

Il concetto di sostenibilità in KRAIBURG TPE

Il nostro approccio a livello prodotto



Milestones del THERMOLAST® R



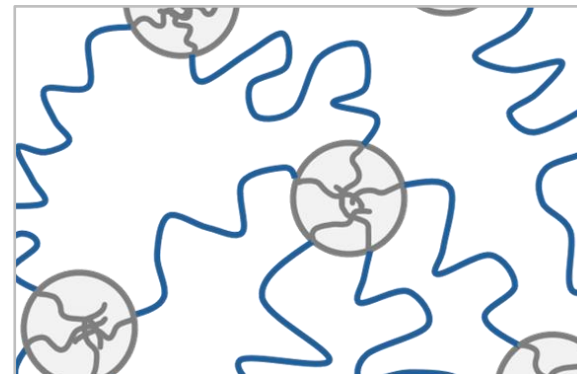
TPS – Materie Prime



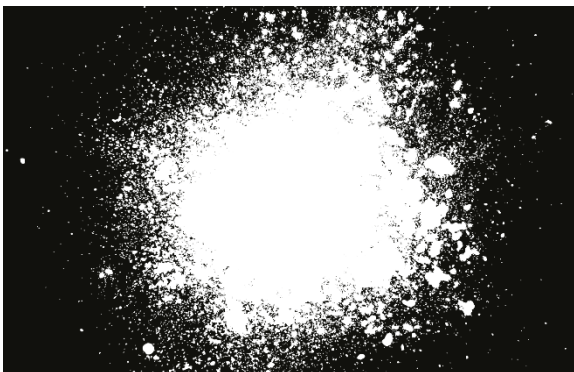
Technical White Oil



Thermoplastic



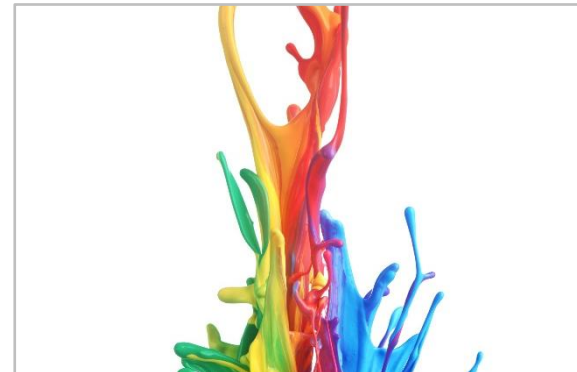
SEBS



Filler



Additives



Color

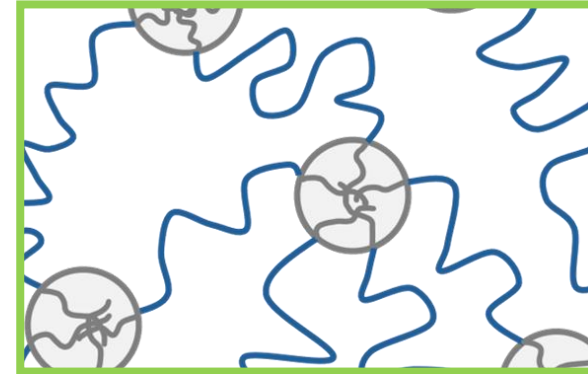
TPS – Le opzioni sostenibili ad oggi



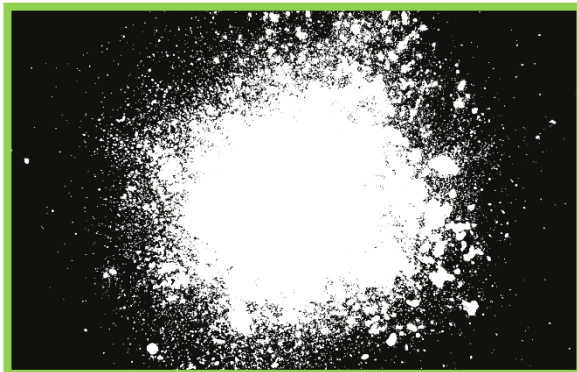
Technical White Oil



Thermoplastic



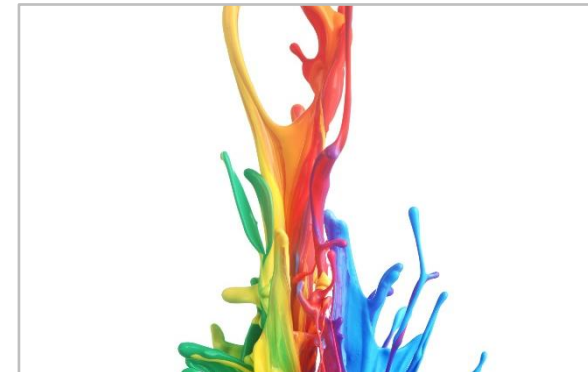
SEBS



Filler



Additives



Color

TPS – Possibilità di riduzione PCF



TPE con contenuto di riciclato

- 25-95 Sh.A
- Adesione a PP, PC/ABS, PA
- PCR and PIR based
- Contenuto di riciclato fino al 77%
- Versioni stabilizzate UV



Bio-based TPE

- 30-80 Sh.A
- Adesione to PP, PC/ABS, PA
- Bio-based Content fino al 71%



ISCC PLUS Mass Balanced TPE

- Disponibile per la maggior parte delle serie a portafoglio
- Per tutti i TPE in adesione a polimeri rigidi
- Mass balanced contents fino al 90%
