GUSTAV WOLF

Elevator traction media and accessories

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The German way up: advantage Gustav Wolf.

As a globally established wire and rope specialist, Gustav Wolf manufactures high-quality elevator suspension means for all areas of application with the knowledge gained from over 130 years of experience. The portfolio includes conventional and alternative suspension means, all of which stands out thanks to German engineering and superior brand quality: with high breaking force, low weight, reliable elongation behavior, and long service life.

With Gustav Wolf solutions, customers can meet all their requirements and, at the same time, benefit from high availability and short delivery routes. Multiple logistics hubs and distributors around the globe ensure the ability of elevator OEMs and service providers to act worldwide.

Get in touch with us: the suspension means specialists at Gustav Wolf have in-depth understanding of the industry and are available to help with your development projects, individual solutions, and topics relating to suspension equipment.

From low-rise to super-high-rise: 100% application range.

The global trend toward urbanization is bringing increasing focus on vertical solutions. Gustav Wolf is your reliable partner for absolutely any application in the low-, mid-, high-, and super-high-rise sector. The varying requirements for suspension means – in terms of breaking strength, service life, wear resistance, elongation and bending behavior – can be precisely met with solutions from Gustav Wolf. In addition, individual solutions for special applications are available.

From steel rod to rope: 100% in-house production.

Gustav Wolf controls the entire production process. The combination of control over all production stages and uniform global specifications makes optimally coordinated components with consistently high quality possible. At the same time, the production process is made more robust against external influences and supply chain risks. The result is exemplary delivery dependability and reliable worldwide availability of all Gustav Wolf suspension equipment. The vertical integration also makes it simpler to develop specific products: Gustav Wolf can meet individual requirements using its own resources and make targeted adjustments to the production process.

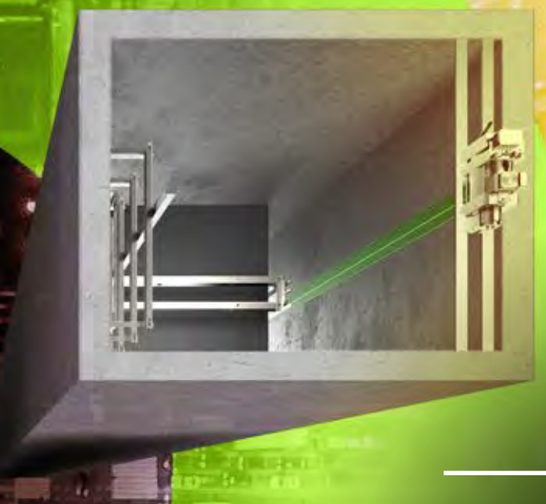
From new construction to modernization: 100% elevator life cycle.

Gustav Wolf is the experienced full-service provider of suspension means for the original equipping of elevators, for subsequent service and maintenance work, and for modernization measures.

In this context, Gustav Wolf supports the entire elevator life cycle as an efficient “one-stop shop”: Gustav Wolf customers receive everything required for all the work to be carried out from a single source, right down to accessories – and also have access to simplified product selection at any time via digital advisory tools.

From east to west: 100% global availability.

With plants in Germany, Poland, Hungary, and China, Gustav Wolf delivers the “Best German Engineering” worldwide. With a large number of distributors and multiple logistics hubs, Gustav Wolf stands for unrestricted availability and delivery reliability. We are not only close to our customers geographically: Gustav Wolf provides customers with contact partners who can speak their language, understand local specifics, provide in-depth industry knowledge, and offer consultation at eye level.



From a proven rope to an innovative belt: 100% portfolio coverage.

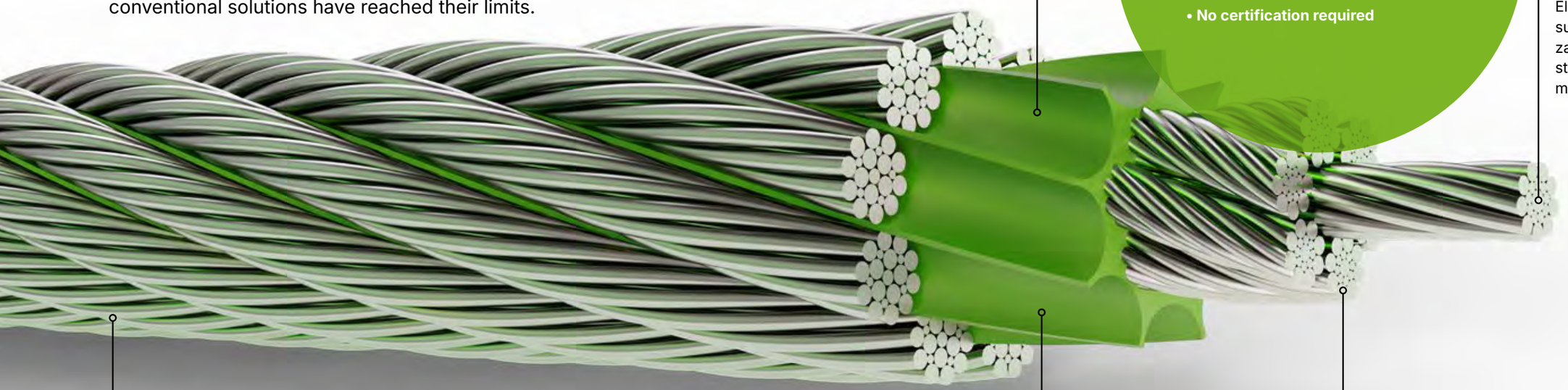
With a wide range of conventional and alternative suspension means, Gustav Wolf can supply all market participants with precisely what they need. Thanks to a high level of innovative drive within the company, the portfolio is expanded in line with the market on an ongoing basis, for example with groundbreaking new concepts and future-proof material combinations.

In addition, customers benefit from comprehensive services available worldwide, which round off the offering and significantly simplify work processes. These include, among other things, ready-to-assemble systems: these can be implemented at short notice if required and include special suspension equipment and end fastenings.

Focus on the future: innovative highlights from Gustav Wolf.

Lowest stretch in high rise.
ElTrac®

Plastic-coated core for minimal wear and tear: ElTrac® sets new standards in the high- and super-high-rise segment with significant value enhancement. The design optimizes wear and elongation behavior – designed for the highest demands and travel heights. At the same time, ElTrac® is retrofit-ready and designed for seamless integration in existing systems – especially for challenging systems and can therefore be used in any any application where conventional solutions have reached their limits.



ElTrac® supports reference projects.

Systems with high visibility require the greatest possible reliability. Particularly reliable operation can be ensured with the use of ElTrac®.

ElTrac® at a glance

- **Plastic-coated solid-steel-rope core**
- **Highest initial stiffness**
- **Minimized internal rope wear and tear**
- **Can be retrofitted in existing systems**
- **No certification required**

ElTrac® is retrofittable.

As an extremely innovative, future-proof, and fully reliable replacement solution, ElTrac® is highly suitable for moderni-zations or as part of standard service measures.

ElTrac® also performs at high frequency.

The exceptional elongation behavior not only impresses in the high-rise and super-high-rise segment: ElTrac® is a reliable long-term option anywhere that elevators are used very frequently.

ElTrac® protects the core.

The high-quality plastic coating of the solid-steel-rope core enables not only the best possible initial stiffness, but also maximum reduction of internal rope wear and tear.

ElTrac® minimizes elongation.

The consistent stiff-ness over the service life ensures reliable elongation behavior.

Technical information page 35

10 top performers in the smallest space. FlatTrac®

As a best-in-class belt solution, FlatTrac® represents a further development of the belt principle and goes beyond the previous technical limits of belt design. FlatTrac® combines up to 10 steel ropes in a polyurethane-coated flat belt. This suspension innovation offers many advantages for elevator manufacturers and operators: compact dimensions, reduced maintenance costs with easy suspension service, and energy cost savings of up to 40%. Thanks to these benefits, FlatTrac® is the belt of choice when it comes to new installations and modernizations of MRL elevators, as well as for the replacement of existing belts.

FlatTrac® reduces system load.

FlatTrac® is made of high-strength materials and is significantly lighter than steel rope, which reduces system load, improves energy efficiency, and allows for more compact elevator designs.

FlatTrac® maximizes flexibility.

The unique low-profile design of FlatTrac® allows for the use of smaller sheaves and machines, resulting in a more efficient overall construction of the elevator. FlatTrac® is suitable for both new installations and retrofits, offering a flexible solution for a wide range of architectural requirements.

FlatTrac® minimizes maintenance.

FlatTrac® not only simplifies handling and installation, but also reduces wear on traction sheaves and pulleys. This minimizes maintenance costs and downtime.

FlatTrac® optimizes ride quality and energy efficiency.

The innovative structure of FlatTrac® minimizes vibrations and noise for a smoother, quieter elevator ride. In addition, the reduced weight and optimized design significantly lower energy consumption.

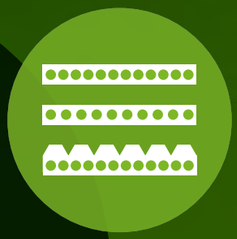
FlatTrac® increases service life.

Unlike steel ropes, FlatTrac® is resistant to rust and environmental influences, ensuring consistent performance in different climates and under difficult conditions. FlatTrac® increases the service life and improves the overall elevator availability by reducing the number of suspension mean changes required throughout the elevator lifecycle.

Three new variants:

Thanks to three new variants, FlatTrac® is ideally suited as a manufacturer-independent spare part for the most commonly installed belt elevators:

- Two new flat variants for the replacement of 30 mm flat belts in one of the most commonly installed existing elevator series
- A new version with a V-profile for another common existing elevator series



FlatTrac® at a glance

- **Polyurethane-coated flat belt**
- **High-performance steel ropes**
- **18 million single bending cycles**
- **Sheaves diameter: min. 85 mm**
- **EN certification**
- **Developed in Germany**

Technical information page 32

Highest breaking strength pays off. CoatTrac®

A real highlight in the low-rise segment, especially for machine-roomless (MRL) elevators: CoatTrac®. With this plastic-coated rope manufactured entirely in-house in Europe, Gustav Wolf offers the ideal suspension equipment for any application where the best possible strength, flexibility, and easy handling are required in the smallest of installation spaces. The exceptionally high breaking force of 30 kN reduces the number of ropes required and thus the overall system costs. In addition, the practice-oriented certification, which takes into account different possible applications, ensures above-average service life – up to five times longer is permissible for common traction sheave diameters.

CoatTrac® reduces system costs by up to 10.35%[1].

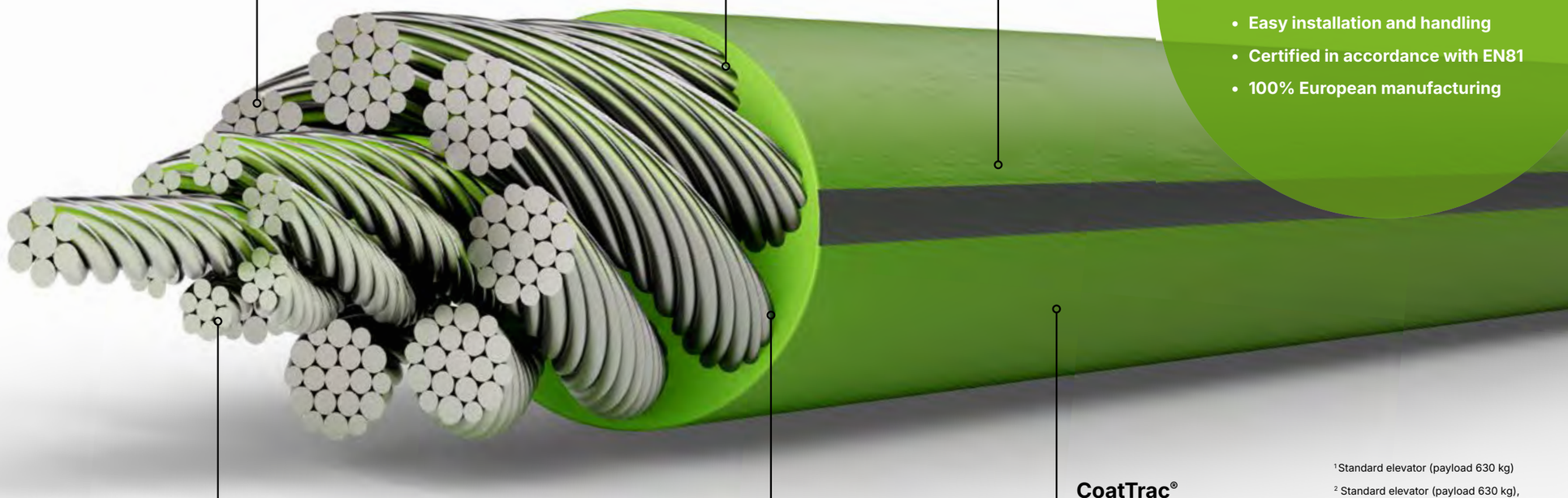
The extended service life of CoatTrac® means that material and replacement costs can be minimized and significant savings can be realized compared to traditional steel wire ropes and other alternative traction media.

CoatTrac® improves costs over the elevator life cycle by up to 44.57%.[2]

The robust structure of CoatTrac® is designed for use under the harshest conditions, reducing wear and ensuring reliable long-term operation.

CoatTrac® enables space-saving design.

The high breaking strength allows for traction sheaves with a smaller width and thus a slim design – without compromising on load-bearing capacity.



