



Advanced PA Tubing

An Excellent Alternative to Polyamide 12

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



LEHENGOTAK, S. A.

ENGINEERING YOUR SUCCESS.



ADVANCED PA TUBING



Industrial Automation

In-Plant Automotive

Material Handling

Transportation

Pneumatics

Robotics

Machine Tools

Packaging

Assembly Machines



For Optimizing Your Equipment, Advanced PA Tubing Guarantees:

- Material availability
- Technical performance: thanks to unsurpassed temperature and pressure resistance
- Versatility: due to chemical compatibility and suitability to a large range of applications
- Environmentally-friendly approach

The Best Offer for:

- Better flexibility than all other polyamide tubing
- Superior mechanical performance: excellent abrasion and shock resistance

Advanced PA Tubing Conforms to:

- NF E49-100: for high quality design and long-term reliability
- DIN 74324, DIN 73378 and ISO 7628*: for compatibility with the most demanding on-board systems

*Test results from certified laboratory expected in 2012

> Technical Characteristics

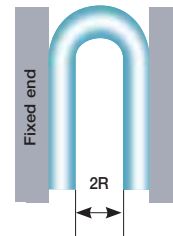


Suitable Fluids	Compressed air, various chemicals, gases and liquids*
Working Pressure	Vacuum up to 50 bar (as per diameter and temperature)
Working Temperature	-40°C to +100°C
Material	Bio-sourced polyamide (68 shore D)

*of Compatibility Chart, page 6

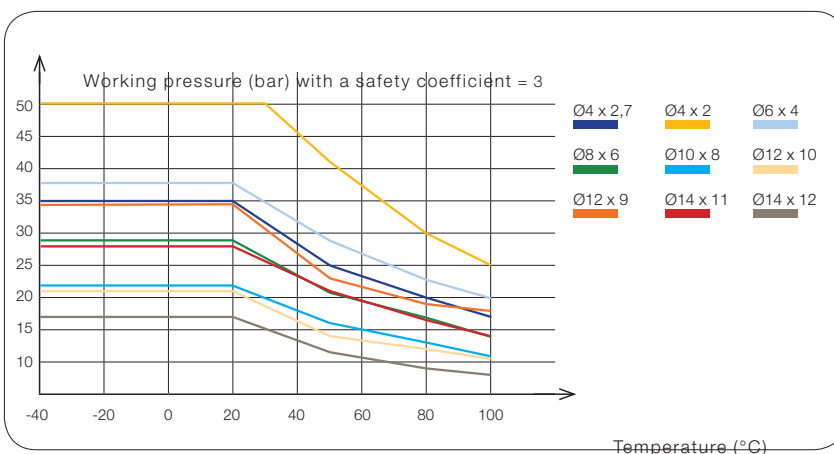
> Dimensions

Ø (mm)		Wall Thickness (mm)		Max. Ovality (mm)	Min. Bend Radius@ +20°C (mm)
O.D.	Tolerances	e	Tolerances		
4	+ 0.05 / - 0.08	0.65	± 0.08	< 0.16	10
4	+ 0.05 / - 0.08	1	± 0.08	< 0.16	10
6	+ 0.05 / - 0.10	1	± 0.08	< 0.20	15
8	+ 0.05 / - 0.10	1	± 0.08	< 0.20	25
10	+ 0.05 / - 0.10	1	± 0.08	< 0.20	50
12	+ 0.05 / - 0.10	1.5	± 0.08	< 0.20	47
12	+ 0.05 / - 0.10	1	± 0.08	< 0.20	90
14	+ 0.05 / - 0.10	1.5	± 0.08	< 0.20	80
14	+ 0.05 / - 0.10	1	± 0.08	< 0.20	116



Measurement method of the bending radius:
 Bend the tube into the U-form at a temperature of +20°C (+/- 3°C).
 Hold one end and close loop gradually up to 2R measurement between both ends.

> Advanced PA Tubing Performance



To calculate burst measurements, the values in this graph should be multiplied by 3.

Close tolerance to perfect sealing with Parker Legris fittings based on NF E49-100.

With compression fittings, a ferrule must be used.

Where Polyamide 12 was used in standard applications, there is no risk of switching to Advanced PA tubing.

