ENGLISH

Green Solutions G1

Jakob® INOX LINE

Green façades for a pleasant atmosphere.

Façade greening, so far usually left to chance, has gained a new dimension: Jakob® INOX LINE.

Attractive training systems for microgardens can be built with a few easy-to-assemble components made of high-grade stainless steel.

The days of haunted castles are over:

Green façades are appealing, ecologically sensible and useful. The latest insights on climbing plants combined with tastefully designed and technically sophisticated training systems open a treasure chest of greening variations and styles. Greening makes sense from a construction physics point of view and has many ecological benefits. The future is indeed green: it will be shaped by the creative collaboration of innovation-driven architects with greening specialists.

Idea / Conception
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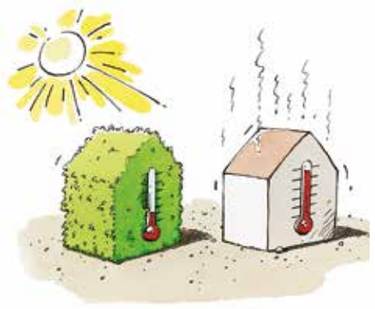
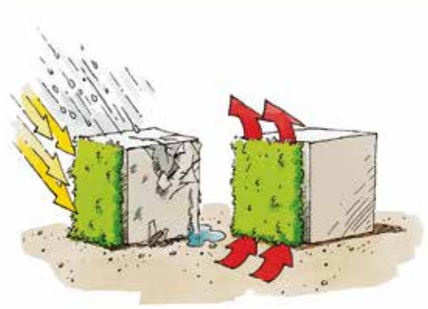
Jakob® INOX LINE



INTERIOR TEMPERATURE REGULATION

The familiar pergola of southern countries is an ancient but highly efficient method of interior temperature regulation. It promotes the formation of an insulating layer of air, thereby preventing an excessive increase of the inside temperature due to direct solar irradiation. This principle also offers several advantages when applied to vertical structures: the insulating cushion of air between vegetation and façade evens out temperature fluctuations and noticeably reduces heating and air-conditioning costs.

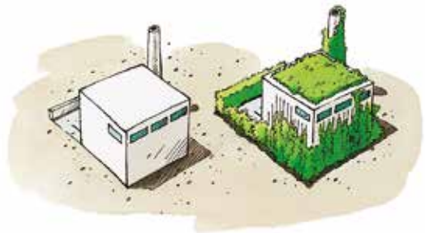


FAÇADE PROTECTION AND VENTILATION

A well-designed covering of vegetation is a natural shield against lashing rain or ultraviolet radiation. In addition, the space between the façade and the greenery has a temperature-regulating effect and promotes optimum ventilation as well.

THE AESTHETICS OF GREENING

The integration of greened surfaces into contemporary architecture presents novel design opportunities. Planners and architects who have teamed up with greening specialists are already producing outstanding results and are defining new dimensions for “art on buildings.”

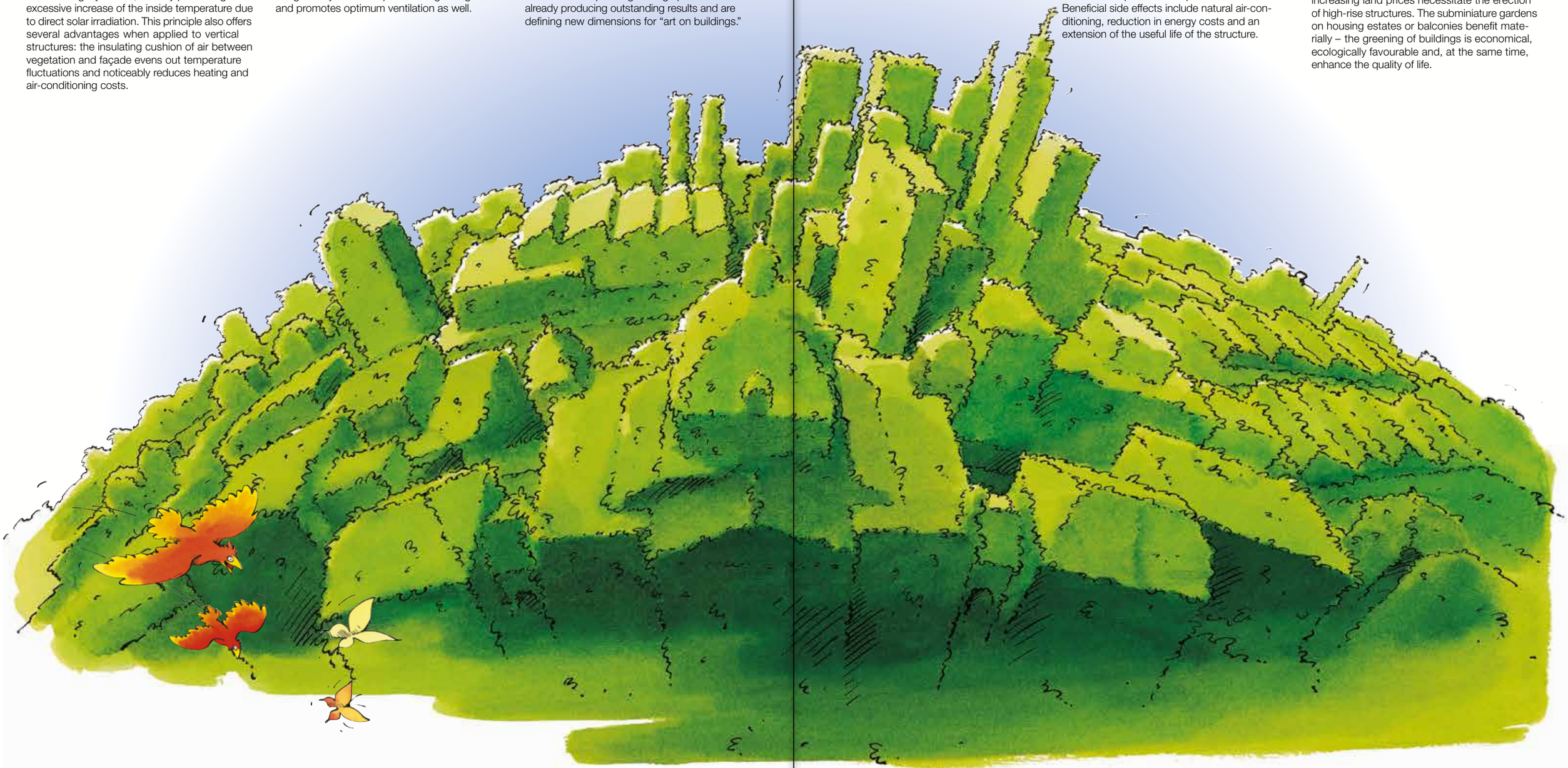


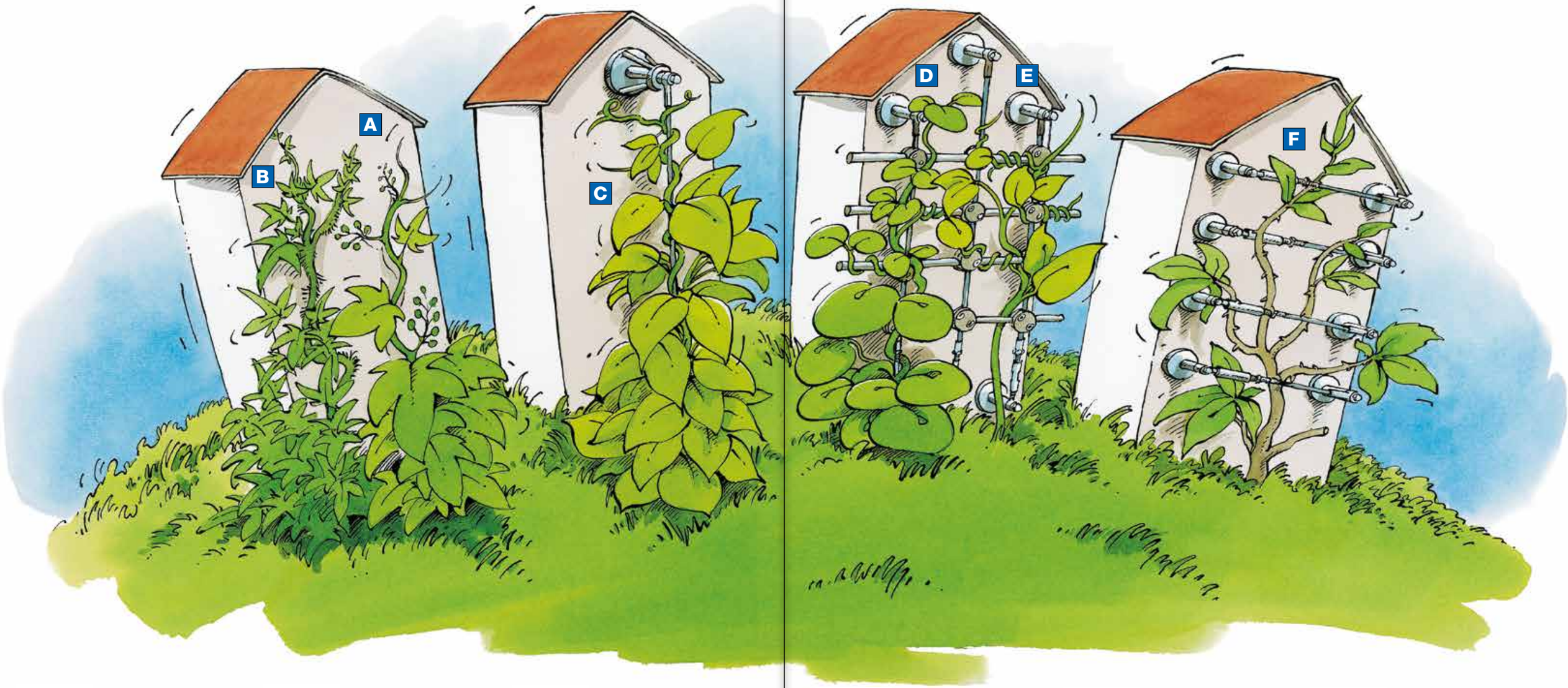
REVALUATION OF EXISTING STRUCTURES

Without any risk whatsoever, professionally conceived façade-greening schemes can aesthetically upgrade bleak storage buildings or non-descript concrete apartment blocks. Beneficial side effects include natural air-conditioning, reduction in energy costs and an extension of the useful life of the structure.

COMPLEMENTARY GREENED SURFACES IN URBAN ENVIRONMENTS

A large number of buildings in conurbations offer locations where plants can be grown. Ever-increasing land prices necessitate the erection of high-rise structures. The subminiature gardens on housing estates or balconies benefit materially – the greening of buildings is economical, ecologically favourable and, at the same time, enhance the quality of life.





A ADHESIVE-SUCKER CLIMBER

B ROOT CLIMBERS

C VINES (TWINING PLANTS)

D LEAF-STEM CLIMBERS

E LEAF CLIMBERS

F SCRAMBLING PLANTS

Characteristics and requirements of climbers
The natural habitats of the climbing plants are for the most part in woodland and forests, clearings and peripheral zones. Supported by other plants, they work their way upwards to the light (several species thrive and support themselves on rocks). **The climbing plants have developed a variety of climbing patterns (A to F).**

Growing conditions as near as possible to those in natural habitats must be provided to ensure the successful covering of façades – moist, humus-rich and loose-packed soil together with a support structure appropriate to any of the climbing patterns. Generally speaking, good supplies of water and nutrients are important. An additional water supply may be imperative to ensure healthy growth.
The correct training system must be selected for each specific climber.

With regard to optimising the planting location, there can be divergences from the typical bionomic habitat such as a shady root-run and sunlight for the top of the plant.

- Wisteria, trumpet vine (Campsis) as well as several Clematis varieties require unobstructed sunlight to encourage free flowering.
- Ivies (Hedera), many honeysuckle (Lonicera) and Clematis varieties do best in lightly shaded locations.

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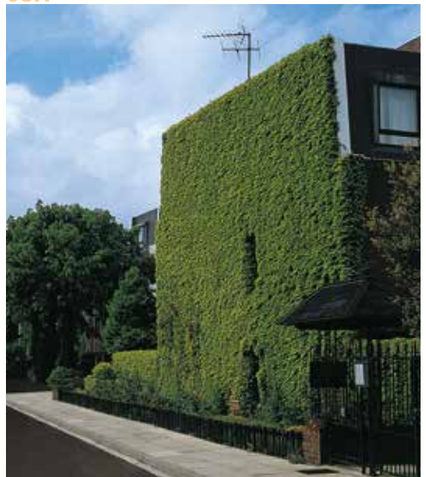

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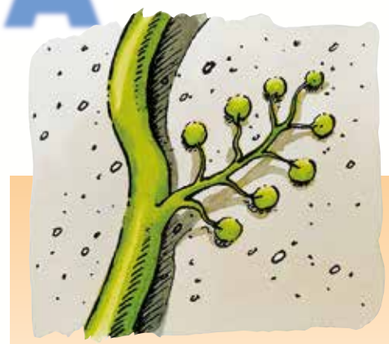
A ADHESIVE-SUCKER CLIMBER

Adhesive-sucker climbers support themselves with short lateral shoots tipped with glandular discs that adhere to any surface, even those that are quite smooth. Although these plants require **no auxiliary means of support,** they can cause damage to buildings.

- Boston ivy (Parthenocissus tricuspidata)



B ROOT CLIMBERS

Adventitious root climbers require **no auxiliary means of support.** They attach themselves firmly to rocks, tree trunks or façades. These climbers, too, can cause damage to buildings.

- Ivy
- Climbing hydrangea
- Trumpet vine (Campsis)
- Euonymus fortunei

C VINES (TWINING PLANTS)

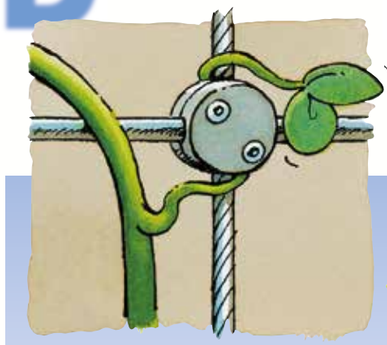
Vines twine around their supports as a result of the circular movement of their stem tips (circumnutation). Only a single vertical support (wire rope) is required.

- Wisteria, honeysuckle (Lonicera)
- Staff tree (Celastrus)
- Hops (Humulus)
- Morning glory (Ipomoea)

D LEAF-STEM CLIMBERS

Leaf-stem climbers form coils around their supports with their leaf stems. Grid-like or reticular structures provide the best supports.

