



4KFLEX[®] COMPOUNDS

SBS SEBS TPV TPO

4KFLEX[®]
COMPOUNDS BY KORRELS



Photo: Henri van der Beek

WHO WE ARE

We are specialist and generalist in one. We Create!

4KFLEX® is a brand of the KORRELS group. KORRELS has gained a great reputation by taking on the most diverse challenges in the field of plastic materials.

With a lot of knowledge, translated into smart material solutions, a strong reputation was built. Resulting in customer-specific solutions, but the versatile portfolio also includes many standard compounds.

We produce TPE SBS/SEBS TPV TPO compounds on request, i.e. customer-specific. In addition, you will find a selection of our standard compounds in this brochure. If your compound is not listed, let us know.

The KORRELS group is located in Wapenveld, The Netherlands. For more than two decades we have been committed to providing our customers with high quality materials and services. But what makes us even more proud is that we continue to grow year after year. Our attention to material, knowledge, staff and customer has helped us to make our company grow.

Our people are the core of our success. We have a dedicated and skilled team working day in and day out to provide the best products and services to our customers. Our employees are passionate about their work and are highly committed to deliver the best results. Together We Create!

We are specialists in materials for
juvenile care applications

WE LIVE OUR VALUES!

Having a clear set of values helps to understand what we stand for. Our company values also give guidance to our work and a sense of security. As a result, we are more likely to make the right decisions; the decisions that help us achieve our company's vision and goals.



FAIRNESS



INNOVATION



CARE



PASSION



ACCOUNTABILITY



RESPECT



TEAMWORK

FAIRNESS is woven into everything we do: aiming to make good decisions that serve the needs of the business without harming anyone. **INNOVATION** is driven by wisdom, which is a combination of knowledge and character. **WE CARE** deeply about our products and their quality, as well as the environment and the afterlife of our products. Our stakeholders, including customers and their unique needs, are also a top priority. We approach our work with **PASSION**, finding it interesting

and exciting, and we actively engage with the day-to-day efforts to satisfy our customers. **ACCOUNTABILITY** is crucial, as each of us is responsible for our words, actions, and results. **RESPECT** is a core value, as we value everyone and treat people with dignity and professionalism. **TEAMWORK** is key to our success, as we achieve more when we collaborate and work together with our colleagues and customers.

4KFLEX® SBS COMPOUNDS

4KFLEX® SBS compounds are 100% recyclable and the best choice when there's no need for special UV or good chemical resistance.

- > Suitable grades for a wide range of applications
- > Hardness Shore A20 to D60
- > Density 0,90 - 1,40
- > Easy to color with PE, PP masterbatches
- > No pre drying
- > Cost efficient
- > Easy to process
- > 100% recyclable



Shock absorbers / Anti slip damper



Roofing / bitumes



Asphalt



Binders



Bed damper



Shoe soles

4KFLEX® SEBS COMPOUNDS

4KFLEX® SEBS compounds are 100% recyclable, with excellent UV resistance, high temperature resistance and excellent chemical resistance.

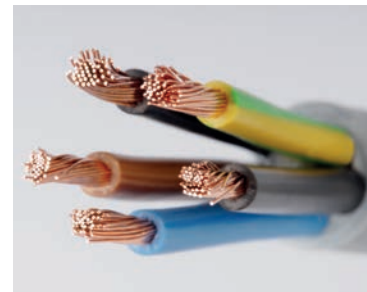
- > Suitable grades for a wide range of applications
- > Hardness Shore A10 to D60
- > Density 0,89 - 1,40
- > Excellent weathering resistance
- > High impact resistance
- > Excellent chemical resistance
- > Excellent UV resistance
- > Flame retardant grades
- > Easy to color with PE, PP masterbatches
- > No pre drying
- > Bondable (2K) grades available
- > Easy to process
- > 100% recyclable



Household electronics



Food containers



Cable & wires



2K bonding on PP, PE, ABS, PS, PC, ASA



Automotive

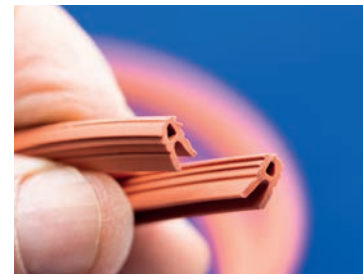
4KFLEX® TPV COMPOUNDS

4KFLEX® TPV compounds are 100% recyclable, with excellent UV resistance, excellent high temperature performance and excellent chemical resistance.

