



THE MULTI-FUNCTIONAL MATERIAL

For custom packaging and storage solutions

Nilkamal introduces the **BubbleGUARD** series for Industrial Packaging Solutions - an innovative range of sheets designed to fit every application and industry. This multi-utility material supplants conventional, single-use packaging by providing superior protection, reducing weight and improving cost efficiency. **BubbleGUARD** offers complete customisation to meet every packaging need.

TECHNOLOGY AT ITS CORE

BubbleGUARD is manufactured with a patented European technology engineered to deliver high-performance. 9 precise microlayers of polypropylene are co-extruded and bonded with a circular honeycomb structure at the centre which fortifies **BubbleGUARD** with non-collapsible bubbles.

The *Air-Lock* technology ensures constant cushioning to protect contents from damage throughout storage, handling and transportation, without losing its effectiveness. The high strength-to-weight ratio delivers impressive impact with compressive strength, absolute durability and ultra-low weight. Nilkamal quality makes **BubbleGUARD** a highly robust solution tailored to exceed even the most rigorous standards.





OUR PLANET OUR RESPONSIBILITY



BLUE FOR GREEN Reduce, Reuse, Recycle

Engineered for **reusability** across multiple usage cycles, Nilkamal BubbleGUARD Industrial Packaging replaces single-use paper and plastic that ends up in landfills polluting the environment. With air-lock technology that provides constant cushioning, BubbleGUARD is durable for a long life.

Our unique space-saving and collapsible packaging designs, allows you to **reduce** your return logistics and packaging material requirement. Less packaging means more savings!

With award-winning Nilkamal quality, our products are made from 100% virgin PP. All BubbleGUARD products are **100% recyclable**.

BubbleGUARD eliminates conventional packaging and can immediately improve your ESG score by reducing your carbon footprint for packaging and logistics. Our solutions firmly promote **sustainability** making it the perfect solution.

THE WIN-WIN SOLUTION

BubbleGUARD solutions combine sustainability with cost efficiency. All products are designed with practicality in mind. BubbleGUARD sheets are 100% waterproof, UV resistant, heat resistant and chemical resistant ensuring protection in all industrial environments. The light-weight structure facilitates reduced freight costs for one-way and return logistics.

We are committed to help companies transition to sustainable and profitable packaging solutions with ease. Our packaging experts will individually customise solutions to your needs and supply chain challenged to deliver a high return on your investment.



Made of 100%
Polypropylene



Reusable
Multiple Times



100%
Recyclable

Pallet**GUARD** *PRO* Sleeve System

The intelligent and complete packaging solution



THE PRACTICAL PALLET ENCLOSURE

Whatever the product, **PalletGUARD** Sleeve System (PSS) offers the most secure and versatile packaging solution. The intelligent space-saving unit is comprised of 3 parts - *Lid, Sleeve and Pallet* - designed to store and transport loads of up to 800 kgs. PSS can be completely collapsed when empty for efficient reverse logistics.

PalletGUARD is available with a wide range of optional features to provide complete freedom and versatility use no matter the contents inside. Precise dimensions as per international standards ensures that PSS can be easily integrated into your existing supply chain.

