Rilsan® Clear for Headphone

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What is Rilsan® Clear?

– Transparent Polyamide

Two high performance product platforms :

- **Cyclo Aliphatic Amorphous PA (PACA) :**
- **=> High Flexibility, UV resistance**
  - Rilsan® Clear G350
  - Rilsan® Clear G830 Rnew *(made from Castor plants)*

- **Semi Aromatic Amorphous PA (PASA):**
- **=> High Tg, Rigid, Chemical resistance**
  - Rilsan® Clear G170

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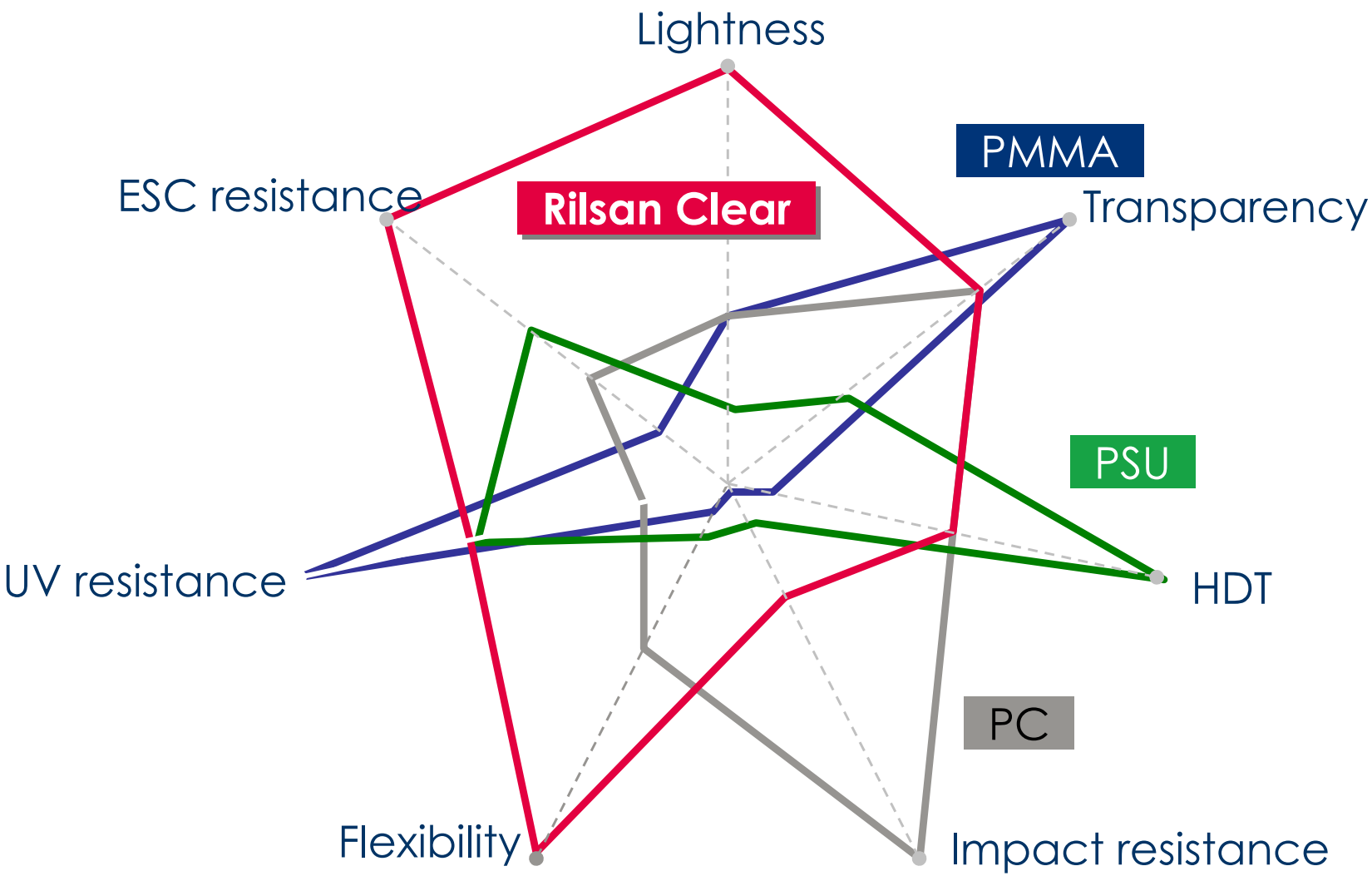
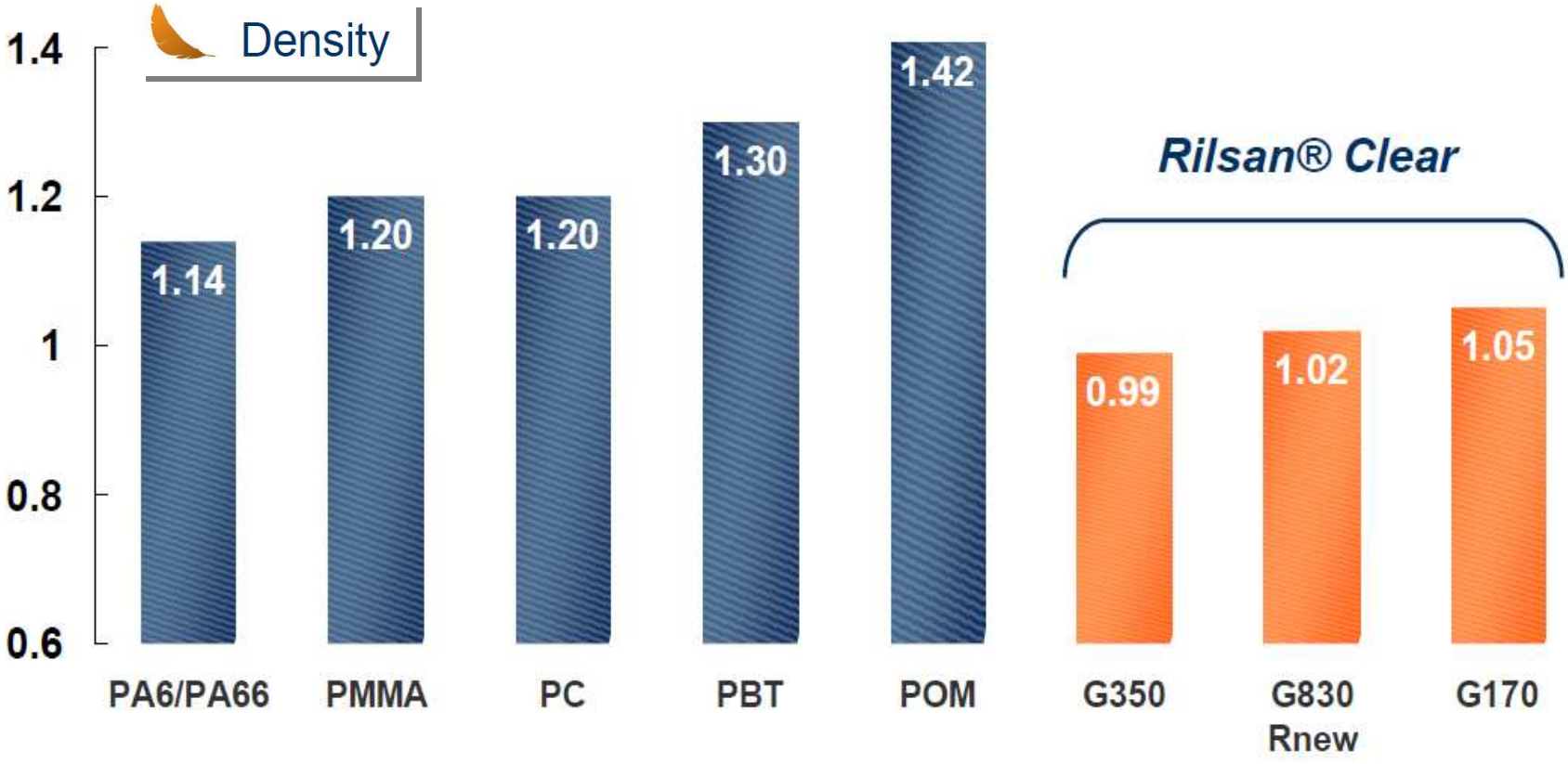
What is Rilsan® Clear

