Die Werkstoff "S"® plus+ Familie

The Material "S"® plus+ Family

Murtfeldt Kunststoffe

Murtfeldt – Innovationen für die Zukunft

Mit der Entwicklung von Werkstoff ”S”® Grün setzten wir im Jahr 1958 richtungsweisende Maßstäbe. Wir wussten damals, dass die Entwicklung moderner Fertigungsanlagen künftig komplexe Anforderungen an Bauteile und deren Materialien stellen würde. So gelang es uns, ein Material zu entwickeln, das bis heute in Sachen Abriebfestigkeit und Gleiteigenschaften zum weltweiten Standard wurde.

Murtfeldt – Innovations for the Future

In developing the Murtfeldt Material ”S”® green in 1958, we set a standard. We already knew at the time that the development of modern production facilities would place complex demands on components and their materials. Thus we were able to develop a material that is still unique today with its abrasion resistance and slide properties – and it has become a world standard.

Werkstoffe für neue Herausforderungen

Nichts ist für uns so gut, als dass wir es nicht noch verbessern könnten. Wir haben über die Weiterentwicklung unseres Werkstoff ”S”® Grün für spezifische Anwendungen in vielen Branchen nachgedacht. Dabei orientierten wir uns vor allem an der Leistungsfähigkeit moderner Produktionsanlagen, die heute einer vielfach größeren Belastung als noch vor wenigen Jahren ausgesetzt sind. Abriebfestigkeit, Gleiteigenschaften und Antistatik sind die Herausforderungen, für die Murtfeldt eine neue Generation von Materialien auf Basis des bewährten Werkstoff ”S”® Grün entwickelt hat.

Materials for New Challenges

In our view, nothing is so good that it cannot be improved. So we put a lot of thought into developing specific versions of our Material ”S”® for individual applications in many different industries. Above all, we focused on modern high-performance plants, which today are exposed to far greater stresses than just a few years ago. The resultant demands on abrasion resistance, slide and antistatic properties challenged Murtfeldt to develop a new generation of materials based on the established Material ”S”® green.

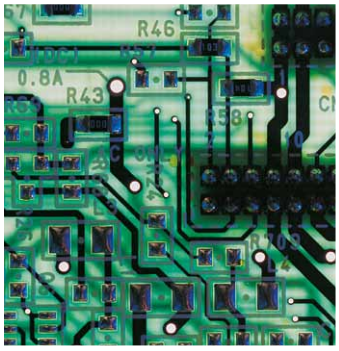
Die Werkstoff ”S”® plus+ Familie

Die von Murtfeldt entwickelte ”S”®plus+ Familie ist eine neue Werkstoffgruppe, die speziell für Ihre Anwendungen und höchste Ansprüche erstellt wurde. Die aus hochwertigem UHMW Polyethylen bestehenden Materialien zeichnen sich durch spezifisch angepasste Eigenschaften für unterschiedliche Anwendungsgebiete aus.

The Material ”S”®plus+ Family

The material ”S”®plus+ Family developed by Murtfeldt is a new group of materials designed for your specific applications and for the very highest demands. Made from high-quality UHMW polyethylene, they all offer specific properties for diverse fields of application.

Original Material "S"® *plus+* ESD



Working without static

Special demands are placed on materials in environments where sparks could cause explosions. Thanks to the highly conductive properties of "S"® plus+ ESD, the material results in a complete discharge of any static load along the material surfaces and ensures a spark-free and safe working environment. The material therefore constitutes an economical alternative to carbon-filled PTFE.

Its extremely low surface resistance makes "S"® plus+ ESD extremely conductive so that static discharge at the surface takes place at highest possible speed.

