

TRON® SYMALIT® FLUOROSINT® ERTALYTE® RADEL® SEMITRON®
TIVAR® KETRON® TECHTRON® SYMALIT® FLUOROSINT® ERTA
TRON® ERTACETAL® TIVAR® KETRON® TECHTRON® SYMALIT
URATRON® ERTALON® NYLATRON® ERTACETAL® TIVAR® KETR
MITRON® ACETRON® DURATRON® ERTALON® NYLATRON® ERTA
LYTE® RADEL® SEMITRON® ACETRON® DURATRON® ERTALO
RTALYTE® RADEL® SEMITRON® ACETR
MALIT® FLUOROSINT® ERTALYTE® RAD

Engineering Plastics

Guide Rails for Drive and Conveyor Systems



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ALIT® FLUOROSINT® ERTALYTE® RADEL® SEMITRON® ACETR
TRON® TECHTRON® SYMALIT® FLUOROSINT® ERTALYTE® RA
RTACETAL® TIVAR® KETRON® TECHTRON® SYMALIT® FLUO
ALON® NYLATRON® ERTACETAL® TIVAR® KETRON® TECHTR
ETRON® DURATRON® ERTALON® NYLATRON® ERTACETAL®
RADEL® SEMITRON® ACETRON® DURATRON® ERTALON® NY
ROSINT® ERTALYTE® RADEL® SEMITRON® ACETRON® DUR
TRON® SYMALIT® FLUOROSINT® ERTALYTE® RADEL® SE
TIVAR® KETRON® TECHTRON® SYMALIT® FLUOROSINT®
TRON® ERTACETAL® TIVAR® KETRON® TECHTRON® S
URATRON® ERTALON® NYLATRON® ERTACETAL® TIVAR®
MITRON® ACETRON® DURATRON® ERTALON® NYLATR
LYTE® RADEL® SEMITRON® ACETRON® DURATR
ALIT® FLUOROSINT® ERTALYTE® RADEL® SEM
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ETRON® DURATRON® ERTA



QUADRANT

You inspire ... we materialize®



You inspire ... we materialize

Quadrant history:

The first engineering polymer shapes for machining.

Quadrant today:

The broadest range of engineering polymer shapes allowing the most effective material choice.

Quadrant tomorrow:

New products for new needs, developed by QEPP's global product and application development team.

For over 60 years, the companies that today form Quadrant have been developing new materials to meet changing demands of customers around the world. The innovative, collaborative spirit between our people and our customers has shaped our success and led to the industry's broadest range of engineering plastic shapes for machining. Our investment in innovation will only increase in the years ahead, to support your requirements for higher levels of performance, productivity and value.

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Engineering Service and Recommended Materials

Quadrant Engineering Plastic Products [EPP] has helped develop many new applications in drive and conveyor technology over the past decades. With very high wear and abrasion resistance as well as outstanding sliding properties and strength, our TIVAR® materials have established themselves as preferred materials in drive and conveyor systems.

The TIVAR materials used for these systems are manufactured using the latest compression moulding and RAM extrusion technology. Our expertise in Engineering Plastics and our cutting-edge production facilities are the foundation for the superior functional performance, quality, and economic advantages of TIVAR materials.

In addition to any standard guide rail, Quadrant EPP's engineering team offers design consulting and turn-key solutions for any individual requirements.

Next to the TIVAR standard grades and as a result of our polymer know-how, R&D capabilities, state of the art processing technology and the close cooperation with our customers, we have developed TIVAR Proprietary Grades with improved sliding and wear properties, enhanced temperature and oxidation resistance, flame retardant properties, static dissipative characteristics and enhanced release properties.

TIVAR Proprietary Grades are modified engineering polymers based on ultra high molecular weight polyethylene [UHMW-PE] developed to solve specific engineering problems. They have a long track record of supporting the development of numerous demanding engineering applications in drive and conveying systems.

Careful selection of first class raw materials and fillers, high quality manufacturing standards and a highly advanced process technology operated by a skilled working force [ISO 9001 certified Quality Assurance System], ensure a reliable and consistent quality of the TIVAR Proprietary Grades.

TIVAR materials [compression moulded or RAM-extruded]

TIVAR® 1000 green, natural, black [further colours on request], [UHMW-PE]

TIVAR® 1000 black antistatic, [UHMW-PE, static dissipative]

TIVAR® ECO green and ECO black antistatic, compression moulded only, with reprocessed content [UHMW-PE]

TIVAR® DrySlide [modified UHMW-PE, optimised wear and sliding properties]

TIVAR® TECH [UHMW-PE, with MoS₂ as solid lubricant]

TIVAR® DS [modified UHMW-PE, optimised wear and sliding properties]

TIVAR® Ceram P [modified UHMW-PE, wear-optimised]

TIVAR® H.O.T. [modified UHMW-PE, heat stabilised, food contact compliant composition EU | USA]

TIVAR® CleanStat [modified UHMW-PE, static dissipative, food contact compliant composition EU | USA]

TIVAR® SuperPlus [modified UHMW-PE, partially cross-linked, wear-optimised]

TIVAR® Oil Filled [modified UHMW-PE, oil filled, self-lubricating, compression moulded only]

Customer Benefits

In most of the modern production lines, high-performance plastics solutions play an integral role. Quadrant, with its broad choice of materials and expertise in polymer conversion technologies, is supporting both: existing technologies and innovative next-generation concepts with solutions in engineering plastics.

Quadrant Engineering Plastics help you run your business economically and successfully:

- Longer material life time
- Less maintenance stops
- Longer operation time between repairs
- Lower energy/power consumption
- Safer production environment
- Increased productivity
- Cost reduction



Our broad product portfolio, including grades for the food, pharmaceutical and medical industries offers engineering solutions for your individual challenge:

- Over 30 years of engineering and profile/guide rail production expertise
- More than 50% of all produced profiles/guide rails individually designed for customers
- Quadrant expertise, state-of-the-art production and manufacturing technology
- Turn-key solutions, quality, service, flexibility and economical production
- Excellent price-performance offers to the market



RAM-Extrusion versus Machining from Compression Moulded Plates

Ultra high molecular weight Polyethylene [UHMW-PE] disposes of a very high molecular weight of 5 to 9 million g/mol and shows a unique combination of mechanical properties:

- Very high wear and abrasion resistance
- Excellent sliding properties
- Outstanding impact strength
- Very good chemical resistance
- Low density
- Very low water absorption
- Very good release properties



The molecular structure and the special property profile in turn require consideration of special machining aspects.

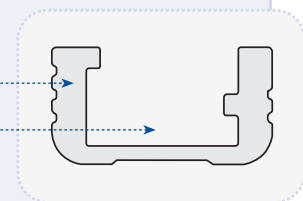
RAM-EXTRUSION

Virgin ultra high molecular weight Polyethylene can only be extruded by one single technology: RAM-Extrusion. Its benefits:

- No material wastage; rough rule of thumb: material needed is less than material taken away
- Most economical production method as of approx. 1000 m per profile [tool cost compensation]
- Highly complex geometries possible

Material needed

Material wastage



MACHINING FROM COMPRESSION MOULDED PLATES

Machining processes require more material input but offer advantages for smaller demands:

- Optimal production process for special geometries and small volumes [no tool costs]
- Suitable for tightest tolerances
- More flexibility concerning lead times and quantity



Production Capabilities

RAM-EXTRUSION

Quadrant disposes of a wide variety of standard and non-standard extrusion dies. A wide number of customers have their specifically designed profiles produced by Quadrant.

Our RAM-extrusion capabilities:

- More than 220 different tools for diverse geometries
- Additional tools possible based on customer requirements and geometry
- 21 RAM-extrusion lines [13 profile lines, 8 rod lines]
- Standard profiles stocked in big quantities for quick delivery
- Various lengths stocked for individual requests: 3 m length, 6 m length, 50 m rolls [according to geometries]
- Available colours natural, green, black [other colours available upon request]

MACHINING FROM COMPRESSION MOULDED PLATES

State-of-the-art production machinery and long-term technology know-how is the key to high quality production of profiles and guide rails.

Our machining capabilities for the conveying sector:

- Any individual colour
- Any individual length [from 0.5 to 10 m; standard up to 6 m, individual up to 10 m on request]
- Any profile up to a cross-section of 240 x 140 mm
- Wide range of standard and proprietary materials available, like TIVAR CleanStat, TIVAR DrySlide or TIVAR H.O.T. or any other UV-resistant, static dissipative, food contact compliant material.
[Please refer to our Polyethylene Delivery Programme.](#)
- 2 profile milling machines
- Flexible production planning provides short lead times

[Please consult us for your individual design requirements.](#)

TIVAR® Product Range

Quadrant Engineering Plastic Products focuses on innovation by modification of TIVAR® 1000 standard materials in order to meet specific requirements of our customers. The TIVAR® Proprietary Grades offer improved sliding and wear properties, static dissipative characteristics, enhanced release properties or other improved characteristics.