- position in Transparent Engineering Polymers



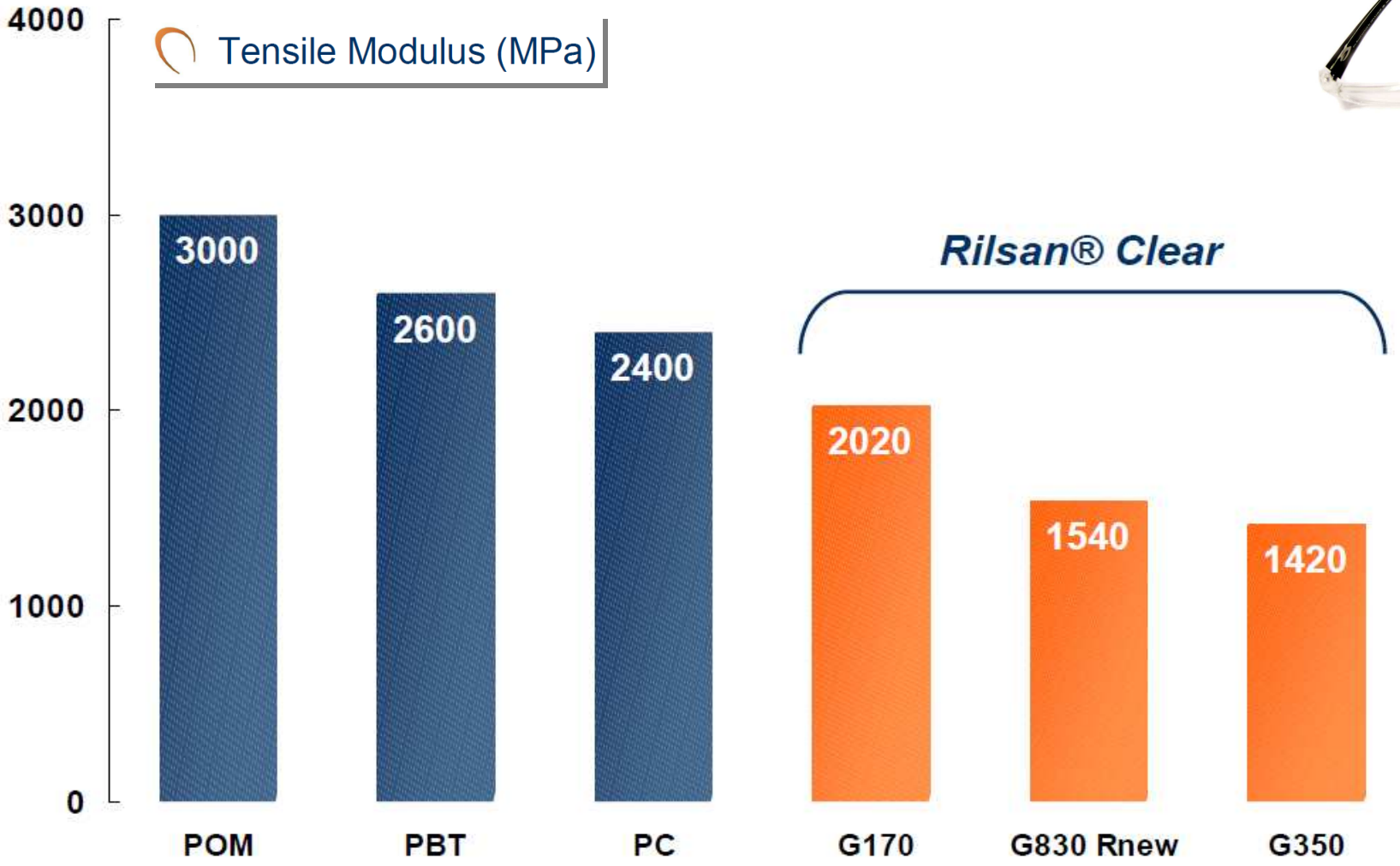
What Rilsan® Clear Brings to headphone?