For more information, see www.murtfeldt.com

Properties

+ Extremely good conductivity (surface resistance ≤ 10^4 ohm)
+ Static discharge at the surface in less than 0.1 seconds
+ Economical alternative to carbon-filled PTFE
+ Suitable for machines and equipment subject to the requirements of Directive 94/9/EC (ATEX 95)
+ Approved for use in the food industry (FDA)

Application areas

+ In the automotive and semi-conductor industries, e.g. as full-surface sliding bases for modular link belts and conveyor belts
+ As workpiece carriers for sensitive electronic components
+ In areas with an increased risk of explosion "S"® plus+ ESD prevents the formation of ignition

Original Material "S"® *plus+* Bright ESD

Clean application

Bright surfaces are essential in many working environments since dirt and dust particles must be visible so that required hygiene levels may be satisfied. Until now, it has been impossible to produce a material that meets the necessary colour requirements and also offers high conductivity. "S"® plus+ Bright ESD is the first bright coloured plastic to be developed that is also highly conductive, which means that electrical charges can be dissipated on earthed components. The material is ideally suited for use in areas where hygiene and anti-static properties are crucial. Its properties are broadly identical to those of Material "S"® plus+ ESD.

For more information, see www.murtfeldt.com

Properties

+ Extremely good conductivity (surface resistance ≤ 10^5 ohm)
+ Ideal for bright and dust-free environments
+ Suitable for machines and equipment subject to the requirements of Directive 94/9/EC (ATEX 95)

Application areas

+ Clean-room technology
+ Medical technology
+ Laboratory environments
+ In many areas of the food industry

Original Material ”S”® *plus+* AB

Sterile and safe

Microbes (e.g. micro-organisms such as bacteria and fungi) can damage the human body. They should therefore be prevented in food production and processing. ”S”® plus+ AB contains special substances that prevent bacterial and microbial growth while simultaneously protecting people and the environment. Microbial growth on this material‘s surface is reduced by at least 99.96% compared with materials without additives; this prevents both unpleasant odours and the build-up of biofilm. ”S”® plus+ AB combines its anti-microbial effect with the excellent properties of the ”S”® plus+ family and is therefore an ideal material for use in the beverage and food industries.

For more information, see www.murtfeldt.com

Properties

+ Prevents bacterial and microbial growth by between 99.96 and 99.99%
+ Approved for use in the food industry (FDA)
+ No moisture absorption
+ Good acoustic insulation
+ Good resistance to chemicals
+ Long service life

Application areas

+ Curve and chain guides, slide bars, and other components used in food production and the beverage industry
+ Slide and drive elements in medical and food technology
+ In all areas where hygiene is required, e.g. the storage and handling of foods, cosmetics, and pharmaceuticals

Original Material ”S”® *plus+* TLS

Hot news

Many industrial applications take place at higher temperatures that ”S”® materials could previously not withstand. Such applications require materials that possess familiar properties such as wear resistance, high impact strength, and resistance to chemicals. Murtfeldt has now created Original Material ”S”® plus+TLS, which can be used in areas where it was previously not possible to use the ”S”® family materials. The molecular structure of this ultra-high molecular weight low-pressure polyethylene does not change even if exposed to high constant operating temperatures of 100°C or even temperatures of up to 120°C for short periods of time. The newly developed additives considerably increase the thermal oxidation point. ”S”® plus+TLS is therefore suited for many different industrial processes where higher temperatures are constantly present.

Properties

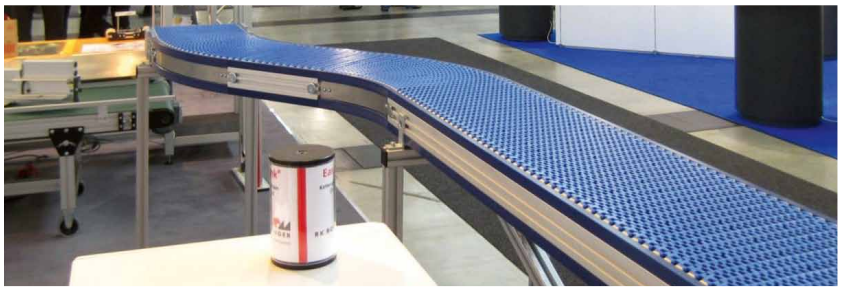
+ Suitable for use at a higher constant temperature of 100°C
+ Extremely good resistance to wear and abrasion
+ Excellent chemical resistance
+ Excellent machinability