TIVAR® PROPRIETARY GRADES

TIVAR DrySlide [UHMW-PE + internal lubricant + other additives] [black]

Thanks to the lubricant built into a UHMW-PE matrix with higher molecular weight, TIVAR DrySlide offers a lower coefficient of friction and enhanced wear and abrasion resistance than TIVAR 1000. The additives used also make this material static dissipative and considerably improve UV-resistance.

TIVAR TECH [UHMW-PE + MoS₂] [grey-black]

This UHMW-PE grade with extremely high degree of polymerisation contains molybdenum disulphide, resulting in a material with improved wear resistance and sliding properties over TIVAR 1000.

TIVAR DS [UHMW-PE + additives] [grey | yellow]

TIVAR DS is a modified UHMW-PE with extremely high molecular weight. The latter in combination with a particular manufacturing process result in a UHMW-PE grade with superior wear and abrasion resistance over TIVAR 1000.

TIVAR Ceram P [UHMW-PE + micro glass beads + other additives] [yellow-green]

TIVAR Ceram P is a wear improved UHMW-PE material with incorporated micro glass beads, specifically developed for use in the dewatering zone of paper machinery equipped with plastic wires and manufacturing paper with highly abrasive filler content.

TIVAR H.O.T. [UHMW-PE + specific additives] [bright-white]

TIVAR H.O.T. [Higher Operating Temperature] is formulated to maintain inherent UHMW-PE key properties over an extended service temperature range, in this way considerably increasing part life in low load bearing applications up to temperatures as high as 125°C. Special additives reduce the oxidation rate of the material at higher temperatures thereby slowing down material degradation and extending wear-life. TIVAR H.O.T. also features a food contact compliant composition.

TIVAR CleanStat [UHMW-PE + specific additives] [black]

TIVAR CleanStat is a UHMW-PE grade for use in food processing and pharmaceutical industries. It exhibits static dissipative properties and has a food contact compliant composition.

TIVAR® Product Range

TIVAR SuperPlus [UHMW-PE, partially cross-linked + specific additives] [grey]

TIVAR SuperPlus is a wear optimised, partially cross-linked UHMW-PE material with extremely high degree of polymerisation for use in most demanding applications and environments.

TIVAR Oil Filled [UHMW-PE + oil + specific additives] [grey]

TIVAR Oil Filled is a self-lubricating UHMW-PE material in the real meaning of the word. Next to an enhanced wear resistance, the incorporated and evenly dispersed oil renders this material a considerable lower coefficient of friction than TIVAR 1000. In conveying equipment, it yields a significant reduction of the required driving force and, in addition, noise reduction. TIVAR Oil Filled also offers an FDA food contact compliant composition.

TIVAR® STANDARD GRADES

TIVAR 1000 [UHMW-PE] [natural, black, green, blue, yellow, red]

TIVAR 1000 exhibits a very well balanced property profile. It combines a very good wear and abrasion resistance with an outstanding impact strength, even at temperatures below -200°C.

TIVAR 1000 antistatic [UHMW-PE + additive; static dissipative] [black]

By incorporating an effective carbon black grade, TIVAR 1000 antistatic offers the electrostatic dissipative properties often required for UHMW-PE components operating at high line speeds and conveying rates, maintaining the inherent key characteristics of UHMW-PE.

TIVAR ECO [UHMW-PE] [green | black antistatic]

These grades, partially composed of reprocessed UHMW-PE material, have an overall lower property level than the virgin TIVAR 1000 and a lower cost. Compared with virgin PE 500, however, they have a much better impact strength and wear resistance. TIVAR ECO black antistatic contains an effective carbon black grade rendering this grade electrostatic dissipative properties. Our TIVAR ECO grades show a favourable price-performance ratio for applications in many kinds of industries with less demanding requirements.

Physical Properties of Quadrant TIVAR® Materials

PHYSICAL PROPERTIES OF THE QUADRANT [U]HMW-PE STOCK SHAPES [INDICATIVE VALUES]

	TEST METHODS	UNITS	TIVAR® 1000	TIVAR® 1000 antistatic	TIVAR® ECO (19)
Colour	-		natural [white] green/black/colours	black	green
Average molar mass (average molecular weight) (1)	-	10 ⁶ g/mol	5	5	≥ 4.5
Density	ISO 1183-1	g/cm ³	0.93	0.935	0.94
Water absorption at saturation in water of 23°C (2)	-	%	0.01	0.02	0.02
Thermal Properties (3)					
Melting temperature (DSC, 10°C/min)	ISO 11357-1/-3	°C	135	135	135
Thermal conductivity at 23°C	-	W/(K.m)	0.40	0.40	0.40
Average coeff. of linear therm. exp. between 23 and 100°C	-	m/(m.K)	200 x 10 ⁻⁶	200 x 10 ⁻⁶	200 x 10 ⁻⁶
Temperature of deflection under load :					
- method A: 1.8 MPa	ISO 75-1/-2	°C	42	42	42
Vicat softening temperature - VST/B50	ISO 306	°C	80	80	80
Max. allowable service temperature in air:					
- for short periods (4)	-	°C	120	120	120
- continuously : for 20,000 h (5)	-	°C	80	80	80
Min. service temperature (6)	-	°C	-200 (7)	-150	-150
Flammability (8):					
- "Oxygen Index"	ISO 4589-1/-2	%	< 20	< 20	< 20
- according to UL 94 (6 mm thickness)	-	-	HB	HB	HB
Mechanical Properties at 23°C (9)					
Tension test (10):					
- tensile stress at yield (11)	ISO 527-1/-2	MPa	19	20	20
- tensile strain at yield (11)	ISO 527-1/-2	%	15	15	15
- nominal tensile strain at break (11)	ISO 527-1/-2	%	> 50	> 50	> 50
- tensile modulus of elasticity (12)	ISO 527-1/-2	MPa	750	790	775
Compression test (13):					
- compressive stress at 1 / 2 / 5% nominal strain (12)	ISO 604	MPa	6.5/10.5/17	7/11/17.5	7/11/17.5
Flexure test (14)					
- flexural strength	ISO 178	MPa	17	18	18
Charpy impact strength - unnotched (15)	ISO 179-1/1eU	kJ/m ²	no break	no break	no break
Charpy impact strength - notched	ISO 179-1/1eA	kJ/m ²	115P	110P	90P
Charpy impact strength - Notched (double 14° notch) (16)	ISO 11542-2	kJ/m ²	170	140	100
Ball indentation hardness (17)	ISO 2039-1	N/mm ²	33	34	34
Shore hardness D (15 s) (17)	ISO 868	-	60	61	60
Relative weight loss during a wear test in "sand/water-slurry"; TIVAR 1000 = 100	ISO 15527	-	100	105	200
Electrical Properties at 23 °C					
Electric strength (18)	IEC 60243-1	kV/mm	45	-	-
Volume resistivity	IEC 60093	Ohm.cm	> 10 ¹⁴	-	-
Surface resistivity	IEC 60093	Ohm	> 10 ¹²	< 10 ⁸	-
Relative permittivity ϵ_r :					
- at 100 Hz	IEC 60250	-	2.1	-	-
- at 1 MHz	IEC 60250	-	3.0	-	-
Dielectric dissipation factor tan δ :					
- at 100 Hz	IEC 60250	-	0.0004	-	-
- at 1 MHz	IEC 60250	-	0.0010	-	-
Comparative tracking index (CTI)	IEC 60112	-	600	-	-

Note: 1 g/cm³ = 1,000 kg/m³; 1 MPa = 1 N/mm²; 1 kV/mm = 1 MV/m.

Legend:

- (1) These are the average molar masses of the UHMW-PE resins [irrespective of any additives] used for the manufacture of the materials. They are calculated by means of the Margolies-equation $M = 5.37 \times 10^4 \times [\eta]^{1.69}$, with $[\eta]$ being the intrinsic viscosity [Stadinger index] derived from a viscosity measurement according to ISO 1628-3:2001, using decahydronaphtalene as a solvent [concentration of 0.0002 g/cm³].
- (2) Measured on 1 mm thick test specimens.
- (3) The figures given for these properties are for the most part derived from raw material supplier data and other publications.
- (4) Only for short time exposure [a few hours] in applications where no or only a very low load is applied to the material.
- (5) Temperature resistance over a period of 20,000 hours. After this period of time, there is a decrease in tensile strength - measured at 23° C - of about 50% as compared with the original value. The temperature values given here are thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.
- (6) Impact strength decreasing with decreasing temperature, the minimum allowable service temperature is practically mainly determined by the extent to which the material is subjected to impact. The values given here are based on unfavourable impact conditions and may consequently not be considered as being the absolute practical limits.
- (7) Because of its outstanding toughness, this material withstands even the temperature of liquid helium [-269° C] at which it still maintains a useful impact resistance without shattering.
- (8) These estimated ratings, derived from raw material supplier data and other publications, are not intended to reflect hazards presented by the materials under actual fire conditions. There are no 'UL File Numbers' available for the UHMW-PE stock shapes.
- (9) The figures given for these properties are average values of tests run on test specimens machined out of 30 mm thick plates.
- (10) Test specimens: Type 1 B