CoatTrac® at a glance

- Outstanding strength and durability
- First-class minimum breaking force
- Increased flexibility
- Easy installation and handling
- Certified in accordance with EN81
- 100% European manufacturing

CoatTrac® offers the highest holding precision.

The high, constant modulus of elasticity ensures exact holding precision over the entire service life of the rope.

CoatTrac® improves ride quality.

The plastic coating and round-groove design reduce noise and vibrations for a smoother, quieter elevator ride.

CoatTrac® simplifies maintenance.

No relubrication required: the ease of maintenance of CoatTrac® means the best possible elevator availability thanks to maximum uptime.

[1] Standard elevator (payload 630 kg)

[2] Standard elevator (payload 630 kg), 15 years of operation considered, compared to conventional traction equipment

Technical information page 33

Retrofit-Booster. HyTrac® 2.0

HyTrac® 2.0 unlocks the full potential of material innovation and efficiency in elevator technology. It offers the advantages of a solid steel wire rope in terms of breaking force and stiffness, but eliminates the usual disadvantages in rope weight and wear thanks to its superior fiber core. This combination results in unmatched efficiency, reliability, and adaptability. HyTrac® 2.0 impresses with the best available breaking-force-to-rope-weight ratio. HyTrac® 2.0 can be used within the scope of elevator and rope standards without the need for separate certification, making it the ideal choice for mid- and high-rise applications.

HyTrac® 2.0 offers a superior power-to-weight ratio.

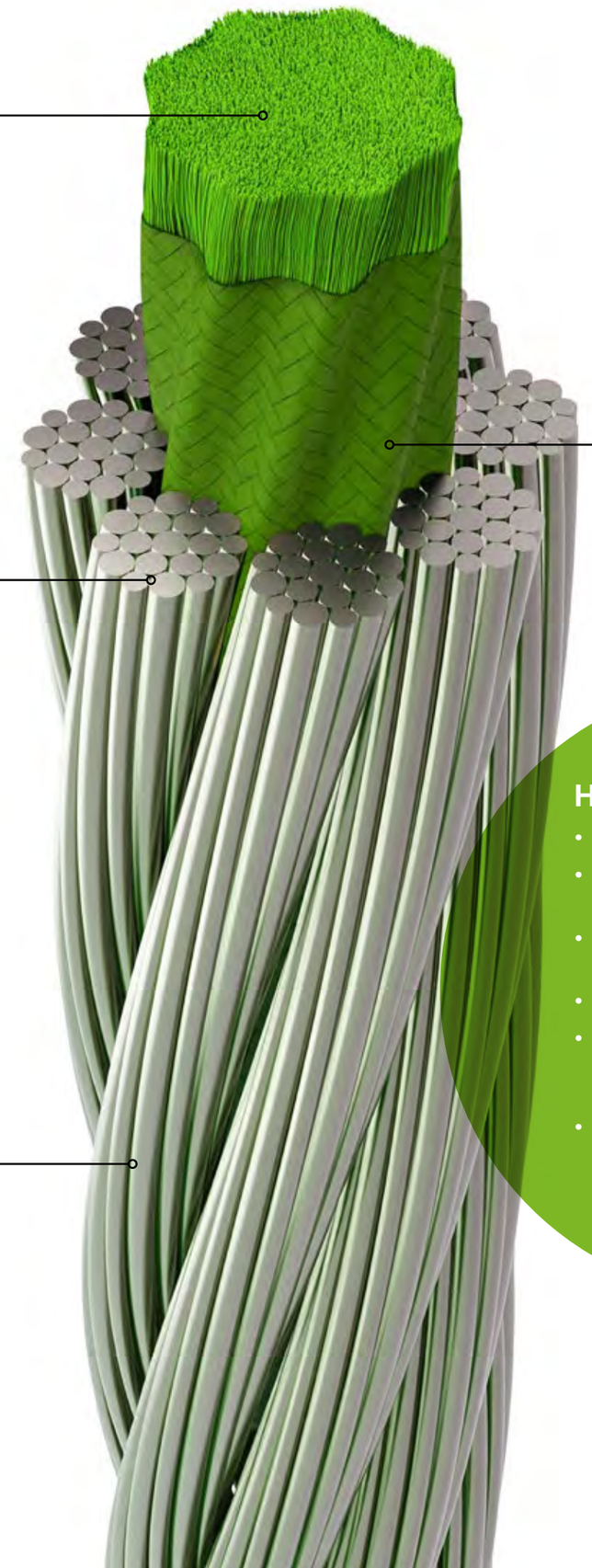
The lightweight HyTrac® 2.0 design impresses with a ratio between minimum breaking force and rope weight optimized by 28.4%. This allows elevator manufacturers to achieve higher lifting heights and minimizes installation effort.

HyTrac® 2.0 provides reliable rope structure.

The HyTrac® 2.0 construction enables a robust rope structure over the entire life cycle. HyTrac® 2.0 has a modulus of elasticity increased by 29.1% compared to conventional ropes and ensures low rope elongation overall.

HyTrac® 2.0 is robust in installation.

HyTrac® 2.0 demonstrates exceptional robustness in installation: the specific design minimizes sensitivity to torsion while maintaining elasticity and absorption properties.



HyTrac® 2.0 uses the latest high-end fiber core.

The flexible fiber core construction of HyTrac® 2.0 uses high-modulus high-performance (HMHP) fibers: genuine state-of-the-art technology.

HyTrac® 2.0 at a glance

- World's most powerful fiber insert
- Best-in-class ratio between minimum breaking force and rope weight
- Increased strength and reduced internal friction for extended service life
- Easy installation and handling
- No additional certification required, ready for immediate use in modernization and new installations
- Ideal replacement for conventional suspension equipment such as IWRC, mixed-core, and NFC rope

Technical information page 40

Straight to the right suspension equipment: with the Solution Guide.

The Gustav Wolf Solution Guide gives you a quick overview of the perfect suspension solution for your specific elevator application. Based on the characteristics of the individual Gustav Wolf ropes and belts, the tabular overview allows you to compare individual solutions directly and then make the choice that meets your needs.

SOLUTION GUIDE

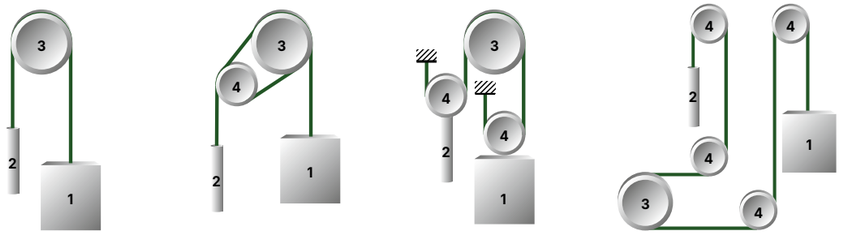
Super-High-Rise (SHR) / High-Rise (HR)	**ElTrac®** page 35	**HyTrac® 2.0** page 40	**TopTrac®** page 35	**F10** page 36	**CompactTrac®** page 40	**PowerTrac®** page 36	**F7S** page 37
Flexibility							
Modulus							
Modulus over service life							
Service life							
MBF / Weight							
Installation ease							

Mid-Rise (MR)	**F3** page 39	**F7** page 39	**819S-FC** page 41	**819W-FC** page 41
Flexibility				
Modulus				
Modulus over service life				
Service life				
MBF / Weight				
Installation ease				

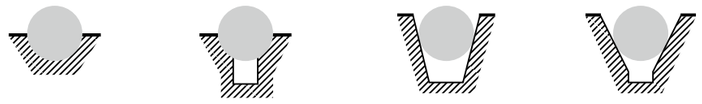
Low-Rise (LR) / Machine-Room-Less (MRL)	**CoatTrac®** page 33	**FlatTrac®** page 32	**819W** page 34	**F7S** page 34
Minimum breaking force				
Easy to maintain				
Service life				
Installation ease				
Systemcost				

Rope suspension and groove shape: important parameters for your product selection.

This concise overview shows you what Gustav Wolf suspension equipment supports which rope drive types and which solutions are suitable for which traction sheave groove shapes.



Rope reeving	Overhead single wrap 1:1	Overhead double wrap 1:1	Overhead single wrap 2:1	Basement Machine single wrap 2:1
ElTrac®	●	●	●	●
HyTrac®	●	●	●	●
TopTrac®	●	●	●	●
F10	●	●	●	●
CompactTrac®	●	●	●	●
PowerTrac®	●	●	●	●
F7S	●	●	●	●
F3	●			
F7	●	●	●	●
819S-FC	●			
819W-FC	●	●	●	



Groove design	Round groove without undercut	Undercut round groove	V-groove	Undercut V-groove
ElTrac®	●	●	●	●
HyTrac®	●	●	●	●
TopTrac®	●	●	●	●
F10	●	●	●	●
CompactTrac®	●	●	●	●
PowerTrac®	●	●	●	●
F7S	●	●	●	●
F3	●	●	●	●
F7	●	●		
819S-FC	●	●	●	
819W-FC	●	●		

Traction Media Portfolio

Belt

FlatTrac®
Optimized
New and existing elevators

Width [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
30	0.223	37.00	93FT3X300

FlatTrac 37kN
EC-type examination certificate
NL22-400-1002-446-01
(available on request)

FlatTrac®
Optimized for replacement in existing systems

Width [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
30	0.205	32.00	93FT3X302

FlatTrac 3.0x30mm-32kN-12×1.61-F
Spare part suitable for OTIS Gen2 elevators equipped with belt types AAA717W1 and AAA717X1 and matching PULSE-system*

Width [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
30	0.236	43.00	93FT33X300

FlatTrac 3.3×30mm-43kN-10×1.98-F
Spare part suitable for OTIS Gen2 elevators equipped with belt types AAA717AJ2 / AAA717AP2 / AAA717AM2 and matching PULSE-system*

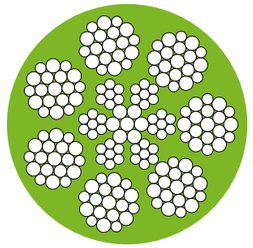
Width [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
30	0.262	42.00	93FT44X300

FlatTrac 4.45×30mm-42kN-12×1.73-PV
Spare part suitable for SCHINDLER elevators equipped with Megadyne STM-PV30-1.73S-PU-42*

*** Disclaimer:**
This is a replacement product. It is not produced by the original manufacturer. The brand names OTIS, Gen2, SCHINDLER and Megadyne are used solely to indicate the compatibility of the product. The use of the trademark is strictly for descriptive purposes and does not imply any association with the trademark owner.

Coated rope

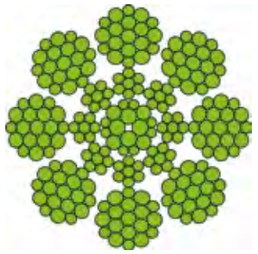
CoatTrac®



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
6.5	0.12	30.00	93CT06530

Ropes with type examination certificate

PAWO 819W

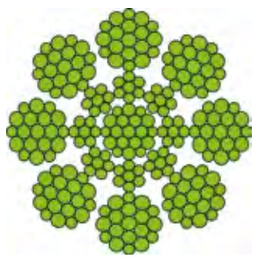


Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
6	0.153	25.9	741306030
6.5	0.170	31.5	741306532
8	0.270	46.0	741308034
10	0.400	70.3	741310034

Construction
8 × 19 W - IWRC 1770 U sZ
EC-type examination certificate CA298/1
(available on request)

NOTE!
Certified elevator ropes for traction sheaves ≥ 120 mm & 18.46 ≤ Dld < 40

PAWO F7S



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
8	0.273	44.6	711208030
9	0.374	56.0	711209030
10	0.424	69.5	711210030

Construction
8 × 19 W - IWRC 1570 U sZ
EC-type examination certificate CA298/1
(available on request)

Rope diameter
permissible tolerance on the nominal rope diameter
- no load max. 3 %
- with load 10 % of F_{min}
  min. –1 %

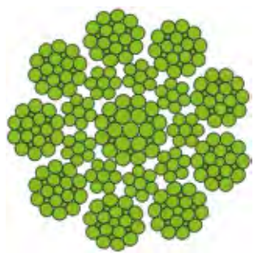
Suitable thread terminal you can find on page 48

Ropes with steel core

ElTrac®

Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
13	0.707	113.40	931213030
16	1.08	174.00	931216030
19	1.51	244.90	931219030

TopTrac®



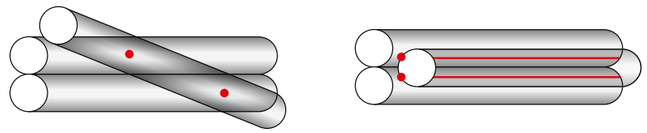
Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
8	0.280	46.6	721208035
10	0.420	71.9	721210033
13	0.730	123.4	721213033
16	1.100	186.2	721216033
19	1.600	263.0	721219033

Construction
Ø 8 +10 mm 9 × 17 F - PWRC 1570 U sZ
Ø ≥ 13 mm 9 × 21 F - PWRC 1570 U sZ

Technical specification
DIN EN 12385, ISO 4344

Material
- GW-Steel wire, bright or galvanized
- Tensile grade 1570 N/mm²
- Liftquality, DIN EN 10264, ISO 4101

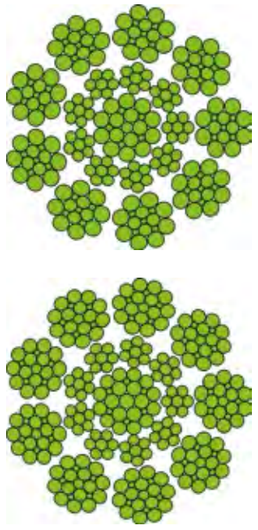
Rope diameter
permissible tolerance on the nominal rope diameter
- no load max. 3% ≤ 10 mm
  max. 2% > 10 mm
- with load 10% of F_{min}
  min. –1% ≤ 10 mm
  min. –1% > 10 mm



TopTrac® achieves an even load distribution through a double-parallel design that allows linear contact with the wires (rather than at specific points).