- > Suitable grades for a wide range of applications
- > Hardness Shore A35 to D60
- > Excellent chemical resistance
- > Excellent UV resistance
- > Excellent high temperature performance
- > Low compression set properties
- > Flame retardant grades
- > Easy to color with PE, PP masterbatches
- > Good adhesion on PP
- > Easy to process
- > 100% recyclable



Automotive industry



Building industry



Juvenile care

4KFLEX® TPO COMPOUNDS

4KFLEX® TPO compounds are 100% recyclable, with good UV resistance and good chemical resistance.

- > Suitable grades for a wide range of applications
- > Hardness Shore A60 to D65
- > Good weathering resistance
- > High impact resistance
- > Excellent scratch resistance
- > Easy to color with PE, PP masterbatches
- > No pre drying
- > Easy to process
- > 100% recyclable



Flooring



Automotive armrest



White TPO roofing

4KFLEX® 2K BONDING COMPOUNDS

We are specialized in 2K applications such as bonding on PP, PE, ABS, PS, PC, ASA. Most of our compounds have a good adhesion to PP, PE. Ask your representative for advice.



DESCRIPTION	HARDNESS	ABS	PS	PA	PC	PC/ABS
4KFLEX® SBS hybride	DIFFERENT HARDNESSES	+	++	+	+	+
4KFLEX® SEBS hybride 35 SHORE A	35A	+	+	+	+	+
4KFLEX® SEBS hybride 40 SHORE A	40A	+	+	+	+	+
4KFLEX® SEBS hybride 50 SHORE A	50A	++	++	++	++	++
4KFLEX® SEBS hybride 60 SHORE A	60A	++	++	++	++	++
4KFLEX® SEBS hybride 70 SHORE A	70A	+++	+++	+++	+++	+++
4KFLEX® SEBS hybride 80 SHORE A	80A	+++	+++	+++	+++	+++
4KFLEX® SEBS hybride 90 SHORE A	90A	+++	+++	+++	+++	+++

4KFLEX® MODIFIERS

4KFLEX® modifiers for impact, moisture and process improvement are easy flow, easy to dose or mix into your process.

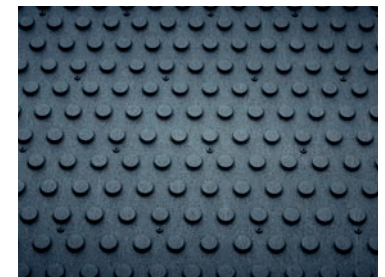
- > Hardness Shore A25 to D60
- > Impact modifiers for PP, PS, ABS and more
- > Moisture absorbers for TPE, PP, PE, PS, ABS and more
- > Process improvement
- > Scratch improvement
- > Mold release
- > Suitable grades for a wide range of applications
- > Easy to color with PE, PP masterbatches
- > No pre drying
- > Easy to process
- > 100% recyclable



Foil PS or ABS



PP-PE, PS-ABS materials



Thermoforming



Photo: Henri van der Beek

4KFLEX[®] SUSTAINABLE ELASTOMERS

Because we care about our planet we can develop your compounds with a share of renewable materials or post-consumer waste. The exact content of sustainable ingredients can be adjusted to your wishes while maintaining the quality.

RENEWABLE BASED

These compounds are made from renewable sources, which simply means coming from natural sources that can be constantly replenished without harming our planet. These are not sources that are in the food chain.

The used basic components of these elastomers are renewable raw materials such as: rubbers, polymers and fillers. Depending on the percentage and the wishes you have for your product, we can compose the compound with a combination of these three raw materials.

POST CONSUMER WASTE

These compounds are made from post consumer waste. Post consumer waste refers to waste generated by individuals or households after a product has served its intended purpose and has been discarded or recycled.

The used basic parts of these elastomers are recycled raw materials such as: rubbers, polymers and fillers. Depending on the percentage and the wishes you have for your product, we can compose the compound with a combination of these three raw materials.