– Super Lightweight – Comfortable feeling



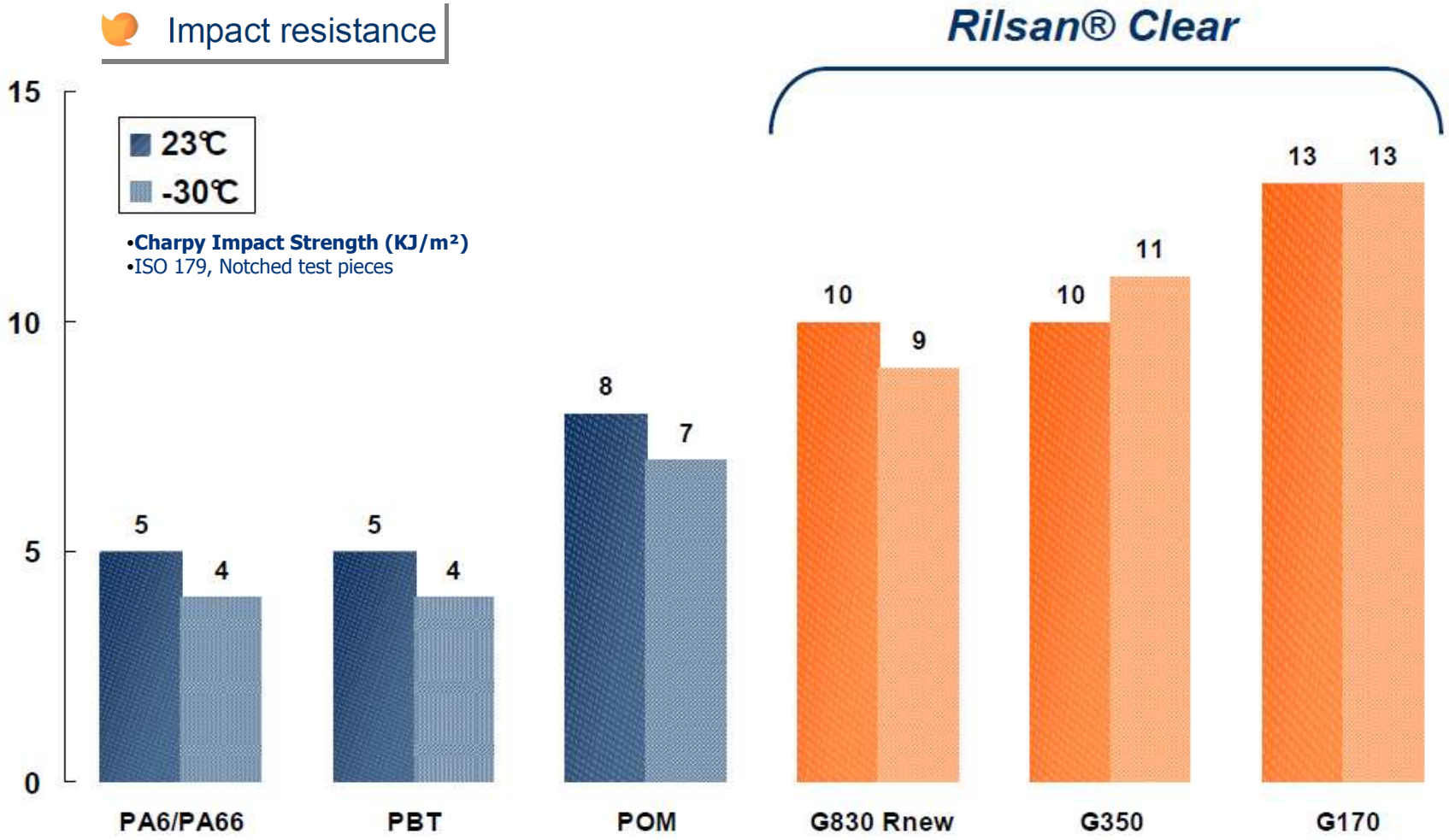
What Rilsan® Clear Brings to headphone?

- Flexibility – Feeling softer



What Rilsan® Clear Brings to headphone?

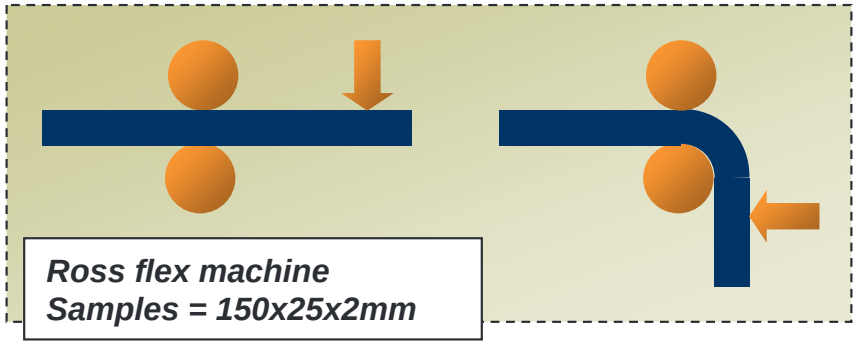
– No doubt in Dropping test



What Rilsan® Clear Bring?
– Fatigue resistance

Test Conditions:

- 90 degree, at room temperature
- Specimen width ; 25 mm
- Cycles: up to 20000



Rilsan Clear G830Rnew Result:

13,000< Break point<14,300

- ** Using Adidas standard on midsole of shoes*

Technical datasheet

				RILSAN(R) CLEAR		
PROPERTIES	Description	Test Method	Units	G170	G350	G830Rnew
Bio Based Carbon	Calculation	ASTM 6866	%	_	_	54
Density		ISO 1183	g/m3	1.05	0.99	1.01
Transperency		ISO 11168-1.2 (560nm, 2mm)	%	90.8	91.5	91.5
Water Absorption	@20C, 50%RH	ISO 62	%	1.3	1.1	1.3
	@23C, 24 hr in water	ISO 62	%	3.2	3.0	3.3
Glass transition temperature (Tg)		ISO 11357	° C	168	145	135
Heat Deflection Temperature (HDT)	under 0.45 Mpa	ISO 75	° C	150	120	110
	under 1.80 Mpa	ISO 75	° C	136	105	95
Shrinkage	flow direction, after 24h, 2mm, mold @ 40° C	Internal Method	%	_	0.5	0.45
	transverse direction, after 24 hr, 2mm, mold @ 40° C	Internal Method	%	_	0.5	0.45
Harness Shore+	Instantaneous	ISO 868	Shore D	84	81	83
	After 15 sec	ISO 868	Shore D	79	78	81
Tensile Test+	Stress at Yield	ISO 527	Mpa	74	51	55
	Strain at Yield	ISO 527	%	9	8	7
	Stress at Break	ISO 527	Mpa	58	50	60
	Strain at Break	ISO 527	%	>100	>150	>150
Tensile Modulus+		ISO 527	Mpa	2020	1480	1690
Flexural Modulus+		ISO 178	Mpa	1980	1340	1530
Charpy Impact	Unnotched 23° C	ISO 179	kJ/m2	No Break	No Break	No Break
	Unnotched -30° C	ISO 179	kJ/m2	No Break	No Break	No Break
	V-notched 23° C	ISO 179	kJ/m2	13	12	11
	V-notched -30° C	ISO 179	kJ/m2	13	10	10

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Process Guideline

		Units	G170	G350	G830Rnew
Drying++	Time	hrs	6	6	6
	Temperature	° C	80~90	80~90	80~90
Extrusion Temperature	Recommended	° C	280	_	_
	Minimum	° C	270	_	_
	Maximum	° C	290	_	_
Injection Temperature	Recommended	° C	290	280	270
	Minimum	° C	270	250	240
	Maximum	° C	310	300	300
Mold Temperature	Typical	° C	40~80	20~80	20~80