TIVAR® ECO black antistatic (19)	TIVAR® DrySlide	TIVAR® TECH	TIVAR® DS	TIVAR® Ceram P	TIVAR® H.O.T	TIVAR® CleanStat	TIVAR® SuperPlus	TIVAR® Oil Filled
black	black	grey-black	yellow/grey	yellow-green	bright-white	black	grey	grey
≥ 4.5	9	9	9	9	9	5	9	9
0.94	0.935	0.935	0.93	0.96	0.93	0.94	0.96	0.93
0.02	0.02	0.03	0.01	0.02	0.01	0.03	0.02	0.01
135	135	135	135	135	135	135	135	135
0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
200 x 10 ⁻⁶	200 x 10 ⁻⁶	200 x 10 ⁻⁶	200 x 10 ⁻⁶	200 x 10 ⁻⁶	200 x 10 ⁻⁶	200 x 10 ⁻⁶	180 x 10 ⁻⁶	200 x 10 ⁻⁶
42	42	42	42	42	42	42	42	42
80	80	80	80	80	80	80	80	80
120	120	120	120	120	135	120	120	120
80	80	80	80	80	110	80	80	80
-150	-150	-150	-200 (7)	-150	-200 (7)	-150	-150	-150
< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
HB	HB	HB	HB	HB	HB	HB	HB	HB
20	18	19	19	18	19	19	17	16
15	20	15	15	15	15	15	20	40
> 50	> 50	> 50	> 50	> 50	> 50	> 50	> 50	> 50
775	650	725	700	750	700	750	600	375
7/11/17.5	6/10/16	6.5/10.5/17	6/10/16	7/11/17.5	6/10/16	6.5/10.5/17	5/8.5/14.5	4/6/10.5
18	16	17	16	17	16	17	14.5	11
no break	no break	no break	no break	no break	no break	no break	no break	no break
90P	100P	105P	100P	105P	100P	110P	90P	80P
100	130	120	130	125	130	120	115	140
34	32	32	31	33	31	33	31	24
60	59	59	58	60	58	60	58	54
200	85	85	85	75	80	85	80	95
-	-	45	45	45	45	-	-	-
-	-	> 10 ¹⁴	> 10 ¹⁴	> 10 ¹⁴	> 10 ¹⁴	-	> 10 ¹⁴	> 10 ¹⁴
< 10 ⁸	< 10 ⁸	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²	< 10 ⁷	> 10 ¹²	> 10 ¹²
-	-	-	2.1	-	-	-	-	-
-	-	-	3.0	-	-	-	-	-
-	-	-	0.0004	-	-	-	-	-
-	-	-	0.0010	-	-	-	-	-
-	-	-	600	-	-	-	-	-

- (11) Test speed: 50 mm/min
(12) Test speed: 1 mm/min
(13) Test specimens: cylinders ø 8 x 16 mm
(14) Test specimens: bars 4 [thickness] x 10 x 80 mm; test speed: 2 mm/min; span: 64 mm.
(15) Pendulum used: 15 J
(16) Pendulum used: 25 J
(17) Measured on 10 mm thick test specimens.
(18) Electrode configuration: ø 25 / ø 75 mm coaxial cylinders; in transformer oil according to IEC 60296; 1 mm thick test specimens. Please note that the electric strength of TIVAR 1000 black material can be considerably lower than the figure listed in the table which refers to natural material.
(19) Taking into consideration the varying composition of these grades which are partially composed of reprocessed UHMW-PE material, their physical properties can differ more from batch to batch than those of the other UHMW-PE grades.

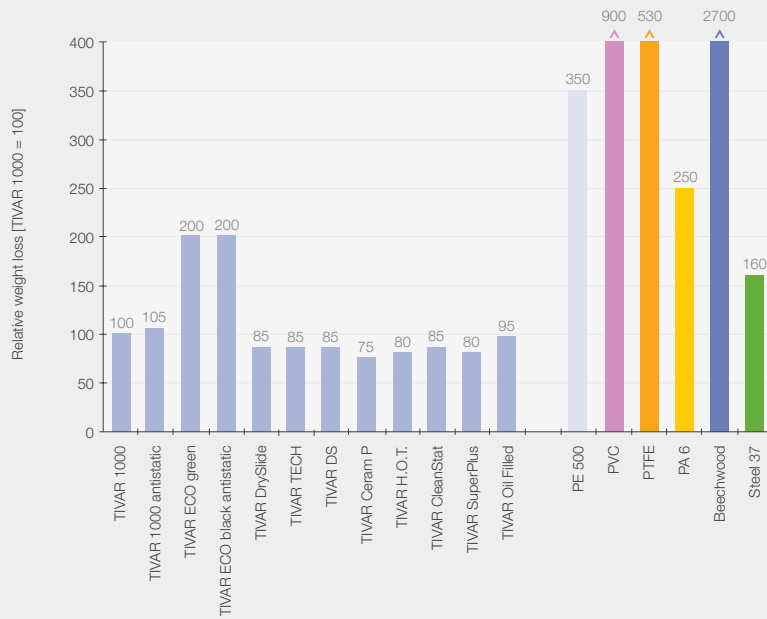
This table, mainly to be used for the comparison purposes, is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties. **However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.**

All information supplied by or on behalf of Quadrant Engineering Plastic Products in relation to its products, in any form, is supported by research and believed to be reliable, but Quadrant Engineering Plastic Products assumes no liability whatsoever in respect of application, processing or use made of the aforementioned information or products, or any consequence thereof. The buyer undertakes all liability in respect of the application, processing or use of the aforementioned information or product, whose quality and other properties he shall verify, or any consequence thereof. No liability whatsoever shall attach to Quadrant Engineering Plastic Products for any infringement of the rights owned or controlled by a third party in intellectual, industrial or other property by reason of the application, processing or use of the aforementioned information or products by the buyer.

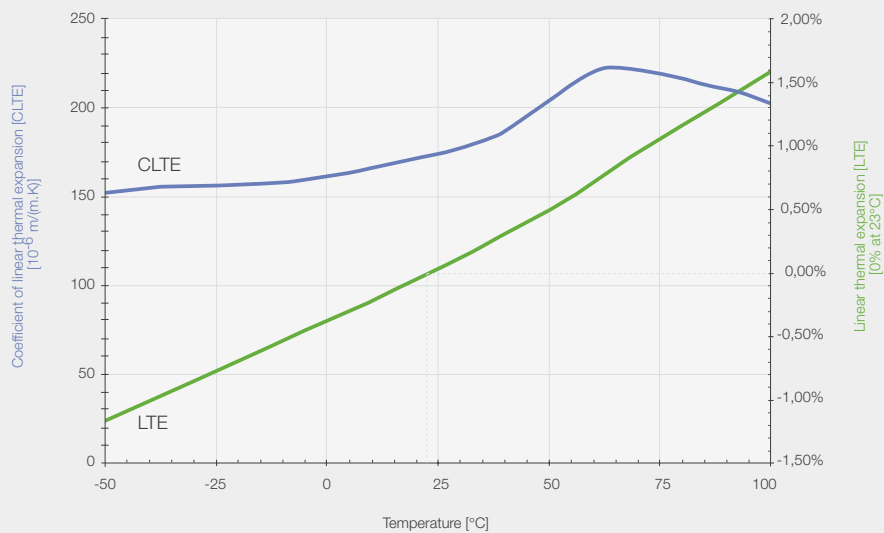
As a result of our internal continuous improvement programmes, availability and gathering of new and/or additional technical data, knowledge and experience, as well as changing market requirements and revised internationally recognised material & test standards, Quadrant Engineering Plastic Products is extending and updating its literature and technical information on a continuous basis. We therefore invite and recommend our customers to consult our website for the latest and up to date information on our materials.