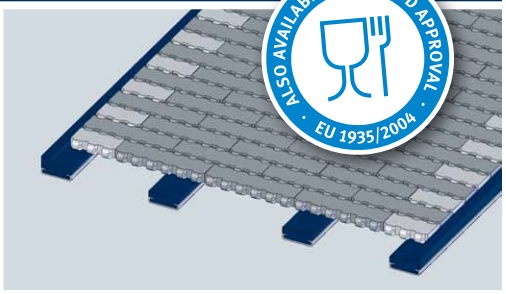
Application areas

+ Slide and guide elements for many different industrial applications in the middle temperature ranges, e.g. drying ovens and chain trough conveyors.

For more information, see www.murtfeldt.com

Original Material "S"® *plus+* LF





Introducing: „Low Friction“

Murtfeldt‘s response to international demands for lower energy consumption and sustainability: Original Material "S"® plus+LF.

With this material, Murtfeldt has been able to further slash the sliding friction coefficient by half again. And what is outstanding here is that the value is constant and is achieved even at low friction intensities. The material drastically reduces the necessary driving forces so motors need less energy and accordingly run more economically. The new material therefore enables machines to run at higher speeds while simultaneously reducing abrasion and consequently maintenance efforts. This means that it significantly increases your productivity. It is protected by a utility patent.

For more information, see www.murtfeldt.com

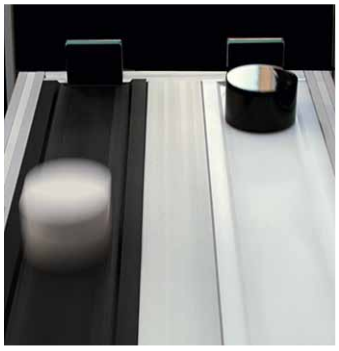
Properties

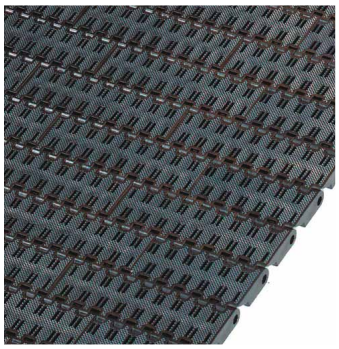
+ Minimal and constant sliding friction coefficient, even in continuous operation
+ No stick-slip effect
+ Self-lubricating
+ No water absorption
+ Reduction in required drive power with no reduction in performance
+ Energy savings of up to 50%
+ Protects the sliding partner
+ Best possible acoustic insulation

Application areas

+ Guides for PET bottle conveyors used in the beverage industry
+ All applications where high sliding speeds are required, e.g. in logistics companies

Original Material ”S”® *plus+* LF ESD





Highest efficiency

The use of this new material saves energy and – thanks to its low frictional resistance – increases the efficiency of your machines. The material reduces the sliding friction coefficient by up to 50% – thus resulting in an equivalent reduction in the energy needed for the required drive power. The material therefore offers great savings potential. Thanks to the additive used, Original Material ”S”® plus+ LF ESD is also electrically conductive and therefore allows electricity to be eliminated as quickly as possible while achieving minimum friction resistance at the same time.

The material complies with European and US American directives for use in the food industry.