Ropes with steel core

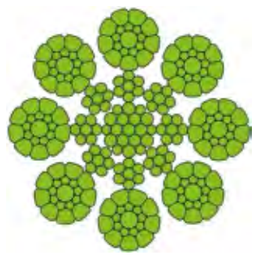
PAWO F10



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
8	0.270	43.2	721208032
9	0.340	54.8	721209032
10	0.420	67.2	721210032
11	0.503	80.2	721211032
12	0.600	95.6	721212032
13	0.707	113.4	721213032
14	0.850	135.7	721214032
15	0.950	152.8	721215032
16**	1.080	174.0	721216032
18	1.410	219.7	721218032
19***	1.510	244.9	721219032
9.5 (3/8")	0.380	60.5	721209530
12.7 (1/2")	0.680	109.5	721212730

Construction
Ø 8 - 12 mm 9 × 17 F - IWRC 1570 U sZ
Ø 13 - 19 mm 9 × 21 F - IWRC 1570 U sZ
** Can also be used as 5/8"
*** Can also be used as 3/4"

PowerTrac



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]
8	0.270	45.4
10	0.430	71.8
13	0.730	121.6
16	1.110	183.2

Construction
8 × K19 S* - IWRC 1570 U sZ

Technical specification
DIN EN 12385, ISO 4344

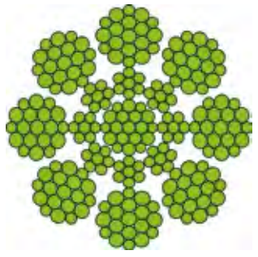
Material
- GW-Steel wire, bright or galvanized
- Tensile grade 1570 N/mm²
- Liftquality, DIN EN 10264, ISO 4101

Rope diameter
permissible tolerance on the nominal rope diameter
- no load max. 3% ≤ 10 mm
  max. 2% > 10 mm
- with load 10% of F_{min}
  min. –1% ≤ 10 mm
  min. –1% > 10 mm

* K19 S = compacted strand in Seale-construction

Ropes with steel core

PAWO F7S



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
8	0.273	44.6	711208030
9	0.347	56.0	711209030
10	0.424	69.5	711210030
11	0.509	83.1	711211030
12	0.598	98.9	711212030
13	0.700	116.0	711213030
16**	1.072	176.1	711216030

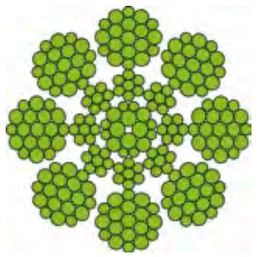
Construction
8 × 19 W - IWRC 1570 U sZ
** Can also be used as 5/8"

Technical specification
DIN EN 12385, ISO 4344

Material
- GW-Steel wire, bright or galvanized
- Tensile grade 1570 N/mm²
- **Liftquality, DIN EN 10264, ISO 4101**

Rope diameter
permissible tolerance on the nominal rope diameter
- no load max. 3% ≤ 10 mm
  max. 2% > 10 mm
- with load 10% von F_{min}
  min. –1% ≤ 10 mm
  min. –1% > 10 mm

PAWO 819W

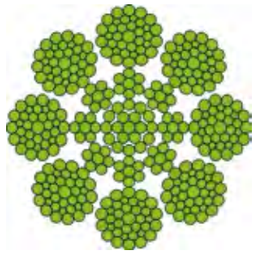


Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
8	0.270	46.0	741308034
10	0.400	70.3	741310034
11	0.510	87.0	741311034
13	0.730	123.0	741313034

Construction
8 × 19 W - IWRC 1770 U sZ

Ropes with steel core

PAWO 836WS



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
14	0.840	135.9	741314081
16	1.100	188.8	741316032

Construction
8 × 36 WS - IWRC 1770 U

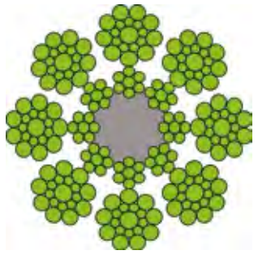
Technical specification
DIN EN 12385-4

Material
- GW-Steel wire to DIN EN 10264
- bright or galvanized
- Tensile grade 1770 N/mm²

Rope diameter
permissible tolerance on the nominal rope diameter
- no load – 0 + 5%
  max. 3% ≤ 10 mm

Ropes with mixed core

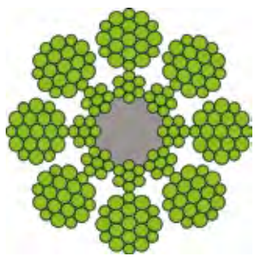
PAWO F3



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
8	0.243	38.0	761208040
9	0.307	48.3	761209033
10	0.385	60.5	761210034
11	0.465	73.4	761211033
12	0.546	86.8	761212033
13	0.650	103.1	761213033
16**	0.981	154.8	761216033
19***	1.376	217.6	761219033
9.5 (3/8")	0.346	54.4	761209533
12.7 (1/2")	0.624	98.3	761212733

Construction
8 × 19 S - IWRC 1570 U sZ
** Can also be used as 5/8"
*** Can also be used as 3/4"

PAWO F7



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
8	0.258	40.6	701208030
10	0.403	63.4	701210030
11	0.485	76.8	701211030
12	0.569	90.7	701212030
13	0.671	105.0	701213030
16**	1.016	160.4	701216030
19***	1.424	225.6	701219030

Construction
8 × 19 W - IWRC 1570 U sZ
** Can also be used as 5/8"
*** Can also be used as 3/4"

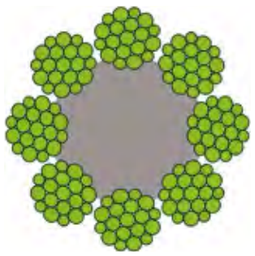
Technical specification
DIN EN 12385, ISO 4344

Material
- GW-Steel wire, bright or galvanized
- Tensile grade 1570 N/mm²
- Liftquality, DIN EN 10264, ISO 4101

Rope diameter
permissible tolerance on the nominal rope diameter
- no load max. 3 % ≤ 10 mm
  max. 2 % > 10 mm
- with load 10 % of F_{min}
  min. –1 % ≤ 10 mm
  min. –1 % > 10 mm

Ropes with fiber core

HyTrac® 2.0



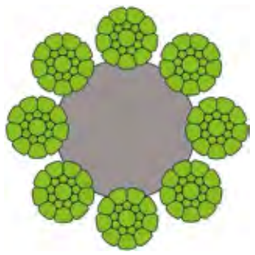
Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
13	0.571	111.0	631213011
16	0.900	180.0	631216011
19	1.200	250.0	631219011

Technical specification
DIN EN 12385, ISO 4344

Material
- GW-Steel wire, bright or galvanized
- tensile grade 1570 N/mm²
- Liftquality, DIN EN 10264, ISO 4101

Rope diameter
permissible tolerance on the nominal rope diameter
- no load max. 3% ≤ 10 mm
  max. 2% > 10 mm
- with load 10% of F_{min}
  min. –1% ≤ 10 mm
  min. –1% > 10 mm

CompactTrac



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]
8	0.200	29.4
9.5	0.320	41.8
12.7	0.630	75.8
16	0.900	119.8

Construction
8 × K19 S* - NFC 1180/1770 U sZ

Technical specification
DIN EN 12385, ISO 4344

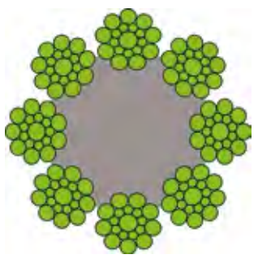
Material
- GW-Steel wire, DIN EN 10264, bright
- Tensile grade of internal wires; 1770 N/mm²
  Tensile grade of external wires; 1180 N/mm²

Rope diameter
permissible tolerance on the nominal rope diameter
- no load max. 6% ≤ 10 mm
  max. 5% > 10 mm
- with load 10% of F_{min}
  min. 0% ≤ 10 mm
  min. 0% > 10 mm

* K19 S = compacted strand in Seale-construction

Ropes with fiber core

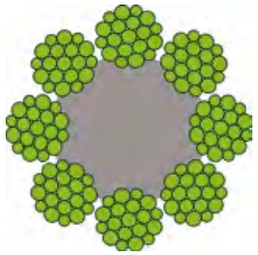
F 819S-FC



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
8	0.215	30.5	621208014
10	0.340	48.2	621210013
11	0.411	58.4	621211013
12	0.488	69.2	621212013
13	0.579	80.7	621213013
16	0.871	121.0	621216013
19	1.218	171.0	621219013

Construction:
8 × 19 S - NFC 1570 U sZ

F 819W-FC



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
8	0.230	32.0	631208012
10	0.350	50.0	631210012
12	0.500	71.3	631212012
13	0.580	82.5	631213012

Construction
8 × 19 W - NFC 1570 U sZ

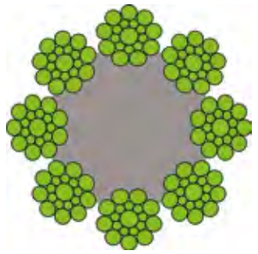
Technical specification
DIN EN 12385, ISO 4344

Material
- GW-Steel wire, bright
- Tensile grade 1570 N/mm²
- Liftquality, DIN EN 10264, ISO 4101

Rope diameter
permissible tolerance on the nominal rope diameter
- no load max. 6% ≤ 10 mm
  max. 5% > 10 mm
- with load 10% of F_{min}
  min. 0% ≤ 10 mm
  min. 0% > 10 mm

Ropes with fiber core

F 819S-FCDT



Nominal rope diameter [mm]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
8	0.220	30.5	621108011
9	0.280	38.4	621109011
10	0.350	48.2	621110011
11	0.430	58.4	621111011
12	0.500	69.2	621112011
13	0.590	80.7	621113011
14	0.680	93.0	621114011
16	0.890	121.0	621116011

Construction
8 × 19 S - NFC 1370/1770 U sZ

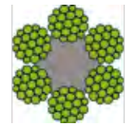
Technical specification
DIN EN 12385, ISO 4344, BS 302 Part 4

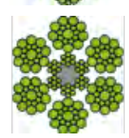
Material
- GW-Steel wire, bright
- Tensile grade of internal wires: 1770 N/mm²
- Tensile grade of external wires: 1370 N/mm²
- Liftquality, DIN EN 10264, ISO 4101

Rope diameter
permissible tolerance on the nominal rope diameter
- see page 41

For special tensile grades like 1180/1770 N/mm² (Traction) or 1670/1960 N/mm² (EHS) see our brochure "Elevator Ropes and Accessories for North America".

Governor ropes





Nominal rope diameter [mm]	Construction	Surface	Tensile grade [N/mm²]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
6.0	**PAWO F1** 6×19 S - SFC	U	1770	0.126	21.0	581306011
6.0	**PAWO F1** 6×19 S - SFC	B	1770	0.126	21.0	585306011
6.0	**PAWO F1** 6×19 S - WSC	B	1770	0.150	25.8	585306030
6.5	**PAWO F1** 6×19 W - SFC	U	1770	0.160	25.8	591306511
6.5	**PAWO F1** 6×19 W - SFC	B	1770	0.160	25.8	595306511
8.0	**PAWO F1** 6×19 W - SFC	U	1770	0.241	37.4	591308011
6.5	**PAWO 819W** 8×19 W - IWRC	U	1770	0.170	31.5	741306531
6.5	**PAWO F3** 6×19 S - IWRC	U	1570	0.161	25.9	761206533

Technical specification
DIN EN 12385

Material
- GW-Steel wire to DIN EN 10264
- bright (U) or galvanized (B)
- Tensile grade 1570 or 1770 N/mm²

Construction
- Regular lay right lay
- slightly lubricated
- Definition of the core: see page 56

Rope diameter
permissible tolerance on the nominal rope diameter
- no load – 0 + 5%

Ropes with electrical conductor

Ropes for Facade Access Platforms with electrical conductor

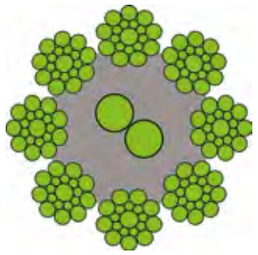
In these highly flexible, galvanized special ropes from Gustav Wolf, electrical conductors are processed inside the rope, which enable to transmit both electrical power and control signals. This makes it possible, without additional cables, to send a signal from the gondola of the facade platform to the drive on the roof, thus setting the gondola or the support arm construction in motion.

To consider:

- End terminals are only possible with rope sockets. Tightly pressed thimbles destroy the E-conductor
- Discard criteria according to ISO 4344 are based on the number of wire breaks. However, special conditions such as weathering should be taken into account. According to TRA 900, a general replacement after 2 or 4 years is recommended. (depending on the design of the system)

NOTE!
Details about the technical data of the used electrical conductors are available on request.