Technical Data of TIVAR® Materials

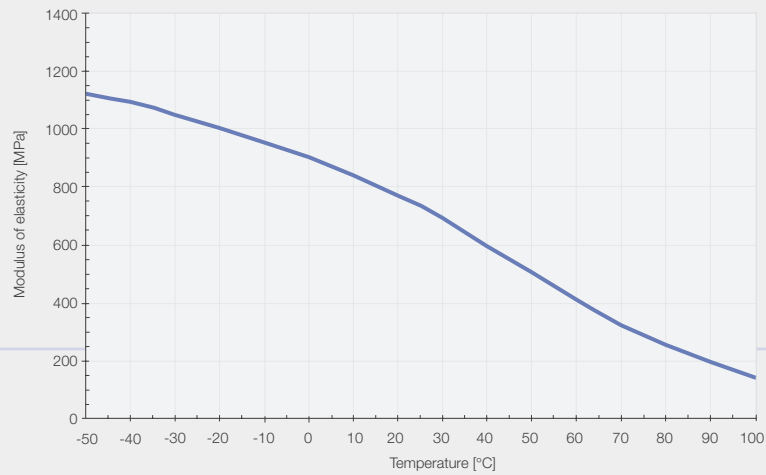
ABRASION RESISTANCE AT 23°C
[derived from "sand/water-slurry" tests]



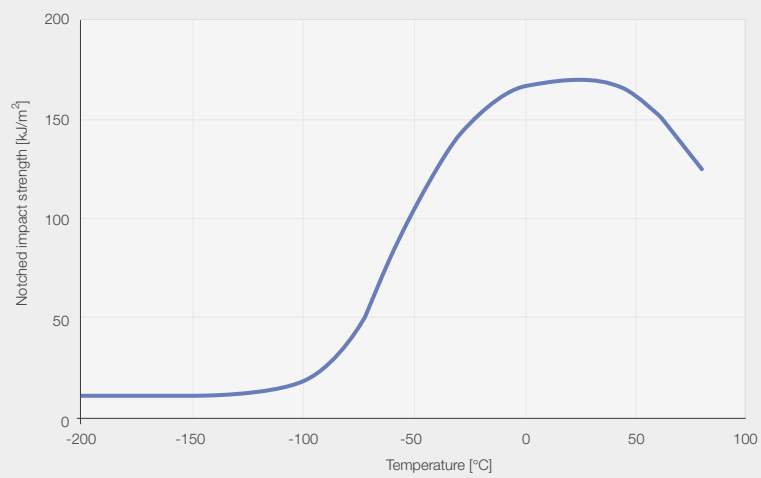
THERMAL EXPANSION OF TIVAR 1000 AS A FUNCTION OF TEMPERATURE
[measured on test specimens annealed in air of 100°C for 24 h prior to the test]



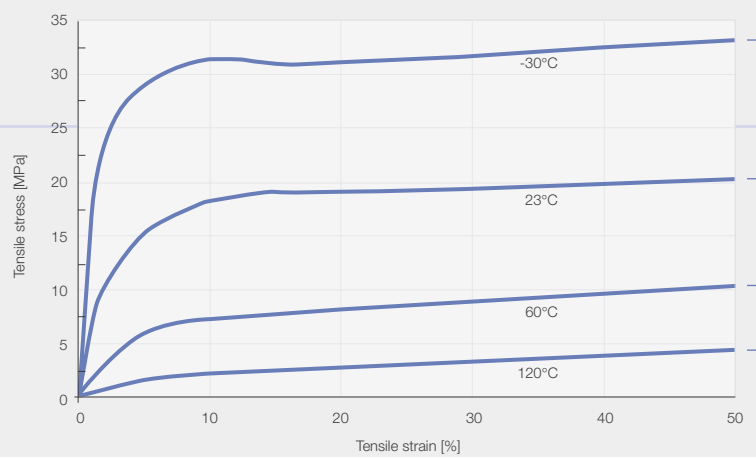
STIFFNES OF TIVAR 1000 AS A FUNCTION OF TEMPERATURE
[derived from DMA-curves]



CHARPY NOTCHED IMPACT STRENGTH OF TIVAR 1000 AS A FUNCTION OF TEMPERATURE
[acc. to ISO 11542-2; double 14° notch]



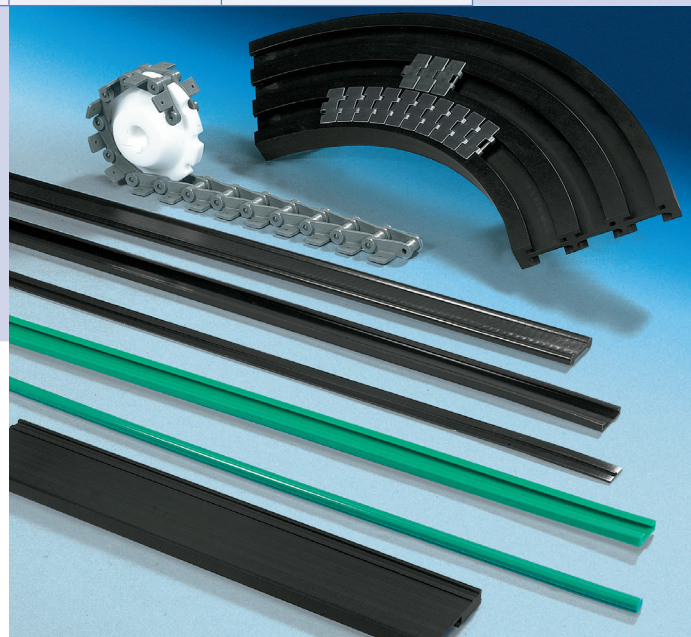
TENSILE STRESS STRAIN CURVES OF TIVAR 1000 AT DIFFERENT TEMPERATURES
[tested acc. to ISO 527; test specimens: Type 1B; test speed: 50mm/min]



Material Selection Table of TIVAR® Materials

POLYETHYLENE PRODUCTS

PRODUCTS	FEATURES	Mol. weight [1]	Colours	Additives	Sliding Properties [coeff. of friction]
TIVAR® 1000		5	natural, green, black, colours	none or pigments	good
TIVAR® 1000 antistatic		5	black	SDA	good
TIVAR® ECO green		> 4.5	green	pigments	good
TIVAR® ECO black antistatic		> 4.5	black	pigments	good
TIVAR® DrySlide		9	black	IL + SDA	very good
TIVAR® TECH		9	grey-black	MoS ₂	good
TIVAR® DS		9	yellow, grey	pigments	good
TIVAR® Ceram P		9	yellow-green	GB + pigments	good
TIVAR® H.O.T.		9	bright-white	HS + pigments	good
TIVAR® CleanStat		5	black	SDA	good
TIVAR® SuperPlus		9	grey	IL + pigments + other	good
TIVAR® Oil Filled		9	grey	oil + pigments	excellent



Wear resistance [plastics pin on steel disk]	Abrasion resistance [sand slurry]	UV- resistance	ESd- properties	Food contact compliant composition [EU & USA (FDA)]
good	good	moderate	no	natural: yes (EU & USA) (3) (2): yes (EU)
good	good	good	yes	yes (EU)
moderate	moderate	moderate	no	no
moderate	moderate	moderate	yes	no
very good	very good	good	yes	no
excellent	very good	moderate	no	yes (EU)
very good	very good	moderate	no	yes (EU)
excellent	excellent	moderate	no	no
very good	excellent	moderate	no	yes (EU & USA) (3)
good	very good	good	yes	yes (EU & USA) (3)
excellent	excellent	moderate	no	no
very good	very good	moderate	no	yes (USA)

- (1): average molecular weight (10^6 g/mol)
(2): black and standard colours
(3): also 3-A Dairy compliant

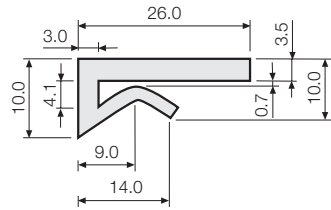
Abbreviations:

SDA : static dissipative additive ; GB : glass beads ; IL : internal lubricant(s) ;
HS : heat stabiliser

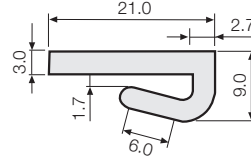
TIVAR® is a registered trademark of the Quadrant Group.

RAM-Extruded Guide Rails

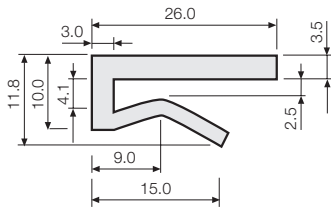
STANDARD PORTFOLIO



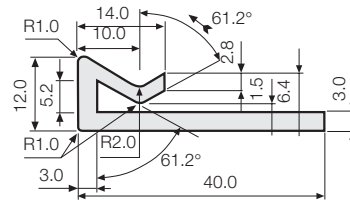
B1



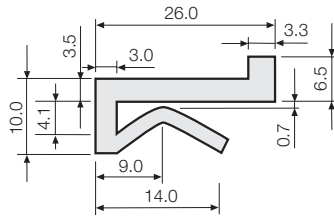
B8



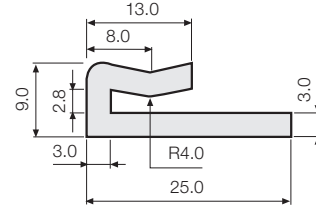
B1a



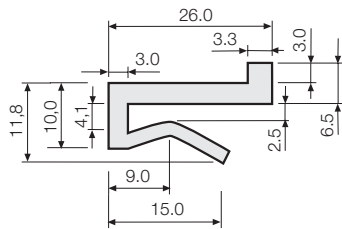
B16



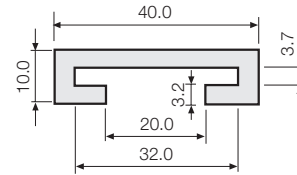
B2



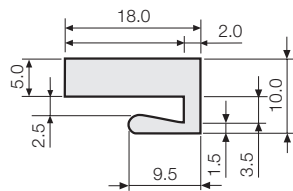
B21



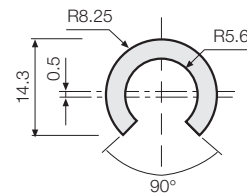
B2a



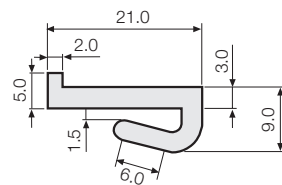
C1



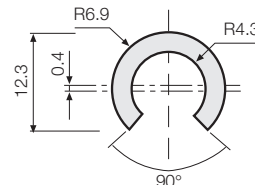
B3



C2



B6



C3

Standard colours: natural, green, black. Please consult us for production of individual colours.

