

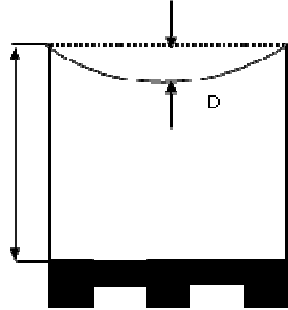
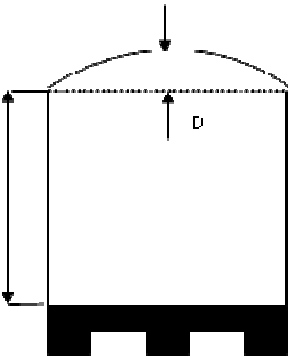
Dimensions of the sheet must be expressed in mm, indicating:

**Length** X **Width** X **Thickness**

First dimension given is always flute direction (along corrugation)

**Basic component:** COPOLYMER POLYPROPYLENE ( C<sub>3</sub>H<sub>6</sub> )<sub>n</sub>( C<sub>2</sub>H<sub>4</sub> )<sub>m</sub>



		Length (flute direction) mm		Width mm		Diagonals difference mm	Thickness mm		Grammage g/m <sup>2</sup>		Master opacity level	Sheet planarity	Pallet planarity	Appearance	
		from	to	from	to		from	to	from	to					
<b>Standard flute sheet **</b>		600*	6000	400	2700	///	1,8	5,0	240	1500	///	///		Evaluation made by the quality control personnel in comparison with sample of reference	
<b>Semilarga flute sheet **</b>					2050	///	3,5	8,0	450	2000					
<b>Triple wall sheet **</b>					2100	///	7,0	11,0	800	3000					
<b>Large flute sheet**</b>					2050	///	8,0	10,0	1450	2500					
<b>Rolls (standard flute sheet)</b>	Without core	50m	Ø max. roll 1m	300	1200	///	1,8	2,5	250	450	///	///		Evaluation made by the quality control personnel in comparison with sample of reference	
	With core: internal diameter 152,4 (6")				1300	///									
	With core: internal diameter 201 mm				2400	///									
<b>Acceptance criteria</b>		+/-1%		+/-3 mm		<0.5% up to max 10 mm	+/- 0,1mm		+/- 10% up to 1000 g/m <sup>2</sup> ; +/- 5% more than 1000 g/m <sup>2</sup>	+/- 5% by comparison with sample of reference	Max 1 wave, +/- 0,5% length/width		Pallet planarity D: ≤3% pallet height (L)		
<b>Testing procedure</b>		7		7		8	9		10		12	14		14	18

\*Smaller dimensions can be achieved with further working after extrusion.

\*\* For other feasibility, please contact our sales department.

Please notify our sales department of any specific requirement/tolerance that could be different or integrative to the above, prior to submit your order.

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**Density limits given by thickness and rib distance**

<b>Standard flute – rib distance 3,2 – 3,5 mm</b>									
Thickness mm		<b>1.8</b>	<b>2.0</b>	<b>2.5</b>	<b>3.0</b>	<b>3.5</b>	<b>4.0</b>	<b>4.5</b>	<b>5.0</b>
<b>Density</b>	Min	240	250	350	400	600	700	850	900
	<b>gsm</b> Max	350	700	800	1.200	1.500	1.500	1.500	1.500

<b>Semilarga flute – rib distance 4,5 mm</b>								
Thickness mm		<b>3.5</b>	<b>4.0</b>	<b>4.5</b>	<b>5.0</b>	<b>6.0</b>	<b>7.0</b>	<b>8.0</b>
<b>Density</b>	Min	450	500	600	650	1.000	1.500	1.500
	<b>gsm</b> Max	600	800	800	1.500	2.000	2.000	2.000

<b>Triple Wall flute – rib distance 5,3 mm</b>					
Thickness mm		<b>7.0</b>	<b>8.0</b>	<b>10.0</b>	<b>11.0</b>
<b>Density</b>	Min	800	1.450	1.750	2.400
	<b>gsm</b> Max	1.500	2.500	3.000	3.000

<b>Large flute – rib distance 8,5 mm</b>			
Thickness		<b>8,0</b>	<b>10,0</b>
<b>Density</b>	Min.	1450	1750
	<b>gsm</b> Max.	2500	2500

**Coefficient of thermal expansion:** value included between 100-200  $\mu\text{m}/^\circ\text{C}/\text{m}$

**Chemical features**

Polypropylene guarantees waterproof properties and resistance against the majority of alkaline products, salts solutions, solvents and heavy mineral acids at temperatures lower than 60°C. They can be on the other side etched by heavy oxidative agents, nitric acid, hydrogen peroxide and chlorosulphonic acid. Waving can be caused by a prolonged aliphatic, aromatic and chlorinated hydrocarbons etching.

