



Pebax® Rnew

Biobased Engineering Elastomer

生物基尼龙弹性体



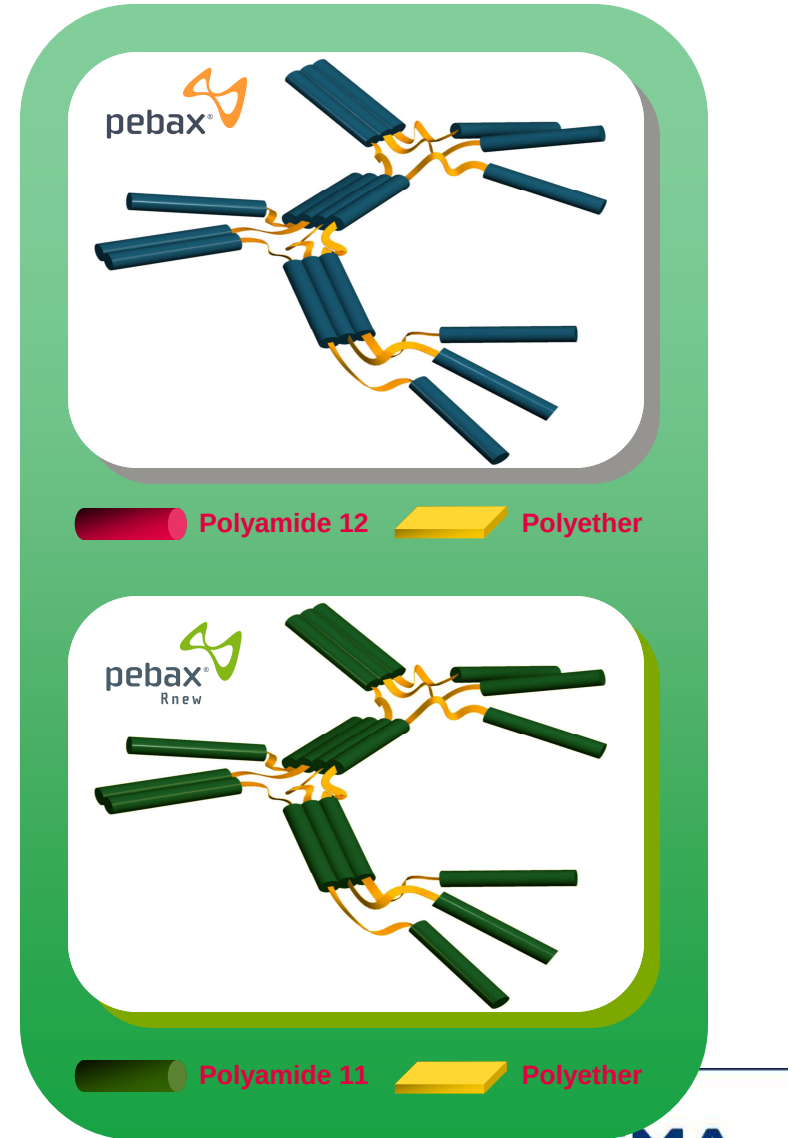
www.pebax.com

What are Pebax® and Pebax® Rnew?



- ➔ **Thermoplastic Elastomer – TPE**
 - ➔ 热塑性弹性体 TPE
- ➔ **Poly Ether Block Amide (eXtreme)**
 - ➔ 聚醚聚酰胺
- ➔ **Two phases structure** 两种结构
 - Polyamide – Rigid Block 硬段- 聚酰胺
 - Polyether – Soft Chain 软段- 聚醚
- ➔ **Molten state polycondensation** 熔融缩聚
- ➔ **PE / PA ratio → Flexibility** 不同比例决定柔韧性

**Pebax® Rnew – 基于蓖麻原的
PA11为硬段聚酰胺**





Pebax® Rnew

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First engineering thermoplastic **Elastomer**
range made from **Renewable** resources
第一个生物基的工程弹性体