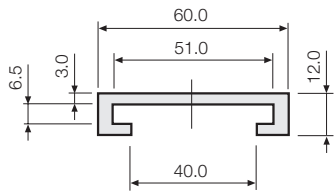
Lengths depend on the individual profile geometries. Unit lengths from 3 m to 12 m. Coil lengths from 25 m to 100 m. Please consult us for production of individual lengths.

RAM-Extruded Guide Rails

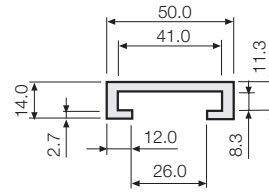
STANDARD PORTFOLIO

Standard colours: natural, green, black. Please consult us for production of individual colours.

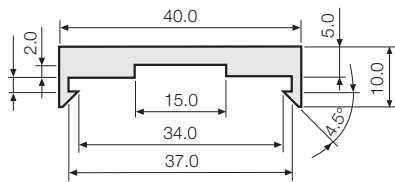
Lengths depend on the individual profile geometries. Unit lengths from 3 m to 12 m. Coil lengths from 25 m to 100 m. Please consult us for production of individual lengths.



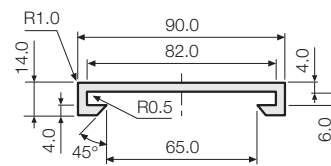
C4



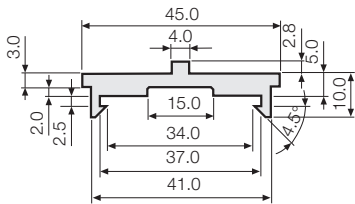
C20



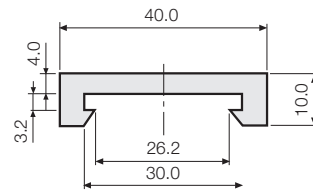
C5



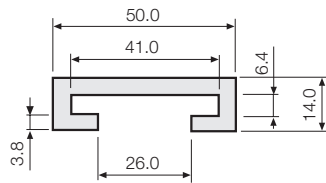
C30



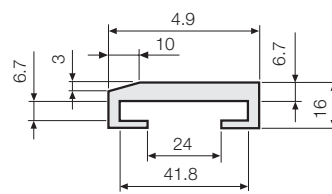
C6



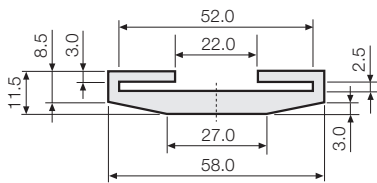
C32



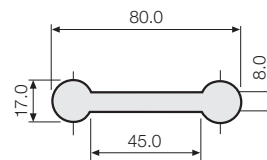
C7



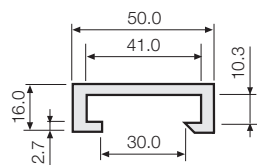
C38



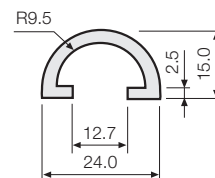
C16



D1



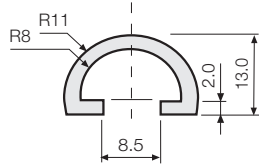
C17



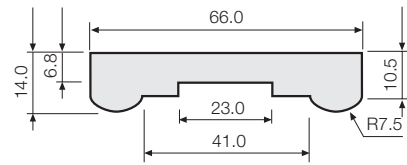
D2

RAM-Extruded Guide Rails

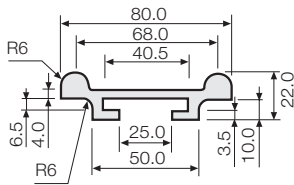
STANDARD PORTFOLIO



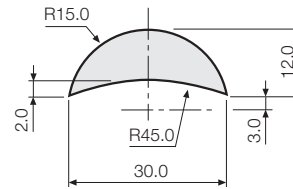
D3



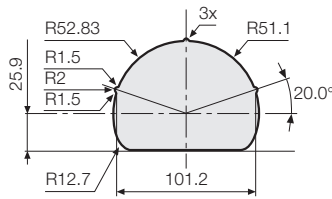
G1



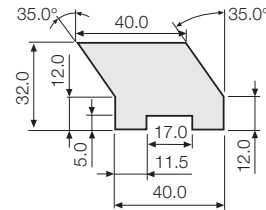
D6



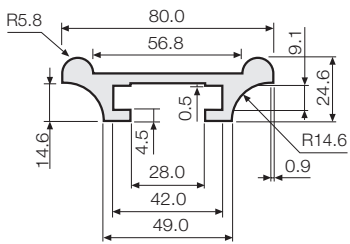
HRF



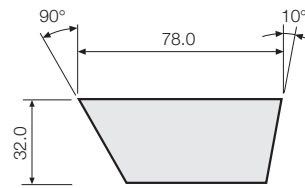
D7



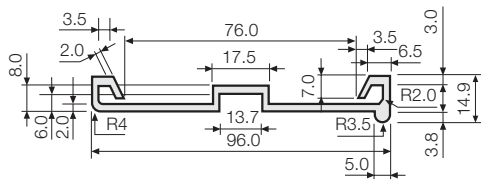
JF1



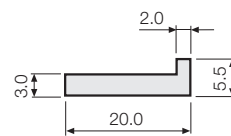
D8



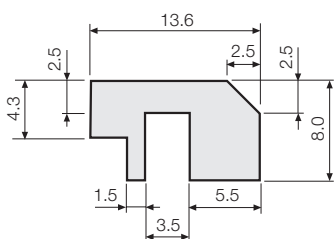
JF2



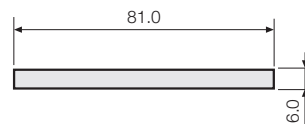
E1



L1



F1



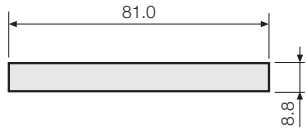
L2

Standard colours: natural, green, black. Please consult us for production of individual colours.

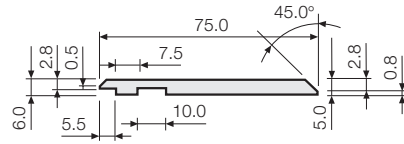
Lengths depend on the individual profile geometries. Unit lengths from 3 m to 12 m. Coil lengths from 25 m to 100 m. Please consult us for production of individual lengths.

RAM-Extruded Guide Rails

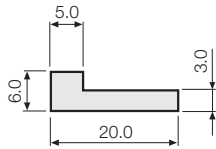
STANDARD PORTFOLIO



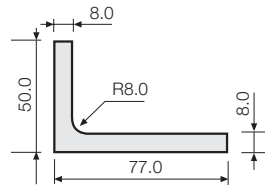
L3



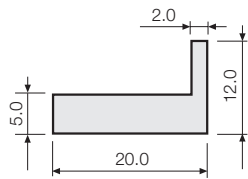
L9



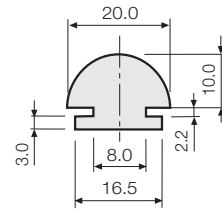
L4



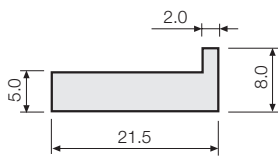
L10



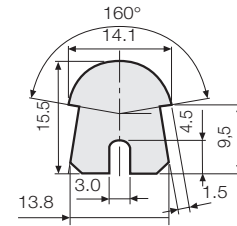
L5



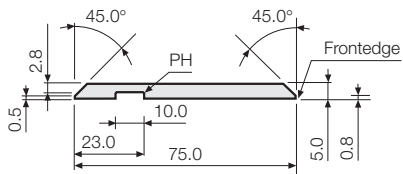
P1



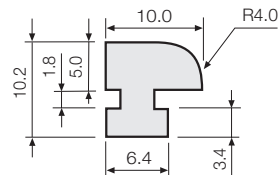
L6



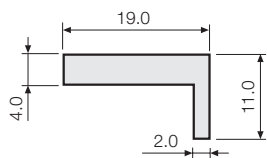
P4



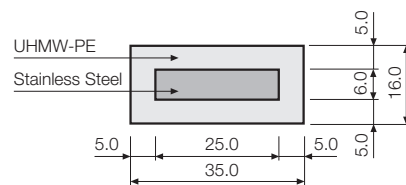
L7



R2



L8



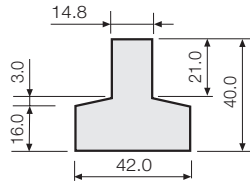
RES1

Standard colours: natural, green, black. Please consult us for production of individual colours.