- Mantenimento delle certificazioni



Lightweight TPE

- Densità 0.725-0.850 g/cm³
- 35-80 Sh.A
- Adesione to PP, PA
- Stabilizzazione UV
- Versioni con contenuto di riciclato

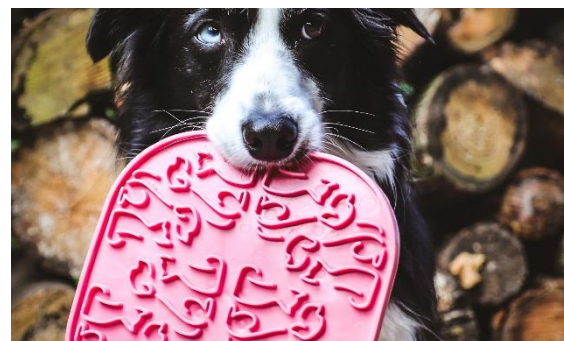
AUTOMOTIVE



INDUSTRY



CONSUMER



MEDICAL





THERMOLAST® R

TPE con contenuto di riciclato

Industry and Consumer Market

■ RC/PCR2 – RC#OGD-NTRL

- PCR-based
- Adesione a PP
- 30-90 Sh.A
- Fino al 79% Recycling Content

■ RC/AD1 – RR#PGD-NTRL

- PCR- and PIR-based
- Adesione ai Polari e.g. ABS
- 40-70 Sh.A
- Fino al 54% Recycling Content

■ RC/AD/PA – RR#NGD-NTRL

- PCR- and PIR-based
- Adesione a PA
- 40-90 Sh.A
- Fino al 60% Recycling Content

		Virgin TF4CGT	RC4OGD- NTRL	Virgin TC6MLB	RR6PGD- NTRL	Virgin TC8PAN	RR8NGD- NTRL
Recycling Content	%	0%	70%	0%	47%	0%	49%
Hardness	Sh.A	38	40	60	60	80	80
Density	g/cm ³	0.880	0.860	1.100	1.150	1.150	0.980
Adhesion	N/mm	PP	PP 3.4 (D)	ABS 6.0 (D)	ABS 4.8 (D)	PA6 8.5 (D)	PA6 8.7 (D)
PCF* kg	kgCO _{2e} /kg	2.56	1.93	3.63	3.45	2.31	2.25
PCF* ℓ	kgCO _{2e} / l	2.30	1.72	3.96	3.90	2.61	2.21

