Note 2: Above values are indicative, theoretical and could change with use conditions.*

# PANEL BOARD FLEXIBLE CONNECTION



Permissible current according to temperature rise ( ambient T°C = 35°C)



Note: Above values are indicative, theoretical and could change with use conditions.

## Selection's Example:

Our example concerns a nominal rated current of 380A and a maximum temperature of 80°C.

- Operating cabinet temperature around the connection) is 35°C
- The acceptable temperature rise is 80°C - 35°C = 45°C
- Selection gives a cross section area of 100 mm<sup>2</sup> or more.

## SHORT CIRCUIT CURRENT & ENERGY

### Conditions:

Maximum temperature reached by the insulation and the braid = 160°C (acc. to IEC 60724)

Short circuit duration = 1 s

Initial temperature of the connection = ~ 80°C

- **Permissible short circuit current (peak current):**

Short circuit current (I<sub>pc</sub>) is calculated with formula from IEC 60865-1.

	25 <sup>2</sup>	50 <sup>2</sup>	100 <sup>2</sup>	120 <sup>2</sup>	240 <sup>2</sup>
<b>I<sub>pc</sub> (kA)</b>	2,8	5,6	11,0	13,2	26,5

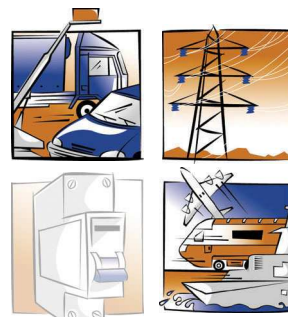
Note: Above values are indicative, theoretical and could change with use conditions.

- **Joule integral (short-circuit energy):**

Energy = I<sub>pc</sub><sup>2</sup>.t

	25 <sup>2</sup>	50 <sup>2</sup>	100 <sup>2</sup>	120 <sup>2</sup>	240 <sup>2</sup>
<b>Energy I<sup>2</sup>t (A<sup>2</sup>s)</b>	7.8 10 <sup>6</sup>	3.2 10 <sup>7</sup>	1.2 10 <sup>8</sup>	1.7 10 <sup>8</sup>	7.0 10 <sup>8</sup>

Note: Above values are indicative, theoretical and could change with use conditions.



## RAW-MATERIAL CHARACTERISTICS

### - *PVC insulation*

PVC thickness:	> 1 mm
Fire resistance:	UL94 V0 (2mm)
Dielectric strength:	> 10 kV
Maximal Operating temperature:	+105°C

### - *Braid part: Red annealed copper wire acc. to EN 13602*

Copper designation:	Cu ETP
Material condition:	Annealed
Resistivity at 20°C	1.724 $\mu\Omega\cdot\text{cm}$

### - *Endplate – Tinned copper: Annealed copper tube acc. to EN 1057*

Copper designation:	Cu DHP
Material condition:	Annealed
Tin thickness:	> 5 $\mu\text{m}$

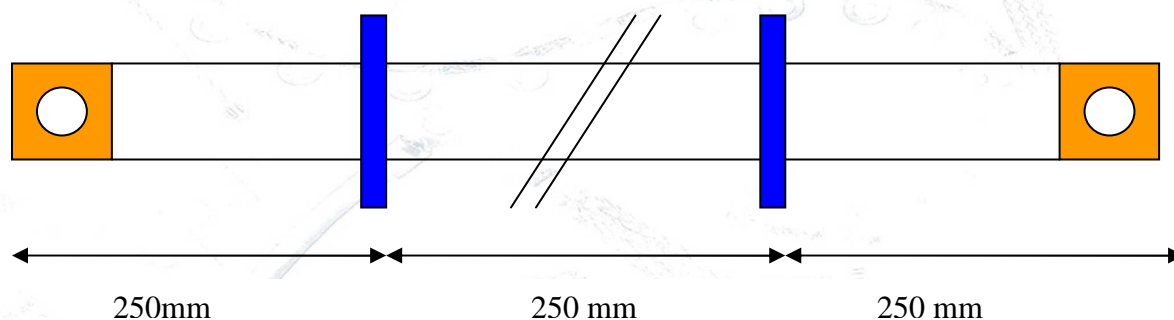
## ASSEMBLY & MOUNTING

### - *Spacer use:*

The short circuit current when it flows through the conductor induces a dynamic mechanical load. Due to the dynamic load, the flexible connection moves and comes back to its initial position without any damage thanks to its flexibility.

In order to limit the motion of the flexible connection, we advise to display spacers.

The distance between two spacers must be lower than 250 mm.



### - *Fixing on connecting terminal (as busbar, terminal plate, ...)*

The flexible connections designed by FORISSIER are made with terminal tubes, and it is preferable to use a flat washer in order to increase the efficiency of the tightening and the electrical contact.