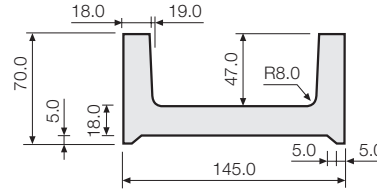
Lengths depend on the individual profile geometries. Unit lengths from 3 m to 12 m. Coil lengths from 25 m to 100 m. Please consult us for production of individual lengths.

RAM-Extruded Guide Rails

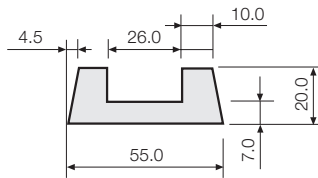
STANDARD PORTFOLIO



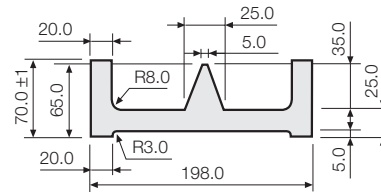
T1



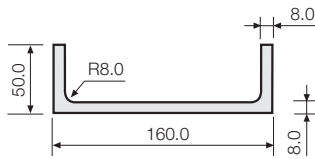
U11



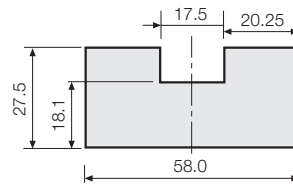
U1



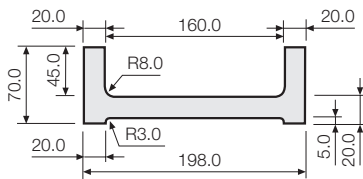
U13



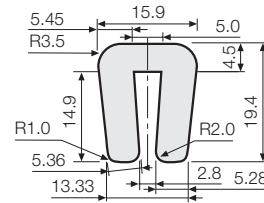
U4



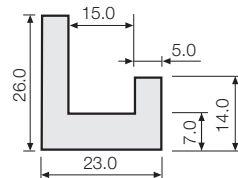
U14



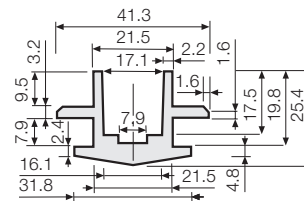
U5



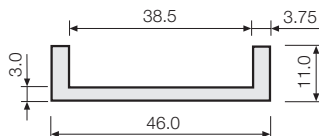
U17



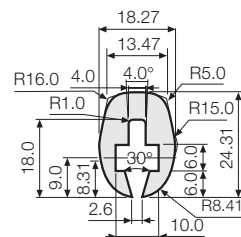
U6



U18



U9



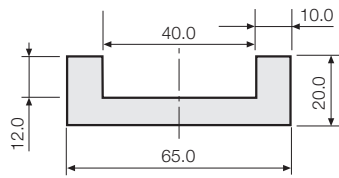
U19

Standard colours: natural, green, black. Please consult us for production of individual colours.

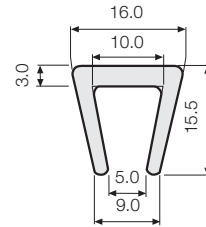
Lengths depend on the individual profile geometries. Unit lengths from 3 m to 12 m. Coil lengths from 25 m to 100 m. Please consult us for production of individual lengths.

RAM-Extruded Guide Rails

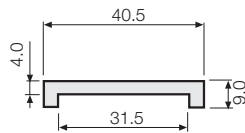
STANDARD PORTFOLIO



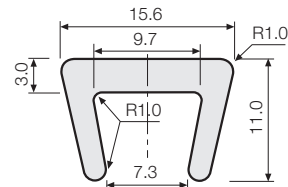
U20



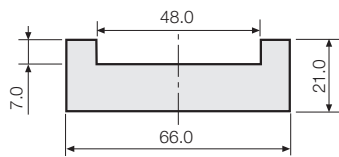
V8



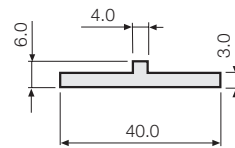
U23



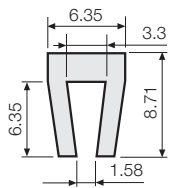
V9



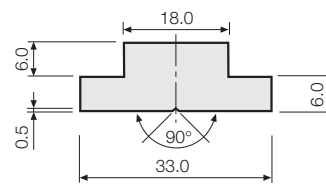
U27



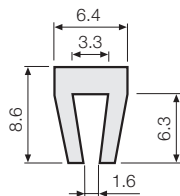
W1



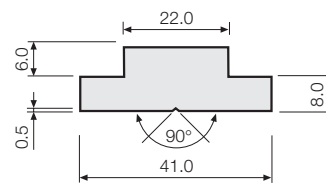
V1



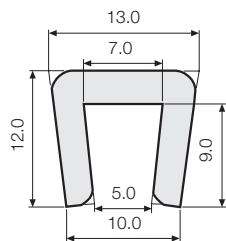
W2



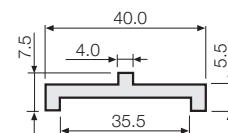
V2



W3



V7



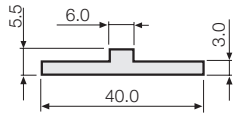
W4

Standard colours: natural, green, black. Please consult us for production of individual colours.

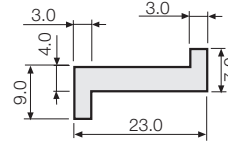
Lengths depend on the individual profile geometries. Unit lengths from 3 m to 12 m. Coil lengths from 25 m to 100 m. Please consult us for production of individual lengths.

RAM-Extruded Guide Rails

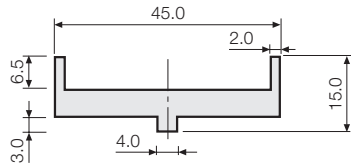
STANDARD PORTFOLIO



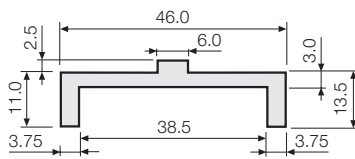
W5



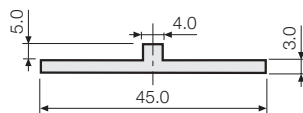
Z2



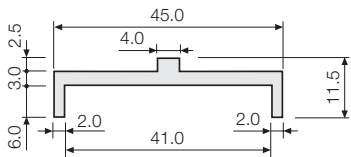
W7



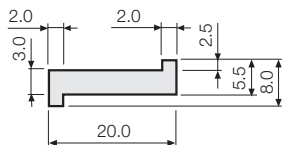
W8



W11



W12



Z1

TOLERANCES FOR EXTRUDED PROFILES AS PER DIN 16941

Dimension	Tolerance
0 - 3 mm	+/- 0,1
> 3 - 6 mm	+/- 0,2
> 6 - 10 mm	+/- 0,25
> 10 - 18 mm	+/- 0,3
> 18 - 30 mm	+/- 0,35
> 30 - 50 mm	+/- 0,4
> 50 - 80 mm	+/- 0,5
> 80 - 120 mm	+/- 0,6

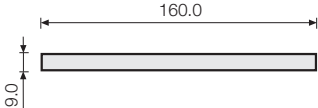
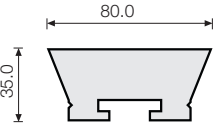
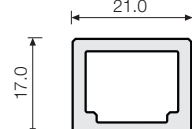
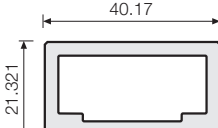
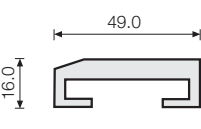
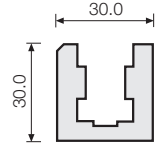
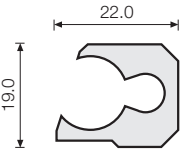
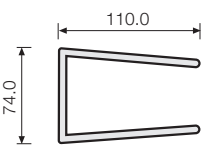
Quadrant's extruded profiles usually show tighter tolerances of this DIN.