*Calculation is performed according to the Greenhouse Gas Protocol in line with DIN EN ISO 14067 and following the principles of DIN EN ISO 14044 and DIN EN ISO 14040. The system boundary is cradle to gate. Emissions for raw materials (with most data provided by KRAIBURG TPE suppliers) and for transportation, manufacturing and packaging are included. Emission factors follow the IPCC 2013 GWP 100a methodology for determining CO₂equivalence.



THERMOLAST® R

TPE con contenuto di riciclato

Automotive Market - Interior

■ RC/GP/FG – RR#GPZ-BLCK

- PCR- and PIR-based
- Adesione a PP
- 25-95 Sh.A
- Fino al 77% Recycling Content

■ RC/FG/SF – RR#FEZ-BLCK

- PCR- and PIR-based
- Adesione a PP, High Flow
- 60-80 Sh.A
- Fino al 69% Recycling Content

■ RC/FG/AD1 – RR#MLZ-BLCK

- PCR- and PIR-based
- Adesione ai Polari e.g. ABS
- 50-60 Sh.A
- Fino al 49% Recycling Content

		Virgin TC6GPZ	RR6GPZ- BLCK	Virgin TC6MLZ	RR6MLZ- BLCK	Virgin TC6FEZ	RR6FEZ- BLCK
Recycling Content	%	0%	70%	0%	49%	0%	67%
Hardness	Sh.A	59	60	59	58	62	60
Density	g/cm ³	1.100	1.090	1.100	1.080	0.930	0.920
Adhesion	N/mm	PP	PP 3.4 (D)	ABS 6.0 (D)	ABS 4.0 (B)	PP 5.4 (B/D)	PP
PCF* kg	kgCO _{2e} /kg	1.88	1.55	3.48	3.17	2.47	1.93
PCF* ℓ	kgCO _{2e} / l	2.06	1.67	3.81	3.43	2.32	1.80

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THERMOLAST® R

TPE con contenuto di riciclato

Automotive Market - Exterior

- **RC/UV – RR#LEZ-BLCK**
 - PCR- and PIR-based
 - Adesione a PP
 - 30-90 Sh.A
 - Fino al 70% Recycling Content
- **RC/UV/AD2 – RR#MUZ-BLCK**
 - PCR- and PIR-based
 - Adesione ai Polari e.g. ABS
 - 65-75 Sh.A
 - Fino al 35% Recycling Content
- **High Flow Exterior RR6WEZ-BLCK**
 - PCR- and PIR-based
 - Adesione a PP
 - 60-90 Sh.A
 - 56 % Recycling Content

		Virgin TC6LEZ	RR6LEZ-BLCK	Virgin TC6MLZ	RR6MLZ-BLCK	Virgin TC6WEZ	RR6WEZ-BLCK
Recycling Content	%	0%	68%	0%	49%	0%	56%
Hardness	Sh.A	62	63	59	58	62	61
Density	g/cm ³	1.980	0.980	1.100	1.080	0.93	0.918
Adhesion	N/mm	PP 5.8 (D)	PP 7.1 (D)	ABS 6.0 (D)	ABS 4.0 (B)	PP 5.0 (D)	PP 2.1 (B)
PCF* kg	kgCO ₂ e/kg	2.15	1.58	3.48	3.17	2.31	1.96
PCF* l	kgCO ₂ e/ l	2.11	1.56	3.81	3.43	2.17	1.85

*Calculation is performed according to the Greenhouse Gas Protocol in line with DIN EN ISO 14067 and following the principles of DIN EN ISO 14044 and DIN EN ISO 14040. The system boundary is cradle to gate. Emissions for raw materials (with most data provided by KRAIBURG TPE suppliers) and for transportation, manufacturing and packaging are included. Emission factors follow the IPCC 2013 GWP 100a methodology for determining CO₂equivalence.