> Tube Marking

- Marking every metre
- Time saved when cutting specific length
- Immediate identification of remaining quantity



> Comparative Product Advantages: Polyamide 12 vs. Advanced PA Tubing

Semi-Rigid Polyamide 12 (PHL*)

Parker Legris' polyamide tubing provides optimum mechanical properties, has good chemical resistance and conforms to the NF E49-100 standard. Shore hardness of semi-rigid tubing is 60D.

Advantages of Parker Legris' Polyamide Tubing

- Large range of working temperatures and pressures
- Good chemical resistance
- Good humidity resistance
- Constant rigidity, good ageing
- Good absorption of vibrations
- Strong abrasion resistance
- Silicone-free
- Tube length marked every metre

Advanced PA Tubing

Very good flexibility and excellent mechanical resistance, combined with a bio-sourced material, allow Parker Legris' Advanced PA tubing to optimize cabling installation without compromising quality.

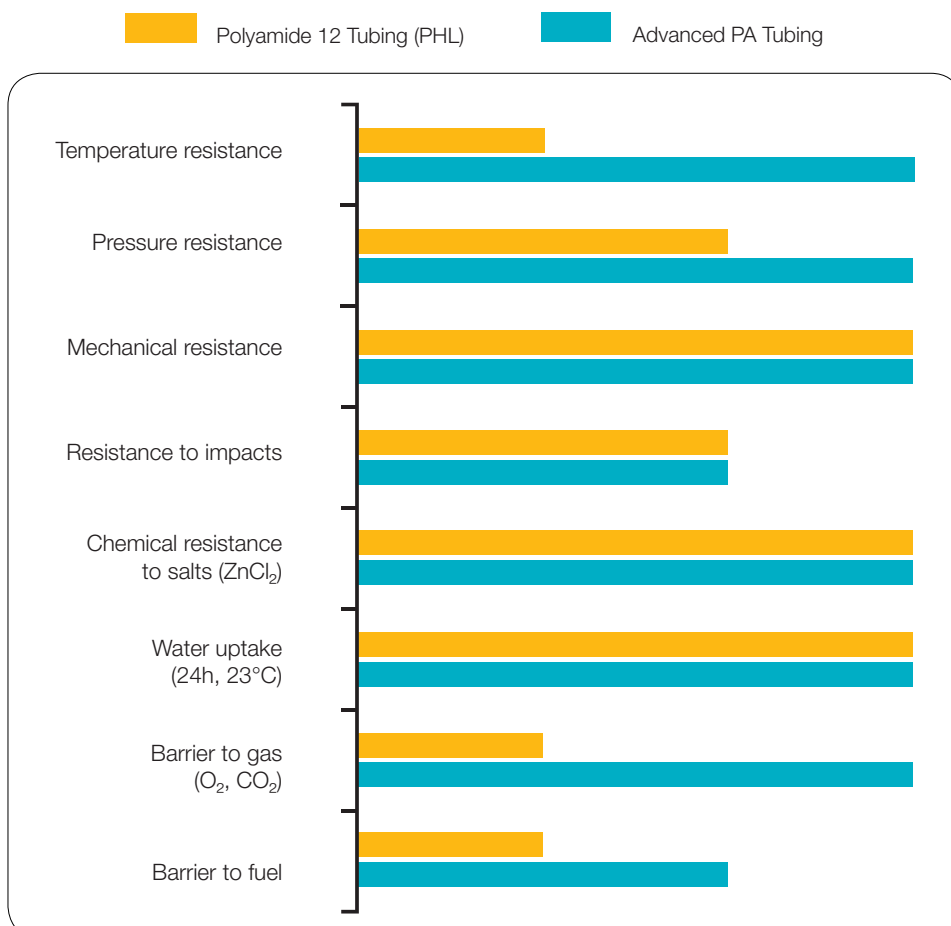
Advanced PA tubing has a shore hardness of 68D and conforms to the NF E49-100 standard.

Advantages of Parker Legris' Advanced PA Tubing

- High resistance to temperature and pressure
- Good chemical resistance
- Very good flexibility and small bend radius
- Constant rigidity, good ageing
- Bio-sourced material
- Strong abrasion resistance
- Silicone-free
- Tube length marked every metre

*PHL (Polymer Ω -Dodecanolactam): plasticized, expandable, heat-ageing and light stabilized.