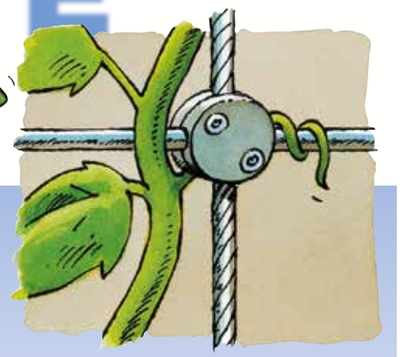
- Clematis (most varieties)
- Nasturtiums (Tropaeolum)



E LEAF CLIMBERS

Leaf climbers develop clinging, often beautiful structures that respond to external stimuli. Grid-like or reticular structures provide optimum supports.

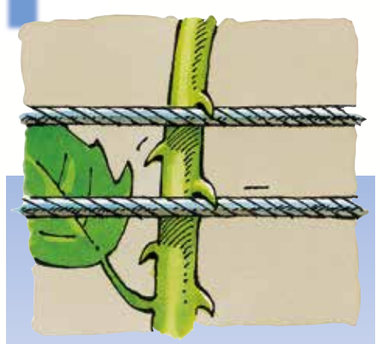
- Grape vines (Vitis)
- Ampelopsis
- Passion flowers (Passiflora)
- Cucumeraceae



F SCRAMBLING PLANTS

Scrambling plants work their way up by using epidermal outgrowths such as prickles, hook-like thorns and bristles.

- Climbing and rambler roses
- Bramble-like shrubs (Rubus)
- Winter-flowering jasmine



STRUCTURAL DAMAGE AND INSECTS

Climbing plants do not bore holes or cause cracks in the masonry. This is why most of them are harmless. Nevertheless, exceptions and potential hazards should not be disregarded. Certain climbers (e.g. the ivies) can grow into joints and cracks, widening them, and thereby causing permanent damage. Collaboration with greening specialists helps to avoid such risks and to optimise the many benefits that result from greening a building.

Greened façades replace the natural greenery that has become rare in urban environments and, at the same time, offer a new biosphere for animal life. Insects are more likely to be beneficial than harmful. They are essential for the pollination of numerous cultivated plants and also act as public health officers while serving as a basic food supply for other creatures. Regular inspections and trimming where it is necessary help to prevent damage and an invasion by unwelcome guests.

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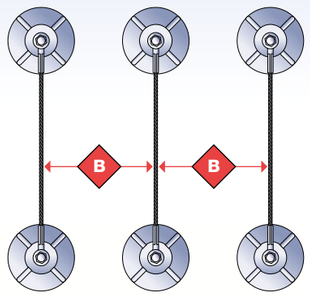
ROPE SPACING FOR VINES

B mm

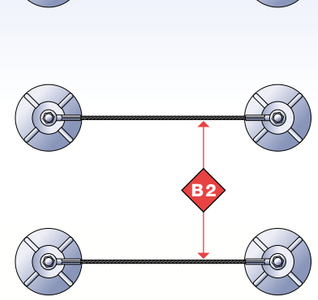
for slow-growing to moderately vigorous climbers (e.g. Lonicera)	approx. **200 – 400**
for very vigorous climbers (e.g. Wisteria)	approx. **400 – 800**



LATTICE SIZES

B1 B2 mm

for slow-growing to moderately vigorous climbers (e.g. Clematis)	approx. **150 x 250**
for very vigorous climbers (e.g. Vitis)	approx. **300 x 500**



DIMENSIONS

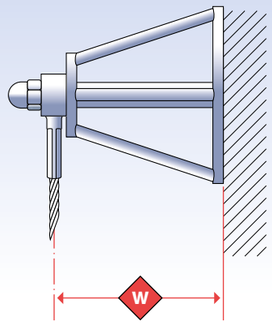
- The ideal height and width of the climber supports
- distances from wall
- wire rope spacing for vines
- lattice size
- wire rope or rod diameters

depend on the vigour, size and climbing pattern of the desired climber as well as on the architecture of the structure and the aesthetics of the greening concept.

DISTANCES FROM WALL

W mm

for slow-growing to moderately vigorous climbers (e.g. Clematis, Lonicera)	approx. **80**
for very vigorous climbers (e.g. Wisteria, Celastrus, Fallopia)	approx. **150**



Plants with different climbing patterns can be combined perfectly well. The plants themselves as well as the configurational and aesthetic aspects determine the choice of the climbing supports. Any desired configuration can be created with the **Jakob**® INOX LINE.

Qualified greening specialists should be consulted when the plants are chosen.

The rope and rod diameters of the **Jakob**® INOX LINE can be used for all climbing and espaliered plants. **Jakob**® INOX LINE combines the practicability and aesthetic attributes with versatility, stability and durability.

BUILDING GREENING IN THE WORLD'S VEGETATION AND CLIMATE ZONES

The greening of buildings meets all the requirements for consideration as an important element in contemporary housing-estate planning.

Main advantage
Occupies very little ground space but nevertheless has many uses.

Example: energy saving
Large amounts of energy and considerable sums of money can be saved by greening buildings with climbing plants, particularly in climatic zones where inner rooms are cooled at certain times (e.g. in the Mediterranean countries, Southern USA, Japan, Australia, etc.).

Example: well-being
Improved ambient conditions, a better quality of life, easing the ecological burden – all these benefits are readily attainable by covering buildings with greenery.

1 BOREAL CONIFEROUS FOREST ZONE

2 DECIDUOUS BROADLEAF AND MIXED-FOREST ZONES

3 MEDITERRANEAN HARDLEAF EVERGREEN ZONE WITH WINTER RAINFALL

4 TROPICAL TO WARM TEMPERATE FOREST

5 SAVANNAH AND DESERT-SHRUB ZONES

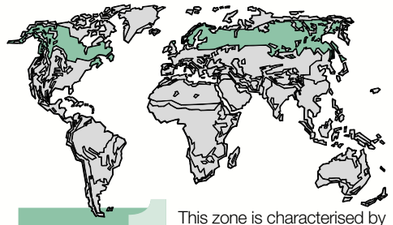
6 HOT DESERTS AND SEMI-DESERTS

7 COLD-WINTER STEPPE, TEMPERATE SEMI-DESERT AND DESERT ZONES

8 HIGH ALPINE

9 TUNDRA AND POLAR DESERT

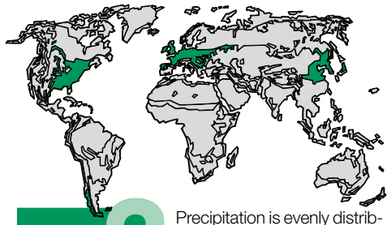
BOREAL CONIFEROUS FOREST ZONE



1 This zone is characterised by its continental-type climate of short, warm summers and long, severe winters. Evergreen climbing shrubs such as ivy are at their climatic limit in this zone.
The hardiness of deciduous climbing shrubs make them suitable for this climate.

- Clematis alpina, sibirica, vitalba, virginiana, macropetala, tangutica
- Parthenocissus quinquefolia
- Polygonum auberti, baldschuanicum
- Celastrus scandens
- Actinidia kolomikta, arguta, etc. (with edible fruits)
- Vitis aestivalis, amurensis, riparia

DECIDUOUS BROADLEAF AND MIXED-FOREST ZONES



2 Precipitation is evenly distributed throughout the year. The summers are warm, the winters moderately cold – the climate typical of Central and Western Europe. Temperatures lower than –15°C tend to occur rarely in Central Europe, and hard frosts (below –5°C) are hardly to be expected in oceanic regions such as the broadleaf forest zone of Eastern Asia or New Zealand. In contrast, the temperature can sink to –30°C and even lower in the north of the USA. The species that flourish in these regions are those listed under the boreal coniferous forest zone heading. Experts should be consulted in case of doubt.

- In the regions with a moderately cold winter (Central and Western Europe), a wide range of attractive Clematises, Loniceras, climbing roses, etc., are available in addition to the "classics" listed in zone 1.
- Many plants that thrive in Mediterranean regions do well in the mild-winter regions of the deciduous forest zones.
The hardier Passiflora species, Solanum crispum and Trachselospernum jasminoides flourish in the company of plants representative of the colder zones.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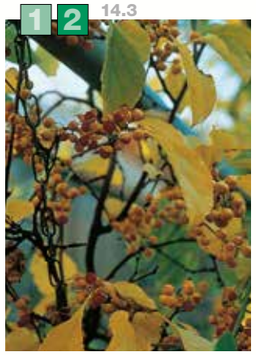
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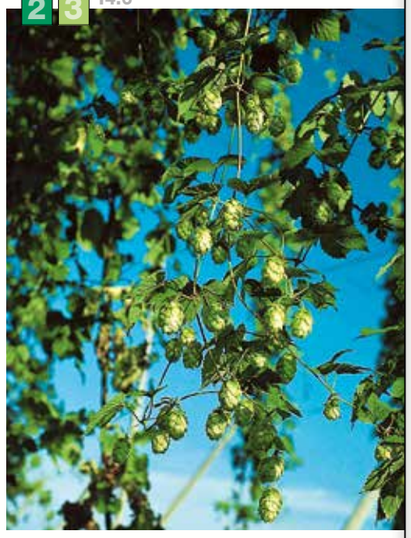
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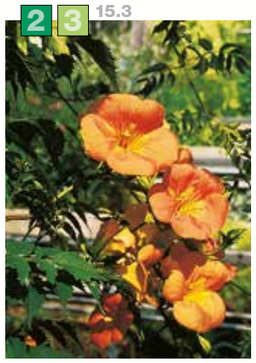
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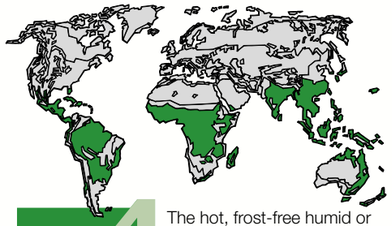
14.1	Clematis vitalba
14.2	Parthenocissus quinquefolia
14.3	Celastrus scandens
14.4	Vitis species
14.5	Climbing rose 'Westerland' combined with Clematis alpina and grape-vine shoots
14.6	Humulus lupulus
14.7	Actinidia arguta
15.1	Large-flowered Clematis 'Hagley Hybrid'
15.2	Lonicera
15.3	Campris x tagliabuana "Mme Galen"
15.4	Clematis fargesii
15.5	Large-flowered Clematis 'The President'
15.6	Ampelopsis brevipedunculata
15.7	Campsis grandiflora
15.8	Campsis radicans
15.9	Clematis montana 'Marjorie' with Elaeagnus angustifolia
15.10	Passiflora caerulea

MEDITERRANEAN HARDLEAF EVERGREEN ZONE WITH WINTER RAINFALL

3 Such zones are found around the Mediterranean Sea, in California, on the Cape and in South Australia. They are characterised by hot, dry summers and mild, humid winters. Light frosts are exceptional. A great variety of attractive climbers and wall shrubs flourish here in all their splendour. These include Bougainvillea and many Passifloras (Passiflora coerulea, amethystina, mollissima, antioquiensis, Distictis buccinatoria, Pandorea jasminoides, Podranea ricasoliana, Beaumontia grandiflora...). In addition, somewhat tender climbing roses such as Rosa brunoni 'La Mortola' or "Banks's rose" (Rosa banksiae) do well here. Watering during the summer months is essential.

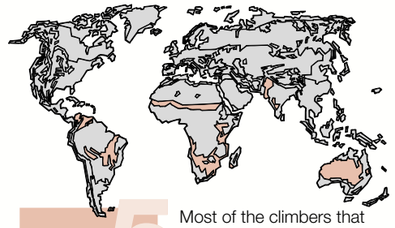
TROPICAL TO WARM TEMPERATE FOREST



4 The hot, frost-free humid or variably humid climate supports lush vegetation consisting of a wide range of plants. Many of these familiar to us in Mediterranean gardens (such as Bougainvillea) grow well in this zone, including those that require considerable warmth such as Thunbergia grandiflora and mysorensis, Passiflora coccinea, quadrangularis (giant granadilla), Petraea volubilis, Clytostoma calistegioides, Allamanda cathartica, Pyrostegia venusta.

Many species grow satisfactorily in a warm temperate climate (North Island of New Zealand) as well as in the tropics. Other varieties, however, require the humid heat of equatorial regions (e.g. Strongylodon macrobotrys).

SAVANNAH AND DESERT SHRUB ZONES



5 Most of the climbers that are used in zone 4 will grow well in zone 5 when the microclimatic conditions are observed and water management is satisfactory.

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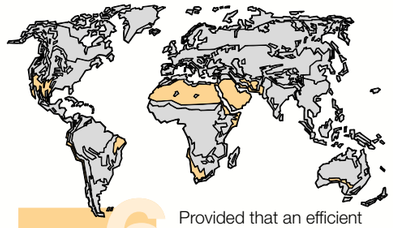
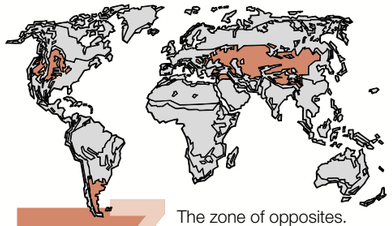
HOT DESERTS AND SEMI-DESERTS



6 Provided that an efficient watering system is available, buildings in these hot, dry regions can be greened to contribute significantly towards a pleasant room temperature. Combination with reliable desert periphery plants (Acacia species, Tamarix, Casuarina, etc.) is good practice because the resulting filter effect slows down wind and drifting sand.

Climbers and espaliered plants from the gardens of the usually neighbouring Mediterranean hard-leaf zone such as Kennedya coccinea, Podranea ricasoliana or even Pyrostegia vinusta will grow on buildings with considerable vigour when they are well tended and watered.

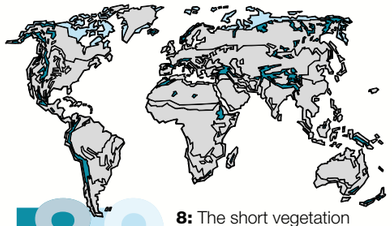
COLD-WINTER STEPPE, TEMPERATE SEMI-DESERT AND DESERT ZONES



7 The zone of opposites. Hot summers are followed by severe winters. The hardy plants listed under borean coniferous forest zone such as Clematis tangutica, alpina and siberica can be used here. Watering is always essential.

The oleasters Elaeagnus angustifolia and commutata are suitable for use as windbreaks.

HIGH ALPINE (8), TUNDRA AND POLAR DESERT REGIONS (9)



8/9 **8:** The short vegetation period makes life difficult for plants that want to climb. However, with careful attention paid to the microclimate (exposure, wind, altitude, topography), the climbers from the coniferous forest zone certainly have a chance of succeeding.