For more information, see www.murtfeldt.com

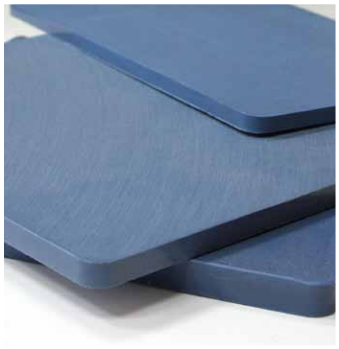
Properties

+ Extremely high conductivity
+ Self-lubricating
+ Static discharge at the surface in less than 0.1 second
+ Reduction in required drive power
+ Energy savings of up to 50%
+ Minimal and constant sliding friction coefficient, even in continuous operation

Application areas

+ PET bottle guides
+ Full-surface sliding bases for modular link and transport conveyors in the semi-conductor industry
+ As workpiece carriers for sensitive electronic components
+ Guides and slide elements in machine construction

Original Material ”S”® *plus+* FP [FS]



Top-quality „food protect“

Original Material ”S”® plus+ FP[FS] is a new technical plastic that completely meets the requirements of the food sector for the detectability of plastic foreign bodies in foods. “FP” stands for “food protect” and embodies two vital properties: This product is both food-safe and metal-detectable. Metallic foreign bodies in foods are safely detected by metal detectors and removed. However, plastic particles from plant components can be problematic. Thanks to the use of additives in Original Material ”S”® plus+ FP[FS], all commonly used metal detectors in the food industry can now detect and remove plastic particles.

For more information, see www.murtfeldt.com

Properties

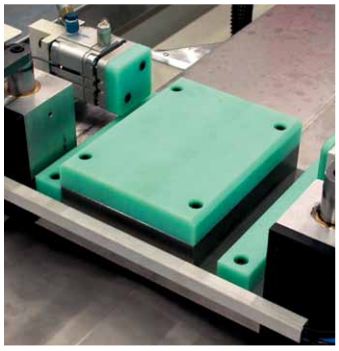
+ Metal-detectable in all commonly used industrial detectors
+ Approved for use in the food industry (EU and FDA)
+ Very good wear and abrasion resistance
+ Extremely good machinability
+ Excellent chemical resistance
+ Increased continuous use temperature of 100 °C