THERMOLAST® R

INDUSTRY



CONSUMER



Bio-based TPE

- 30-80 Sh.A
- Adesione a PP, PC/ABS
o PA
- Bio-based Content fino al 71%



		Virgin TF3CGN	RB3OBG- NTRL	Virgin TC6YCZ	RB6NBG- NTRL	Virgin TF9FMA	RB9PBG- NTRL
Bio-based Content*	%	0%	71%	0%	63%	0%	49%
Hardness	Sh.A	30	30	65	60	86	85
Density	g/cm ³	1.100	1.070	1.200	1.150	1.100	1.200
Adhesion	N/mm	PP 3.0 (D)	PP 2.8 (D)	PA6 7.3 (D)	PA6 5.0 (D)	ABS 8.3 (A)	ABS 6.0 (B)
PCF* kg	kgCO _{2e} /kg	1.90	1.11	2.19	1.47	5.6	2.78
PCF* l	kgCO _{2e} / l	2.06	1.18	2.59	1.65	6.11	3.33

*) bio-content = real input of renewable based raw materials

**) calculation carried out within system boundary cradle-to-gate, in line with DIN EN ISO 14067 and following the principles of DIN EN ISO 14040/14044 and the GHG protocol, values are incl. Biogenic absorption, transportation, packaging and compounding

Mass Balanced TPE

ISCC PLUS

- Disponibile per la maggior parte dei nostri TPE a portafoglio
- Valido per tutti i gradi di TPE da adesione
- Contenuto con bilancio di massa fino al 90%
- Mantenimento delle certificazioni



		TF4CGN	TF4CGN ISCC PLUS*	TM6MED	TM6MED ISCC PLUS*	TF8CMB	TF8CMB ISCC PLUS*
ISCC PLUS certified Content*	%	0%	27%	0%	50%	0%	92
Hardness	Sh.A	40	40	56	56	80	80
PCF* kg	kgCO ₂ e/ kg	1.89	1.02	3.61	1.97	4.51	1.54
PCF* ℓ	kgCO ₂ e/ l	2.08	1.10	3.21	1.78	4.14	1.43
Regulatory Status		(EU) No 10/2011 - US FDA CFR 21 (raw material) - EN71-3	(EU) No 10/2011 - US FDA CFR 21 (raw material) - EN71-3	- VDI 2017 - ISO 10993-5 (Cytotox)	- VDI 2017 - ISO 10993-5 (Cytotox)	(EU) No 10/2011 - US FDA CFR 21 - China GB4806-2016 - EN71-3	(EU) No 10/2011 - US FDA CFR 21 - China GB4806-2016 - EN71-356

*Calculation is performed according to the Greenhouse Gas Protocol in line with DIN EN ISO 14067 and following the principles of DIN EN ISO 14044 and DIN EN ISO 14040. The system boundary is cradle to gate. Emissions for raw materials (with most data provided by KRAIBURG TPE suppliers) and for transportation, manufacturing and packaging are included. Emission factors follow the IPCC 2013 GWP 100a methodology for determining CO₂equivalence.