4KFLEX® EXAMPLES OF APPLICATIONS

- 1 TPV & SEBS compounds for gaskets and seals
- 2 SEBS & TPV & TPU compounds for cables and wires
- 3 TPV & SEBS compounds for (industrial) wheels
- 4 SEBS compounds for non-slip and anti shock / vibration dampers & pads
- 5 SEBS & TPV compounds for window seals
- 6 SEBS compounds for adhesion on toothbrush (Soft Grip)
- 7 SEBS compounds for adhesion on shaver (Soft Grip)
- 8 SBS & SEBS compounds for bed dampers
- 9 TPV & SEBS compounds for refrigerator sealing
- 10 SEBS compounds seals for drinking cups
- 11 SEBS & TPV compounds for non-slip caps
- 12 SEBS compounds for anti-impact profiles for tables
- 13 SBS & SEBS compounds for carpet backing
- 14 TPV & SEBS compounds for car seats and strollers (juvenile care innovations)
- 15 SEBS & TPV & TPU compounds for hoses and tubes
- 16 SEBS & TPU compound for seals and closures (also drinking water approved)
- 17 SEBS & TPV compounds for draft profiles
- 18 SEBS Compounds for sound-absorbing profiles
- 19 SEBS compounds for sealing profiles for greenhouse construction
- 20 SEBS compounds for profiles for water drain motor cover
- 21 SEBS compounds for handles on bicycle handlebar
- 22 S(E)BS & TPU compounds for shoe soles

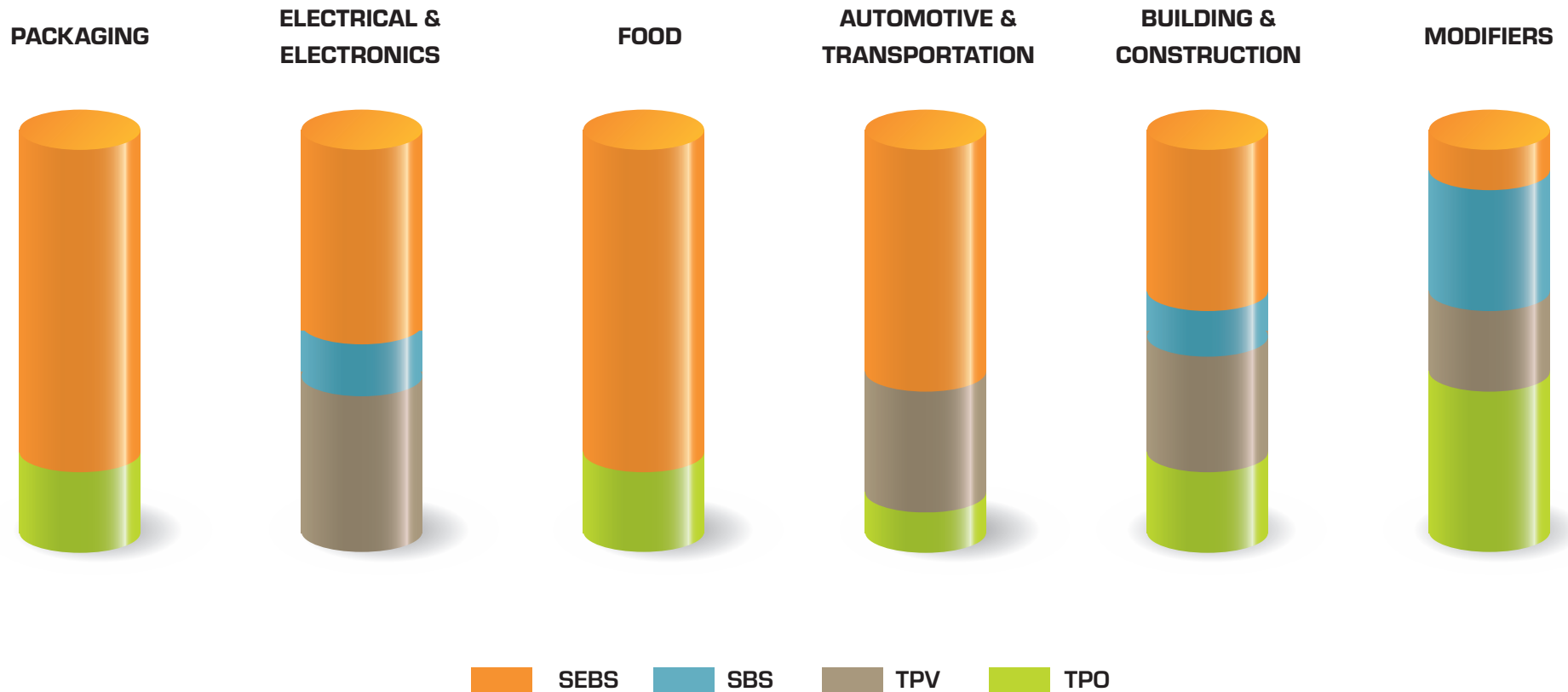
4KFLEX® TPE CHARACTERISTICS

To use the right material it's important to determine the specific requirements needed. Below you will find a comparison of the characteristics of our main materials. Our hybrid compounds are a mix of materials to combine there best properties in one ready to use compound.