9: Greening buildings with climbing plants in this vegetation-less zone is virtually impossible.

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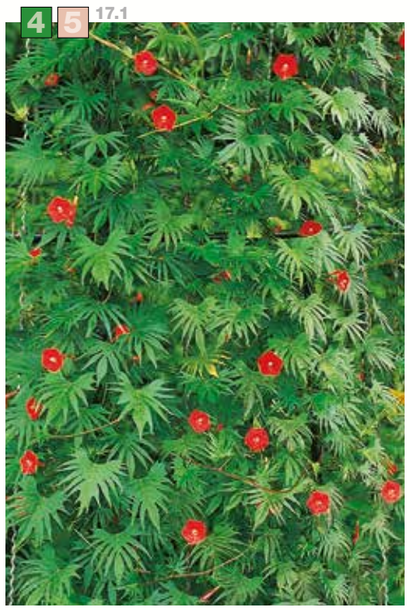

17.1

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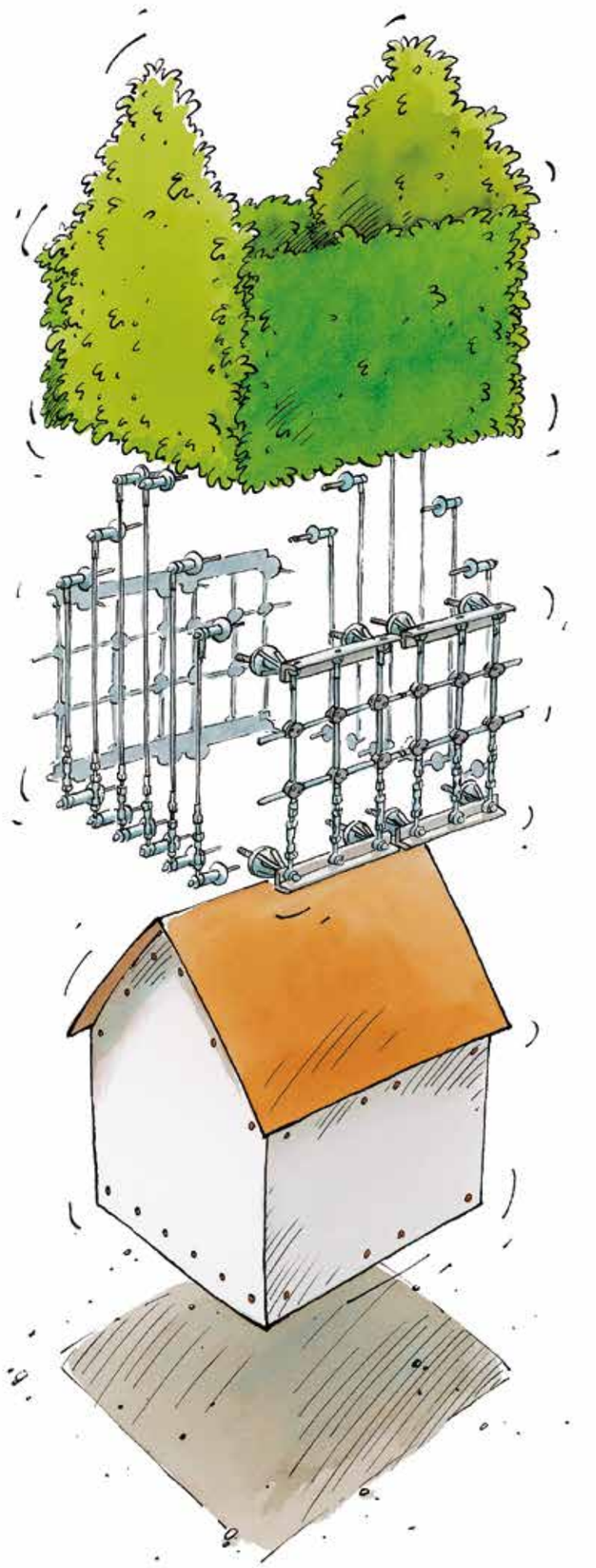
16.1 Solandra grandiflora
16.2 Beaumontia grandiflora
16.3 Passiflora amethystina
16.4 Berberidopsis corallina
16.5 Distictis buccinatoria
16.6 Thunbergia grandiflora
16.7 Epipremnum aureum 'Marble Queen' (syn. Scindapsus aureus)
16.8 Passiflora quadrangularis
16.9 Passiflora coccinea
17.1 Ipomoea quamoclit (syn. Quamoclit pinnata)
17.2 Cobaea scandens
17.3 Hoya carnosa
17.4 Pyrostegia venusta
17.5 Clematis tangutica



DIMENSIONING TRAINING SYSTEMS

The overall load of a greened surface is composed of:

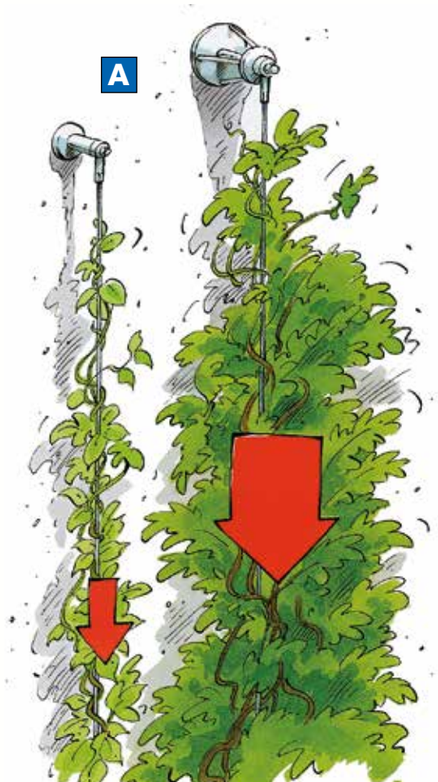
- Weight of the plant
- Wind load on plant surface
- Weight of dew and rain
- Weight of snow
- Weight of training structure

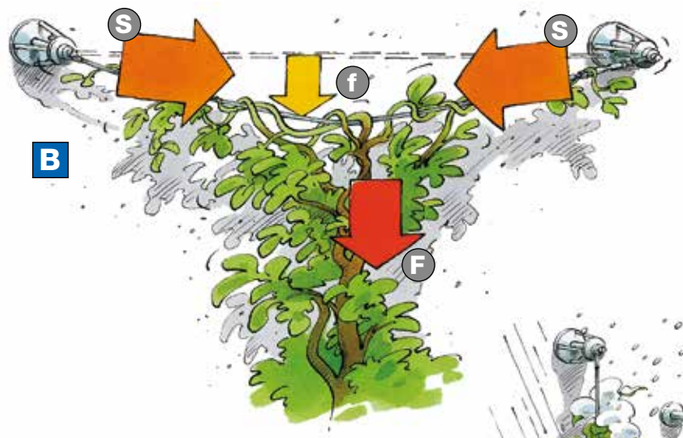
Load distribution
If the entire vertical load is absorbed solely by the training system at the top and bottom, the upper suspension must hold the entire vertical load and half the wind load. The bottom suspension must hold only half the wind load.

The safety factor
The defined vertical load to be absorbed by the upper suspension must be multiplied by a safety factor.

A: PLANT WEIGHT

Depending on the variety, the unit weight per square metre of plant area can vary from 1 to 50 kg/m².
The plant weight is influenced by the location, the soil quality, the growth rate and owner care.





B: HORIZONTAL AND VERTICAL WIRE ROPES

When computing rope forces, a distinction must be made between horizontally and vertically tensioned wire ropes.

Intermediate supports for rods and wire ropes
The sag **(f)** of horizontal or inclined rods and wire ropes can be diminished with intermediate supports.

C: WIND LOAD

When planning and installing training systems, the wind load is an important aspect. It is composed of wind pressure and wind suction as well as side winds on the greened surface. Although it can be assumed that part of the wind will breeze through the vegetation, we recommend looking at the greened mass as a solid surface.

The following suggested values apply **to wind suction** calculations:

- Height above ground up to 8 metres: approx. 0.5 kN/m²
- Between 8 and 20 metres above ground: approx. 0.8 kN/m²
- Higher than 20 metres above ground: 1.1 kN/m²

A suction effect on the vegetated surface occurs when the wind blows parallel to the greened surface. The resulting tensile forces must be transmitted to the building structure via the dowels.

Incident side winds impose a bending moment on the spacers. In special cases, it may be necessary to reinforce the spacers and/or guy them down with wire ropes.

Where trainers are **subsequently attached** to a building structure, it should be determined if and at which locations the computed forces are transmitted and where they can be diverted into the foundation.

In new buildings, it is the planner's responsibility to investigate whether and how training systems should be included and mounted.

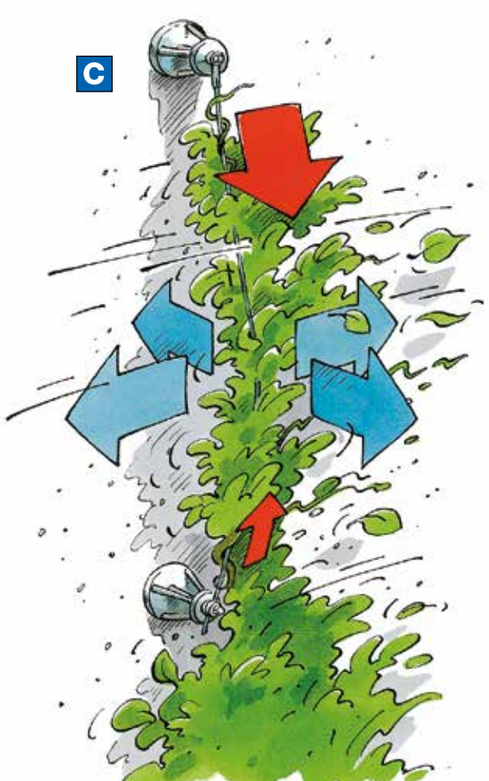
D: DEW, RAIN, AND SNOW LOADS

In addition to the weight of the plant, the training structure must also be capable of absorbing dew, rain, and snow loads. This load is factored in by multiplying the plant weight by the following coefficients:

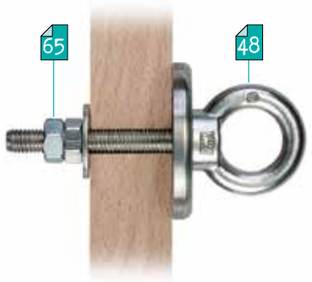
For deciduous plants: **plant weight times 2;** for evergreens: **plant weight times 3.**

E: STRONG TWINING CLIMBERS

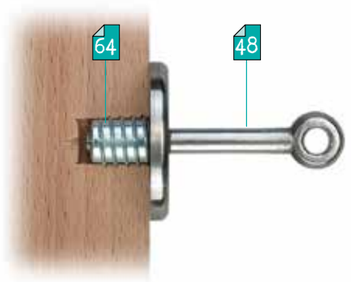
At least one end of the wire rope which holds climbers that twine significantly (Wisteria, for example) must be protected with a **Jakob**® INOX LINE **overload clamp** (No. **30920-**0400-10, page 65). This is the only way to prevent major façade damage by tensile overloads on spacers (Fig. 2, page 29).



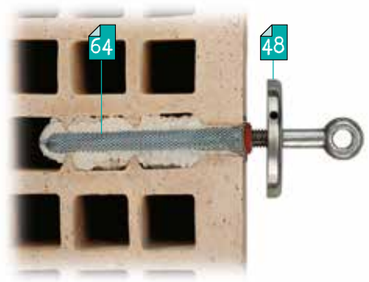
WALL-MOUNTING SPACERS ON VARIOUS BUILDING MATERIALS



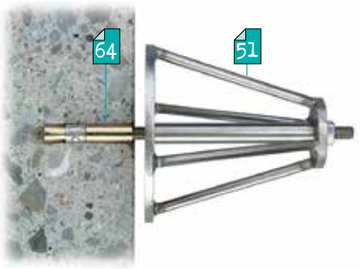
Through hole in wood
Headless screw with nut and check nut at back, front ring nut with support washer to absorb lateral forces at front.



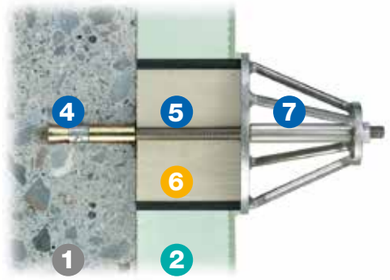
Screw-in nut for wood
The metric internal thread of the screw-in nut accepts a rope holder or a headless screw.



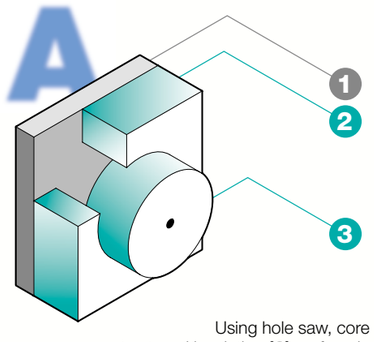
Perforated hollow wall anchor
The perforated anchor is secured with a two-component mortar. The metric internal thread accepts a rope holder.



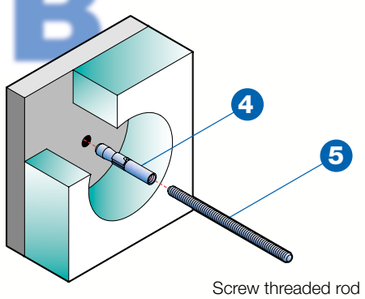
Bolt anchor with internal thread
Suitable for concrete façades and hard stone. The bolt anchor expands and grips when the threaded rod is screwed in.



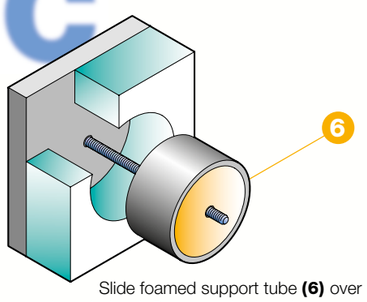
Externally insulated façades
The spacer is mounted on an insulated support tube and thus transfers lateral forces to the substrate **(see Figs. A to F).**



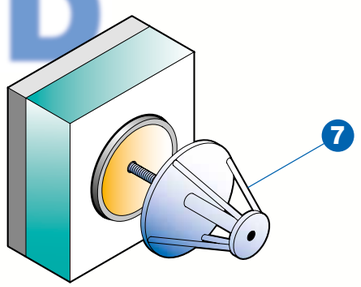
Using hole saw, core out external insulation **(2)** on façade **(1)** and remove insulation piece **(3).**



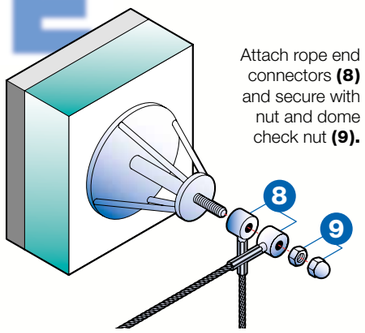
Screw threaded rod **(5)** into bolt anchor with internal thread **(4)** and tighten.