> Technical Features at a Glance



> Advanced PA: Eco-Design Approach

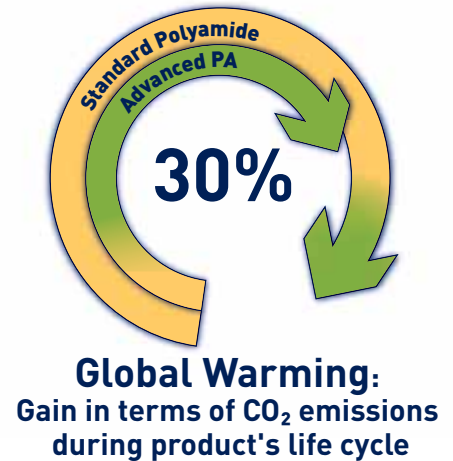
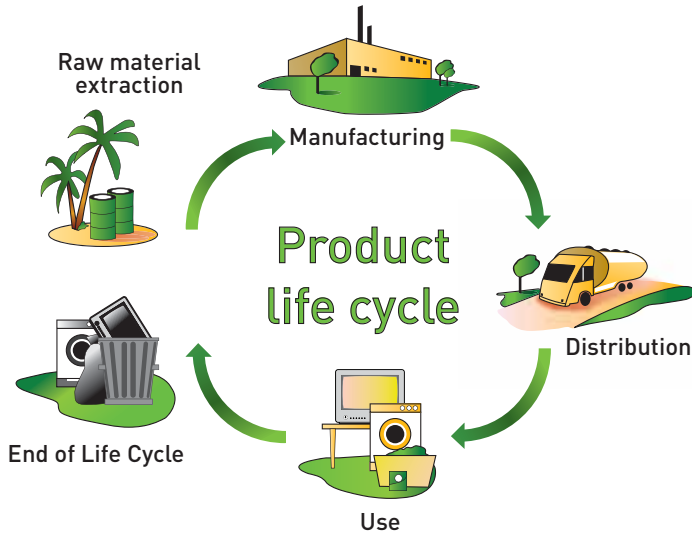


In the manufacturing of Parker Legris' Advanced PA, we have applied the Product Life Cycle Analysis (PLCA). This approach aims to evaluate the environmental impact of a product during its different life cycle stages and thereby:

- allows for the protection of natural resources
- guarantees the improvement of equipment performance
- contributes to your ISO 14001 certification

The use of organic carbon for the polymer manufacturing of this Advanced PA tubing significantly reduces its:

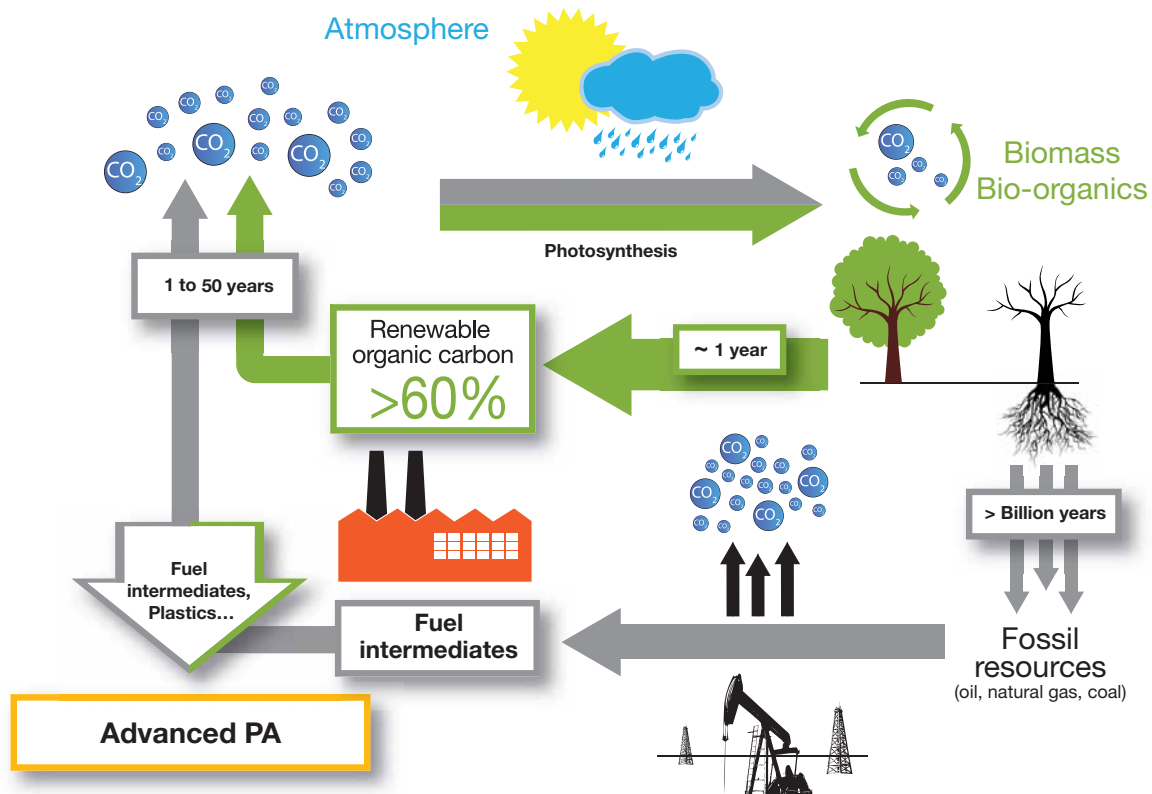
- environmental footprint, hence the depletion of our planet's natural resources
- CO₂ emissions that are in part responsible for global warming