	SBS	SEBS	TPV	TPO
Hardness Shore	A20 to D60	A10 to D60	A35 to D60	A60 to D65
Density	> 0,90	> 0,89	> 0,88	> 0,89
Compression set	Medium/Fair	Very good	Excellent	Medium
Scratch resistance	Good	Very good	Excellent	Excellent
Chemical resistance	Medium/Fair	Excellent	Excellent	Good
Weathering resistance	Medium/Fair	Excellent	Excellent	Good
UV resistance	Medium	Excellent	Excellent	Good
Impact resistance	Excellent	Excellent	Excellent	Excellent
Temperature resistance	Good	Very good	Excellent	Good
Colorable	Easy	Easy	Easy	Easy
Recycable	100%	100%	100%	100%

4KFLEX® MARKETS

4KFLEX® TPE COMPOUNDS are widely spread and divided over a number of market segments. We can divide these segments roughly between our six largest markets.



4KFLEX® SBS COMPOUNDS

	TEST NORM	IMPACT MODIFIERS		SEMI MINERAL FILLED				
Hardness (Shore)	ISO 868	20A	45A	50A	60A	70A	80A	90A
Density (g/cm³)	ISO 1183	1.23	1.23	1.03	1.03	1.03	1.03	1.03
Tensile strength (MPa)	ISO 37	2.2	4.7	4.0	4.5	5.0	6.0	8.0
Elongation at break (%)	ISO 37	900	590	525	500	475	460	450
Modulus 100% (MPa)	ISO 37	0.27	1.2	1.5	2	2.5	3.5	4
Modulus 300% (MPa)	ISO 37	0.73	2.3	2.0	2.5	3.5	4.5	5.0

This is a selection of our wide range of standard compounds, if your compound is not listed, please contact your local sales agent.

4KFLEX® SEBS COMPOUNDS

	TEST NORM	UNFILLED (TRANSLUCENT & TRANSPARENT)								
Hardness (Shore)	ISO 868	10A	20A	30A	40A	50A	60A	70A	80A	90A
Density (g/cm ³)	ISO 1183	0.89	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90
Tensile strength (MPa)	ISO 37	1.5	3.4	5.4	7.5	9.7	11.9	14.1	16.4	18.8
Elongation at break (%)	ISO 37	634	625	620	618	620	625	634	646	662
Modulus 100% (MPa)	ISO 37	0.4	0.6	0.8	1	1.3	1.8	2.3	2.8	3.5
Modulus 200% (MPa)	ISO 37	0.5	0.7	1	1.4	1.8	2.3	2.9	3.6	4.3
Modulus 300% (MPa)	ISO 37	0.7	0.9	1.3	1.8	2.4	3	3.8	4.7	5.6
Tear strength (kN/m)	ISO 34-2	12	12.4	12.8	13.9	17	23.6	32.6	44.2	58.3

	TEST NORM	SEMI MINERAL FILLED							
Hardness (Shore)	ISO 868	20A	30A	40A	50A	60A	70A	80A	90A
Density (g/cm³)	ISO 1183	1.03	1.02	1.03	1.03	1.03	1.03	1.03	1.03
Tensile strength (MPa)	ISO 37	3.4	4.6	5.9	7.2	8.4	9.7	11	12
Elongation at break (%)	ISO 37	650	630	500	550	610	610	630	610
Modulus 100% (MPa)	ISO 37	0.6	0.8	1.0	1.4	2.0	2.8	3.8	5.3
Modulus 200% (MPa)	ISO 37	1.0	1.3	1.7	2.3	3.0	3.9	5.1	6.2
Modulus 300% (MPa)	ISO 37	1.4	2.1	2.9	3.6	4.3	5.1	5.8	6.6
Tear strength (kN/m)	ISO 34-2	14	18	21	25	30	36	44	52