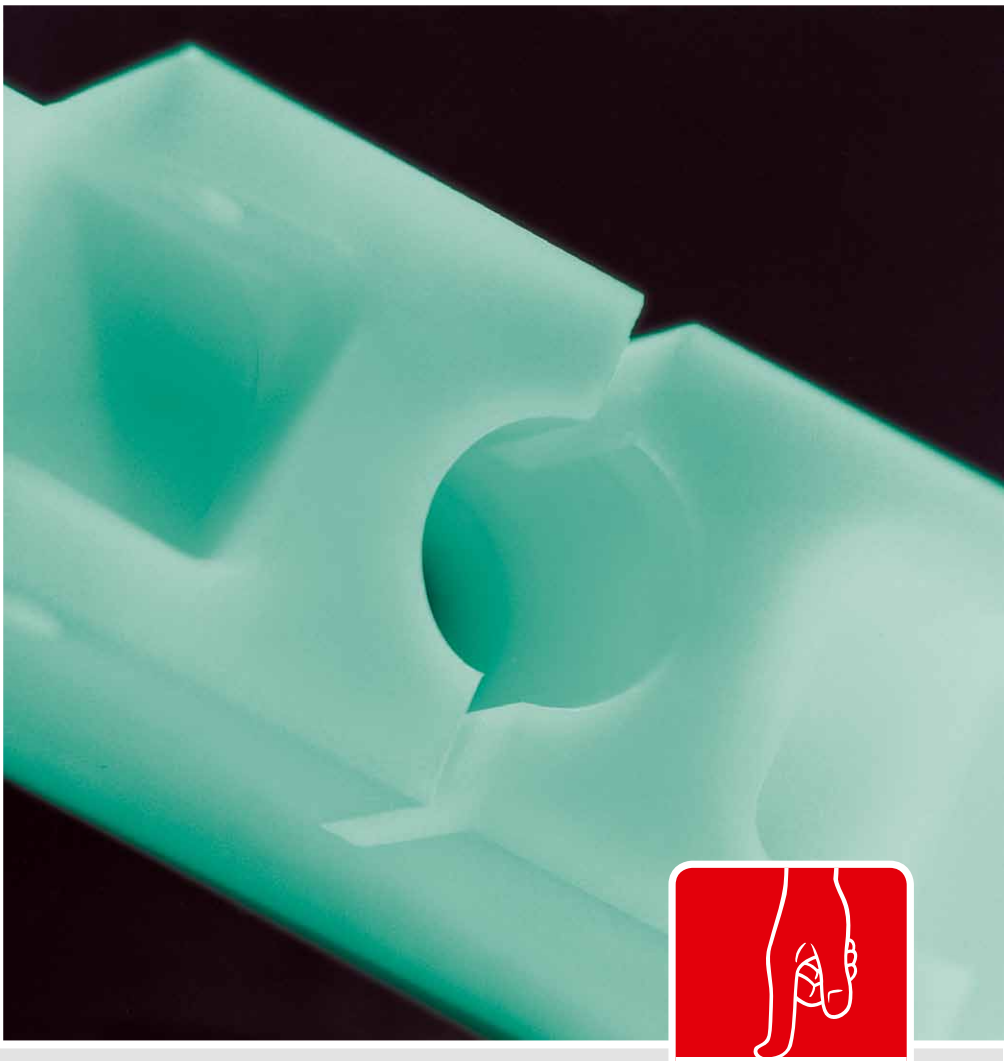
Application areas

+ Curve and chain guides, slide bars, or components used for food production/in the beverage industry
+ Slide and drive elements in medical and food technology
+ In all areas where hygiene and metal-detectability are required

Information on its use: The detection capability of Original Material ”S”® plus+ FP[FS] is determined by the “product effect” of the products to be tested and the sensitivity of the detector. As a precise adjustment of your detector is required, we will be happy to send you test samples of our Original Material ”S”® plus+ FP[FS].

Original Material "S"® plus+ GB





Practically no wear

This material is used for applications that involve manufacturing and transportation at high pressure. The balanced quantity of micro glass beads in Material "S"® plus+ GB provides the combined benefits of extremely high molecular weight polyethylene and glass. The glass beads that protrude from the surface give a rounded and hard sliding surface.

Properties

+ Protects the sliding partner (unlike glass-fibre reinforced plastics)
+ Extremely good resistance to chemicals
+ Approved for use in the food industry (EU and FDA)

Application areas

+ Guides for PET bottlenecks in the beverage industry
+ In abrasive environments (for example, environments where lint is present)

For more information, see www.murtfeldt.com

INFORMATION ON MATERIALS

The material characteristic tables, which are based on data from our suppliers of raw materials, are intended to help you to quickly compare/select a material. The values stated are short-term values that can be affected by processing, environmental, and application conditions. The customer is solely responsible for the suitability of the selected material for the specific application.

+	Dry
++	Air-moist (saturation in standard atmosphere of 23°C / 50% RH)
RH	Relative humidity
NB	No break
HB	Horizontal Burning
UL	Underwriters Laboratories
	also available as Food Safe Material ref. EU 1935/2004.

1) The mechanical and electrical characteristics are based on a test temperature of 23°C
2) Temperature stress for several hours; no or low mechanical stress (short-term service temperature)
3) Temperature stress for 5000h; then reduction (approx 50 %) of tensile strength of initial value (constant: for 5000h)
4) As the temperature decreases, the impact strength drops. The specified values are based on the most unfavourable impact load possible and do not represent absolute practical limits (lower service temperature)
5) The electric strength can be up to 50% lower than for natural coloured materials (for black Murylon® B, Murylon® A, Murytal® C/H, and Murylat®)

Chemical resistance of our materials:
For a detailed selection chart, see our Internet pages at www.murtfeldt.com.