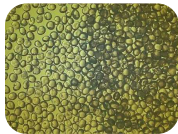


Vegetal Oil

植物

- renewable resource -

MONOMER SYNTHESIS



Polyamide 11

- hard block -

20 to 95%

Petroleum

石油

- fossil resource -

MONOMER SYNTHESIS

Polyether

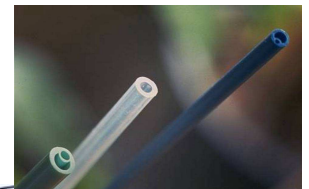
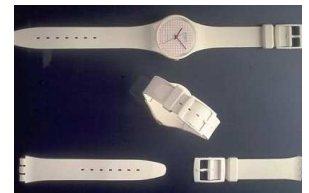
- soft block -

5 to 80%

BLOCK POLYMERIZATION

Pebax® Rnew

- Polyether Block Amide -

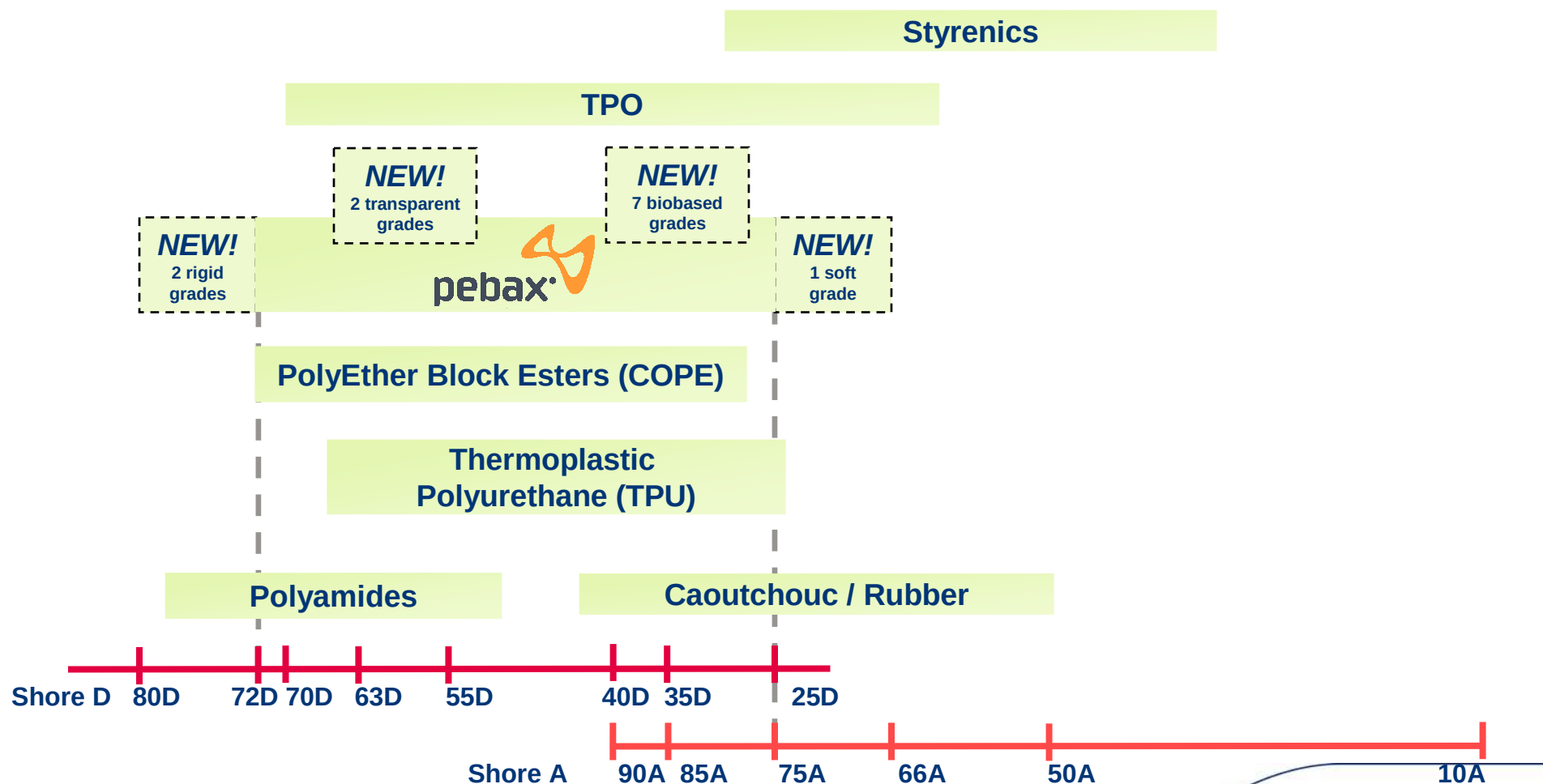




Hardness 硬度范围



广泛适用的硬度范围及牌号:





Flexibility 柔韧性

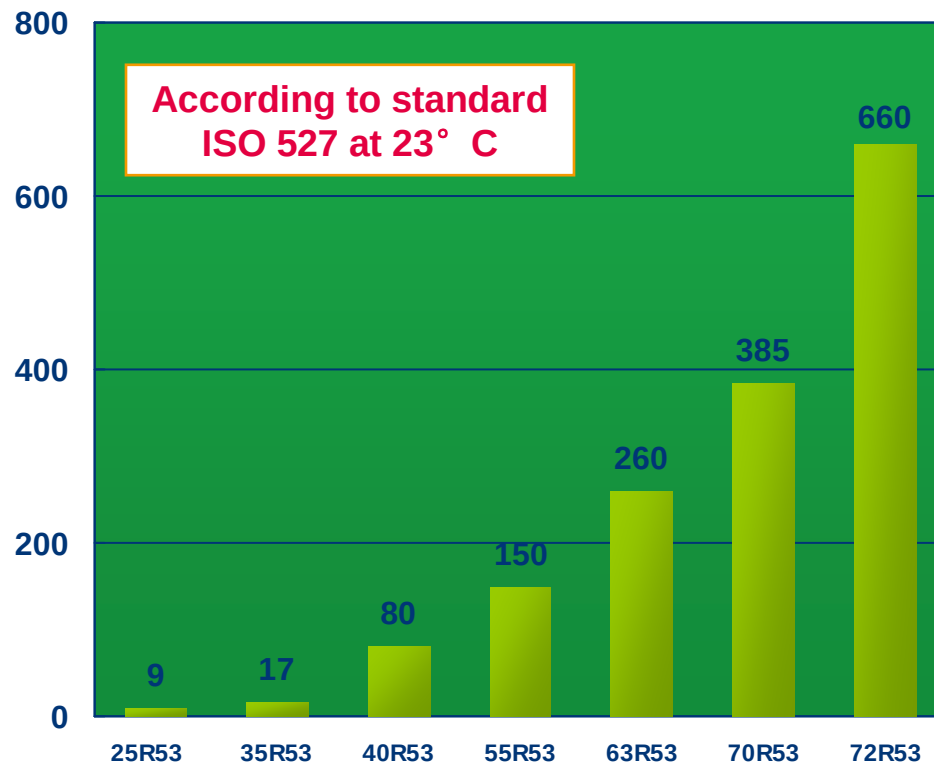


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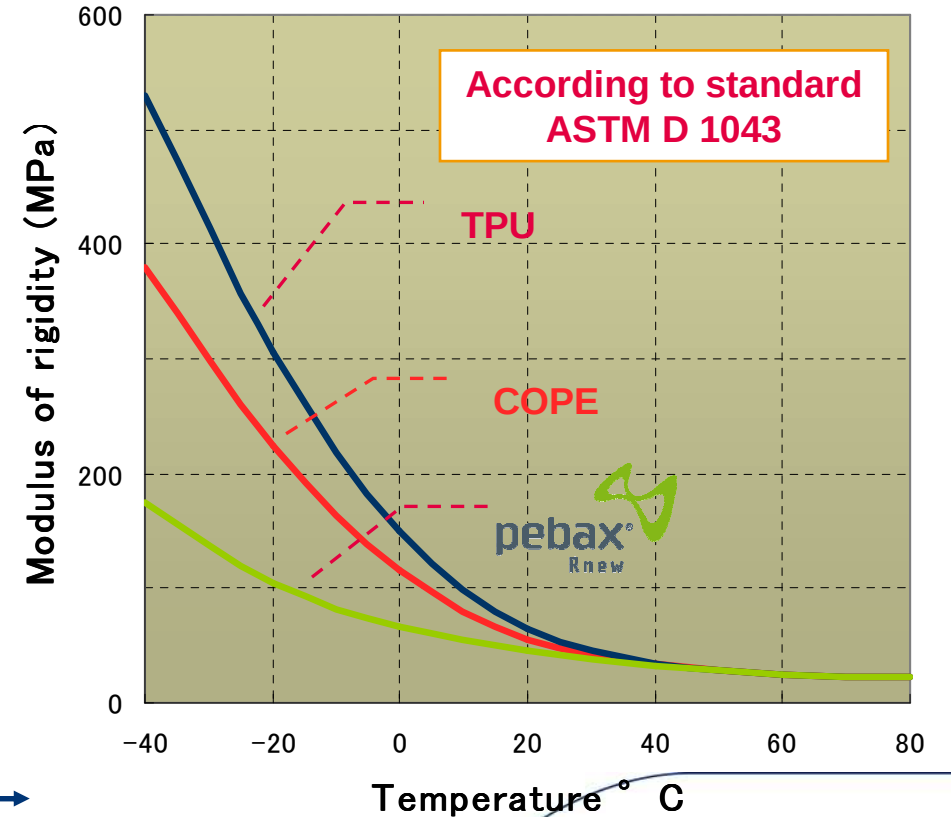
➡ BEST PERFORMANCE AT LOW-TEMPERATURE

➡最佳的表现： 低温下韧性

拉伸模量:



低温表现:



← RUBBER - BEHAVIOR OF THE MATERIAL - POLYAMIDE →



Density 密度



Lightest weight among
Thermoplastic Elastomer

➡ Save **20% weight**

➡ 相对于其他弹性体，质轻约**20%**

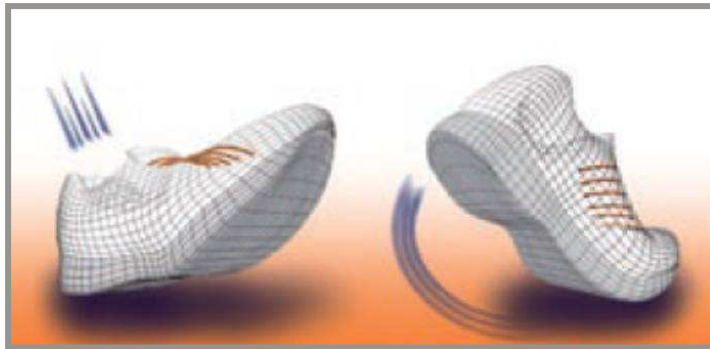
		COPE Polyester Elastomers	TPU Thermoplastic Urethanes
Soft grades (<shore D 64)	1.03	1.18 ~ 1.20	1.21 ~ 1.25
Rigid grades (>shore D 64)		1.22 ~ 1.26	1.25 ~ 1.26