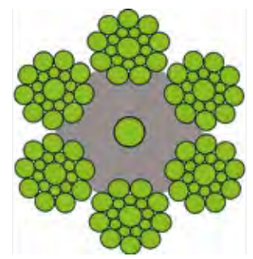
PAWO F4e



Nominal rope diameter [mm]	Electrical conductor (cross section) [mm²]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
6.5	2 × 0.60	0.142	21.9	775306530
6.5	3 × 0.60	0.150	21.9	775306533
7	2 × 0.60	0.172	26.1	775307030
7	2 × 0.96	0.174	26.1	775307036
8	2 × 0.96	0.216	33.2	775308030
8	3 × 0.96	0.223	33.2	775308034
8	2 × 0.60	0.208	33.2	775308036
9	3 × 0.96	0.274	42.3	775309035
10	3 × 0.96	0.332	51.9	775310031
12	3 × 0.96	0.488	80.4	775312032
13	3 × 0.96	0.657	93.1	775313032
9*	2 × 0.96	0.311	42.3	775309030
10*	2 × 0.96	0.374	51.9	775310030
12*	2 × 0.96	0.572	80.4	775312030
13*	2 × 0.96	0.573	93.1	775313030

Construction
8 × 19 S - SFC 1770 B sZ
* Special construction

PAWO F5e



Nominal rope diameter [mm]	Electrical conductor (cross section) [mm²]	Calculated mass [kg/m]	Minimum breaking force [kN]	Part-no.
6.5	1 × 0.96	0.154	24.7	775306532
7	1 × 0.96	0.183	29.6	775307032
8	1 × 0.96	0.232	38.2	775308032
9	1 × 0.96	0.287	48.2	775309032
10	1 × 0.96	0.368	61.9	775310033

Construction
6 × 19 S - SFC 1770 B sZ
Standard construction of the conductor: 1 strand

Technical specification
DIN EN 12385, DIN EN 1808

Material

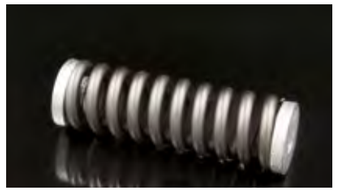
- GW-Steel wire to DIN EN 10264, galvanized
- Tensile grade 1770 N/mm²
- with electrical conductor according to DIN EN 1808 – 10.1.3

Rope diameter
permissible tolerance on the nominal rope diameter

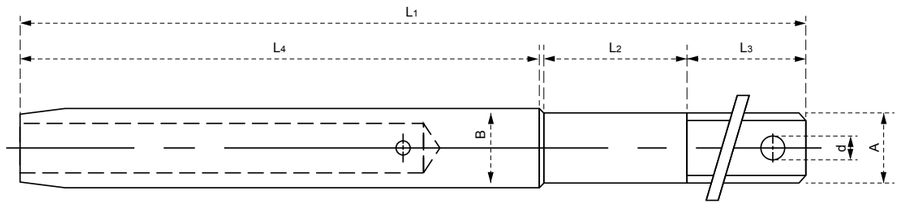
- no load: – 0 + 3%

Traction Media accessories

Traction media accessories



Pressed thread terminal



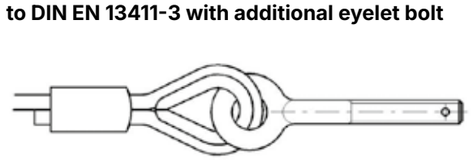
Part-no.	Rope Ø	A Ø	S	L1	L2	L3	L4	B Ø	d
460610140	6	M10	17	208.0	30.0	110	66	12.5	5
4606510140	6.5	M10	17	213.0	30.0	110	71.5	12.5	5
460814225	8	M14	22	314.0	55.0	170	88	15	5
460914225	9	M14	22	325.0	55.0	170	99	15	5
461016225	10	M16	24	336.0	55.0	170	110	18	5
461120250	11	M20	30	371.0	80.0	170	121	20	5
461220250	12	M20	30	382.0	80.0	170	132	20	5
461320250	13	M20	30	394.0	80.0	170	143	22	5
461422300	14	M22	32	456.0	130.0	170	154	25	5
461522300	15	M22	32	467.0	130.0	170	165	25	5
461624300	16	M24	36	478.0	130.0	170	176	32	5

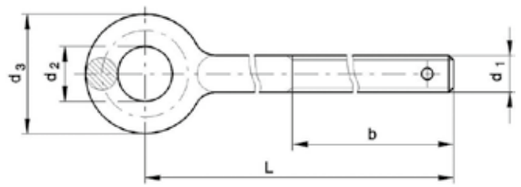
All dimensions in [mm]
The connection is made acc. DIN EN 13411-8
EC-type examination certificate CA455-1 (available on request)

NOTE!
All unspecified units on the following pages refer to the unit of measurement millimeter [mm].

Pressed Thimble with eyelet bolts

Thimble with pressed Z-Sleeve to DIN EN 13411-3 with additional eyelet bolt



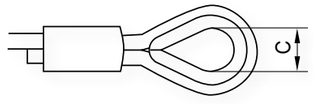


	M12 × 260	M12 × 350	M12 × 500	M16 × 260	M16 × 350	M16 × 500	M20 × 290	M20 × 450	M24 × 400
d_1	12	12	12	16	16	16	20	20	24
d_2	26	26	26	28	28	28	28	28	27
d_3	50	50	50	60	60	60	68	68	65
b	60	150	150	150	200	200	120	200	220
L*	260	350	500	260	350	500	290	450	400
MBF [kN]	42.2	42.2	42.2	78.5	78.5	78.5	122	122	176

* Special lengths for eyelet bolts are available on request
Strength class 5.8 acc. DIN EN ISO 898-1
MBF = Minimum breaking force

Pressed Thimble

Thimble with pressed Z-Sleeve to DIN EN 13411-3

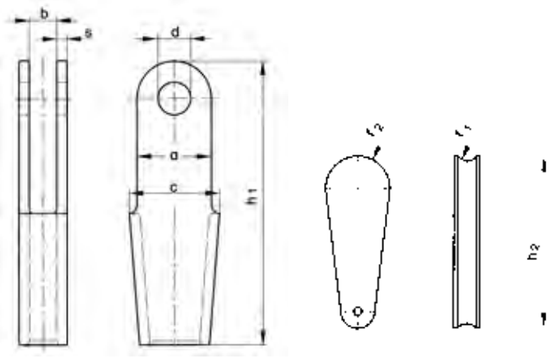


Rope Ø	6-8	9-10	11-12	13-14	15-16	17-18	19-20
Size	8	10	12	14	16	18	20
C	20	25	30	35	40	45	50

NOTE!
The breaking load of the eyelet bolt must be aligned with the breaking force of the applied rope.

Traction media accessories

Rope sockets for lifts
acc. to DIN EN 13411-7

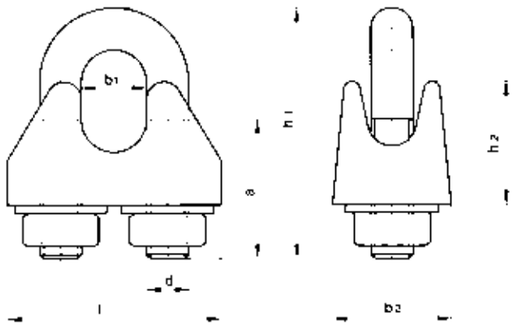


NOTE!
The usage of ropes with a single wire strength > 1770 N/mm² is not appropriated.

Rope Ø	Size	Part-no.	Rope socket housing						Rope wedges		
			a	b	c	d	h1	s	r1	r2	h2
4 – 5	5	ZSSSV05K	26	12	33	10	110	3	2.5	9.5	68
5 – 6.5	6.5	ZSSSV065K	28	10	35	10	100	4	3.25	9.0	58
6 – 8	8	ZSSSV08K	37	14	45	12	150	4	4.0	12.5	92
9 – 11	11	ZSSSV11K	48	17	60	16	190	6	5.5	16.0	117
12 – 14	14	ZSSSV14K	58	22	78	18	230	8	7.0	19.0	141
15 – 17	17	ZSSSV17K	70	25	92	22	260	10	8.5	23.0	162
18 – 20	20	ZSSSV20K	82	27	106	25	300	12	10.0	26.0	186

Complete with wedge, pin and split-pins. The surface is galvanized.

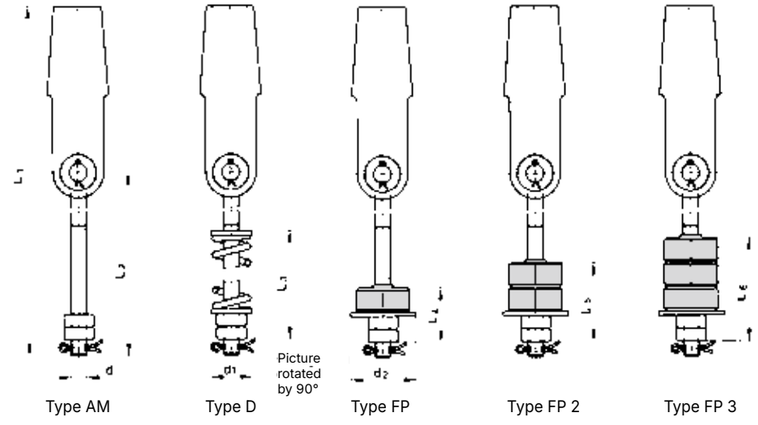
Wire rope clips
similar to DIN EN 13411-5



Nominal size*	Part-no.	a	b1	b2	d	h1	h2	l
5	ZS114205	13	7	13	M 5	25	13	25
6.5	ZS1142065	17	8	16	M 6	32	14	30
8	ZS114208	20	10	20	M 8	41	18	39
10	ZS114210	24	12	20	M 8	46	21	40
12	ZS114212	28	14	24	M 10	56	25	50
14	ZS114214	31	16	28	M 12	66	30	59
16	ZS114216	35	18	32	M 14	76	35	64
19	ZS114219	36	22	32	M 14	83	40	68
22	ZS114222	40	24	34	M 16	96	44	74

* The nominal size corresponds to the maximum rope diameter

Rope suspensions with rope sockets
acc. to DIN EN 13411-7



Type AM | Type D | Type FP | Type FP 2 | Type FP 3

Rope Ø	Size	d	S	L 1	L 2 *	d1	L 3	d2	L 4	L 5	L 6
5 – 6.5	6.5	M 10	17	265	180	25	85.5	35	51	79	107
6 – 8	8	M 12	19	450	320	45	167	50	51	79	107
9 – 11	11	M 16	24	484	320	46	173	58	59	87	115
12 – 14	14	M 20	30	598	400	54	201.5	68	65	93	121
15 – 17	17	M 24	36	674	450	65	248	80	74	102	130
18 – 20	20	M 27	41	760	500	65	254	–	–	–	–

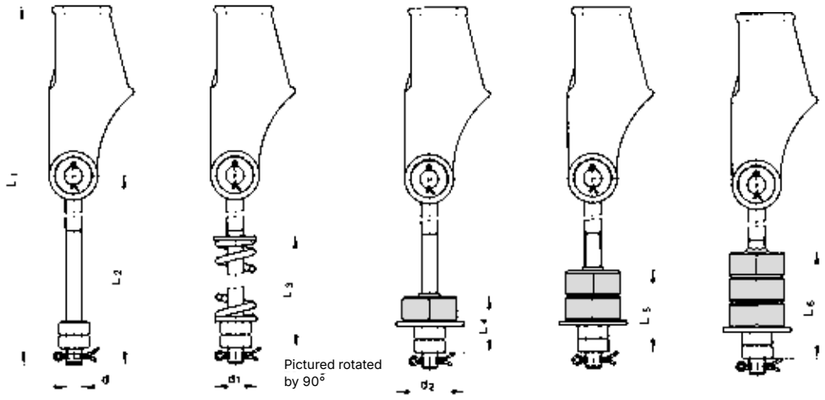
* Special lengths for eye bolts are available on request
The surface of the rope sockets is galvanized.

NOTE!
The breaking load of the eye bolt must be aligned with the breaking force of the applied rope.

Rope Ø	Size	Part-no. Type AM	Part-no. Type D	Part-no. Type FP	Part-no. Type FP2	Part-no. Type FP3
5 – 6.5	6.5	ZSSSA065M	ZSSSA065D	ZSSSA065F	ZSSSA0652	ZSSSA0653
6 – 8	8	ZSSSA08M	ZSSSA08D	ZSSSA08F	ZSSSA082	ZSSSA083
9 – 11	11	ZSSSA11M	ZSSSA11D	ZSSSA11F	ZSSSA112	ZSSSA113
12 – 14	14	ZSSSA14M	ZSSSA14D	ZSSSA14F	ZSSSA142	ZSSSA143
15 – 17	17	ZSSSA17M	ZSSSA17D	ZSSSA17F	ZSSSA172	ZSSSA173
18 – 20	20	ZSSSA20M	ZSSSA20D	–	–	–

Traction media accessories

Rope suspensions with wedge sockets
acc. to DIN 43148



Type AM | Type D | Type FP | Type FP 2 | Type FP 3

Rope Ø	Size	d*	S	L 1	L 2**	d1	L 3	d2	L 4	L 5	L 6
6 – 7	353	M 12	19	430	300	45	167	50	51	79	107
8	352	M 12	19	430	300	45	167	50	51	79	107
9 – 12	351	M 12	19	430	300	45	167	50	51	79	107
10 – 12	402	M 16	24	440	300	46	173	57	59	87	115
12 – 14	401	M 16	24	440	300	46	173	57	59	87	115
12 – 15	450	M 20	30	590	400	54	201.5	68	65	93	121
16 – 17***	–	M 27	41	740	500	65	254	–	–	–	–
18***	–	M 27	41	740	500	65	254	–	–	–	–
19 – 20***	–	M 30	46	740	500	80	251	–	–	–	–

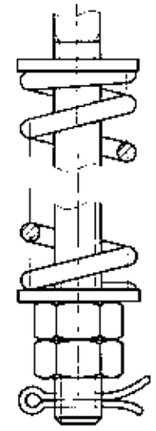
* Screw head is partly not acc. to DIN 444
** Special lengths for eye bolts are available on request
*** Wedge socket in steel casting acc. to DIN EN 13411-6

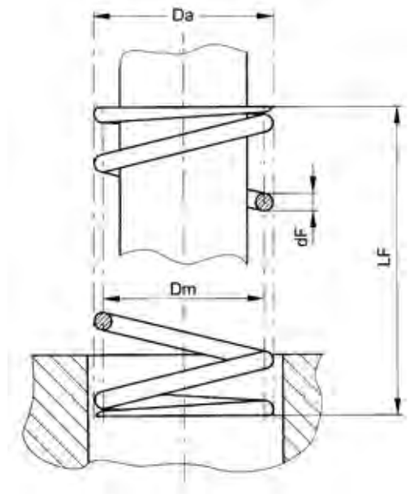
NOTE!
The breaking load of the eye bolt must be aligned with the breaking force of the applied rope.