Lightweight TPE

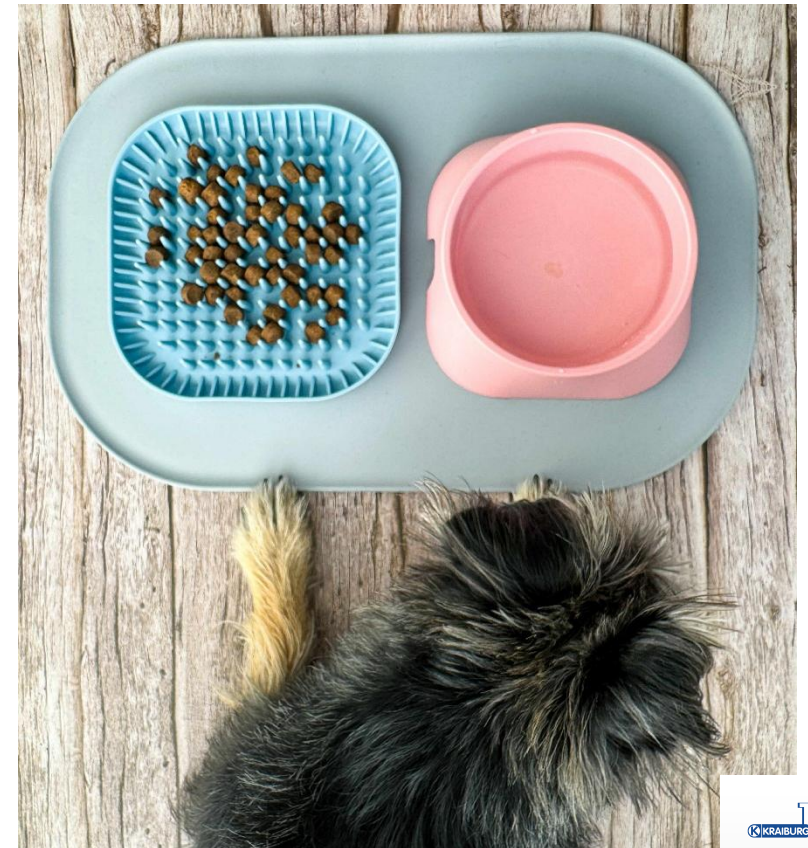
- 35-80 Sh.A
- Bassa densità
- Adesione a PP, PA
- Stabilizzazione UV
- Recycling content versions
- Tempo di raffreddamento corto
- Sensibile riduzione tempo ciclo



		Virgin TL3OCW-BLF5	SRC9999/239	Virgin TL6OCW-BLCK	RL6OCW-BA60	Virgin TL8OWG-BLCK	RL8OWG-BSLP
Recycling Content	%	0%	47%	0%	39%	0%	50%
Hardness	Sh.A	37	33	65	60	80	77
Density	g/cm³	0.855	0.841	0.730	0.730	0.725	0.744
CS 72h/23° C	%	16	15	17	12	29	30
PCF* kg	kgCO ₂ e/kg	3.35	3.08	3.21	2.93	2.72	2.26
PCF* ℓ	kgCO ₂ e/l	2.88	2.62	2.43	2.18	2.04	1.73