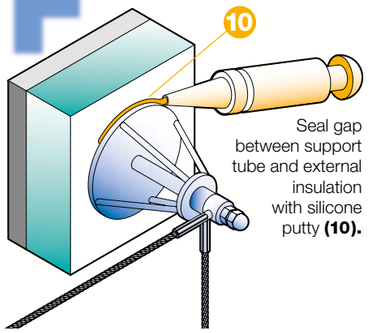
Slide foamed support tube **(6)** over threaded rod. Support tube length approx. 5 to 8 mm larger than insulation thickness.



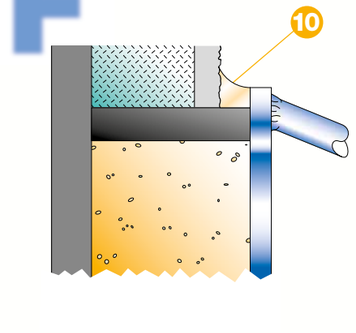
Slide spacer basket **(7)** on threaded rod and align.



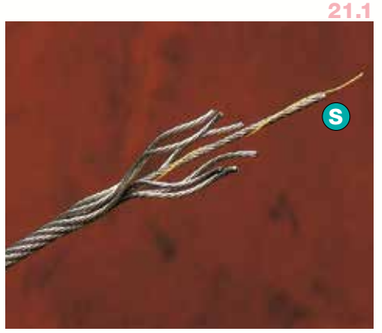
Attach rope end connectors **(8)** and secure with nut and dome check nut **(9).**



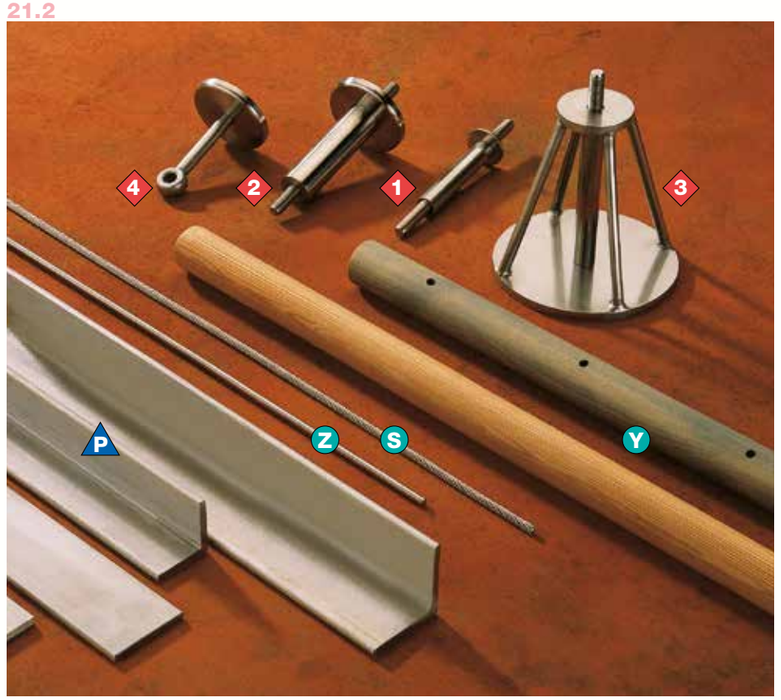
Seal gap between support tube and external insulation with silicone putty **(10).**



21.1



21.2



TRAINING SYSTEMS IN THE JAKOB LINE

Choosing suitable materials
The different atmospheric conditions (rural, urban, industrial) determine the selection of materials. Urban and industrial atmospheres may contain aggressive carbon-containing particles and sulphur dioxide (SO_2). At sea level, the air contains aerosols with chloride ions. Rural air is usually unproblematic.

All parts of the Jakob® INOX LINE **are made of AISI 316, 1.4401, and AISI 316L, 1.4404,** alloys to offer excellent corrosion resistance.

AISI 316
1.4401, EN 10088-3 X5CrNiMo17-12-2

AISI 316L
1.4404, EN 10088-3 X2CrNiMo17-12-2

The life span of plants for façade greening can range from 30 to 100 years! To assure that the training systems outlive the plants, the selection of materials is very crucial.

ROPES / RODS / SECTIONS

The wire ropes have a rated diameter of 4 mm (actual: Ø 3.7 mm). **A yellow code filament (S) confirms the authenticity of the rope** made from AISI 316 and guarantees a minimum breaking load of 9.1 kN. The 3.7 mm diameter ground rods **(Z)** are also made from AISI 316; they have a minimum breaking load of 5.5 kN.

Our wooden rods (Y) have a diameter of 25 mm. They are made either of glazed spruce (grey) or untreated larch. All wooden rods are available with cross bores (Ø 0.5 mm) along their entire length.

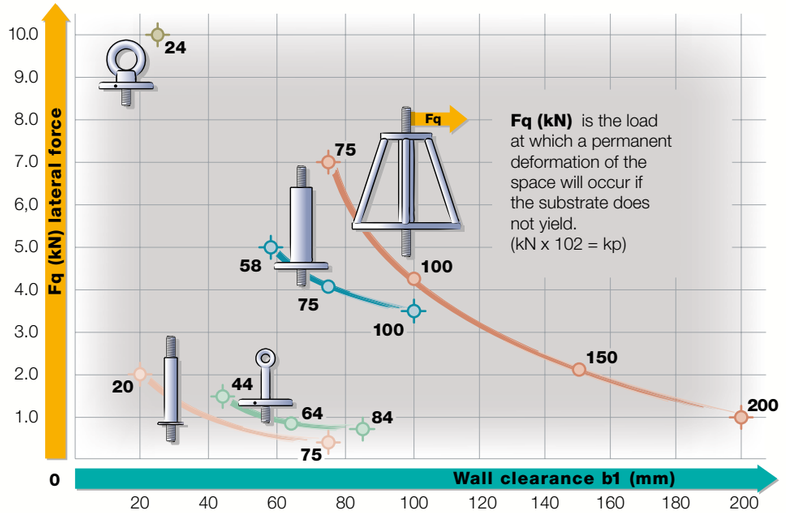
Wall mounts
- Spacer Ø12/24 **(1)**
- GreenGuide spacer Ø 20/50 **(2)**
- Spacer basket Ø 40/100 **(3)**
- Eye bolt with support washer **(4)**

Brackets (P) for spacers
- Angle section 30 / 30 / 4 mm
- Angle section 40 / 40 / 4 mm
- Flat section 30 / 4 mm
- Flat section 40 / 4 mm

Dimensions (mm)	**J** (cm^4)	**W** (cm^3)	**kg/m**
40 / 40 / 4	4.48	1.56	2.42
30 / 30 / 4	1.81	0.86	1.78
40 / 4	2.13	1.06	1.26
30 / 4	0.90	0.60	0.94

J = moment of inertia / **W** = moment of resistance

SPACER LOAD DIAGRAM



PLANNING AIDS FOR THE ENGINEER

The following parameters are important for planning a training system:

- Selected plant and its weight per m^2
- Deciduous or evergreen?
- Which configuration of ropes/rods is needed (horizontal/vertical/combined/inclined, etc.)?
- Orientation: South / North / East / West? Special site conditions such as wind, etc.
- Rope/rod grid aperture and wall clearance
- Length and width of greened area (sketch with dimensions)
- **Jakob®** INOX LINE catalogue

A B C DIY ASSEMBLY OF END CONNECTORS

Technically mature end connectors make it possible to complete the termination of the wire ropes on site. Non-tensionable end connectors **(A)** are swaged with the rope at the factory.

- The rope **(B)** can be terminated **to the correct length** on site with the separately supplied LT2 external thread ends **(C)** (Fig. 45.1, page 45) and wire rope cutters.

D ADJUST AND SECURE ROPE TENSION

Using the tensionable end connectors **(D)** which should be located at easily accessible points of the installed training system, the wire ropes can be moderately tensioned.

- If the tension is too high, the spacers and anchors will be unnecessarily burdened. The tension should be great enough to prevent the ropes and plants from being rocked back and forth by the wind.
- The end connectors should be secured with check nuts to prevent unintentional loosening.
- Find out if the training system should be electrically earthed.

E SELECTING THE APPROPRIATE CLIMBERS

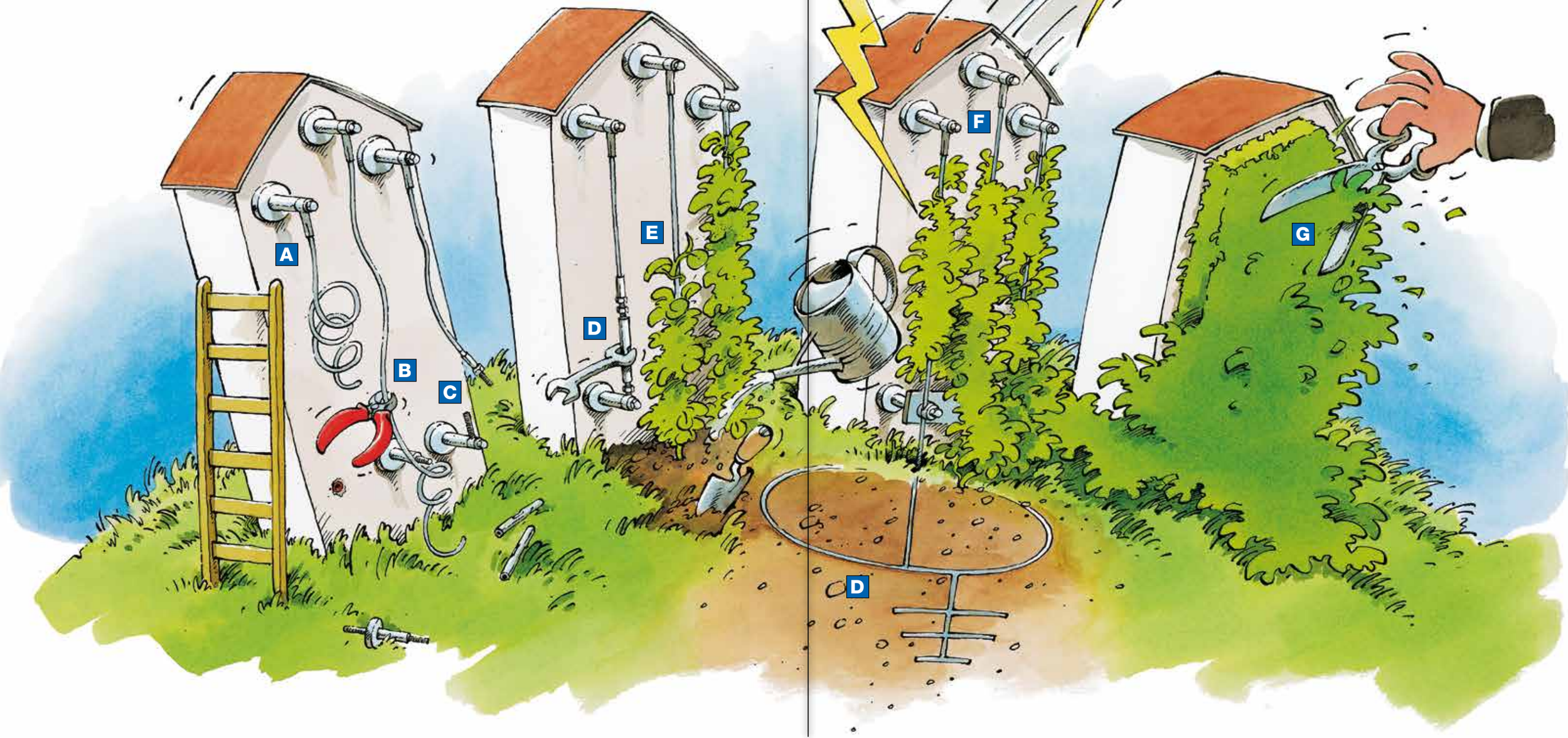
Ecological considerations speak in favour of including indigenous plants in the selection.

- Basically, local greening specialists should be consulted.
- Some ideas are provided on pages 12 to 17.

F G CARING FOR GREENED FAÇADES

Simple façade vegetation requires little care. Sophisticated and attractive plant combinations with climbing roses, Clematis, grape vines or kiwis need to be cared for by professionals on a regular basis. This care is rewarded with blossoms, fruit, and freedom from pests.

- Training systems that are compatible with the intended plants generally eliminate the need for attaching the plants. Climbing roses and grape vines are exceptions to this rule. However, climbers do need a good manual or automatic water and nutrient supply.
- Pest problems will hardly occur if the plants are compatible with the site. Pesticides should not be used in residential zones.
- Many climbers (such as honeysuckle) only need to be cut back if their growth is to be controlled. Climbing roses, many Clematis varieties, grape vines and kiwis will grow vigorously and stay healthy if professionally cut. They will look better and develop more blossoms and fruit as well.
- In the course of the years, the weight of the plants will increase. It may be necessary to retension the wire ropes or add anchors and reinforcement elements.



Pages 26 27

GREENGUIDE ROPE STYLES **F1/F2/F3**

For DIY installation / Material: AISI 316 (V4A)

Completely terminated wire ropes with top and bottom spacers. Types F1, F2, and F3 are designed for different load cases and available for different wall clearances.

Pages 28 31

GREENGUIDE ROPE STYLE **F4**

For DIY installation / Material: AISI 316 (V4A)

Training structure tailored to your dimensions. The stainless steel angle sections can be supplied with all mounting holds. The scope of the product line covers various load cases.