Rope Ø	Size	Part-no. Type AM	Part-no. Type D	Part-no. Type FP	Part-no. Type FP2	Part-no. Type FP3
6 – 7	353	ZSSSA353M	ZSSSA353D	ZSSSA353F	ZSSSA3532	ZSSSA3533
8	352	ZSSSA352M	ZSSSA352D	ZSSSA352F	ZSSSA3522	ZSSSA3523
9 – 12	351	ZSSSA351M	ZSSSA351D	ZSSSA351F	ZSSSA3512	ZSSSA3513
10 – 12	402	ZSSSA402M	ZSSSA402D	ZSSSA402F	ZSSSA4022	ZSSSA4023
12 – 14	401	ZSSSA401M	ZSSSA401D	ZSSSA401F	ZSSSA4012	ZSSSA4013
12 – 15	450	ZSSSA450M	ZSSSA450D	ZSSSA450F	ZSSSA4502	ZSSSA4503

Pressure springs for rope suspensions

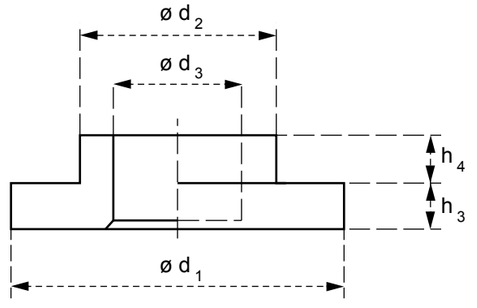
Da Outer diameter (mm)
Dm Mid thread diameter (mm)
dF Diameter spring wire (mm)
LF Unstressed length (mm)
F Elastic force (N)
s Range of spring (mm)
c Spring rate constant (N/mm)





Description	Da	Dm	dF	LF	F	s	c	For eye bolt
Spring I	23.5	19	4.5	61.5	1703	21	81	M 10
Spring II	43	35.5	7.5	135	3382	47	72	M 12
Spring III	46	37	9	135	5930	40.5	146	M 16
Spring IV	53	42	11	157.5	9383	42	223	M 20
Spring V	65	50	15	190	14880	32.5	458	M 24 / M 27
Spring VI	81	62	19	149	33081	26.9	1228.8	M 30

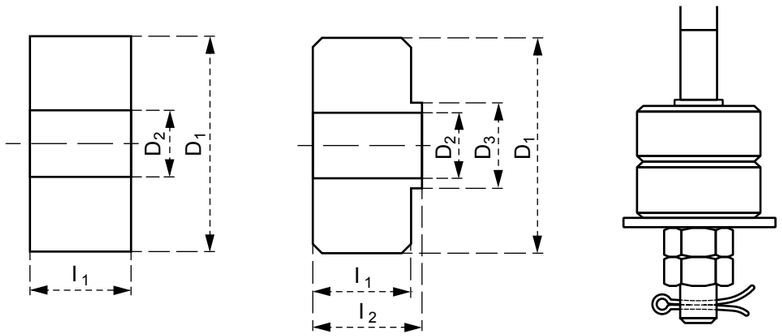
Spring collars for pressure springs



Description	d1	d2	d3	h3	h4	For eye bolt
Spring I	25	–	10.5	4	–	M 10
Spring II	45	26	12.5	7	8	M 12
Spring III	45	26	17	8	9	M 16
Spring IV	54	30	21	8.5	10	M 20
Spring V	65	34	25	10	6	M 24
Spring V	65	34	28	10	6	M 27
Spring VI	80	42	31	12	12	M 30

Traction media accessories

Spring buffers for rope suspensions



Rope Ø	Size	Note	For eye bolt	D1	D2	D3	l1	l2	F	Washers
5 – 6.5	5 – 6.5	OB	M 10	35	11		28		3500	36.5 × 13 × 3
6 – 8	8	MB	M 12	50	13	22	28	33	6867	50 × 13 × 3
6 – 8	8	OB	M 12	50	13		28		6867	50 × 13 × 3
9 – 11	11	MB	M 16	50	17	22	28	33	6867	56 × 17.5 × 5
9 – 11	11	OB	M 16	50	17		28		6867	56 × 17.5 × 5
12 – 14	14	MB	M 20	65	21	27	28	33	11772	68 × 22 × 5
12 – 14	14	OB	M 20	65	21		28		11772	68 × 22 × 5
15 – 17	17	MB	M 24	80	25	27	28	33	17658	85 × 24 × 8
15 – 17	17	OB	M 24	80	25		28		17658	85 × 24 × 8

MB = with collar OB = without collar

Set of accessories for pressed eyelet bolts

Type FP, FP2, FP3

Type D

Rope Ø	Size	For eye let bolt	Part-no. Type AM	Part-no. Type D	Part-no. Type FP	Part-no. Type FP2	Part-no. Type FP3
5 – 6.5	6.5	M 10	45ZOESM10	45065D000	45065FP00	45065FP20	45065FP30
6 – 8	8	M 12	45ZOESM12	45080D000	45080FP00	45080FP20	45080FP30
9 – 11	11	M 16	45ZOESM16	45110D000	45110FP00	45110FP20	45110FP30
12 – 14	14	M 20	45ZOESM20	45140D000	45140FP00	45140FP20	45140FP30
15 – 17	17	M 24	45ZOESM24	45170D000	45170FP00	45170FP20	45170FP30
18 – 20	20	M 27	–	45200D000	–	–	–

Item is galvanized

Suspension FlatTrac®

Suspension with wedge socket size 30 and eyebolt M12×320

Nominal width [mm]	d	L1	L2	d1	L3
30	M12	481	320	45	167

Type	Part-no.
AM	ZBSSFT30M
D	ZBSSFT30D

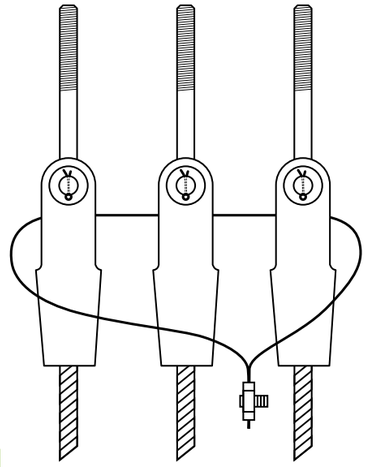
Type
AM

Type
D

Anti Twist Protection Set

We recommend a maximum untwist of 0.5 rotation per 10 m.
(for 1:1 reeving, free rope length / for ropes with NFC max. 1 rotation per 10 m are accepted)

In order to avoid subsequent untwisting of the ropes after installation the use of **anti-twist protection** is recommended. After proper adjustment of the rope tension the anti-twisting rope should be attached to the termination of the hoist ropes.



Scope of delivery	Part-no.
2 × 1 m ø 2.5 mm steel wire rope 4 wire rope clamps	45ZSVERDS2

Rope tension measurement

Rope tension

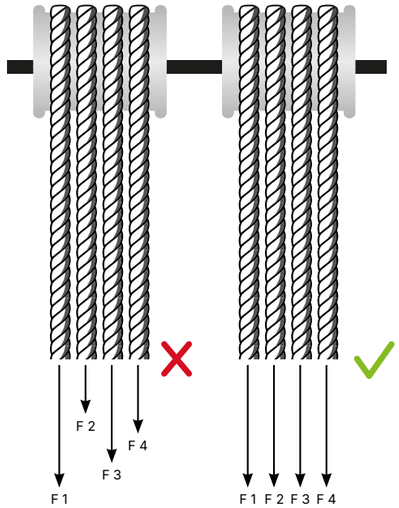
The improper installation of hoist ropes can considerably influence their service life. If the load and thereby the tension on the ropes is not equally distributed on all ropes then the service life of individual ropes can be dramatically reduced. In order to avoid this condition our **rope tension measuring device** can be of service. The system measures the hoist rope tension with individual sensors which are attached to each rope. The real time tension on each rope is shown on a portable LCD touch-screen unit. The system calculates automatically an average value so that the rope tension can be equally adjus-ted on all ropes. This information can be displayed and saved on your computer by using the enclosed USB cable and software.

Scope of delivery	Part-no.
Evaluation unit with touch screen, Bluetooth, 4 GB memory, 6.75 Ah battery capacity	ZSSMGUNIT
Plastic case incl. 4 sensors for rope-ø 6 – 16 mm. The case can hold up to 10 sensors, 1 × USB cable incl. power supply, 1 x computer software	ZSSMGKIT1
Protection cover for the evaluation unit (optional)	ZSSMGCOVE

The last three items are recommended as a basic package.
Please contact us if you require additional/different sensors!

NOTE!
Nowadays, elevator maintenance companies are confronted with increasing demands by the authorities, building owners etc. to provide more data on rope installations and rope maintenance. This device is essential in this regard.

The free-of-charge App **MSM Wizard** (currently only available for Android) makes it possible – in combination with the evaluation unit – to transfer the rope tension figures via Bluetooth to your cell phone. Note that this App has read access only – the user cannot change the numbers. This tool is especially helpful in elevator installations with a 2:1 roping arrangement, i.e. the rope terminations are located in the machine room, but sensors and evaluation unit are required to be suspended in the shaft for measuring the rope tension. It will no longer be necessary to change your location to record the modified tension values nor will a second person need to take the readings. Hence, the user can save a considerable amount of time and cost.



Additional details can be found in the user manual.

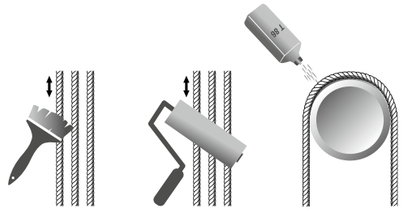
Rope lubricant

The following re-lubricates are available:

T86 for manual re-lubrication

T10 for automatic and manual re-lubrication

Our lubricants are a very thin fluid and absorbs readily into the rope interior. They can be applied easily and cleanly with a brush (for T10 also with a roller) or sprayed on with the handy 1 liter bottle. The rope lubricant should be applied within the range of where the ropes are in contact with the traction and/or deflection sheaves when possible since the rope "opens" there due to the deflection which permits the rope lubricant to more easily flow into the rope interior.



T86

T86 contains solvent. The flash point is 60°C and after evaporation of the solvent it is 235°C.

Product	Part-no.
1 liter	4500T8601
5 liter	4500T8605

Quantity of re-lubrication [recommendation]

T86 l/100m rope*	Ø 8 mm	Ø 10 mm	Ø 13 mm	Ø 16 mm	Ø 19 mm
Natural Fiber core rope	0.16	0.32	0.56	0.80	1.10
Mixed Steel core rope	0.16	0.32	0.56	0.80	1.10
Full steel core rope	0.16	0.32	0.56	0.80	1.10

* After the evaporation of the solvent approximately 50 % of the above mentioned amount of lubricant remains in the rope.

NOTE!
For the application of T86 or T10 we refer to the corresponding material safety data sheet and the mentioned notes about the safe handling of this product.The material safety data sheet (MSDS) can be downloaded from our homepage at www. gustav-wolf.de.

T10

Product	Part-no.
1 liter	4500T1001
5 liter	4500T1005

NOTE:
solvent-free · Suitable for AUTOMATIC Inbrication system also.

Quantity of re-lubrication [recommendation]

T10 l/100m rope**	Ø 8 mm	Ø 10 mm	Ø 13 mm	Ø 16 mm	Ø 19 mm
Natural fiber core rope	0.08	0.16	0.28	0.40	0.55
Mixed steel core rope	0.08	0.16	0.28	0.40	0.55
Full steel core rope	0.08	0.16	0.28	0.40	0.55

** The values are valid for the manual re-lubrication.

Re-lubrication Device GW-Lub

Dry, unlubricated ropes belongs to the past with this device. With the **GW-Lub** re-lubrication system the lubricant can be applied easily and specifically to the ropes. In combination with the **solvent-free** lubricant

T10 you can increase the life time of your ropes significantly. The adjustable lubricant dispenser can distribute over a time span of up to 12 months continuously the lubricant equally and properly over the special brushes to the ropes. The effort for maintenance, the costly, manual re-lubrication and the follow-up cost for re-roping can be reduced.