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Esempi

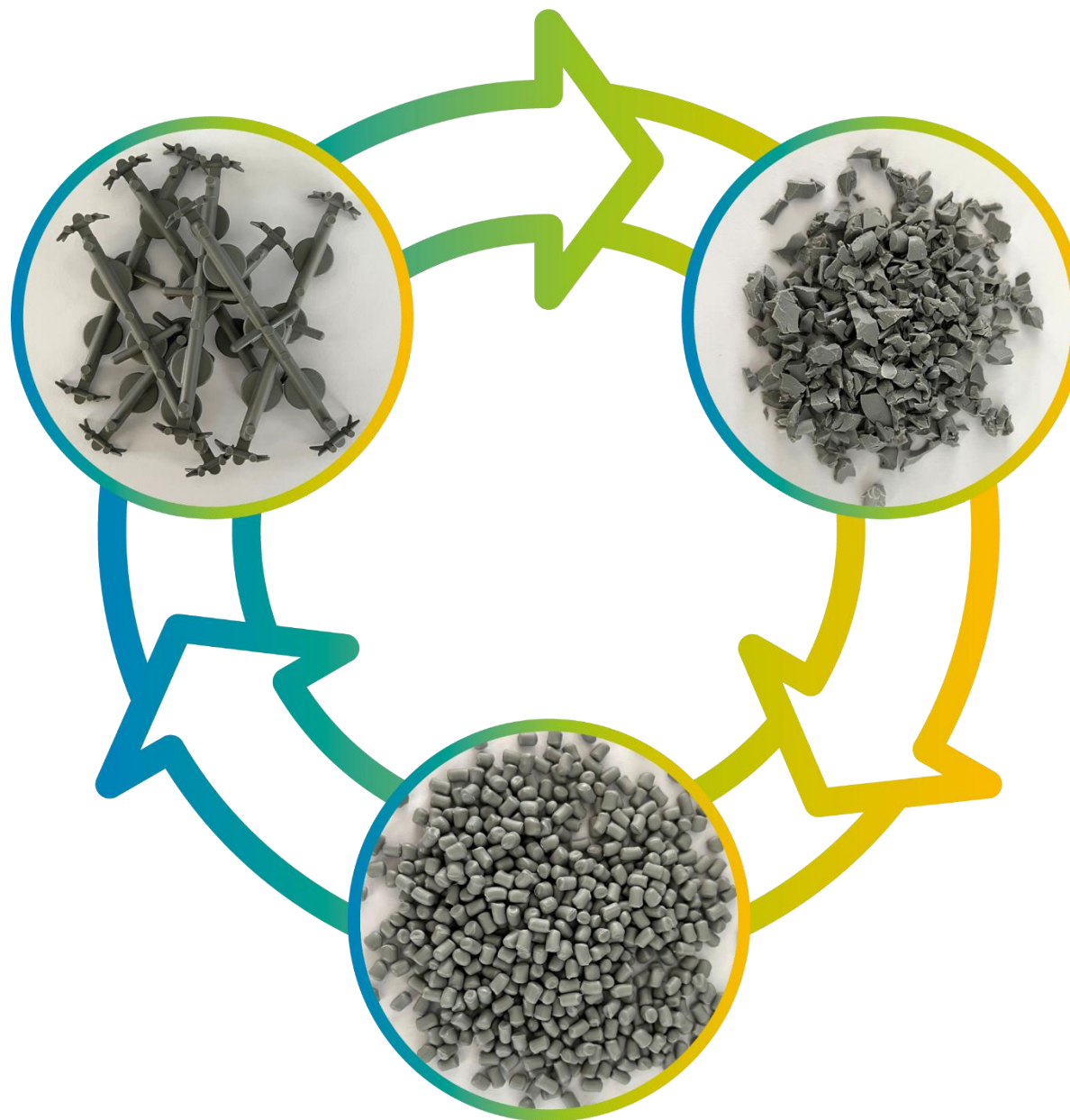


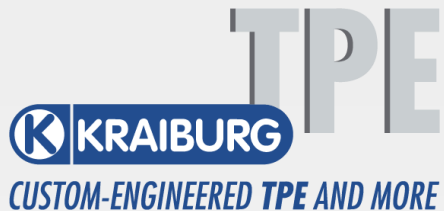
La ricerca della “circularità”

Creazione di soluzioni dedicate per favorire la circolarità dei TPE

Loop TPE

- Presa in carico di materiali di scarto come materozze e pezzi scartati
- Test interni sulla macinabilità dei pezzi
- Compound per ottenere un TPE basato al 100% su PIR
- Technical Delivery Agreements per garantire prestazioni del prodotto stabili e adeguate





The information provided in this document correspond to our knowledge on the subject at the date of is publication and may be subject to revision as new knowledge and data become available. All values reported are typical values based on sample test results and are not a guarantee of performance. The responsibility to conduct testing to determine suitability of use for the particular process or end-use application remains with the customer. KRAIBURG TPE does not warrant or assume any liability with regards to the use of the information presented in this document.

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For more information about KRAIBURG TPE please visit:
www.kraiburg-tpe.com



Massimo De Fazio

Key Account Manager
Team European Offices

Tel: +39 344 0470846

Mail: massimo.defazio@kraiburg-tpe.com