Energy Return 能量回复



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Pebax[®] Rnew

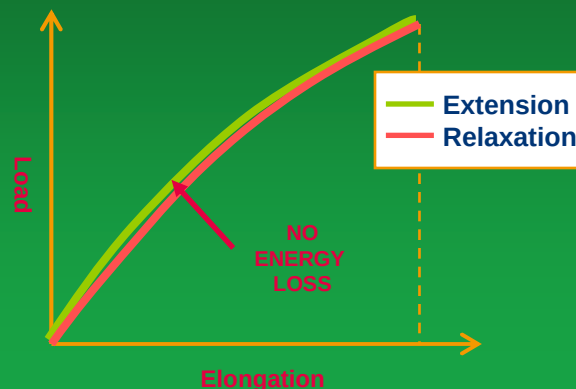
has lower energy loss factor than TPU

低于TPU的能量损失

➔ **BEST Energy Return***

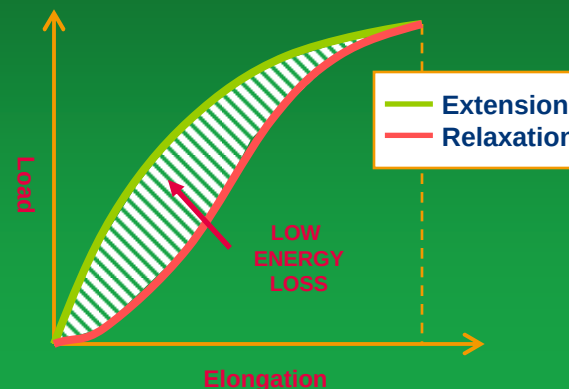
理想状态 (theoretical)

➔ 能量损失因子 = 0



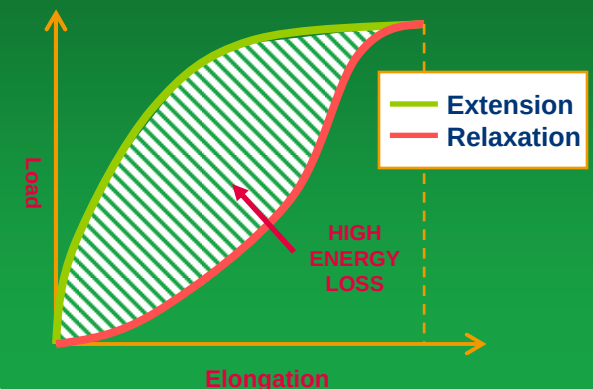
Pebax[®] Rnew (80 shore A)

➔ 能量损失因子 = 0.1~0.2



TPU (80 shore A)

➔ 能量损失因子 = 0.4~0.5



* Capacity of a material to retain a maximum of energy during extension phase and to deliver back a maximum of it ("return") during relaxation phase.

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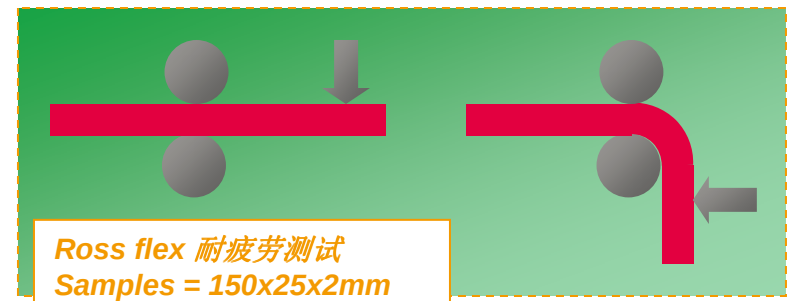
Weather resistance 耐候性