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4KFLEX® SUSTAINABLE ELASTOMERS

		TEST NORM	UNFILLED (TRANSLUCENT & TRANSPARENT)								
RENEWABLE	Hardness (Shore)	ISO 868	20A	30A	40A	50A	60A	70A	80A	90A	
	Density (g/cm³)	ISO 1183	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	
	Tensile strength (MPa)	ISO 37	3.4	5.4	7.5	9.7	11.9	14.1	16.4	18.8	
	Elongation at break (%)	ISO 37	625	620	618	620	625	634	646	662	
	Modulus 100% (MPa)	ISO 37	0.6	0.8	1	1.3	1.8	2.3	2.8	3.5	
	Modulus 200% (MPa)	ISO 37	0.7	1	1.4	1.8	2.3	2.9	3.6	4.3	
	Modulus 300% (MPa)	ISO 37	0.9	1.3	1.8	2.4	3	3.8	4.7	5.6	
	Tear strength (kN/m)	ISO 34-2	12.4	12.8	13.9	17	23.6	32.6	44.2	58.3	
			TEST NORM	SEMI MINERAL FILLED							
	Hardness (Shore)	ISO 868	20A	30A	40A	50A	60A	70A	80A	90A	
	Density (g/cm³)	ISO 1183	1.03	1.02	1.03	1.03	1.03	1.03	1.03	1.03	
	Tensile strength (MPa)	ISO 37	3.4	4.6	5.9	7.2	8.4	9.7	11	12	
	Elongation at break (%)	ISO 37	650	630	500	550	610	610	630	610	
	Modulus 100% (MPa)	ISO 37	0.6	0.8	1.0	1.4	2.0	2.8	3.8	5.3	
	Modulus 200% (MPa)	ISO 37	1.0	1.3	1.7	2.3	3.0	3.9	5.1	6.2	
	Modulus 300% (MPa)	ISO 37	1.4	2.1	2.9	3.6	4.3	5.1	5.8	6.6	
Tear strength (kN/m)	ISO 34-2	14	18	21	25	30	36	44	52		
		TEST NORM	SEMI MINERAL FILLED								
RECYCLED	Hardness (Shore)	ISO 868	40A	50A	60A	70A	80A	90A			
	Density (g/cm³)	ISO 1183	1.03	1.03	1.03	1.03	1.03	1.03			
	Tensile strength (MPa)	ISO 37	5.9	7.2	8.4	9.7	11	12			
	Elongation at break (%)	ISO 37	500	550	610	610	630	610			
	Modulus 100% (MPa)	ISO 37	1.0	1.4	2.0	2.8	3.8	5.3			
	Modulus 200% (MPa)	ISO 37	1.7	2.3	3.0	3.9	5.1	6.2			
	Modulus 300% (MPa)	ISO 37	2.9	3.6	4.3	5.1	5.8	6.6			
	Tear strength (kN/m)	ISO 34-2	21	25	30	36	44	52			

This is a selection of our wide range of standard compounds, if your compound is not listed, please contact your local sales agent.

4KFLEX® TPV COMPOUNDS

	TEST NORM						
Hardness (Shore)	ISO 868	35A	55A	75A	80A	85A	90A
Density (g/cm ³)	ISO 1183	0.96	0.91	0.93	0.96	0.92	0.98
Tensile strength (MPa)	ISO 37	4.3	3.8	8.9	12.3	9.9	11.9
Elongation at break (%)	ISO 37	545	390	650	700	580	730
Modulus 100% (MPa)	ISO 37	0.95	1.82	2.94	4.05	4.43	4.7
Modulus 300% (MPa)	ISO 37	2.15	3.31	4.46	5.64	6.05	6.07

4KFLEX® TPO COMPOUNDS

	TEST NORM	MINIMAL FILLED				SEMI FILLED	
Hardness (Shore)	ISO 868	60A	70A	85A	40D	75A	65D
Density (g/cm ³)	ISO 1183	0.86	0.86	0.88	0.90	1.1	1.07
Elongation at break (%)	ISO 37	> 2000	1900	1800	590	1850	640
Modulus 100% (MPa)	ISO 37	0.95	1.82	2.94	8.47	1.82	19.82
Modulus 300% (MPa)	ISO 37	2.15	3.31	4.46	9.71	3.3	19.80

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