Scope of delivery	Part-no.
2pcs cartridge (125ml) with lubricant T10 2pcs brushes to apply the lubricant 2pcs fittings (screw connections) 1pcs bracket	45T100KIT

Spare parts	Part-no.
Cartridge (125ml) with lubricant T10	45T100125
Brush to apply the lubricant	45T10B100
Fittings (screw connections)	45T10NIPP
Bracket	45T10HALT

Additional details can be found in the user manual.

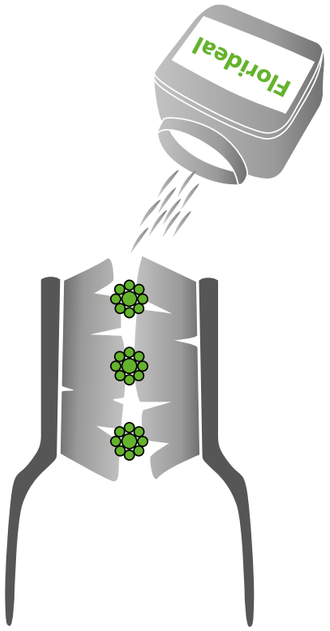
Rope degreasing

Florideal degreasing powder

It is possible that over application of rope lubricant can lead to slippage of the ropes on the traction sheave. With our Florideal you can correct this condition. The powder adheres to the excessive rope lubricant and can then be cleaned up.

The powder should be applied as follows in order to avoid the coverage of the complete installation (due to the air draft in the elevator shaft):

Position a hand broom on each side of the rope. Apply the powder on top of the hand brooms and let the rope slowly slip through them. This way the ropes assimilate the powder. After the excessive lubricant is absorbed, the agglutinated powder has to be removed from the ropes with a wire brush.



Product	Part-no.
1 liter	45FLORIDE

NOTE!
In no case should the ropes be treated with a cleaning agent containing solvent. The solvent penetrates the rope and partially dissolves the lubricant inside the rope which results in the additional escape of lubricant. Thereby the possible chance of rope slippage is increased.

The last three items are recommended as a basic package.
Please contact us if you require additional/different sensors!

Compensation chains

Compensation Chains

Weight Compensation chain

The PVC-coated chain serves as a weight compensation for the suspension ropes to achieve an even distribution of force of the ropes on the traction sheave.

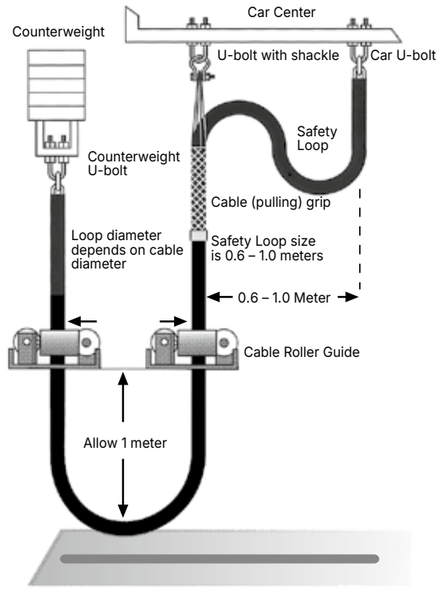
This type of coated chain as weight compensation run due to their larger and more uniform loop than bare chains or chains with sash cord. These coated chains minimize vibrations and problems with the car balance.

Construction

1. Chain – Low carbon, welded proof coil chain.
2. Jacket – A high-quality polyvinyl chloride PVC* adds mass and forms a round cross-section.

Application

Acc. to the DIN EN 81-20 (Pos. 5.5.6) it is allowed to use Compensation Chains for a speed up to 3.0 m/s only.



* The chains are not halogen-free! PVC contains chloride which can be classified as a halogen.

Product selection

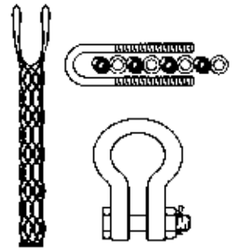
Part-no.	Size	Total weight [kg/m]	Diameter [mm]	Max. hang length [m]	Loop diameter * [mm]
420112044	CC075	1.12	24	160	610
420149044	CC10	1.49	27	160	610
420224044	CC15	2.24	32	130	610
420298044	CC20	2.98	38	160	660
420373044	CC25	3.73	47	140	660
420447044	CC30	4.47	47	150	660
420522044	CC35	5.22	52	150	690
420596044	CC40	5.96	59	150	690

* Measured from middle of the chain to middle of the chain (deviation of ±10% possible)

Installation kits

Part-no.	Size
420IK0750	CC05
420IK1000	CC10
420IK1500	CC15
420IK2000	CC20
420IK2500	CC25
420IK3000	CC30
420IK3500	CC35
420IK4000	CC40

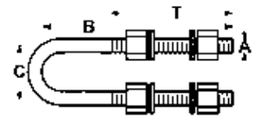
Each installation hardware kit includes:
3 U-Bolt (includes nuts, and washers),
1 shackle, 1 heavy duty grip.



Steel u-bolt

Part-no.	For use on cable	A	B	C	T	MBF [kN]
420UB1075	CC075	6.0	120	50	75	13.8
420UB1500	CC15 & CC10	8.0	120	50	75	22.2
420UB2000	CC20	10.0	120	50	75	36.7
420UB2530	CC25 & CC30	12.0	120	50	75	57.1
420UB3540	CC35 & CC40	14.0	120	50	75	74.7

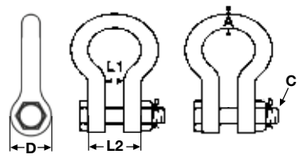
All dimensions in [mm]



Steel shackle

Part-no.	for use on cable	A	C	D	L1	L2	MBF [kN]
420SCH1075	CC10 & CC75	12.0	M8 × 45	23	12.5	28.5	22.2
420SCH1520	CC15 & CC20	12.0	M10 × 50	23	12.5	28.5	36.7
420SCH2530	CC25 & CC30	12.0	M12 × 50	23	12.5	28.5	57.1
420SCH3540	CC35 & CC40	16.0	M14 × 60	27	18.0	36.0	74.7

MBF = Minimum breaking force

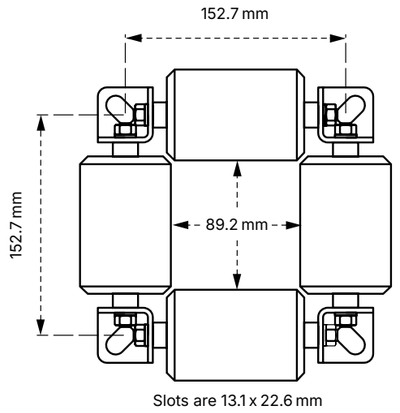


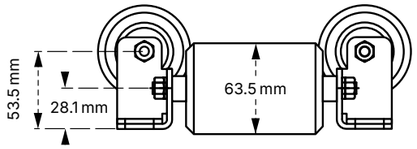
Roller guides for compensation chains

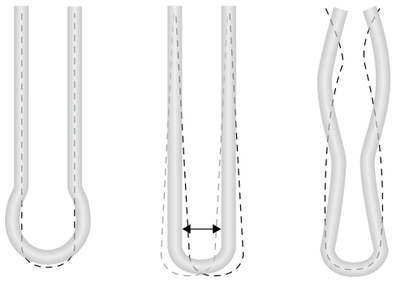
Super Swayless Dampening Device

Part-no. 420000062

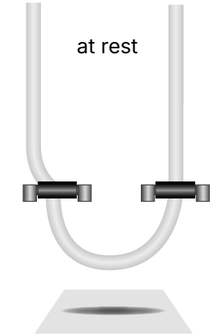
For elevator speeds over 350 ft./min. and up to 490 ft./min. (1.75 m/sec to 3.50m/sec), a roller guidance system must be used. Thus chains oscillations or swayings of the chain can be reduced or avoided totally which are caused by starts and stops of the elevator or wind in the elevator shaft.



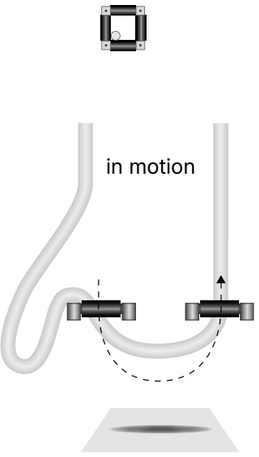


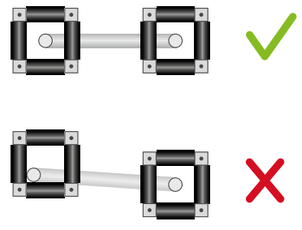


These rollers also help to maintain the natural loop of the compensating cable. For the installation of the roller guides you have to pay attention that the chain is running centered in the guides. Otherwise it could happen, that the chain will be lifted up out of the guides and get damaged.



cable not centered





Technical information

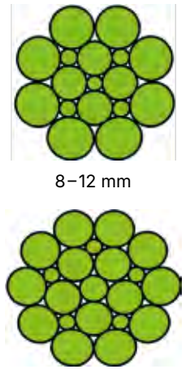
Important rope terms

Strand construction

Seale (S) 1-9-9
The thicker wires of the outer strand layer provide greater wear resistance. Ropes with such strands are mainly used when the rope service life is more strongly impac-ted by abrasion than by rope fatigue due to bending.
» PAWO F3, F819 S-FC, F819 S-FC DT

Warrington (W) 1-6-6-6
With its more, thinner outer wires the Warrington construction is more flexible and better resists fatigue bending than the Seale construction. Ropes with such strands are often used where the service life of the rope is strongly influenced by fatigue due to bending and smaller sheaves than by abrasion of the outer wires.
» PAWO F7S, PAWO F7, F819 W-FC, PAWO 819W

Filler (F) 1-4-4-8 or 1-5-5-10
This construction employs the advantages of both priormentioned strand types. It has more thinner wires for flexibility, a higher metallic cross section for greater breaking strength and thicker outer wires to fight against abrasion. Ropes with such strands are being used in high-rise/high-speed elevators which demand the most in the areas of elongation, round cross-section, flexibil-ity, fatigue resistance and breaking strength.
» PAWO F10



8–12 mm

13–20 mm

Type of core

- FC Fiber core
- NFC Natural fiber core
- SFC Synthetic fiber core
- WSC Wire strand core
- IWRC Independent wire rope core
- PWRC Wire rope core in parallel roping

Surface

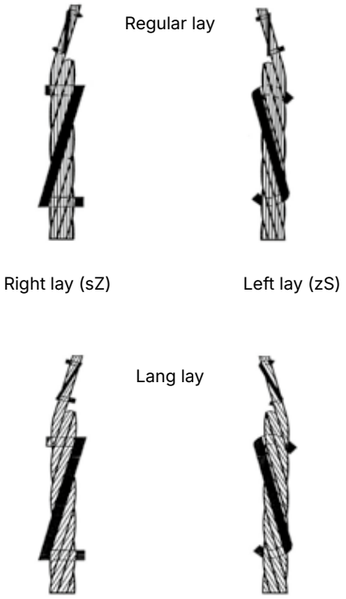
- U ungalvanized
- B galvanized (class B)

Direction and type of lay

Direction of lay
The direction of lay for the strands is the direc-tion of the helix of the wires within the strands. The direction of lay for the ro pe is the direction of the helix of the outer strands within the rope.

Type of lay
Regular lay: the wires in the outer strands have the opposite direction of the outer strands in the rope.
Lang lay: the wires in the outer strands have the same direction as the outer strands in the rope.

NOTE!
The information men-tioned on page 72+73 are extracts of the standard DIN EN 12385-2 and illustrate the most important items for elevator ropes. Further details can be found in the standard DIN EN 12385-2.



Example for the composition of the rope terms

10 8×19 W-IWRC 1570 U sZ

Nominal rope-Ø [mm]
Rope class [8 outer strands with 19 wires each]
Strand construction
Type of core
Tensile grade [N/mm²]
Surface
Direction and type of lay

Discarding criteria

Elevator ropes are discarded on account of wire breaks, wear and/or diameter reduction. During evaluation, corrosion, rope deformation or excessive elongation should also be taken into account.

Regarding discardation, DIN EN 12385 points to ISO 4344.