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Pebax® Rnew

➔ **LONGEST LIFE-TIME**



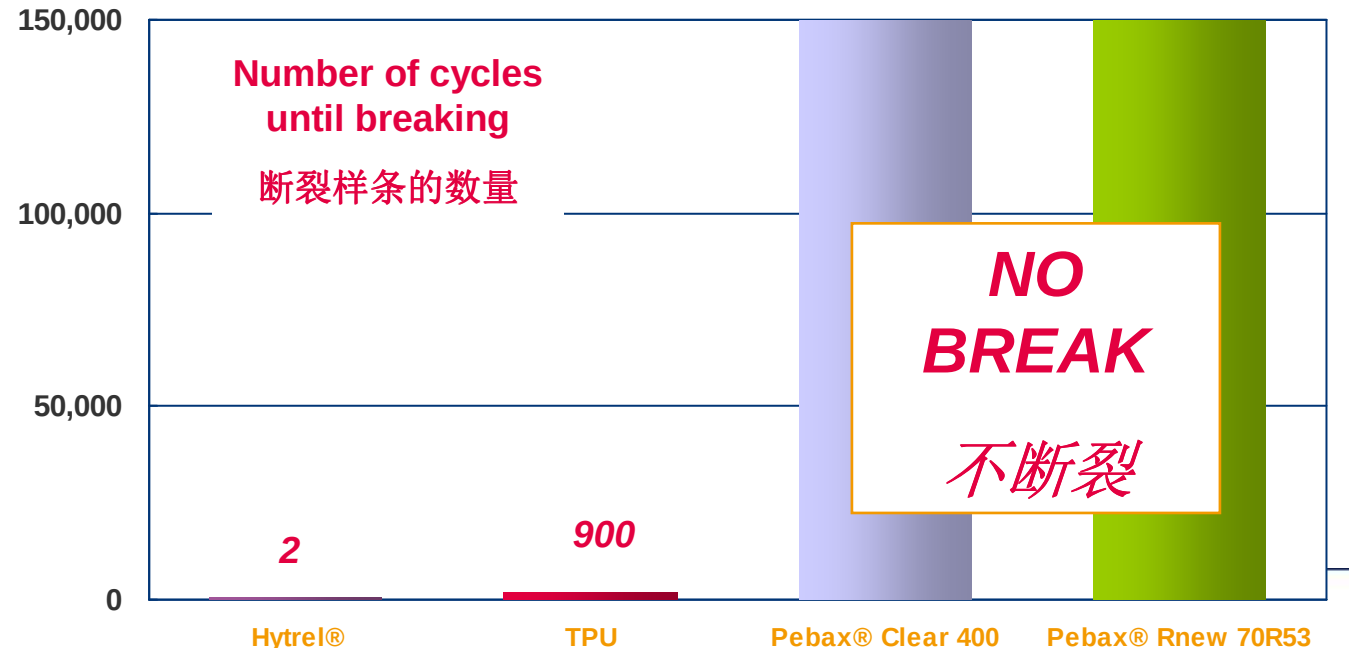
1. UV test- UV 老化测试

2 weeks (2周)
60°C, 0.68W/m² at 340nm



2. Ross flex test 耐疲劳测试

- 30°C, angle 90°, 100cycles/min
150,000 cycles





Productivity



Excellent processability of Pebax® Rnew

绝佳的加工特性

- Injection molding 注塑加工
- Extrusion (cast film, blown film, sheet, tube...) 挤出加工（流延，吹膜，挤板，管材）
- Assembly process : overmolding and co-extrusion 双色射出

Productivity increase by Pebax® Rnew

生产率的提高

- Wide processing window among TPE (TPU) 加工窗口宽泛
- Good flowability 流动性好
- Possibility to inject extremely thin part (0.8mm) 薄壁成型 0.8mm
- Shorter cycle time than TPU 成型周期小于TPU
- Higher recyclability than TPU 回收能力好于TPU