> Advanced PA: Carbon Cycle

The carbon cycle is an important part of the Product Life Cycle Analysis because it explains:

- the manufacturing process of our Advanced PA tubing
- the impact that a product has on its environment



> Chemical Compatibility Chart

1	Recommended
2	Satisfactory
3	Not recommended



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For complementary information, please contact us.

Substances	PA	Advanced PA
Acetaldehyde	1	1
Acetone	1	1
Acetylene	1	1
Acid, acetic	-	2
Acid, hydrochloric up to 10%	1	1
Acid, citric	1	1
Acid, chromic up to 10%	3	3
Acid formic up to 10%	-	2
Acid, nitric	1	1
Phosphoric acid up to 50%	3	3
Acid, sulphuric up to 10%	1	2
Ammonia and gaseous	1	1
Benzene	1	1
Bromine	3	2
Butane	1	1
Butyl acetate	1	1
Butylic and Butyl alcohol	1	1
Calcium choride	1	1
Carbon tetrachloride (sodium hypochlorite)	3	2
Copper sulphate	1	1
Compressed air	1	1
Cyclohexanone	1	1
Ethanol	-	1
Ethyl acetate	1	1
Ethyl alcohol	1	1
Ethylen oxide	1	1
Freon 12-22	1	1
Formalin (formaldehyde)	2	1
Glucose	1	1
Hydrogen	1	1
Hydrogen peroxide (perydrol)	2	3
Kerosene	1	1
Magnesium chloride (up to 30%)	-	1
Methane	1	1
Methyl acetate	1	-
Methyl alcohol (pure)	1	1
Methyl bromide	1	1
Methyl chloride	1	2

Substances	PA	Advanced PA
Methyl ethyl ketone	1	1
Methyl isobutyl ketone	1	1
Oils (cutting)	1	1
Oils (ASTM class A)	1	1
Oils (ASTM class B)	1	1
Oils (ASTM class C)	1	1
Oils (ASTM class 1)	1	1
Oils (ASTM class 2)	1	1
Oils (ASTM class 3)	1	1
Oils, engine (diesel)	1	1
Oils, paraffin	1	1
Oxygen	2	2
Ozone	3	3
Perchlorate ethylene	2	1
Phenols	3	3
Potash	1	1
Potassium chloride up to 40%	1	1
Potassium Hydroxide	-	1
Potassium sulphate	1	1
Propane	1	1
Soda 50%	1	1
Sodium carbonate	1	1
Sodium chloride	1	1
Sodium hydroxide (caustic soda)	2	2
Sodium hypochlorite(bleach)	1	1
Sulphurous anhydride	2	2
Petrol with up to 40% aromatic	1	1
Petrol with more than 40% aromatic	1	1
Tetrachloroethylene	1	1
Toluene	1	1
Tributylphosphate	1	1
Trichlorethylene	1	1
Water (drinking, food)	3	3
Water (Industrial)	1	1
Water (distilled)	1	1
Water (sea)	2	2
Xylem	1	1
Zinc chloride	1	1