Pages 32 35

GREENGUIDE ROPE STYLE **F5**

For DIY installation / Material: AISI 316 (V4A)

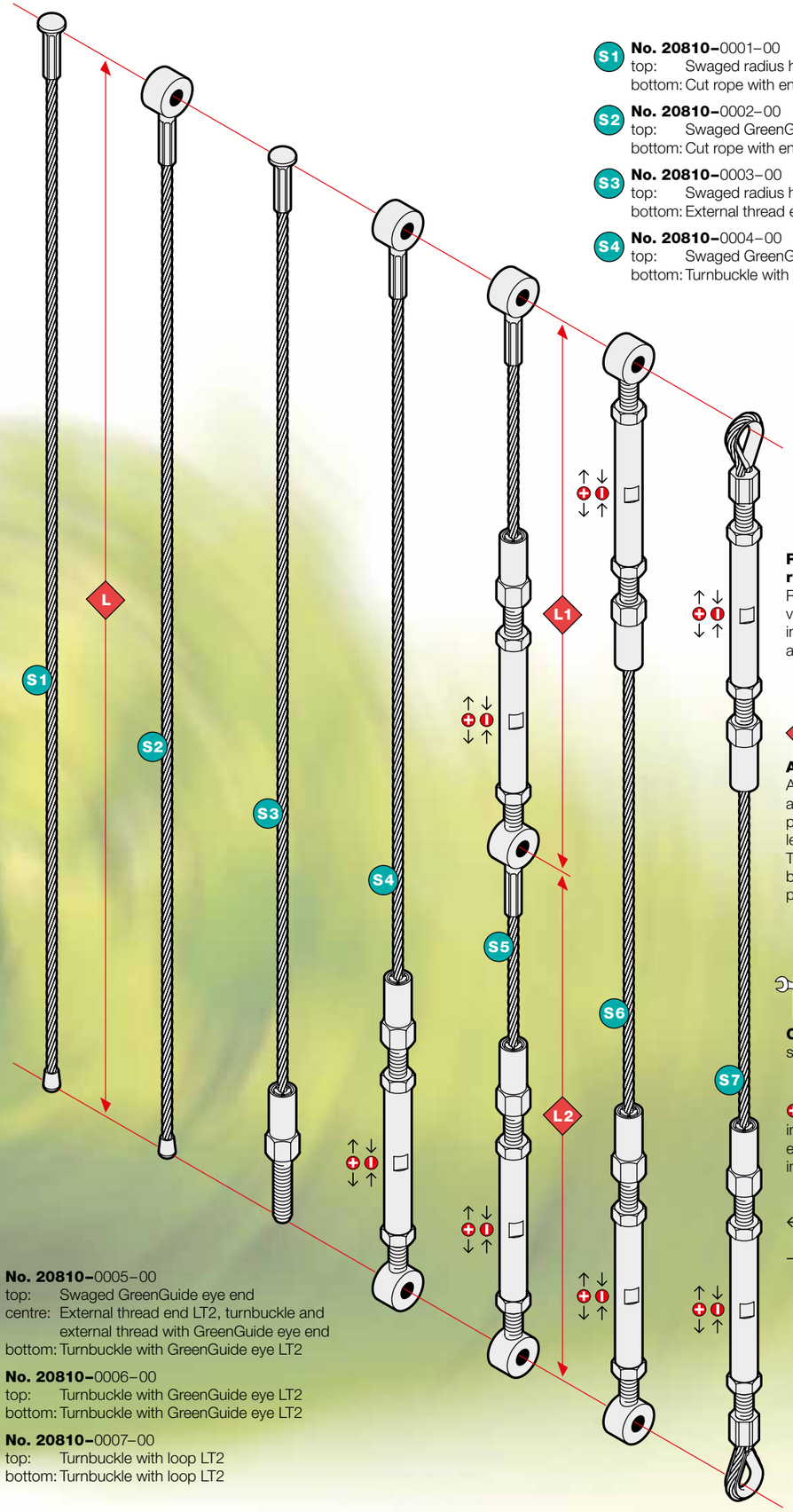
Training structure tailored to your dimensions. The top and bottom mounting sections can be inclined at any angle (under a pitched roof, for example). Wall clearances and loads variable.

Pages 36 37

GREENGUIDE ROPE STYLE **F6**

For DIY installation / Material: AISI 316 (V4A)

The training structure consists of two spacers for the beginning and end of the wire rope as well as of deflectors.



S1 **No. 20810–**0001–00
top: Swaged radius head end stop
bottom: Cut rope with end cap

S2 **No. 20810–**0002–00
top: Swaged GreenGuide eye end
bottom: Cut rope with end cap

S3 **No. 20810–**0003–00
top: Swaged radius head end stop
bottom: External thread end LT2

S4 **No. 20810–**0004–00
top: Swaged GreenGuide eye end
bottom: Turnbuckle with GreenGuide eye LT2

S5 **No. 20810–**0005–00
top: Swaged GreenGuide eye end
centre: External thread end LT2, turnbuckle and external thread with GreenGuide eye end
bottom: Turnbuckle with GreenGuide eye LT2

S6 **No. 20810–**0006–00
top: Turnbuckle with GreenGuide eye LT2
bottom: Turnbuckle with GreenGuide eye LT2

S7 **No. 20810–**0007–00
top: Turnbuckle with loop LT2
bottom: Turnbuckle with loop LT2

Ropes for GreenGuide rope styles F1 – F6
Ropes S1 to S7 include all versions which can occur in GreenGuide rope styles and training structures.

L **Assembly lengths**
All tensionable end connectors are supplied as DIY assembly parts. This allows the exact rope length to be determined on site. The ordered rope length should be about **10% longer** than the planned length.

On-site assembly
see Fig 45.1, page 45

Tensioning range
information: both thread ends are screwed halfway into the turnbuckle body.

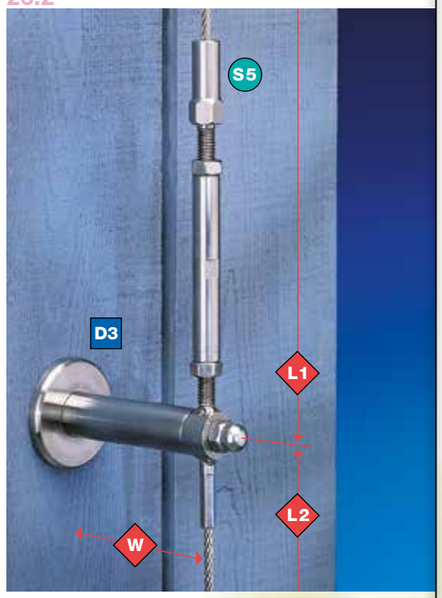
←⊕→ = make longer (relax) **8 mm**
→⊖← = make shorter (tension) **24 mm**

The load and design of a greening system depends on various factors. Please consult pages 18, 19 and 21 for details.

26.1

D2: Intermediate spacer (rope clamped) with maximum clamping force of 1 kN.

26.2



D3: Intermediate spacer (rope tensionable) for long wire ropes.

GREENGUIDE ROPE STYLES **F1/F2/F3**

For on-site assembly / Patent/DBGM pending
Material: ropes AISI 316, fittings AISI 316L
To order: see examples on opposite page

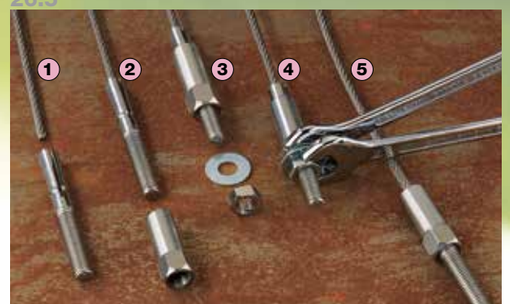
		F1 Spacer **Ø 12/24**	**F2** Spacer **Ø 20/50**	**F3** Spacer **Ø 40/100**	**Info:** Page
D1	**Top spacer**	for swaged GreenGuide eye end (non-tensionable end connector)			21, 25
D2	**Intermediate spacer**	clamped for contiguous rope, clamped (rope S2 / S4 / S5)			25
D3	**Intermediate spacer, tensionable**	for external thread with GreenGuide eye end and turnbuckle (rope S5)			25, 45
D4	**Bottom spacer**	accepts rope ends S2 / S4 / S5			21, 25, 47
L	**Assembled rope lengths**	indicate **partial lengths L1 / L2** at intermediate spacer D3			25
W	**Wall clearances**	variable to max. 81	64 / 81 / 106	87 / 112 / 162 / 212	40 / 41
S2	**Rope** with clamped end	●	●	●	25
S4	**Rope** with tensionable end connector		●	●	25
S5	**Rope** with tensionable end connectors		●	●	25
X	**Wall mounting** on wood, hollow walls, concrete or external insulation. See installation principles and materials on pages				20, 64

see page no.

26.3

26.4

26.5



27.1

L S

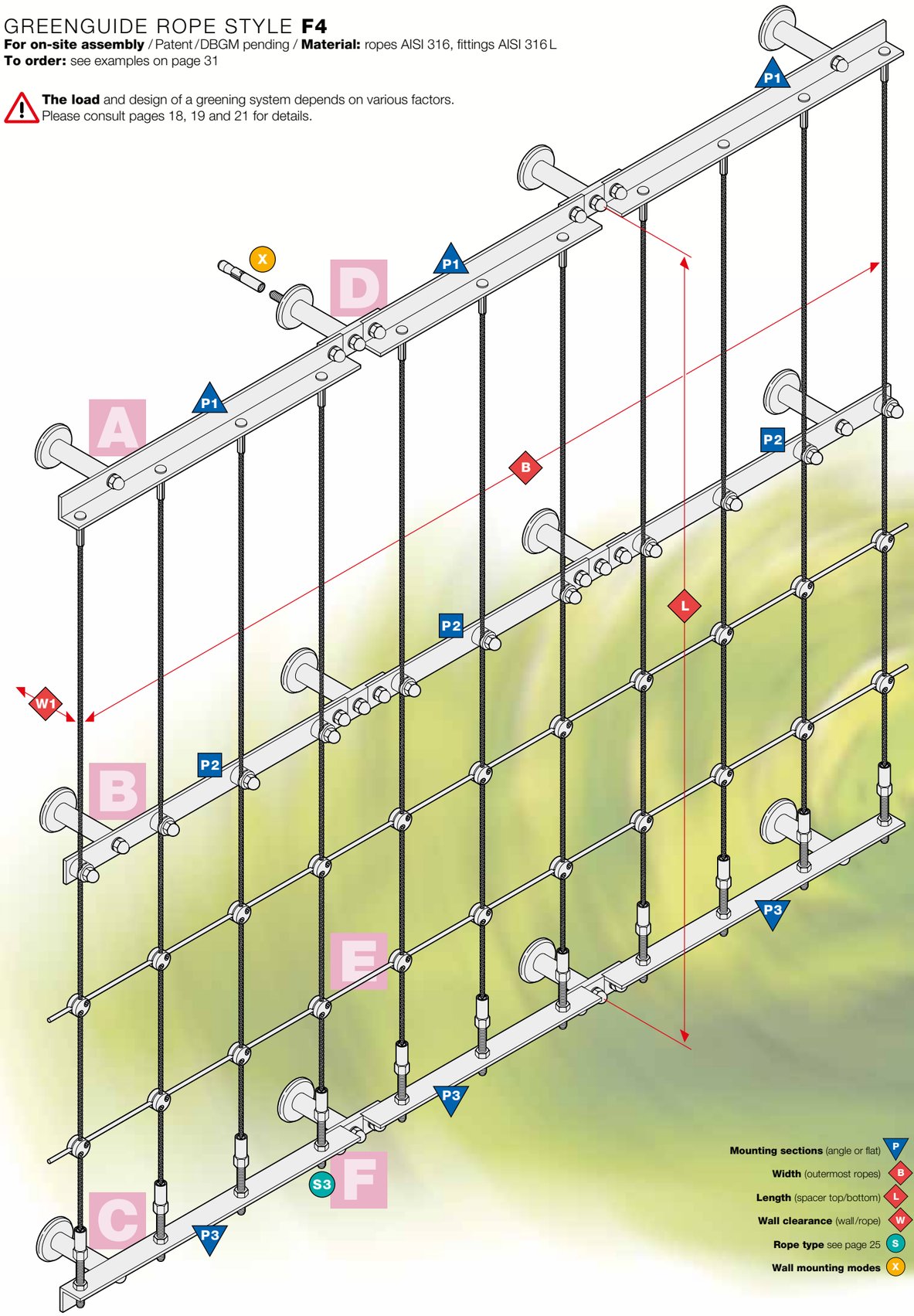
Assembled lengths (L / L1 / L2) for on-site assembly: Max. approx. 3000 mm. Please see notes on page 25.

The user is responsible for choosing **the correct assembly method** (see Fig. 26.5) and the proper rope diameter. **Functionality** is guaranteed only by Jakob rope **No. 10820–**0400 with the yellow code filament. Have a civil engineer check **strength values** and permissible loads on the basis of the given load case (see page 21).

GREENGUIDE ROPE STYLE **F4**

For on-site assembly / Patent / DBGM pending / **Material:** ropes AISI 316, fittings AISI 316 L
To order: see examples on page 31

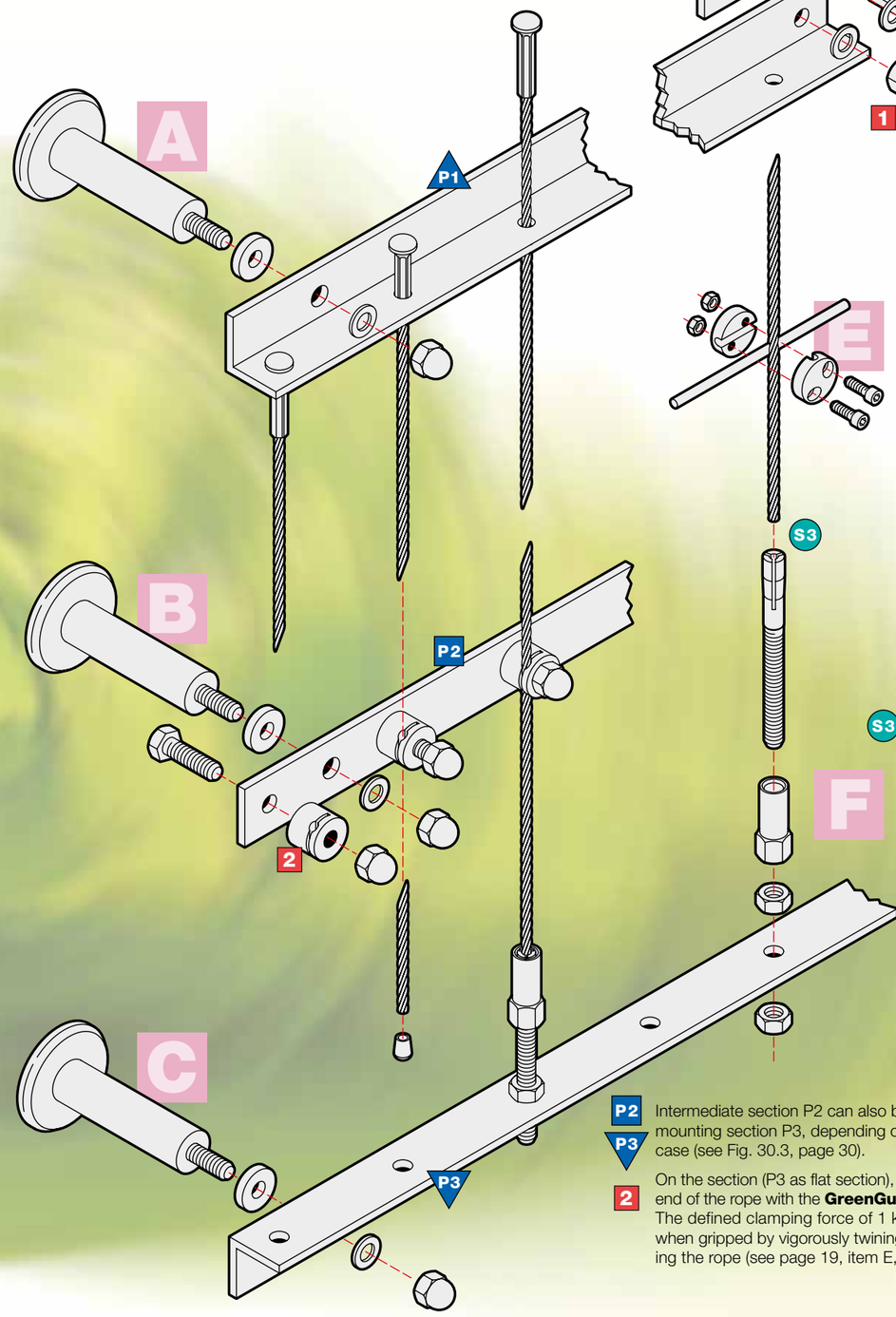
The load and design of a greening system depends on various factors.
Please consult pages 18, 19 and 21 for details.