➡ **Time cycles reduced by 10 to 30 %***

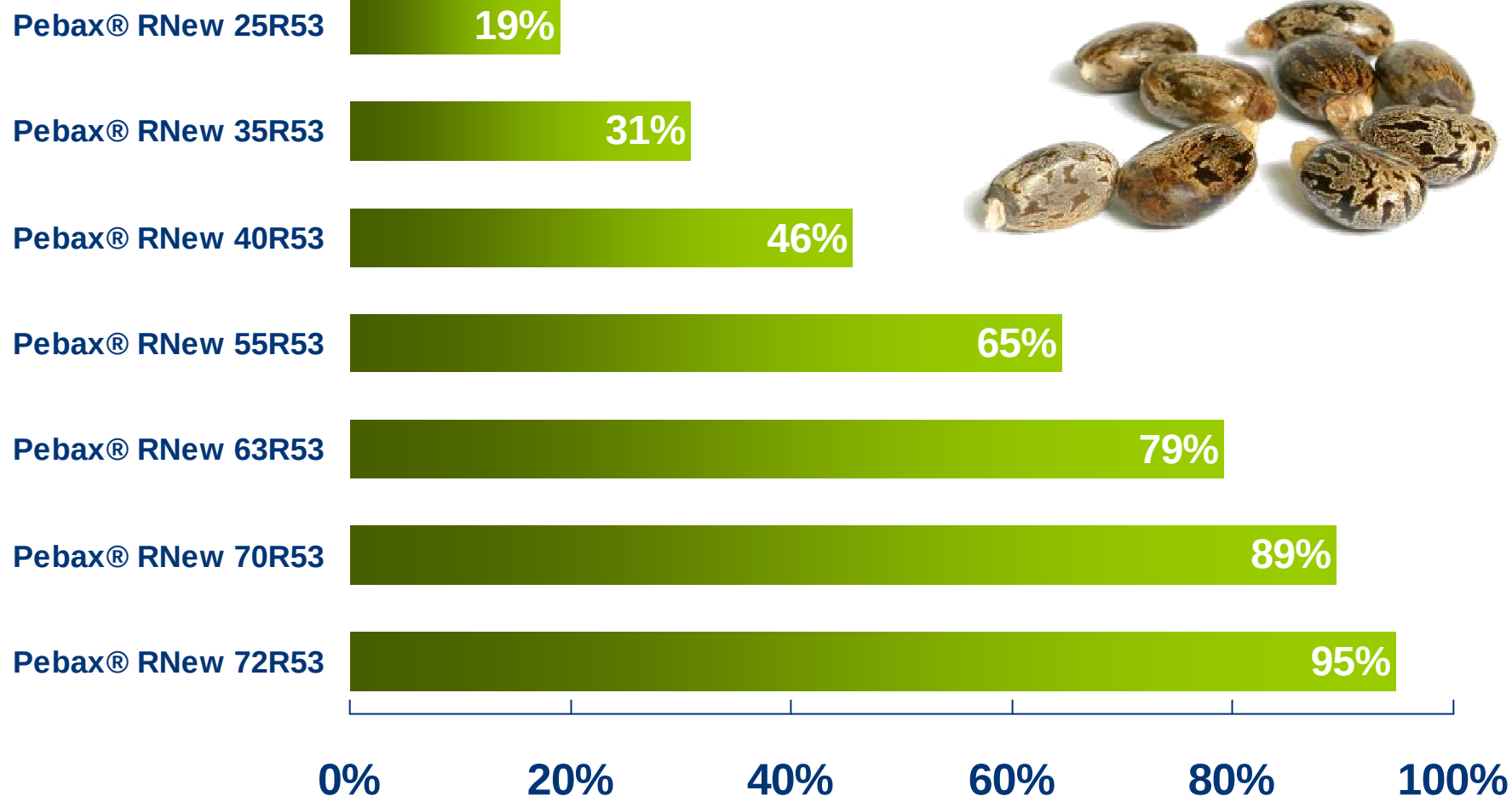
➡ 可以节省**10~30%** 成型周期

* Compare to TPU & COPE, according to our major customers on sports, automotive & industrial markets
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Renewable Resources* Carbons

可再生碳在材料成分中的比例



* This calculation follows the guideline of the ASTM 6866 norm. The real amount of C from renewable sources can be measured by isotopic analysis of the $^{14}\text{C} / ^{12}\text{C}$ ratio and will have to be determined experimentally. This real value may be slightly different (probably by a few %) for the industrial grades.