Polypropylene is a biologically recalcitrant polymer, that is suitable to be used as packaging material during sterilization process with ethylene oxide (EtO) in gaseous phase. Potential effects of attack by EtO on polypropylene are limited to its liquid and technological pure phase, whereas the use of EtO in gaseous phase should not represent particular bias. Microorganism deactivation by EtO depends on various factors, which are: gas concentration, temperature, relative humidity and reaction time. Since these process conditions are chosen by the Customer, the User is advised to make his or her own tests to determine the suitability of polypropylene in the particular environment.

**Possible treatments – on Customer's request when asking for quotation**
**1) Antistatic / conductive treatment**

	<b>Feasibility</b>	<b>Resistivity (<math>\Omega</math>)</b>	<b>Duration of treatment</b>	<b>Colour</b>
<b>Conductive sheets (volumetric)</b>	All densities	$10^3 - 10^4$	Permanent	Black
<b>Conductive sheets (superficial) *</b>	Density > 700gsm	$10^3 - 10^4$	Permanent	Black
<b>Dissipative sheets (volumetric)</b>	All densities	$10^6 - 10^8$	Permanent	Black
<b>Dissipative sheets (superficial) *</b>	Density > 700gsm	$10^6 - 10^8$	Permanent	Black
<b>Antistatic sheets**</b>	All densities	$10^9 - 10^{11}$	1 year	Any colour

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\* For densities lower than 700 gsm please contact our sales office at number + 39 0434 788811.

\*\*The resistivity that could be obtained is influenced by the environmental humidity, that is necessary to obtain the resistivity level above-written. In order to have a duration of treatment of one year is necessary to avoid to wash and rub the surface of the sheet, because the additive would lose his effectiveness.

## 2) Anti UV additivation

Additivation available upon request, in case of outdoor applications.

In order to manage correctly the product design, Customer is pleased to notify our sales departments when submitting initial request for a material to be suitable for outdoor use and/or need withstand generic UV irradiation, providing the following information:

- Type of exposition of the finished article (direct sunlight / internal / outdoors);
- Minimum requested endurance (target time) in that environment.

The interaction of chemicals such as varnishes, solvents, printing inks and cleaning agents could jeopardise the UV endurance of the finished article. Please verify the compatibility with polypropylene.

Any outdoor use of polypropylene material is made at the Customer's own risk unless the above minimum information has been notified in writing.

Karton will not be held liable for any fault/complaint arisen due to articles that have not been specifically designed and validated (by Karton or by the Customer) for being used outdoors and protected with specific anti-UV additivation, nor Karton will be held liable for any interactions between its own manufactured products and further treatments that are not under its own responsibility.

## 3) Flame Retardant additivation

The flame retardant additivation gives to the sheet flame retardant properties.

## 4) Corona treatment

- $\geq 46$  dyn / cm for every kind of flute type and thickness except layer pads and conductive /dissipative sheets
- On both sides of the sheet
- Average duration 6 months under proper storage conditions (i.e. packaged sheets properly stocked in dry places)

We recommend as a good practice to check and record corona treatment before printing process and report any anomalies to Karton technical departments.