Mounting sections (angle or flat) P
Width (outermost ropes) B
Length (spacer top/bottom) L
Wall clearance (wall/rope) W
Rope type see page 25 S
Wall mounting modes X

X **Wall mounting** on wood, hollow walls, concrete or external insulation.
See installation principles and materials on pages 20 and 64.

1 **Section connector**
The max. length of the flat and angle sections is 2000 mm. The section connector has two slotted holes.
(Page 64: **No. 30922–**3004 and –4004)



Horizontal rods combined with vertical wire ropes result in ideal training structures. Two different methods are available for attaching rods to wire ropes.

- GreenGuide 90° cross clamp
  No. 30920–0400–02
  (Fig. 30.5, page 30)
- Rope clip for stainless steel rods
  No. 30920–0400–01
  (Fig. 52.2, page 52)
- Horizontal rod Ø 3.7
  No. 30922–0400–00
  (page 65)

S3 **Rope type S3**
Rope S3 is supplied with a tensionable end connector and is intended for **on-site assembly** (rope types see page 25).

P2 Intermediate section P2 can also be used as a bottom mounting section P3, depending on function and load case (see Fig. 30.3, page 30).

P3

2 On the section (P3 as flat section), it is possible to clamp the end of the rope with the **GreenGuide overload clamp (2).** The defined clamping force of 1 kN allows the rope to slip when gripped by vigorously twining climbers, thus lengthening the rope (see page 19, item E, and Fig. 54.2, page 54).

30.1

30.2

30.3

P2: Intermediate section for long ropes (see page 29)
P3: Bottom mounting section with clamped rope ends (see pages 29 and 54)

GREENGUIDE ROPE STYLE **F4**

For on-site assembly / Patent/DBGM pending / **Material:** ropes AISI 316, fittings AISI 316 L
To order: see examples on opposite page

		a	b	c	d	**Info:** Page
P1	**Upper mounting section**	Angle 30/30/4	Angle 40/40/4			21, 29, 64
P2	**Intermediate mounting section**			Flat 30/4	Flat 40/4	21, 29, 64
P3	**Bottom mounting section**	Angle 30/30/4	Angle 40/40/4	Flat 30/4	Flat 40/4	21, 29, 64
B	**Max. width** with 2 spacers	Suggested: approx. 1500 (with W 100 and plant weight 15 kg/m²)				
L	**Max. length** with 2 spacers	Suggested: approx. 3000 (with W 100 and plant weight 15 kg/m²)				
W1	**Wall clearance** with spacer Ø 20/50	See wall clearance table on pages				40/41
W2	**Wall clearance** with spacer Ø 40/100	See wall clearance table on pages				40/41
S	**Possible rope types: S1 / S3**	See notes on pages				25, 29
X	**Wall mounting** on wood, hollow walls, concrete or external insulation. See installation principles and materials on pages					20, 64

P **Mounting sections**
On request, we will supply the stainless steel sections ready to install with all holes (according to binding drawings).

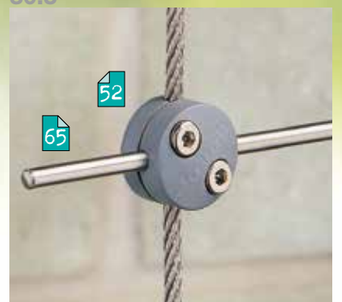
Horizontal rods combined with vertical wire ropes result in ideal training structures. See description on page 29 and the figure below (30.5).

The load and design of a greening system depends on various factors. Please consult pages 18, 19 and 21 for details.

see page no.

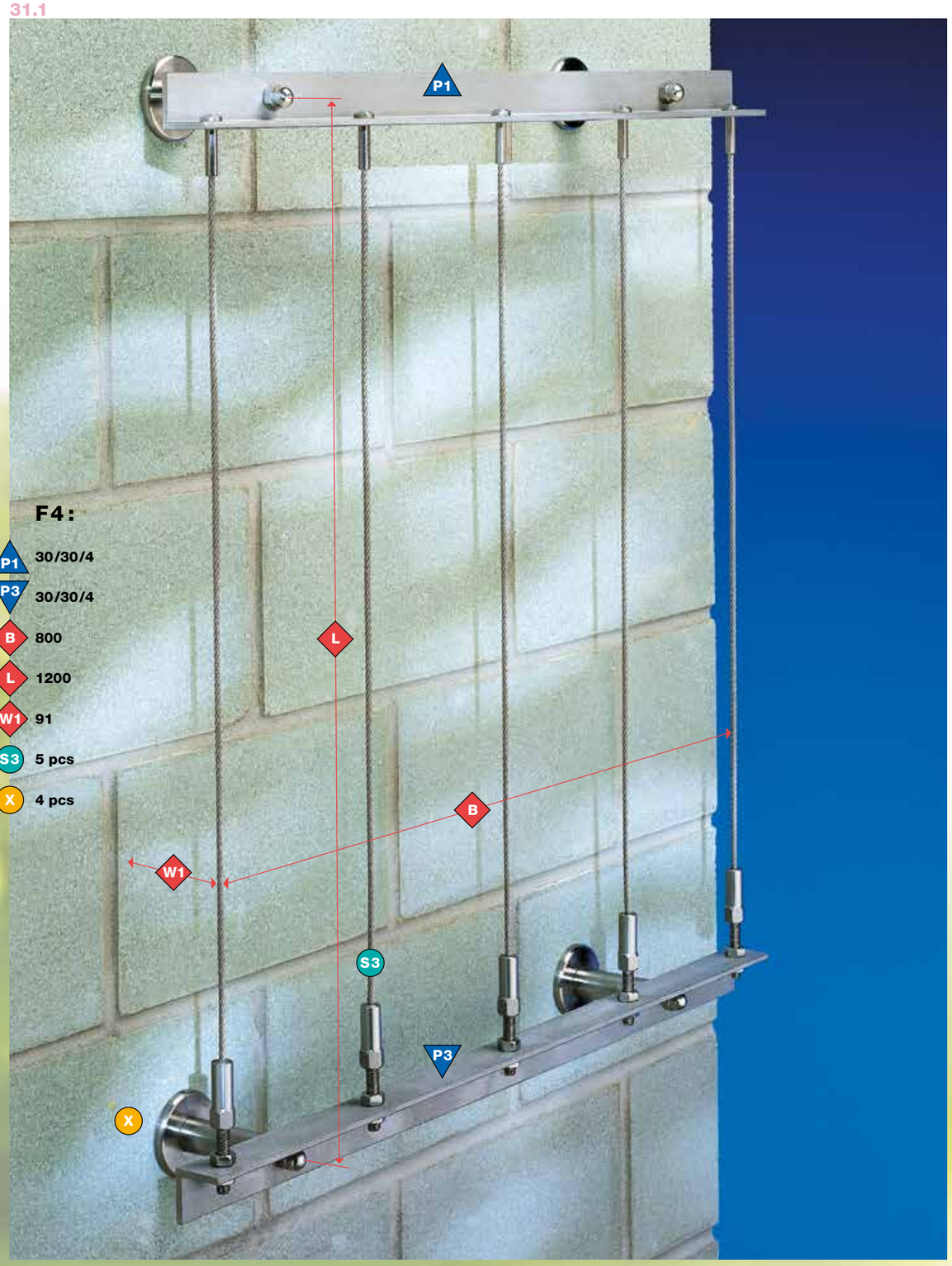
30.4

30.5



30.6

31.1



Ordering example (for the picture at right):

F4:
P1 30/30/4
P3 30/30/4
B 800
L 1200
W1 91
S3 5 pcs
X 4 pcs

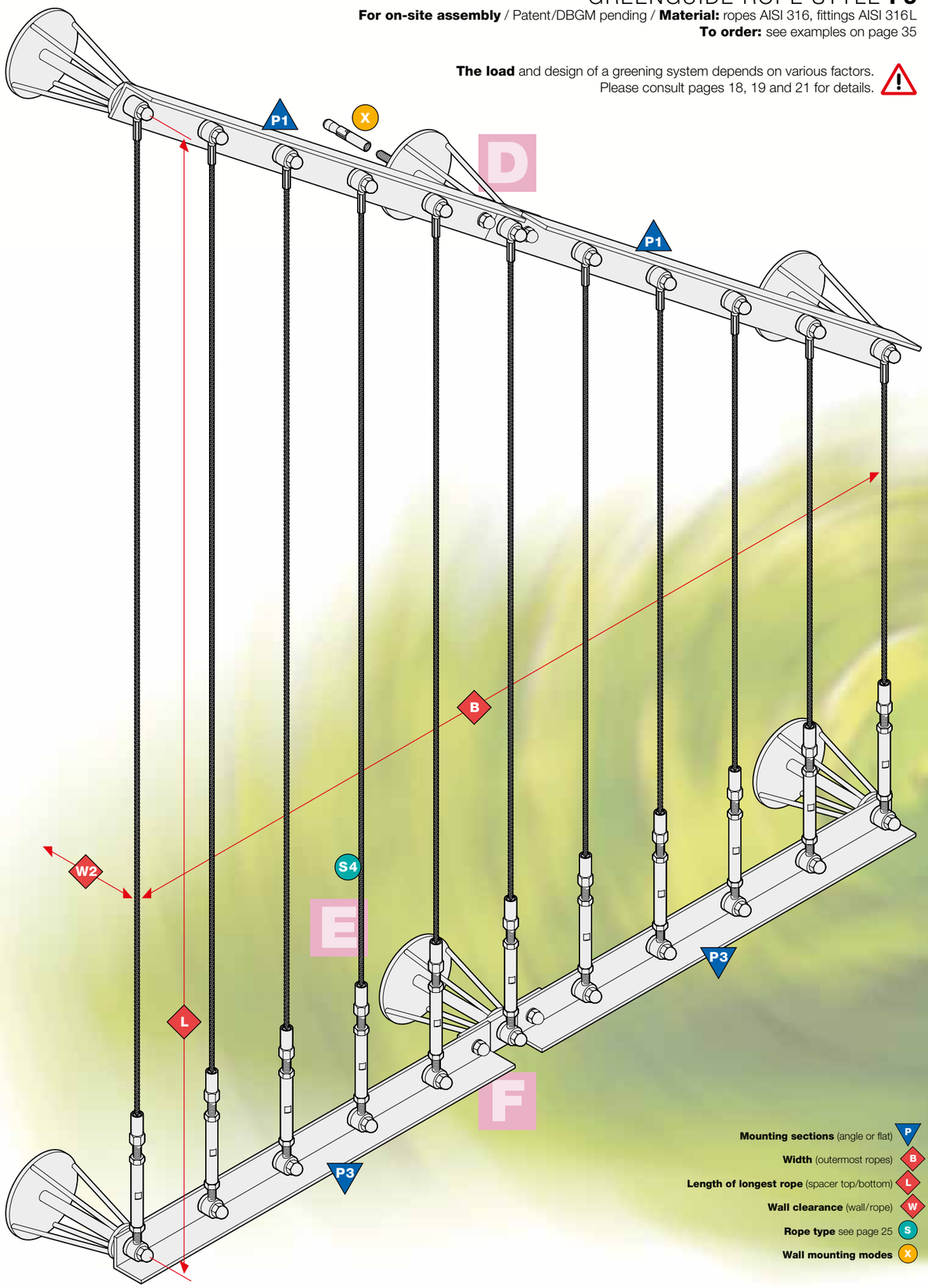
L S1 S3
Assembled lengths for on-site assembly:
Please see notes on page 25.

The user is responsible for choosing **the correct assembly method** (see Fig. 26.5 on page 26) and the proper rope diameter. **Functionality** is guaranteed only by Jakob rope **No. 10820–**0400 with the yellow code filament. Have a civil engineer check **strength values** and permissible loads on the basis of the given load case (see page 21).

GREENGUIDE ROPE STYLE **F5**

For on-site assembly / Patent/DBGM pending / **Material:** ropes AISI 316, fittings AISI 316L
To order: see examples on page 35

The load and design of a greening system depends on various factors.
Please consult pages 18, 19 and 21 for details.