Wire break replacement criteria

to ISO 4344

Rope specifications	Number of load bearing wires	Rope class	Replace ropes or examine within a specified period as stated by an authorised expert				Discard rope immediately			
			Case 1	Case 2	Case 3	Case 4	Case 1	Case 2	Case 3	Case 4
F 819S-FC	152	8 × 19	>15	> 8	≤ 4	≤ 1	> 30	>10	> 4	> 1
F 819W-FC	152	8 × 19	>15	> 8	4	1	> 30	>10	4	1
F 819S-FCDT	152	8 × 19	>15	> 8	4	1	> 30	>10	4	1
PAWO F 3	6.5 mm	114	6 × 19	>12	> 6	4	1	> 24	> 8	4	1
	7 – 20 mm	152	8 × 19	>15	> 8	4	1	> 30	>10	4	1
PAWO F7		152	8 × 19	>15	> 8	4	1	> 30	>10	4	1
PAWO F7S		152	8 × 19	>15	> 8	4	1	> 30	>10	4	1
PAWO F10	8 – 12 mm	117	9 × 13	>12	> 6	4	1	> 23	> 8	4	1
	13 – 20 mm	144	9 × 16	>14	> 8	4	1	> 28	>10	4	1
PAWO 819W		152	8 × 19	>15	> 8	4	1	> 30	>10	4	1
PAWO 836WS		288	8 × 36	> 24	>12	4	1	> 48	>18	4	1
PAWO F4e		152	8 × 19	>15	> 8	4	1	> 30	>10	4	1
PAWO F5e		114	6 × 19	>12	> 6	4	1	> 24	> 8	4	1
PAWO F 1		114	6 × 19	>12	> 6	4	1	> 24	> 8	4	1
		114	6 × 19	>12	> 6	4	1	> 24	> 8	4	1
		152	8 × 19	>15	> 8	4	1	> 30	>10	4	1

Case 1 Broken wires randomly distributed among other strands per rope lay*

Case 2 Broken wires predominating in one or two outer strands per rope lay*

Case 3 Adjacent broken wires in one outer strand

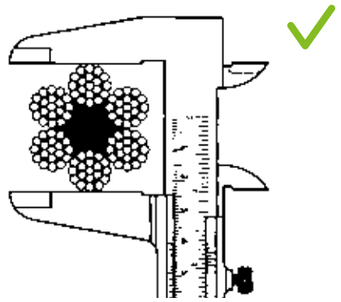
Case 4 Valley breaks per rope lay*

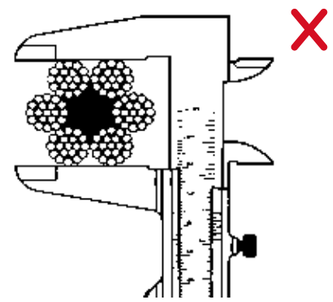
* The length of one rope lay is approxymately equivalent to 6 x d
(where d is the nominal rope diameter)

Diameter reduction

Following the recommendations of ISO 4344, ropes should be discarded in case of a diameter reduction by 6 % in relation to the nominal diameter.

NOTE!
A caliper with bigger jaws can help to avoid measurement faults.



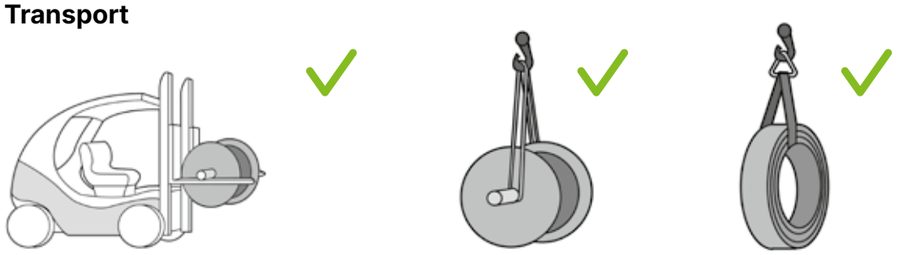


To measure the rope diameter

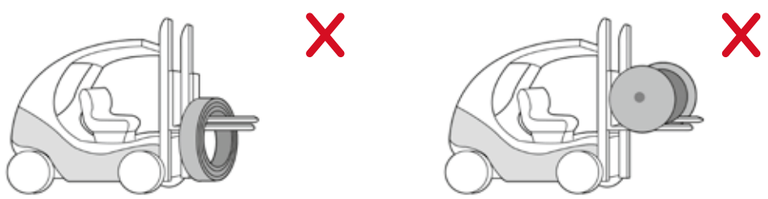
NOTE!
For ropes in lang lay only half of the numbers of wire breaks from the table on page 48 have to be applied.

Handling

Transport

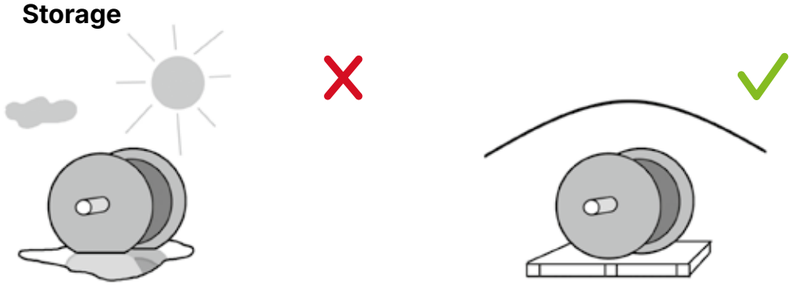


For transportation you have to use suitable accessories like slings, axes or pallets.



Avoid the contact with hard surfaces or edges. This can cause damages to the ropes.

Storage

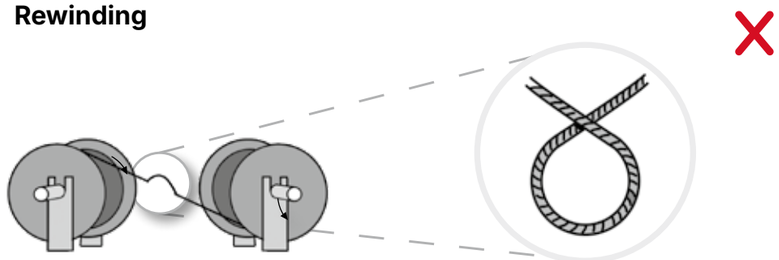


Ropes have to be stored dry and clean. Ideally in a suitable hall. Use pallets as underlay.
Moisture (rain, condensate, etc.) and/or direct insolation have to be avoided.

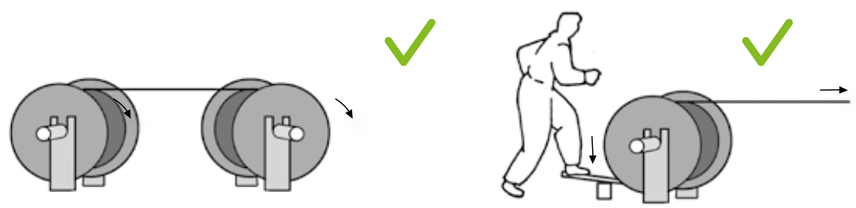
Installation

Avoid pulling the rope over sharp edges. This generates twist in the rope and causes
a spiral deformation or kinks.

Rewinding



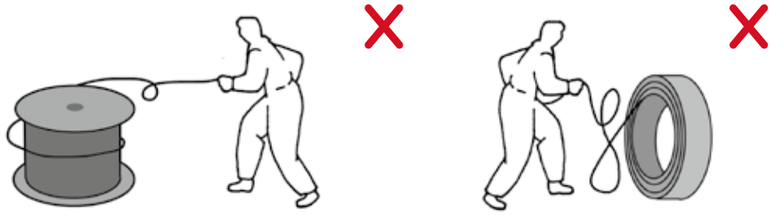
No reveres bending’s to avoid kinks.



A certain pre-tension has to be maintained.

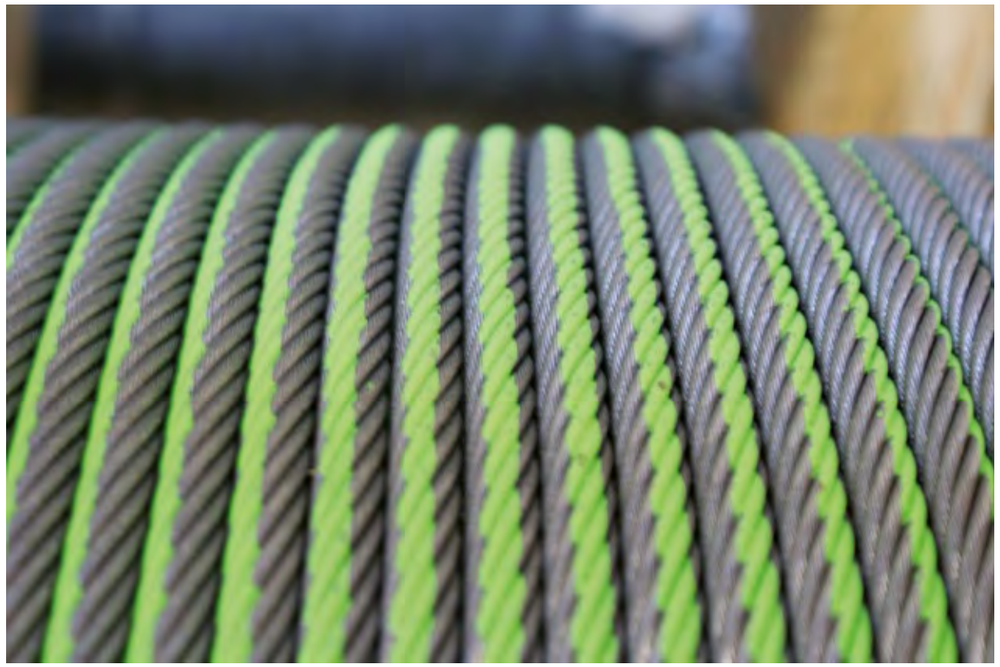
Uncoiling

Uncoiling of a wire ropes has to be done by rolling the ropes.



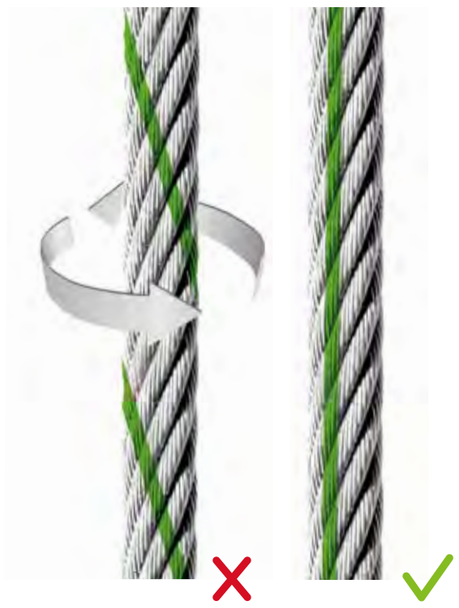
Never pull the ropes laterally from a coil or reel. This generates twist in the rope and causes kinks.
Don’t pay-off ropes on a dusty or dirty underground.

Rope twist



Rope untwist

It is important to pay attention during installation that the ropes do not untwist, otherwise the rope structure can be weakened and the rope life reduced. In order to avoid and/or correct untwisting we have applied a surface line to all our ropes which aid the installers in determining if and how much the ropes may have untwisted during installation.



Rope lubrication

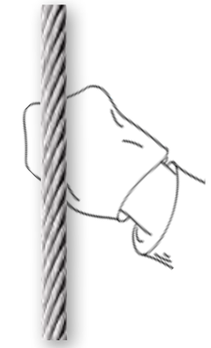
Re-lubrication

These days, rope re-lubrication is playing an important role. Elevator ropes are exposed to higher usage and stresses in modern elevators than before. Smaller traction sheaves are being used, rope pressure in the grooves is higher, the speed is accelerating ...

Gustav Wolf elevator ropes are carefully lubricated during production. During operation and over time the factory-provided lubricant is reduced as the lubricant is used up. A timely and regular re-lubrication of the elevator ropes is therefore mandatory.

Re-lubrication of wire ropes is crucial to protect the rope from humidity, oxidation/corrosion and abrasion as well as to prolong life time of rope, drive sheave and diverter pulleys.

Dry ropes can have up to an 80 % shorter service life than sufficiently lubricated ropes!!!



How to determine if re-lubrication is necessary?

The state of the lubrication can usually be checked by running a cloth (or a finger) over the surface of the rope. If there is no oily film on the cloth a relubrication is highly recommended. If only a slight lubricating film is visible, which does not feel oily, a slight re-lubrication is recommended.

Recommendation for re-lubrication

The before described, manual check by finger/cloth might not be suitable enough, if the elevator is highly frequented. **Cycle counts** has to be considered when you are deciding about the right time to re-lubricate.

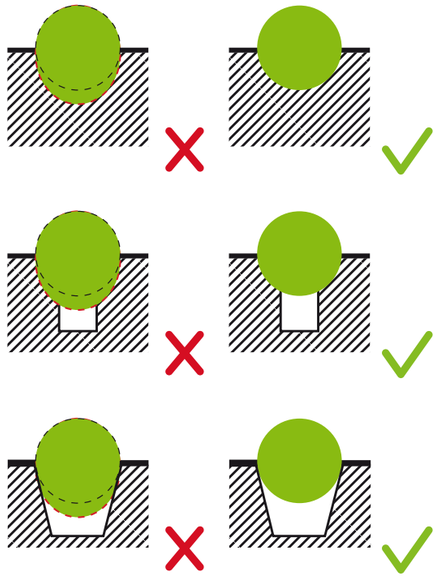
Re-Lubrication shall be carried out in any case on an annual basis (preferably in spring, not before winter) OR after 250.000 cycles, whichever occurs first.

The efforts of manual re-lubrication, associated system downtime and costs can be effectively minimized or avoided by means of automatic re-lubrication system. A technical solution, comprising full compatibility with the Gustav Wolf base lubricant is our automatic, continuous re-lubrication system **GW-Lub** (see page 60).

Groove condition / Equality of Lots

Groove condition – Checking the groove shape

The condition of the groove in the traction sheave is extremely important. Through friction with the rope, both the rope diameterand and the groove shape are changed. A new rope generally has a larger diameter and may not fit into the existing groove, as the shape of the groove has changed through frequent use. This means that it is advisable to check the groove shape (e.g. with a radiuses gauge) before each use. If the deviation from the ideal shape is too great, the traction sheave must be replaced or reset.



Equality of Lots

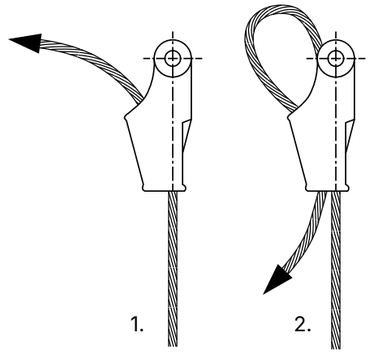
As a machine element, ropes are linked to tolerances, influenced by the individual wires and cores. The relevant standards specify such tolerances by explicitly referencing them. As a result, each production lot may show slight variations with regard to rope diameter, actual breaking force and elongation properties.