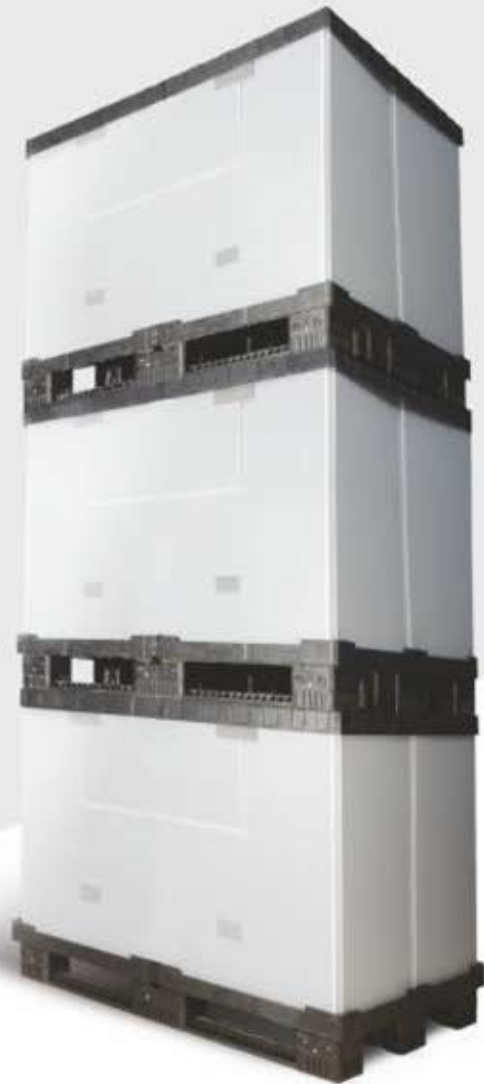


BUILT TO ENDURE

The injection moulded *Lid* and *Pallet* deliver high strength and load carrying capacity without increasing the weight of the packaging. The scientifically designed walls and ribs provide larger internal dimensions and carrying capacity. **PalletGUARD Lid** and *Pallet* are designed with a 3-runner base for stable stacking and compatibility with all standard forklifts for easy handling.

The *Sleeve*, made from Nilkamal **BubbleGUARD** with a unique honeycomb core, offers a combination of high physical durability and ultra-low weight. It's impressive impact and compressive strength due to *air-lock* technology keeps damage at bay during rough transportation.

The robust unit is quality tested for 1000+ cycles to provide an outstanding cost-performance ratio per use. Replacement Sleeves are available to further extend usage.



KEY BENEFITS



Reusable
Multiple Times



Durable



Foldable Design



Lightweight



Rounded Edges
For Safety



Available As
Per Size Required



High Point Load
Bearing Capacity



100%
Recyclable



Can Be Fully
Customised

STANDARD SPECIFICATIONS

Pallet Dimensions*	Inner Dimensions	Loading Capacity**	Max Stacking
1200 X 1000	1135 X 935	500 KG	3 (1+2)
1200 X 800	1130 X 730	400 KG	3 (1+2)

*Other sizes available on request

**Loading capacity will vary with stacking height

MATERIAL DESCRIPTION:

Co-extruded polypropylene sheets with a central honeycomb bubble structure layer

Product	Thickness	Weight (Gr / sqm)	Colour
Bubble GUARD	1.6 mm - 11 mm	200 - 3500	Various

TREATMENT:

- + Corona- up to 60 dynes
- + Fire Retardant- upon request
- + UV Resistant- on select variants

Printing	One Side	Two Side
Offset UV	✓	✓
Digital UV	✓	✓
Screen-printing	✓	✓

COMPATIBLE CONVERSION

- + Gluing (hot melt; PP or polyurethane reactive)
- + Heat or Ultrasonic Welding
- + Screwing
- + Riveting
- + Stapling
- + Cutting (guillotine, die cut, laser, knife, plotter)
- + Folding (hot or cold)

MECHANICAL PROPERTIES

Property	Method	GSM 300	GSM 1000	GSM 3000	Units
Breaking Strength	ASTM D 638	11.8	35.5	84.3	kgf / 15mm
Elongation MD	ASTM D 638	26.5	23.2	32.7	%
Elongation TD	ASTM D 638	N/A	33.4	42.7	%
Puncture Resistance	IS - 4006-2	75	354	>1500	Beach units (BU)
		22.9	108	>457.5	kgf/cm
Edge Crush Test	IS - 7063	0.5	5.1	18.2	kN/m

CHEMICAL PROPERTIES

Nilkamal **BubbleGUARD** products are manufactured with virgin blend Polypropylene which is non-toxic and food grade safe with RoHS and FDA compliance.

Polypropylene has good chemical inertness and good resistance to cracking under stress. It has no solvent at 20°C. Very resistant to mineral and organic products; it is neither affected by water solutions of mineral salts, nor by chemical bases and mineral acids at temperatures lower than 60°C, except very strong acids. Not resistant to substances with an oxidizing effect or to certain solvents. Details can be supplied on request.

ENVIRONMENT

Polypropylene is persistent in the environment and is not biodegradable.

RECYCLING PROPERTIES

Thermal recycling or incineration

The heat produced can then be used as substitutes for oil, gas and coal or to generate energy at power plants. The complete combustion of polypropylene with air only produces carbon dioxide and water. At higher temperatures traces of nitrogen oxide are present. The incomplete combustion of polypropylene produces soot, carbon dioxide and monoxide, and several carbon, hydrogen and oxygen compounds. Unburnt substances or additional products may be released. The same by-products are also released during the combustion of natural materials such as wood or wool.

MECHANICAL RECYCLING

Polypropylene wastes can easily be recycled. They are collected, separated, milled, melted and extruded in granules in order to be re-injected in our process. We can reuse our own waste.