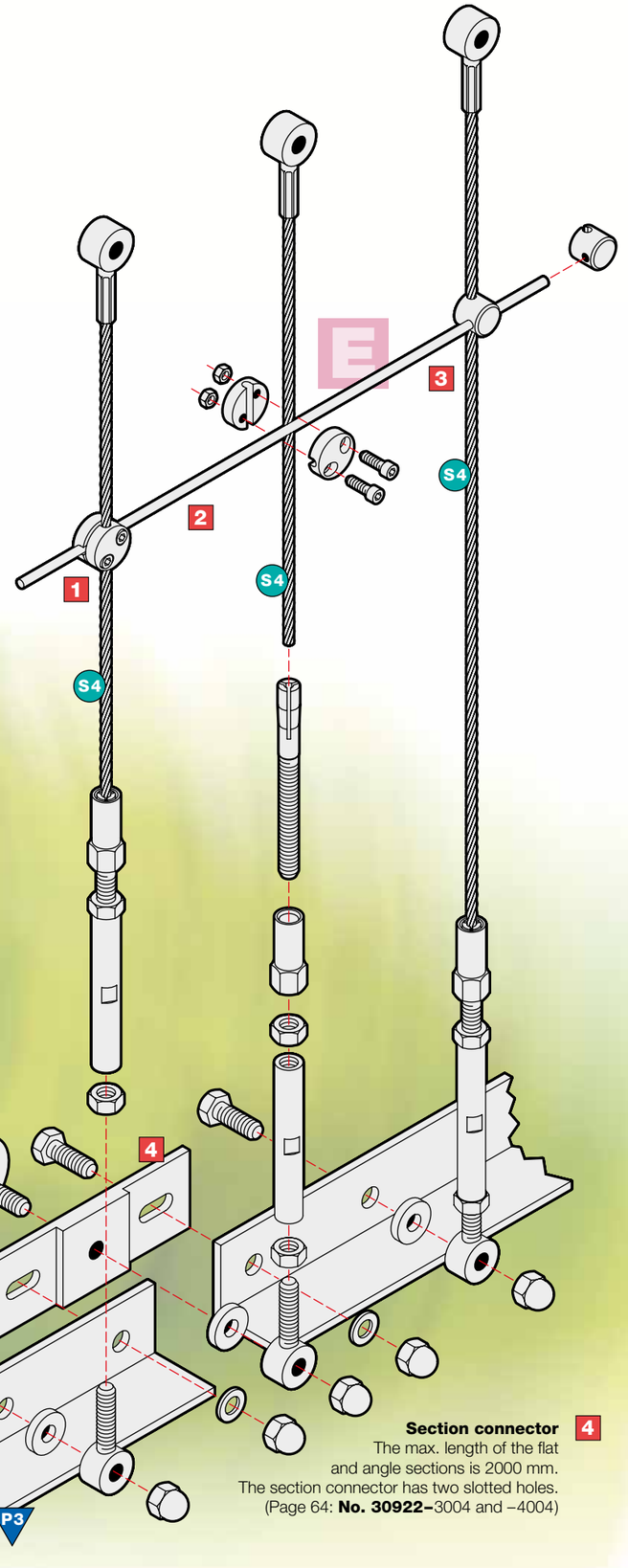
Mounting sections (angle or flat) P
Width (outermost ropes) B
Length of longest rope (spacer top/bottom) L
Wall clearance (wall/rope) W
Rope type see page 25 S
Wall mounting modes X

Horizontal rods combined with vertical wire ropes result in ideal training structures.
Two different methods are available for attaching rods to wire ropes.

1 • GreenGuide 90° cross clamp — **No. 30920–**0400–02 (Fig. 30.5, page 30)
2 • Horizontal rod Ø 3.7 — **No. 30922–**0400–00 (Page 65)
3 • Rope clip for stainless steel rods — **No. 30920–**0400–01 (Fig. 52.2, page 52)

S4 **Rope type S4**
Rope S4 is supplied with a tensionable end connector and is intended for **on-site assembly** (rope types see page 25).

X **Wall mounting** on wood, hollow walls, concrete or external insulation. See installation principles and materials on pages 20 and 64.



P1 P3 **Top/bottom mounting sections**
Depending on the load case, angle sections 40 / 40 / 4 or 30 / 30 / 4 are identical at the top and bottom.

P2 Intermediate section P2 can also be used as a bottom mounting section P3, depending on function and load case (see Fig. 34.3, page 34).

Section connector 4
The max. length of the flat and angle sections is 2000 mm.
The section connector has two slotted holes.
(Page 64: **No. 30922–**3004 and –4004)

34.1

34.2

34.3

P2: Intermediate section for long ropes (see page 29)
P3: Bottom mounting section with clamped rope ends (see pages 29 and 54)

GREENGUIDE ROPE STYLE **F5**

For on-site assembly / Patent/DBGM pending / **Material:** ropes AISI 316, fittings AISI 316L
To order: see examples on opposite page

		a	b	c	d	**Info:** Page
P1	**Upper mounting section**	Angle 30/30/4	Angle 40/40/4			21, 29, 64
P2	**Intermediate mounting section**			Flat 30/4	Flat 40/4	21, 29, 64
P3	**Bottom mounting section**	Angle 30/30/4	Angle 40/40/4	Flat 30/4	Flat 40/4	21, 29, 64
B	**Max. width** with 2 spacers	Suggested: approx. 1500 (with W 100 and plant weight 15 kg/m²)				
L	**Max. length** with 2 spacers	Suggested: approx. 3000 (with W 100 and plant weight 15 kg/m²)				
W1	**Wall clearance** with spacer Ø 20/50	68 / 85 / 110 – see wall clearance table on pages				40/41
W2	**Wall clearance** with spacer Ø 40/100	85 / 110 / 160 / 210 – see wall clearance table on pages				40/41
S	**Possible rope types: S2 / S4**	See notes on pages				25, 33
X	**Wall mounting** on wood, hollow walls, concrete or external insulation. See installation principles and materials on pages					20, 64

P **Mounting sections**
On request, we will supply the stainless steel sections ready to install with all holes (according to binding drawings).

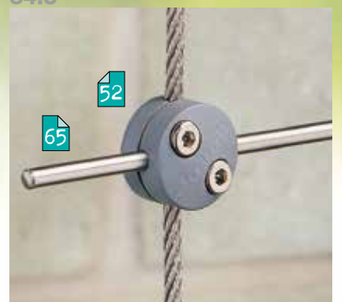
Horizontal rods combined with vertical wire ropes result in ideal training structures. See description on page 29 and the figure below (34.5).

The load and design of a greening system depends on various factors. Please consult pages 18, 19 and 21 for details.

see page no.

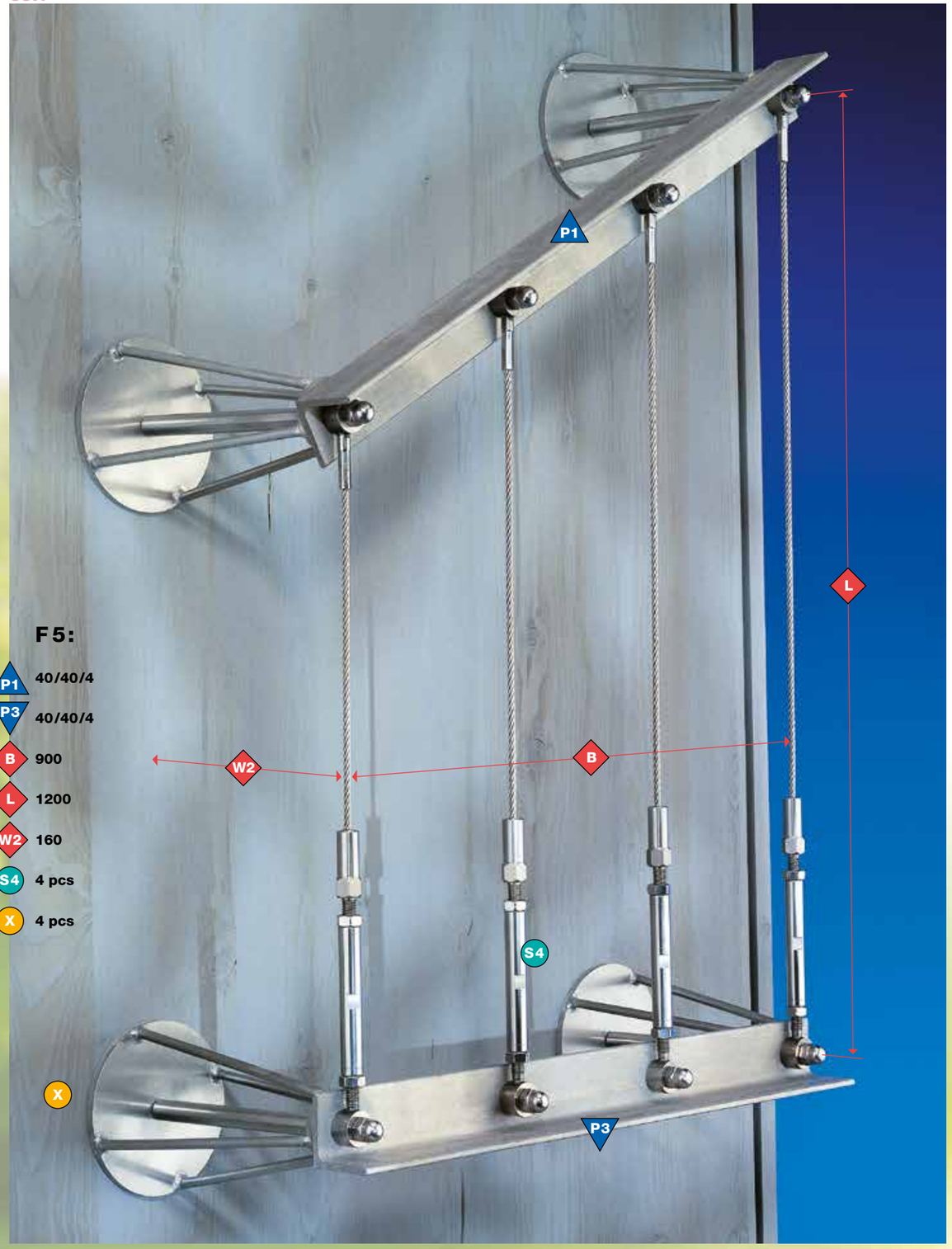
34.4

34.5



34.6

35.1



Ordering example (for the picture at right):

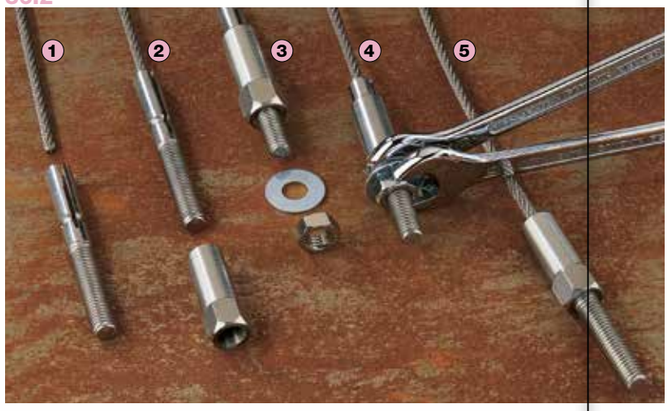
F5:
P1 **40/40/4**
P3 **40/40/4**
B **900**
L **1200**
W2 **160**
S4 **4 pcs**
X **4 pcs**

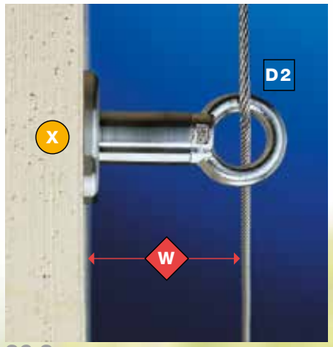
L S2 S4
Assembled lengths for on-site assembly:
L always applies to the longest wire rope.
Please see notes on page 25.

The user is responsible for choosing **the correct assembly method** (see Fig. 26.5 on page 26) and the proper rope diameter. **Functionality** is guaranteed only by Jakob rope **No. 10820–**0400 with the yellow code filament. Have a civil engineer check **strength values** and permissible loads on the basis of the given load case (see page 21).

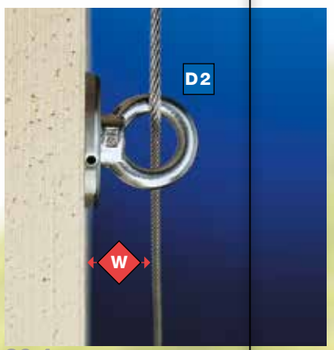
36.1

36.2



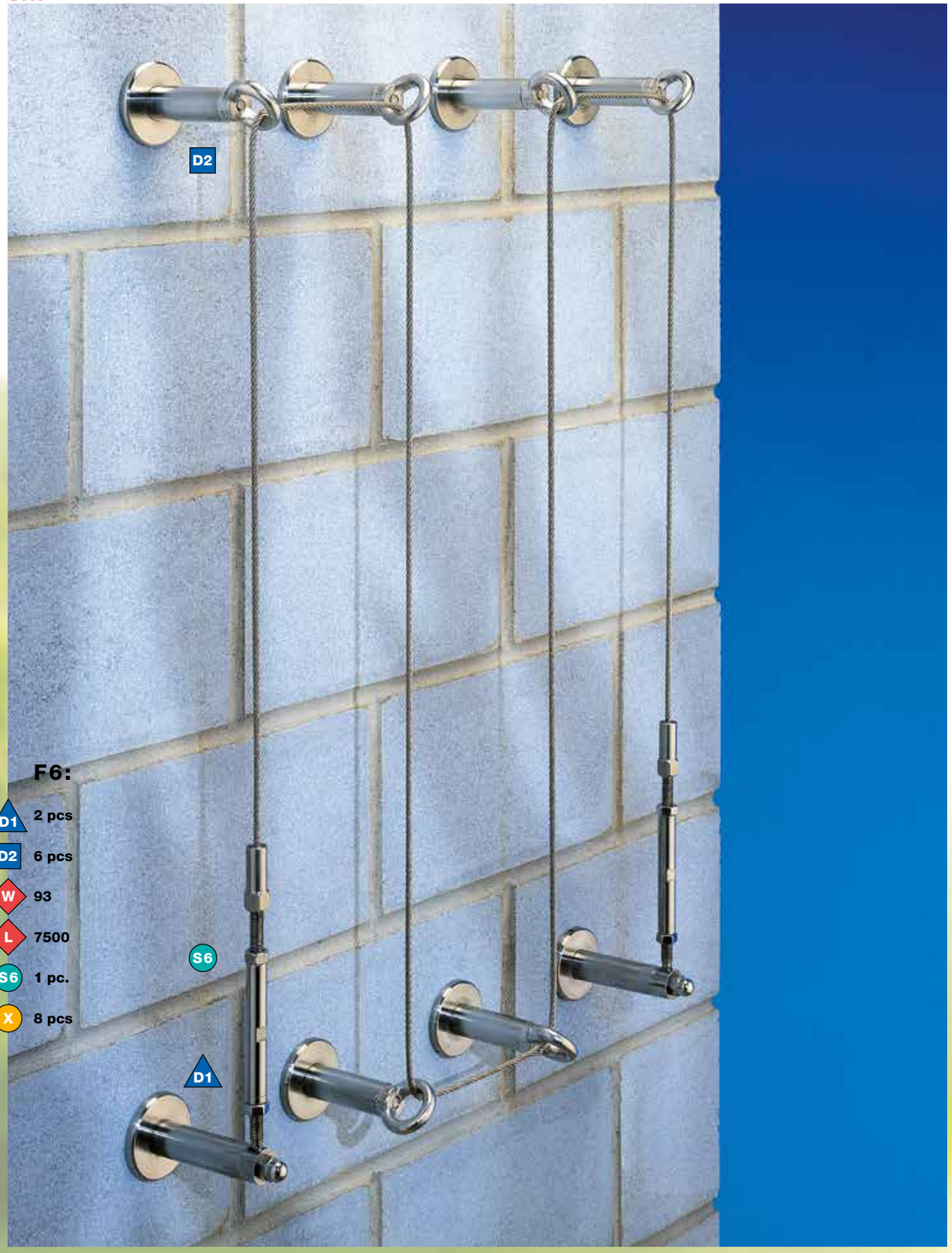


36.3



36.4

37.1



GREENGUIDE ROPE STYLE **F6**

For on-site assembly / **Material:** ropes AISI 316, fittings AISI 316L
To order: see examples on opposite page