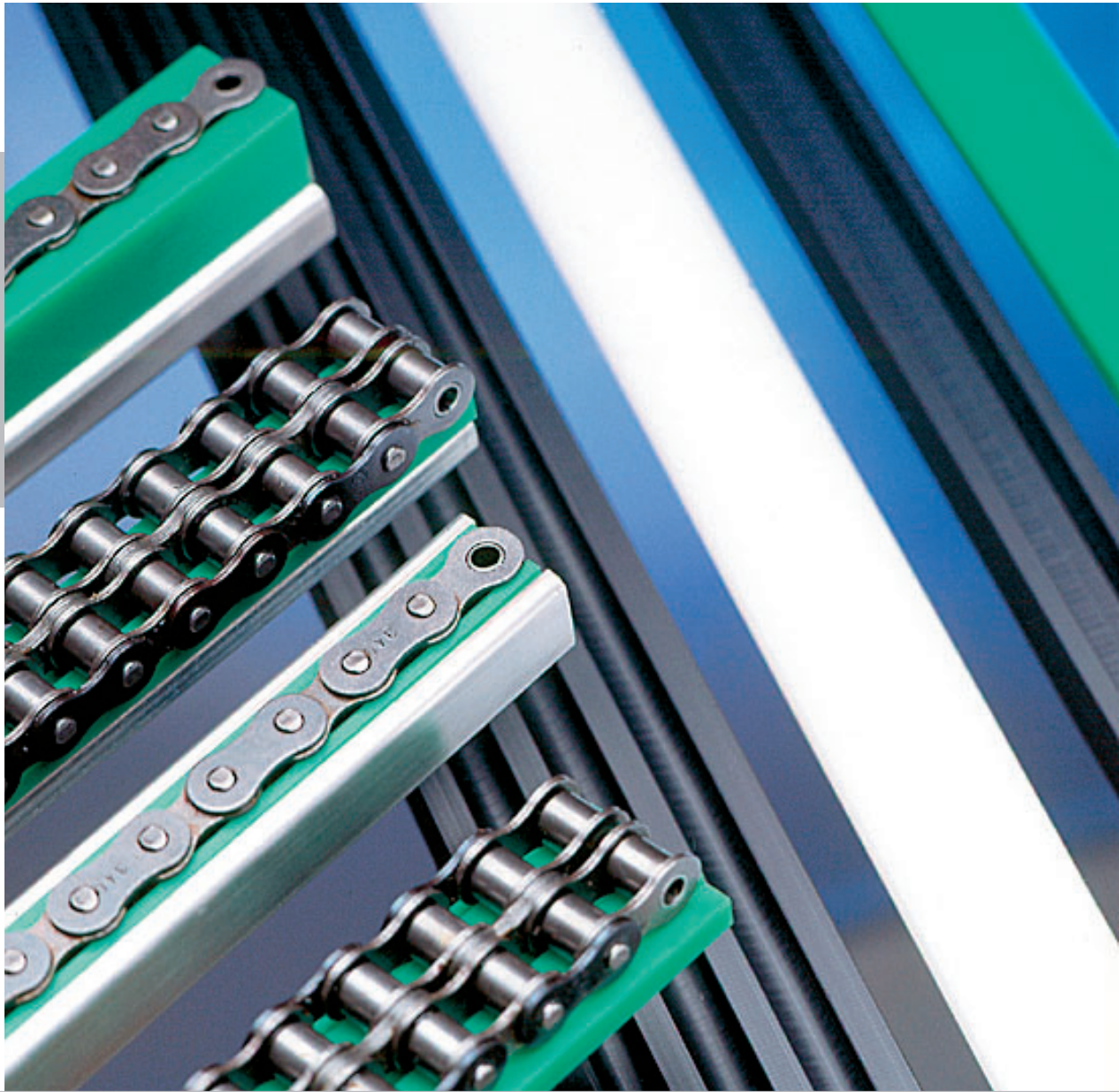
Standard colours: natural, green, black. Please consult us for production of individual colours.

Lengths depend on the individual profile geometries. Unit lengths from 3 m to 12 m. Coil lengths from 25 m to 100 m. Please consult us for production of individual lengths.

RAM-Extruded Guide Rails

EXAMPLES OF SPECIALTIES

 <p>12.60 6.16</p>	<p>AC1</p>	 <p>160.0 9.0</p>	<p>L12</p>
 <p>20.0 10.0</p>	<p>B26</p>	 <p>28.0 19.0</p>	<p>PV3</p>
 <p>80.0 35.0</p>	<p>BF1</p>	 <p>21.0 17.0</p>	<p>PV13</p>
 <p>246.0 30.0</p>	<p>BF2</p>	 <p>40.17 21.321</p>	<p>PV17</p>
 <p>11.0 7.0</p>	<p>C37</p>	 <p>20.4 18.0</p>	<p>U29</p>
 <p>49.0 16.0</p>	<p>C38</p>	 <p>30.0 30.0</p>	<p>U30</p>
 <p>22.0 19.0</p>	<p>CS14</p>	 <p>110.0 74.0</p>	<p>U74</p>
 <p>28.5 10.5</p>	<p>G2</p>	 <p>12.7 12.7</p>	<p>V10</p>
 <p>25.0 21.0</p>	<p>K3</p>		



Machined Guide Rails

In addition to ram-extruded clip-on profiles, Quadrant EPP provides machined guide rails for almost any kind of drive and conveyor equipment in the bottling, filling, transportation and packaging industry.

Due to their favourable properties, TIVAR® materials are highly recommended for these industries. Machine operators profit from:

Properties profile of TIVAR materials
in the drive and conveyor industry

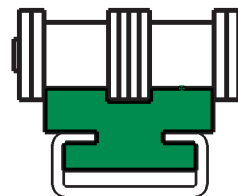
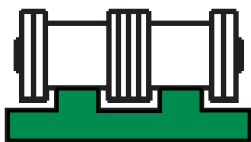
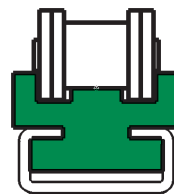
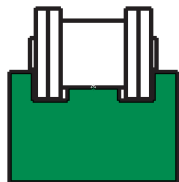
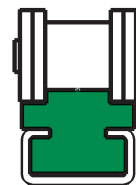
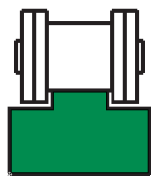
- Extremely high abrasion resistance
- Very good sliding properties
- Self-lubricating materials
- Good vibration and noise absorption
- High impact strength
- High chemical resistance, no corrosion
- No moisture absorption
- Food contact compliant composition for a number of selected TIVAR materials

Machined Guide Rails

Chain Guides for Roller Chains [DIN 8187]

The standard range comprises 14 basic types in different variants. Depending on the application and the operating conditions, please consult us for the right material for the job.

Suitable steel C profiles [DIN 59413] are available on request.