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Pebax® Rnew soft grades



GENERAL PROPERTIES			25R53	SP 01	35R53	SP 01	40R53	SP 01
Renewable carbon content	ASTM 6866	%	17-21		24-28		44-48	
Density	ISO 1183	g/cm ³	1.03		1.03		1.03	
Melting Point	ISO 11357	° C	136		146		148	
Hardness								
Instantaneous	ISO 868	Shore D	26		32		42	
After 15 s.			22		25		39	
Tensile								
Stress at break	ISO 527	MPa	NC		NC		> 25	
Elongation at break		%	NC		NC		> 600	
Tensile modulus	ISO 527	MPa	9		17		80	



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Pebax® Rnew hard grades



GENERAL PROPERTIES			55R53 01	SP	63R53 SP 01	70R53 SP 01	72R53 SP 01
Renewable carbon content	ASTM 6866	%	62-66		77-81	87-91	93-97
Density	ISO 1183	g/cm ³	1.03		1.03	1.03	2.03
Melting Point	ISO 11357	° C	167		180	186	186
Hardness							
Instantaneous	ISO 868	Shore D	53		62	68	71
After 15 s.			41		57	60	65
Tensile							
Stress at break	ISO 527	MPa	46		56	55	55
Elongation at break		%	> 500		> 450	> 350	> 300
Tensile modulus	ISO 527	MPa	150		260	385	660



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Injection conditions

	Drying	Injection Temperature	Mold Temperature
Pebax® 25R53	4-8 hours / 55 - 65° C	180° C / 210° C / 240° C	10 - 30° C
Pebax® 35R53	4-8 hours / 55 - 65° C	180° C / 210° C / 240° C	10 - 30° C
Pebax® 40R53	4-6 hours / 60 - 70° C	200° C / 240° C / 270° C	10 - 30° C
Pebax® 55R53	4-6 hours / 65 - 75° C	200° C / 240° C / 270° C	25 - 60° C
Pebax® 63R53	4-8 hours / 55 - 65° C	230° C / 260° C / 290° C	25 - 60° C
Pebax® 70R53	5-7 hours / 70 - 80° C	230° C / 260° C / 290° C	25 - 60° C
Pebax® 72R53	5-7 hours / 70 - 80° C	230° C / 260° C / 290° C	25 - 60° C
Rilsan® unfilled - BMNO	4-1 night / 80 - 90° C	230° C / 260° C / 290° C	20 - 40° C
Rilsan® filled - AZM 30	4-1 night / 80 - 90° C	240° C / 280° C / 310° C	40 - 60° C

滑雪镜-太阳镜应用

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与Rilsan Clear 双射成型

PEBAX Rnew



Winter Sports – Scarpa

冬季滑雪靴

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Posters and flyers on the booth
Hangtags on the boots



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AF
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Pebax® Rnew 户外运动应用案例

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Helmets
Rilsan®
Pebax® Rnew

Ski top-layers
Rilsan®

Ski boots
Pebax® Rnew

Binding
Pebax® Rnew

Frame
Rilsan® + Glass

Poles
Rilsan®

Goggles
Rilsan® Clear
Pebax® Rnew

Sportswear
Rilsan® B

Bindings
Rilsan®
Rilsan® Clear Rnew

Outsole
Pebax® Rnew

Are you concerned by the preservation of the environment where you are skiing ?



➤ **Air Zoom Rage**

➤ **Air Zoom Apocalypse**

➤ **Air Zoom Barracuda**





Under Armour



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Metal D Series

Metal Power



Metal Power Mid



Metal Power High



Dual plate (*Pebax®* forefoot)

Metal Speed



Metal Speed Low



Metal Speed Mid



Dual plate (*Pebax®* forefoot)