## Other processes available

- Back trimming and die-cutting **performed under standard temperature conditions** (the tolerance on length and width of the sheets is reduced to  $\pm 1$  mm during these procedures).
- Die cutting: please note that standard die-cutting guarantees a cleaning of scraps of 96% approximately. Consequently, a possible presence of scraps in a percentage not exceeding 4% has to be taken into consideration. Only at the express written request of the customer, agreed with our sales / quality department, it is possible to increase the effectiveness of the cleaning of scraps up to a percentage equal to 99-100%.
- Edge sealing (tolerances on length and width:  $\pm 3$  mm)
- Microperforation: on only one side or both sides, based on thickness and grammage (\*)
- Printing
  - Flexographic print on line 1 colour on both side of the sheet. Max dimension 450 \* 90 mm
  - Printing out of line

Printing	Print centering	Colour centering
Positioned flexographic print, up to 5 colour (max dimensions of printing 2030*1300 mm)	$\pm 4$ mm	$\pm 2$ mm
Screen print	$\pm 4$ mm	$\pm 0,3$ mm
Digital print	$\pm 4$ mm	No overlapping

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- Laser printing on edge sealed layerpads
- Hot transfer print on edge sealed layerpads

Karton would like to inform you that printing customization are water resistant in normal using conditions; safe uses can be considered i.e. advertisement vertical panels, fruit and vegetable boxes and other applications which imply only temporary contact with water. Water should be always allowed to drip and dry out prior to use. (Please see Storage instruction).

Under no circumstances our company will acknowledge claims or nonconformities due to immersion of printed polypropylene articles since this is not a validated and foreseen application for our products.

**Suggested product use**

- Store at room temperature.
- Working temperature range is included between:  $-20^{\circ}\text{C} < T^{\circ}\text{C} < +60^{\circ}\text{C}$ . Polypropylene can withstand peak temperatures included between  $-20^{\circ}\text{C} < x < 120^{\circ}\text{C}$  without damage
- Before other processes make sure that all the material reach a temperature higher than  $15^{\circ}\text{C}$  in every part of it.
- Instructions for Protecting Covering Materials: Please mind putting the printed side of the board always facing up. The printed side should never be in direct contact with protected surfaces. Please mind sealing carefully each board with adequate adhesive tape.

**Regulatory requirements**

- Regulation 1907/2006/CE of 18<sup>th</sup> December 2006 (REACH) and subsequent amendments
- Safety Data Sheet: In accordance to the REACH Regulation, this product is an article for which is not required to issue the product safety data sheet.
- Other requirements available upon request prior to obtain a commercial offer.

**Storage instruction**

The product will be supplied with a standard packaging: wooden pallets, packed with shrinking film, strips and side corner protectors.

Please note that our standard packaging is not to be considered as "waterproof". The Customer can request specific and customized waterproof packaging (with quotation). This risk assessment remains a specific responsibility of the Customer.

We would like to inform you that Karton S.P.A. load goods in protected conditions; logistic operations upon arrival, such as download of goods and related safety precautions are a specific responsibility of the receiver.

Whenever material must be stored/used outdoors we do recommend to follow strictly the following advices:

- Strictly avoid stagnant water to stay over prints for prolonged time;
- Avoid storing outdoors material that is laying horizontally exposed to rainfall without adequate protection;
- Store the material vertically, in order to allow proper water drainage and dry out prior to safe use;
- Please remember always to protect the material with adequate waterproof protection such as PE film or similar.

**Recyclability**

Polypropylene sheets, as supplied by Karton S.p.A., are made up of a thermoplastic polyolefin 100% recyclable, via thermomechanical processes. The symbol associated to these products is 05 (PP), according to the dispositions of the Association of Plastic Industry (API).



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**Basic technical conditions of supply**

- Flute type and colour are features agreed with Customer by comparison with the sample of reference.
- Conformity of the material to particular laws (i.e. food contact, toys, etc.) can be certified and declared only on Customer's request white asking for quotation.
- Selling units of measurement: no. of pieces, possible requests in kilo are converted in pieces using density
- You have to keep the identification label of the product to go back easily over the product.
- All the processes and the controls on the product take place in standard temperature conditions.

Please note that information in this document regards the product as commercialized by Karton Spa and consequently the Company cannot be held liable for any further treatment, handling or processing performed by the Customer. Please note that it is a responsibility of the end user to verify that the products are suitable for the intended use in compliance with applicable European Legislation and to verify that the products are fit for the intended technological use.

Design and validation of final articles, specific appropriateness for the end use, specific risk assessment and behaviour of this product after use and in specific conditions that are not described into this document, all must be considered intellectual property and specific responsibility of the Customer.

(\*) For further information and for any special requests:  
please contact our sales office at number + 39 0434 788811.