	Standard	Unit	Original Material "S"® plus + FP [FS]	Original Material "S"® plus + LF
Code	ISO 1043-1		PE-UHMW	PE-UHMW
Sheet group	ISO 15527	–	1.1	1.1
Material colour	–	–	light blue	cobalt blue
Average molecular weight	–	g/mol	9×10^6	9×10^6
Density	ISO 1183	kg/dm³	≤ 1,14	≤ 0,93
Mechanical properties [1]				
Yield/break stress	ISO 527	MPa	26	20
Breaking elongation	ISO 527	%	250	275
Notch impact toughness (Charpy)	ISO 179	kJ/m²	≥ 100	≥ 120
Shore hardness D	DIN 53505	°	64	60
Indentation hardness	–	MPa	40	38
Sand-Slurry-Test	–	%	100	80
Coefficient of sliding friction (dry)	–	–	0,1-0,2	‹ 0,1
Thermal properties				
Heat conductivity at 23° C	ISO 52612	W/(K × m)	0,4	0,4
Linear thermal coefficient of expansion α:	ISO 11359			
– Average value between 23 and 60° C		m/(m × K)	20×10^{-5}	20×10^{-5}
Upper service temperature in air:				
– Short-term service temperature [2]	–	°C	120	90
– Constant: for 5000 h [3]	–	°C	100	80
Lower service temperature [4]	–	°C	-200	-200
Burning behaviour as per UL94	–	–	HB	HB
Electrical properties				
Electric strength	IEC 60243	kV/mm	≥ 45	≤ 45
Specific contact resistance	IEC 60093	E × cm	$\leq 10^{12}$	$> 10^{14}$
Surface resistance	IEC 60093	E	$\leq 10^{12}$	$> 10^{13}$
Physiological properties				
Approved for use in the food industry – FDA	–	–	Yes	Yes
Approved for use in the food industry – EU 1935/2004 (only [FS] material)	–	–	Yes	Yes

Original Material "S"® plus + LF ESD	Original Material "S"® plus + AB	Original Material "S"® plus + TLS	Original Material "S"® plus + GB	Original Material "S"® plus + ESD	Original Material "S"® plus + Bright ESD
PE-UHMW	PE-UHMW	PE-UHMW	PE-UHMW	PE-UHMW	PE-UHMW
1.1	1.2	1.1	1.1	1.2	1.2
black	sky blue	ruby red	light green	black	light grey
9×10^6	5×10^6	9×10^6	9×10^6	5×10^6	5×10^6
≤ 0,93	≤ 0,93	≤ 0,93	≤ 0,94	≤ 0,93	≤ 0,93
20	20,3	23	25	20,4	21,6
255	320	250	290	290	225
≥ 150	≥ 170	≥ 140	≥ 100	≥ 120	≥ 170
60	64	64	65	63	64
30	38	38	44	38	38
80	100	80	80	110	120
‹ 0,1	0,1-0,2	0,1-0,2	0,15-0,2	0,1-0,2	0,1-0,2
0,4	0,4	0,4	0,4	0,4	0,4
20×10^{-5}	20×10^{-5}	20×10^{-5}	17×10^{-5}	20×10^{-5}	20×10^{-5}
90	90	120	90	90	90
80	80	100	80	80	80
-200	-200	-200	-200	-150	-150
HB	HB	HB	HB	HB	HB
–	≤ 45	≤ 45	≤ 45	–	–
$\leq 10^4$	$> 10^{14}$	$> 10^{14}$	$> 10^{15}$	$\leq 10^4$	$\leq 10^5$
$\leq 10^4$	$> 10^{13}$	$> 10^{14}$	$> 10^{13}$	$\leq 10^4$	$\leq 10^5$
Yes	Yes	Yes	Yes	Yes	No
Yes	Yes	Yes	–	–	–

Murtfeldt
Kunststoffe

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