> Polyamide 12 vs. Advanced PA Tubing

1125P Close tolerance semi-rigid polyamide tubing, 25 m rolls

Length: 25 m						
O.D. tube (mm)	I.D. tube (mm)	Minimum bend radius for tube at ambient temp. (mm)				for 25 m
4	2	25	1025P04 00	1025P04 01	1025P04 04	0.318
4	2.7	30	1025P04 00 27	1025P04 01 27	1025P04 04 27	0.254
6	4	35	1025P06 00	1025P06 01	1025P06 04	0.535
8	6	55	1025P08 00	1025P08 01	1025P08 04	0.748
10	8	90	1025P10 00	1025P10 01	1025P10 04	0.989
12	9	75	1025P12 00 09	1025P12 01 09	1025P12 04 09	1.769
12	10	90	1025P12 00	1025P12 01	1025P12 04	1.345
14	11	100	1025P14 00 11	1025P14 01 11	1025P14 04 11	2.226
14	12	120	1025P14 00	1025P14 01	1025P14 04	1.734



1025P..C Advanced PA Tubing, 25 m rolls

Length: 25 m						
O.D. tube (mm)	I.D. tube (mm)	Minimum bend radius for tube at ambient temp. (mm)				for 25 m
4	2	10	1025P04C00	1025P04C01	1025P04C04	0.318
4	2.7	10	1025P04C00 27	1025P04C01 27	1025P04C04 27	0.254
6	4	15	1025P06C00	1025P06C01	1025P06C04	0.535
8	6	25	1025P08C00	1025P08C01	1025P08C04	0.748
10	8	50	1025P10C00	1025P10C01	1025P10C04	0.989
12	9	47	1025P12C00 09	1025P12C01 09	1025P12C04 09	1.769
12	10	90	1025P12C00	1025P12C01	1025P12C04	1.345
14	11	80	1025P14C00 11	1025P14C01 11	1025P14C04 11	2.226
14	12	116	1025P14C00	1025P14C01	1025P14C04	1.734

1100P Close tolerance semi-rigid polyamide tubing, 100 m rolls

Length: 100 m						
O.D. tube (mm)	I.D. tube (mm)	Minimum bend radius for tube at ambient temp. (mm)				for 100 m
4	2	25	1100P04 00	1100P04 01	1100P04 04	1.152
4	2.7	30	1100P04 00 27	1100P04 01 27	1100P04 04 27	0.893
6	4	35	1100P06 00	1100P06 01	1100P06 04	1.799
8	6	55	1100P08 00	1100P08 01	1100P08 04	2.898
10	8	90	1100P10 00	1100P10 01	1100P10 04	3.667
12	9	75	1100P12 00 09	1100P12 01 09	1100P12 04 09	5.600
12	10	90	1100P12 00	1100P12 01	1100P12 04	5.052
14	11	100	1100P14 00 11	1100P14 01 11	1100P14 04 11	5.200
14	12	120	1100P14 00	1100P14 01	1100P14 04	4.800



1100P..C Advanced PA Tubing, 100 m rolls

Length: 100 m						
O.D. tube (mm)	I.D. tube (mm)	Minimum bend radius for tube at ambient temp. (mm)				for 100 m
4	2	10	1100P04C00	1100P04C01	1100P04C04	1.152
4	2.7	10	1100P04C00 27	1100P04C01 27	1100P04C04 27	0.893
6	4	15	1100P06C00	1100P06C01	1100P06C04	1.799
8	6	25	1100P08C00	1100P08C01	1100P08C04	2.898
10	8	50	1100P10C00	1100P10C01	1100P10C04	3.667
12	9	47	1100P12C00 09	1100P12C01 09	1100P12C04 09	5.600
12	10	90	1100P12C00	1100P12C01	1100P12C04	5.052
14	11	80	1100P14C00 11	1100P14C01 11	1100P14C04 11	5.200
14	12	116	1100P14C00	1100P14C01	1100P14C04	4.800

NB: for other diameters or colours, please continue to order close tolerance semi-rigid polyamide tubing.

> Packaging

TubePack® Advantages:

- Compactness: optimized sizes
- Easy to stock, to use and to identify
- Available on stock



Drum Advantages:

- For optimized handling
- Available on request



> Product Codes

Polymer Type

P = Polyamide

Type of Tubing

C = Advanced Polyamide

2010P04C 00 27

Packaging code

- 1 = TubePack
- 2 = Drum

Length

005 =	500 m	04 = 4 mm
		06 = 6 mm
		08 = 8 mm
		10 = 10 mm

OD Code

010 =	1000 m	04 = 4 mm
		06 = 6 mm

Colour

- 00 = clear
- 01 = black
- 04 = blue

Special ID

27 = 2.7 mm