This is why we strongly recommend to always select ropes for an individual elevator installation from the same production lot. Following this recommendation will facilitate the achieving of an even rope tension, reducing uneven run over traction sheaves and pulleys as well as variation in the elongation behavior of individual ropes while in service.

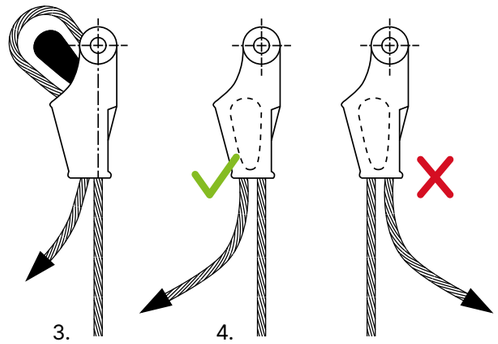
Replacing a single rope in a set of ropes in operation must therefore be avoided in all cases.

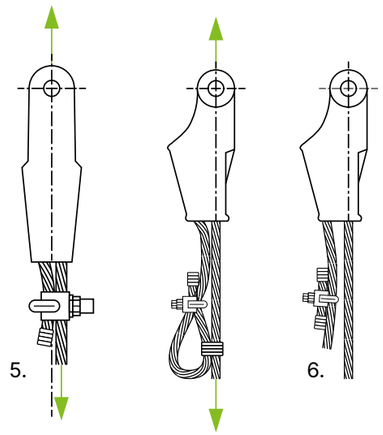
Installation Wedge Socket

For the installation of a wedge socket you have to consider the correct position of the hoist rope. See the below photo series. For a wedge socket, the direction of the forces from the rope and the wedge housing lies on the same axis (pic. 6).
For a rope socket, it is easier due to the symmetric form of the socket since the change in the position of the hoist rope has no negative influence. The direction of the forces from rope and rope sockets doesn't lie on the same axis (pic. 5)



1. Run the rope down through the wedge socket body.
2. Thread the rope 'dead' end back up through the top of the wedge socket body. Leave a loop of rope just large enough to insert the wedge.
3. Insert the wedge into the loop.
4. Pull down on the rope with one hand to keep it taut. Use a quick pull on the dead end to seat the wedge.
5. Install one wire rope clip to hold the dead end in place (pic. 6). Wire rope clips bear no load – they are used only to keep the rope and wedge in place should there be a momentary loss of tension.

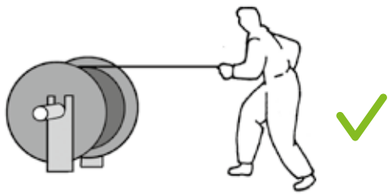


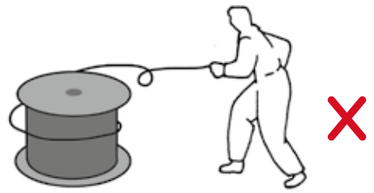


NOTE!
The securing of the rope 'dead' end conforming to the standards is made differently for symmetric rope sockets and asymmetric wedge sockets (pic. 5 + 6).

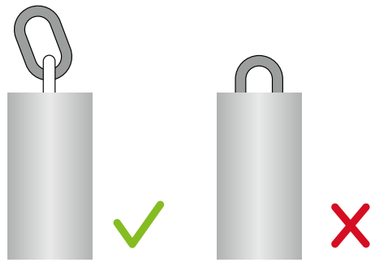
Installation of compensation chains

Exactly like for ropes the uncoiling of the chains has to be done rolling. Otherwise this causes twist in the chain.



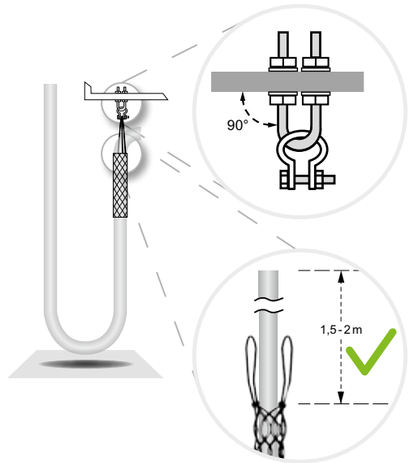


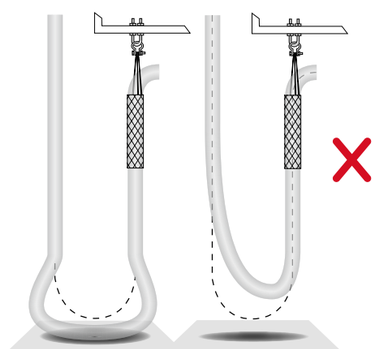
To realise a proper installation, there should be 1½ chain links uninsulated.



Make sure that the U-bolt is fightly held at a 90° angel to the car frame.

Place the mesh grip over the end of the chain that will be attached to the car. Position the grip so that the top of the weave is between 1.5–2 m from the free end of the chain. Hang the grip from the shackle. Adjust as needed so that the chain hangs freely at least 15 cm above the pit floor and forms a „relaxed“ loop.





Certificates

Quality

Quality is a well-integrated component of our company policy and deeply routed in our guide-lines. Being aware of quality is exemplified through a constant dialogue with our staff.

The company-owned well equipped laboratories closely monitor the whole production process by performing reception control, control of the semifinished product and, of course, pre-shipment control.

Certificates

For many years, Gustav Wolf has established a comprehensive QA System. Every member of the group has been certified by the TÜV body as per DIN EN ISO 9001 and DIN EN ISO 14001.

Packaging

Cut-to-length traction ropes on wooden spools

Traction ropes in coils, bundled

Meter lengths on large reel

GENERAL INFORMATION!
Unless otherwise agreed, our General Terms of Sale and Delivery prevail and are subject to change without notice.

All representations of pictures, products, standards and designs, as well as information on availability are current as of publication date.

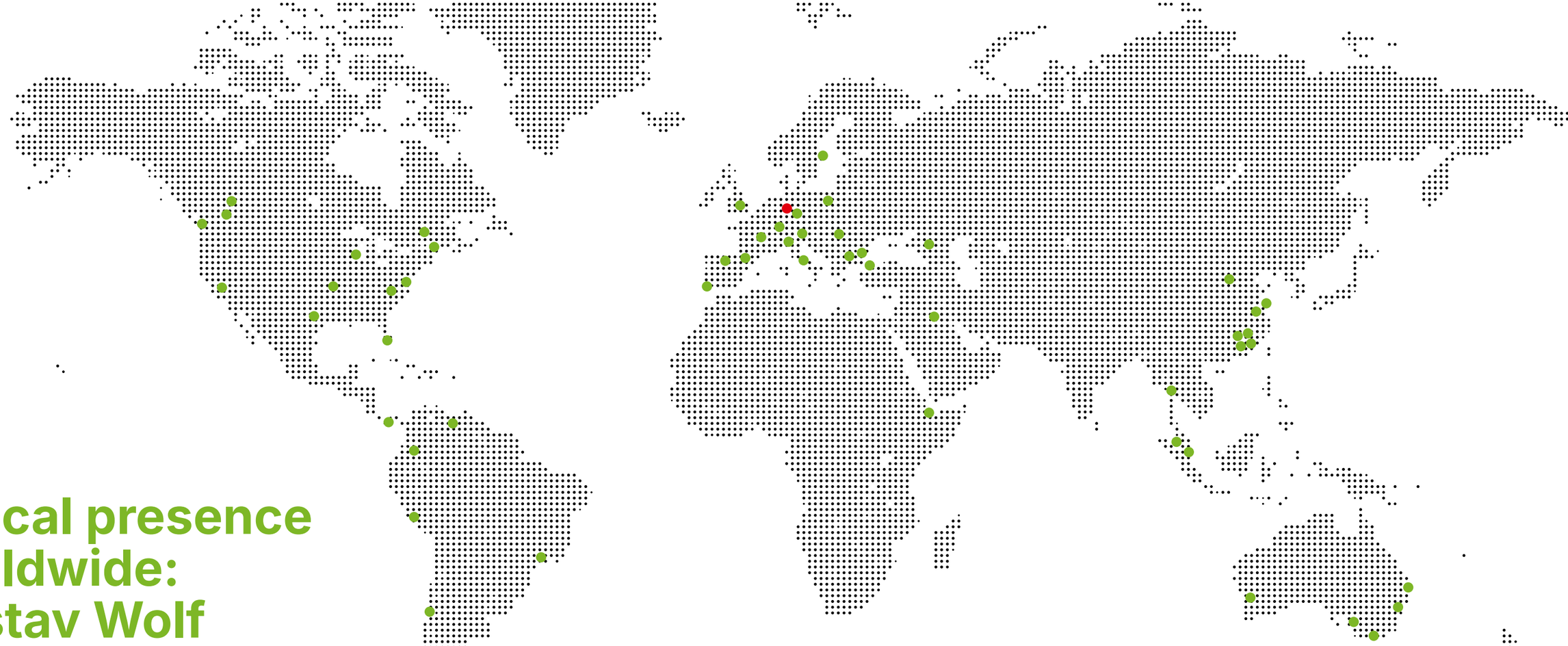
We do not take any responsibility for the correctness of the dimensions indicated herein.

The technical data from these brochure as further other information can be found on the internet at www.gustav-wolf.de.

With the publication of this catalogue, all older versions cease to be valid. We do not assume any responsibility for printing errors or mistakes.

Our written consent is required for any reprint, reproduction or dissemination of this catalogue or parts of it.

Each set of elevator ropes packed in a cardboard box on a one-way pallet



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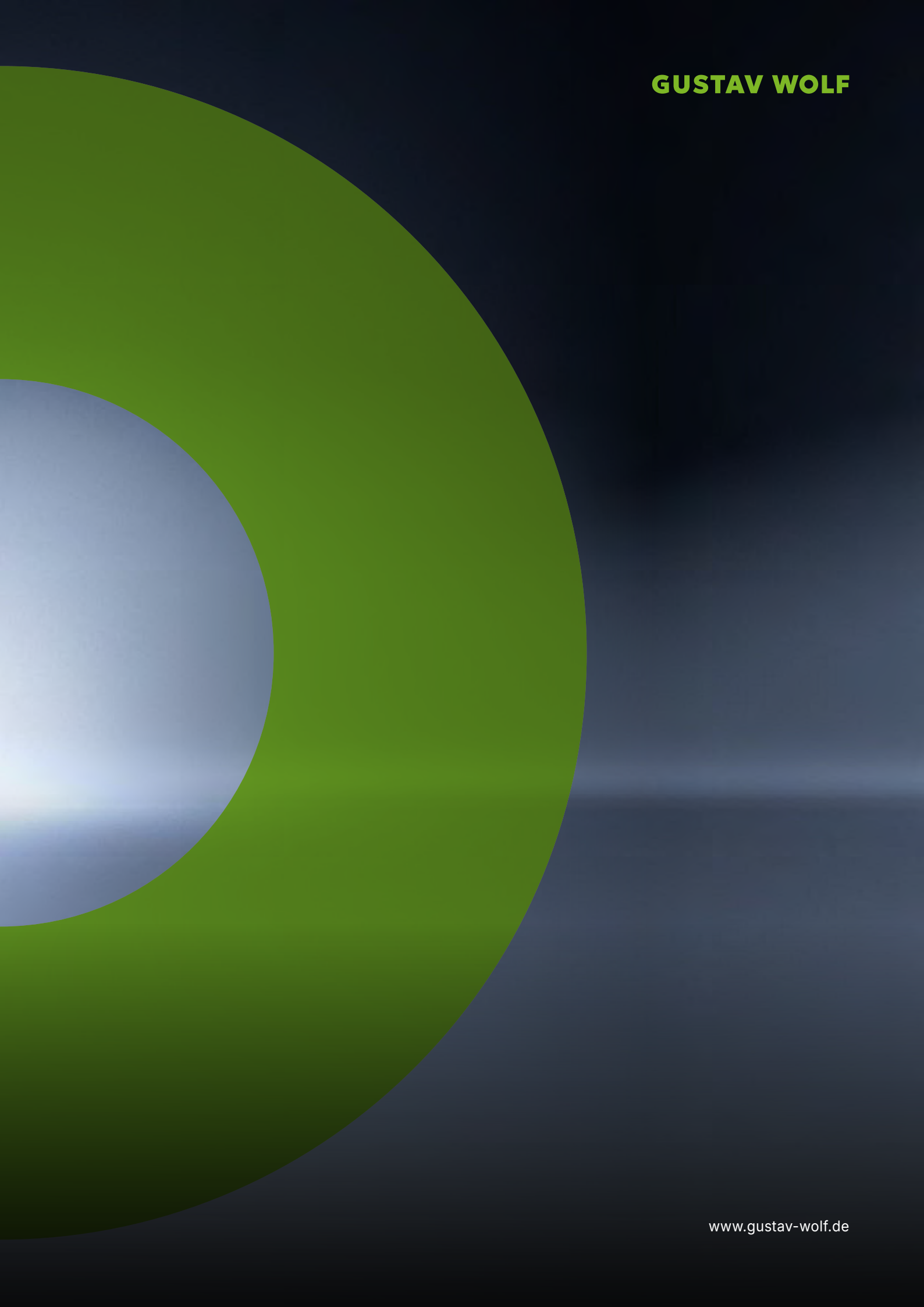
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