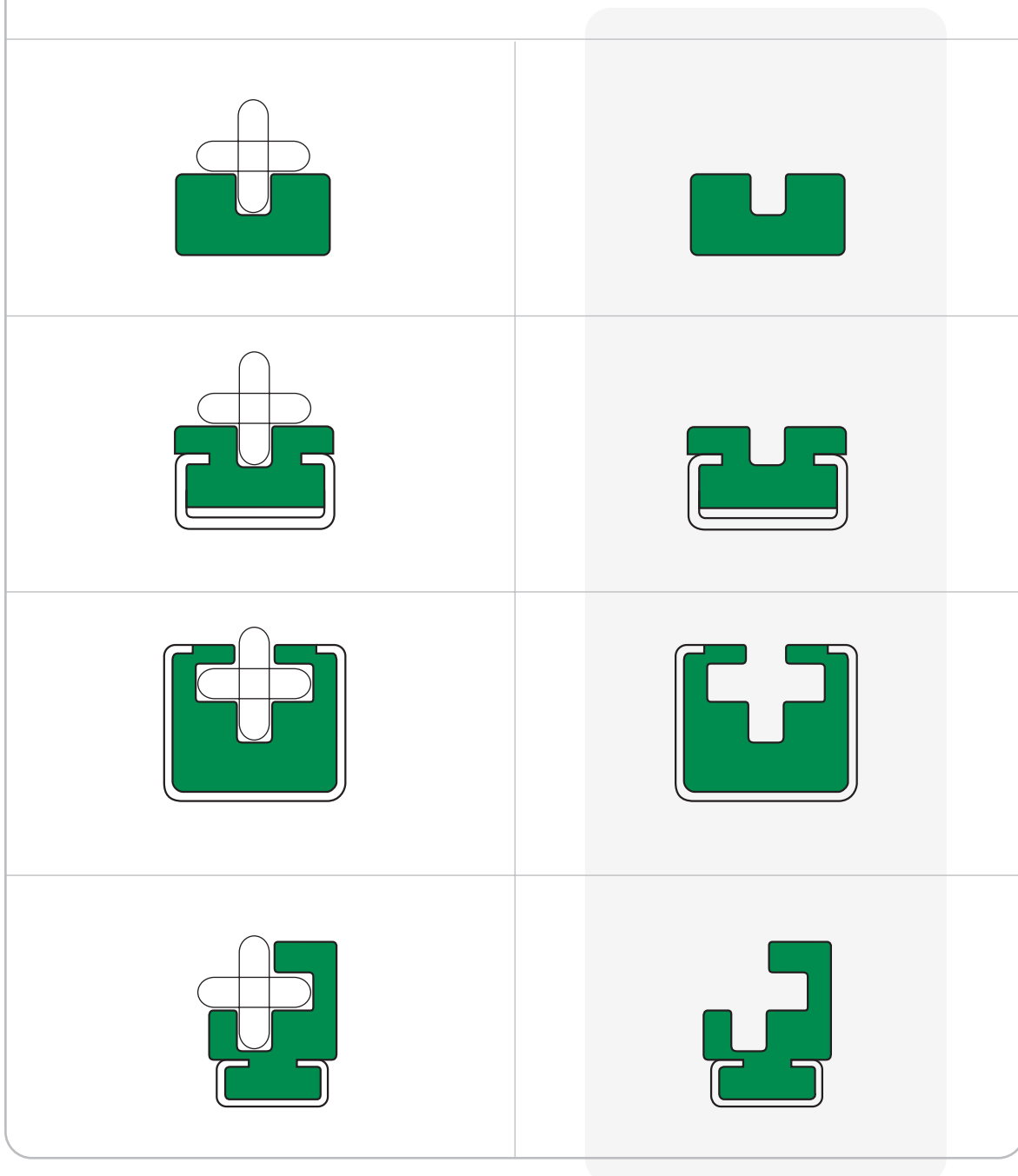


Machined Guide Rails

Chain Guides for Round Link Chains [DIN 7661764]

8 different types form the basic standard product portfolio. Delivered with a top surface finish and tolerances as per DIN 2768, our round link chain guides fulfil the most challenging requirements in conveyor lines.

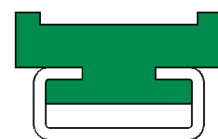
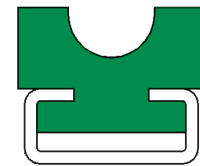
Suitable steel C profiles [DIN 59413] are available on request.



Machined Guide Rails

Guide Rails for Belts: Round Belts, V-Belts, Flat Belts

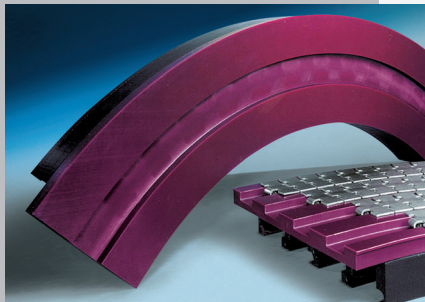
We also provide machined belt guides made of TIVAR materials for round, V- and flat belts. Models with galvanized or stainless steel C profiles are also available. The preferred material for the belt guides is TIVAR 1000 antistatic, however, depending on applications and operating conditions other materials can also be used.



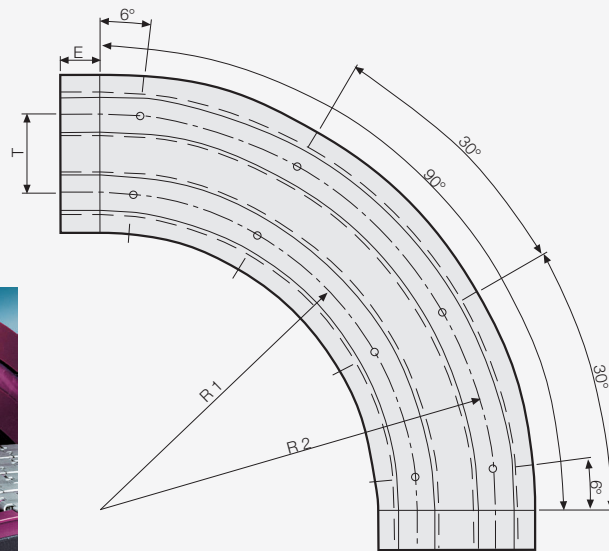
Machined Corner Wear Bends and Straight Guides

Quadrant produces single and multiple corner wear bends and straight guides as per customers' individual requests. Please consult us for the right material choice.

Single and Multiple Corner Wear Bends & Straight Guides



G = threaded insert M 8 brass
S = countersunk bore \varnothing 9M5 90°



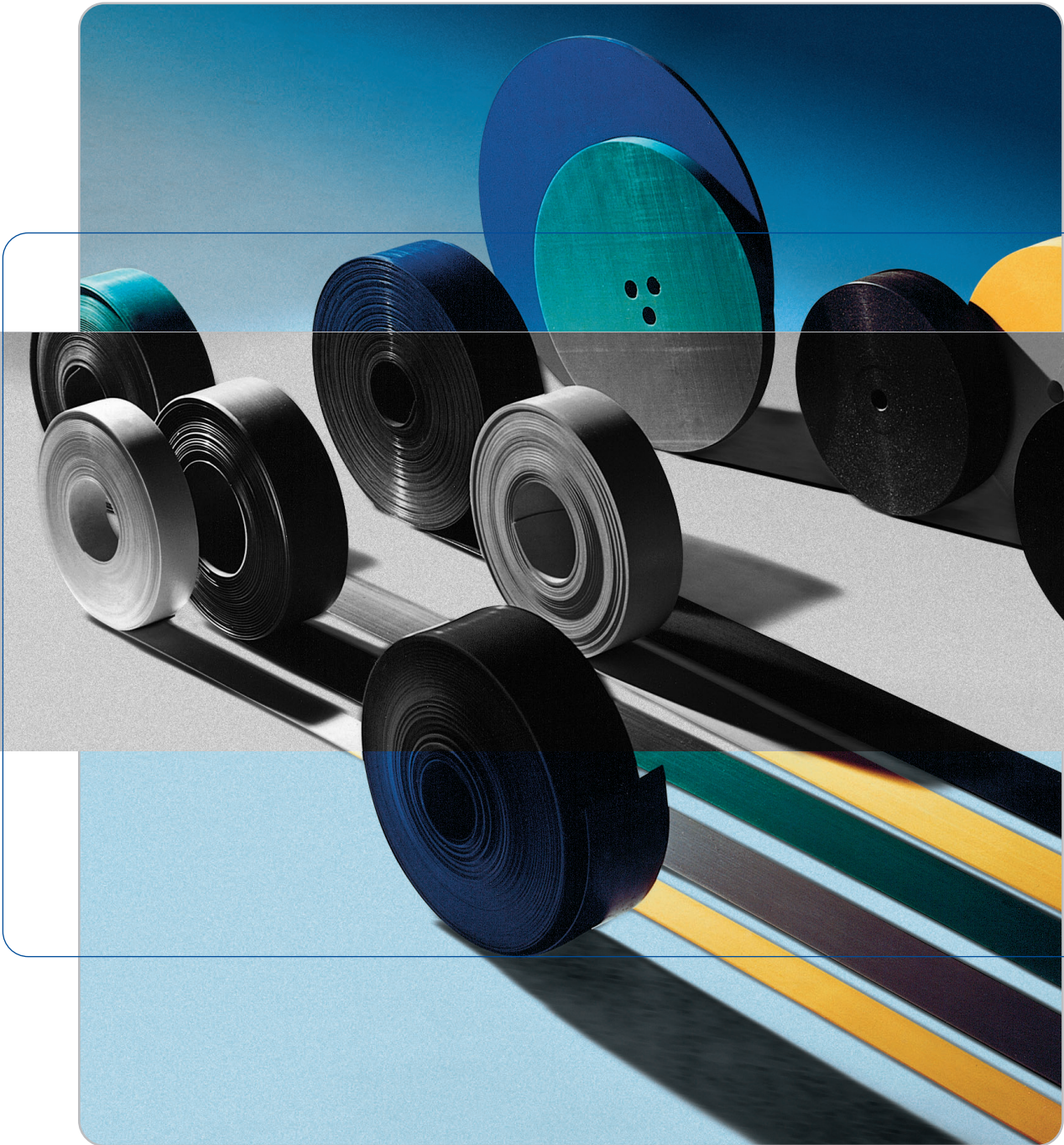
BEVEL guide	TAB guide
<p>[For different dimensions, please give parameters]</p>	

Tape Material

TIVAR® Tape Material and Profiles

In thicknesses ranging from 0.5 to 7 mm and coil lengths from 35 to 480 m we produce tape material and profiles for various sliding and wear applications in conveying lines.

Thickness	0,5 mm	1 mm	2 mm	3 mm	4 mm	5 mm	6 mm	7 mm
Coil length	[480m]	[240m]	[120m]	[80m]	[60m]	[48m]	[40m]	[34m]
Width								
15	o	o	o	o	o	o	o	o
20	o	o	o	o	o	o	o	o
25	o	o	o	o	o	o	o	o
30	o	o	o	o	o	o	o	o
35	o	o	o	o	o	o	o	o
40	o	o	o	o	o	o	o	o
45	o	o	o	o	o	o	o	o
50	o	o	o	o	o	o	o	o
60	o	o	o	o	o	o	o	o
70	o	o	o	o	o	o	o	o



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