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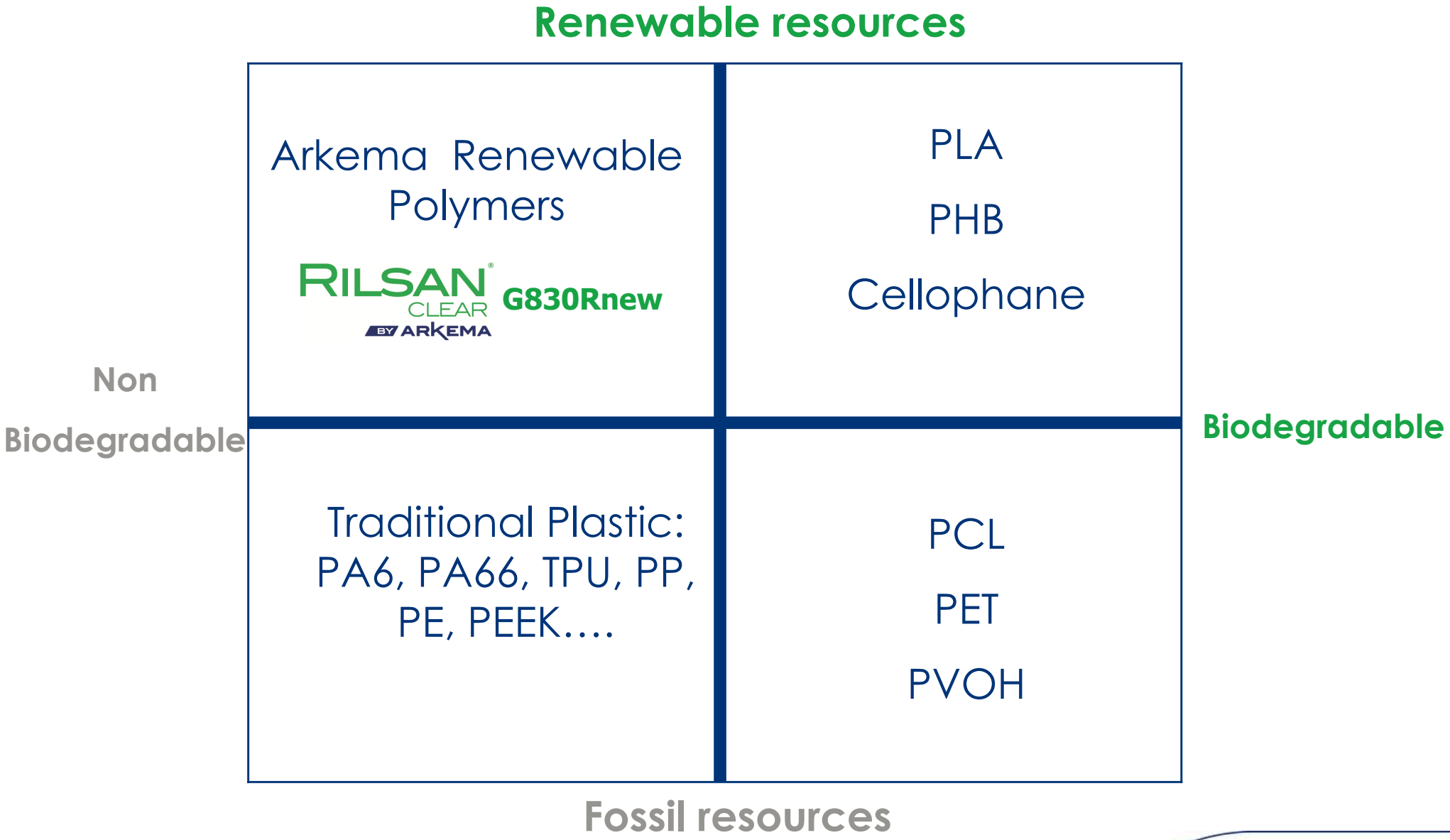
Rilsan® Clear G830Rnew

- Biobased solution

Rilsan® Clear G830Rnew - Biobased solution



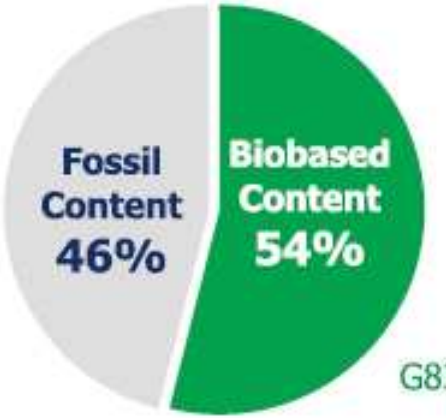
Rilsan® Clear G830Rnew - Biobased solution

Rilsan® Clear G830 Rnew

- Rilsan® Clear G830 Rnew is using 54% of biobased raw material thus contributing to reduce CO_2 emissions. This grade fits perfectly in to eco-design concept, offering a unique combination of key benefits.

54% Biobased:

- The carbon of this plastic is derived from a renewable resource (biological process) in opposition to a fossil source
- The Carbon which is produced through photosynthesis process is under the form of ^{14}C whereas the Carbon coming from a fossil source in under the form of ^{12}C
- The ASTM D6866 is the reference norm to measure the percentage of renewable carbon (^{14}C)



G830 Rnew

Rilsan® Clear G830Rnew - Biobased solution

- **Non edible** crops
  - Several harvests in a year
  - No competition with food
- **Non GMO**
- Use very **few pesticide**
  - Robust culture

- Grown on poor soil in **semi arid areas**
  - As compared to corn, soy
  - Use very few water

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Rilsan® Clear Case study

- Everywhere in life

Optical lens

Mobile phone

Reading glasses

tennis

Watch cover

Green lens

3D glasses

Fliter

Oil can

Cable

SAMSUNG ELECTRONICS

SMITH OPTICS

QUIKSILVER

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