			Info: Page
D1	**GreenGuide spacer**	Matches rope type S6 with GreenGuide eye	25, 49
D2	**Intermediate spacer** with ring nut	Rope guide or deflection point	48/49
D3	**Spacer** with ring nut	Loop of rope S7 is swaged directly to ring nut	48/49
W	**Wall clearances**	24 / 76 / 93 / 118 (D1 including 12 mm spacer washer)	40/41
L	**Rope length** (assembled length)	L = stretched rope with two assembled end connectors	25
S	**Possible rope types: S6 / S7**	See notes on pages	25
X	**Wall mounting** on wood, hollow walls, concrete or external insulation. See installation principles and materials on pages		20, 64

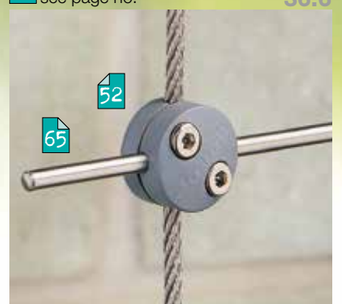
Ordering example (for the picture at right):

F6:
- D1 **2 pcs**
- D2 **6 pcs**
- W **93**
- L **7500**
- S6 **1 pc.**
- X **8 pcs**

36.5

see page no.

36.6



36.7

L S6 S7 **Assembled lengths for on-site assembly:** Please see notes on page 25.

D2 The sum of all **deflections should** not exceed 540°; max. 90° per deflection.

The user is responsible for choosing **the correct assembly method** (see Fig. 26.5 on page 26) and the proper rope diameter. **Functionality** is guaranteed only by Jakob rope **No. 10820–**0400 with the yellow code filament. Have a civil engineer check **strength values** and permissible loads on the basis of the given load case (see page 21).

38.1–38.4

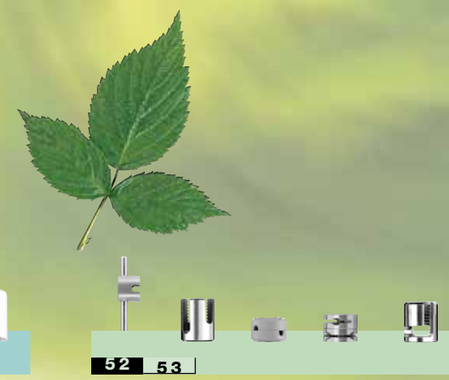
SUPERB MATERIALS – EASY ASSEMBLY

THE SINGLE ROPE DIAMETER (4 MM) AND ONE THREAD SIZE (M8) MAKE THIS LINE ABSOLUTELY INTEROPERABLE

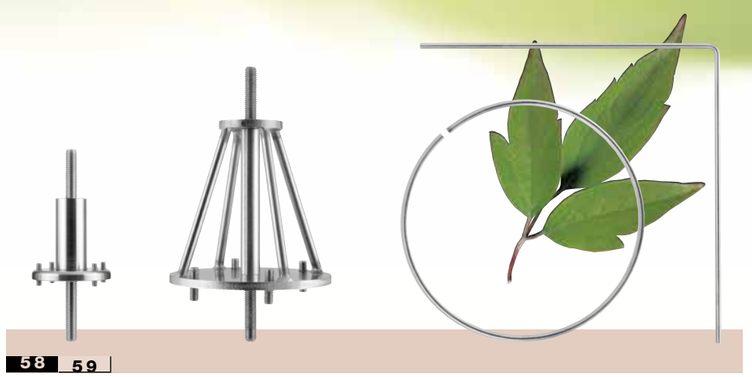
All parts of the **Jakob®** INOX LINE are made of top-quality materials. **The two alloys used – AISI 316 (1.4401) and AISI 316L (1.4404) – provide high corrosion resistance and plant compatibility.**

46 47
END STOP / EYES / LOOPS

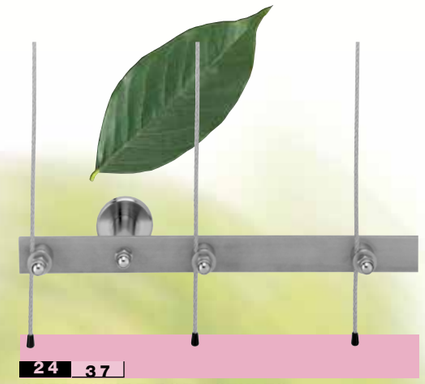
50 51
SPACERS



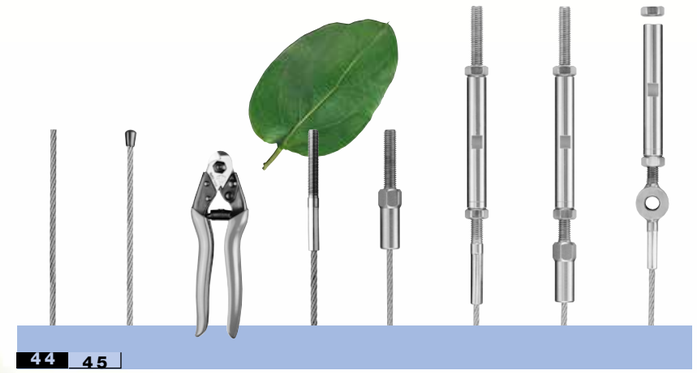
52 53
CROSS CLAMPS



58 59
COLUMN GREENING

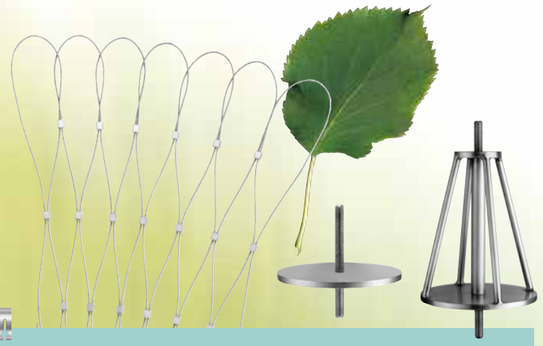


24 37
GREENGUIDE ROPE STYLES

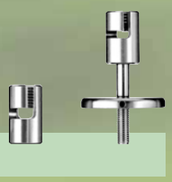


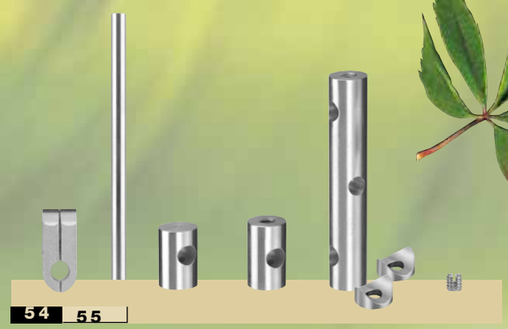
44 45
STAINLESS STEEL ROPE / EXTERNAL THREADS

48 49
SPACERS

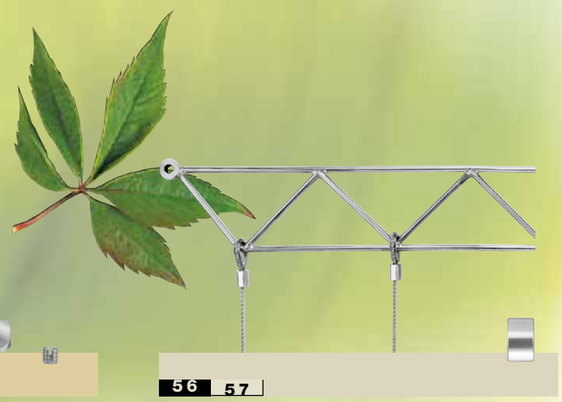


50 51
WEBNET / SPACERS

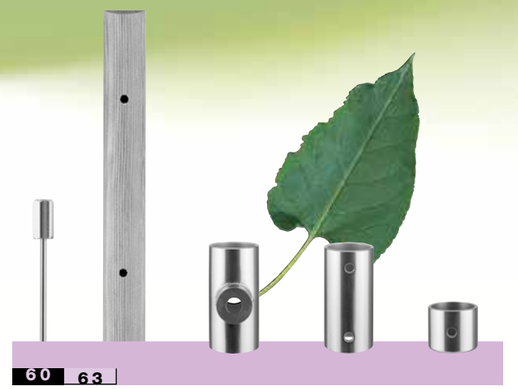




54 55
ROD SYSTEM



56 57
TRELLISWORK

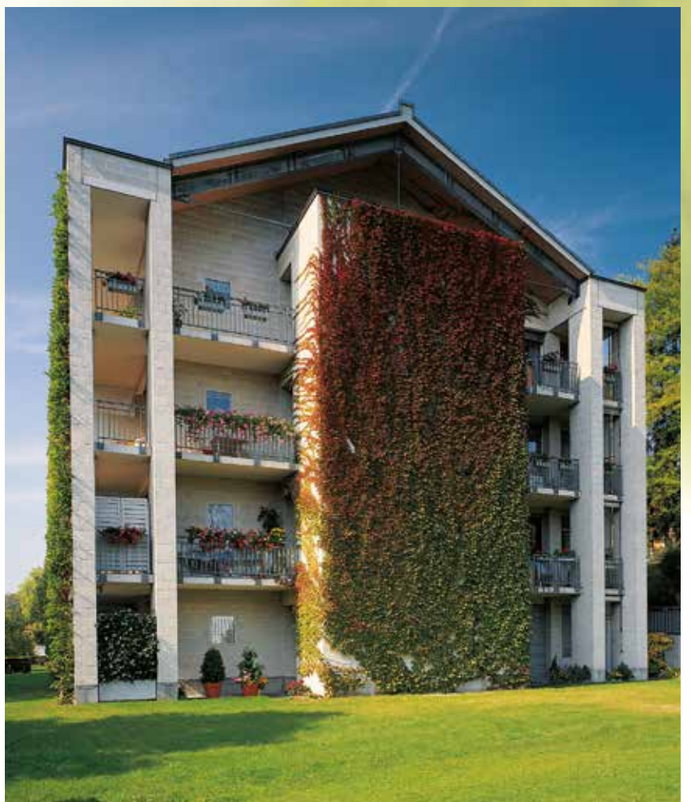


60 63
WOODEN ROD SYSTEM

64 65
SECTIONS / ASSEMBLY AIDS

see page no.

40.1–40.4



40.5

Wall clearance (W) means the distance between the façade and the training system (centre of rope).

WALL CLEARANCE EXAMPLES

	Swaged radius head end stop **No. 30869–**0400	With angle section 30 / 30 / 4 mm **No. 30922–**3030	With angle section 40 / 40 / 4 mm **No. 30922–**4040	Swaged GreenGuide eye **No. 30914–**0400	With flat section 30 / 4 mm **No. 30922–**0030	Loop swaged with GreenGuide eye **No. 30915–**0400	GreenGuide rod holder **No. 30921–**1000–01	GreenGuide rod / rope holder **No. 30921–**1000–04	GreenGuide overload clamp **No. 30920–**0400–10 (on flat section)	Spacer washers, three sizes: 4, 6 or 12 mm
	46	46	46	46	46	47	44	44	44	65
Eye bolt, slotted, with support washer **No. 30836–**0044–01 Unslotted **No. 30836–**0044 (48)	W 44	W	W	W	W	W	W	W	W	W
Eye bolt, slotted, with support washer **No. 30836–**0064–01 Unslotted **No. 30836–**0064 (48)	W 64	W	W	W	W	W	W	W	W	W
Eye bolt, slotted, with support washer **No. 30836–**0084–01 Unslotted **No. 30836–**0084 (48)	W 84	W	W	W	W	W	W	W	W	W
GreenGuide spacer Ø 20 / 50 **No. 30919–**0058 (49)		74	80	64	68	61	68	71	74	+ 12 / + 6 / + 4
GreenGuide spacer Ø 20 / 50 **No. 30919–**0075 (49)		91	97	81	85	78	85	88	91	
GreenGuide spacer Ø 20 / 50 **No. 30919–**0100 (49)		116	122	106	110	103	110	113	116	
Spacer basket Ø 40 / 100 **No. 30897–**0075 (51)		91	97	81	85		85	88	91	
Spacer basket Ø 40 / 100 **No. 30897–**0100 (51)		116	122	106	110		110	113	116	
Spacer basket Ø 40 / 100 **No. 30897–**0150 (51)		166	172	156	160		160	163	166	
Spacer basket Ø 40 / 100 **No. 30897–**0200 (51)		216	222	206	210		210	213	216	

+ 12 / + 6 / + 4 **No. 30922–**0800 **No. 30922–**0800–01 **No. 30922–**0800–02

42.1–42.4

see page no.

51 **1 Spacer basket Ø 40/100**
with four different wall clearances

46 **2 Swaged GreenGuide eye**
for rope Ø 4 mm
(dome nut M8, p. 65)

64 **3 Angle section**
in two sizes:
30/30/4 or 40/40/4 mm

46 **4 Swaged radius head end stop**
for rope Ø 4 mm

65 **5 Climber stud**
UV-resistant plastic
Colour grey

52 **6 GreenGuide cross clamp 90°**
UV-resistant plastic
Colour grey

52 **7 Rope clip for stainless steel rod**
UV-resistant plastic
Colour grey

62 **8 End cap**
for wooden rod Ø 25 mm

49 **9 GreenGuide spacer Ø 20/50**
with three wall clearances

62 **10 Wooden rod holder**
incl. special Mininut
for wooden rod Ø 25 mm

65 **11 Horizontal rod Ø 3.7**
for combinations with vertical ropes

63 **12 Wooden rod Ø 25**
glazed spruce (grey) or untreated larch

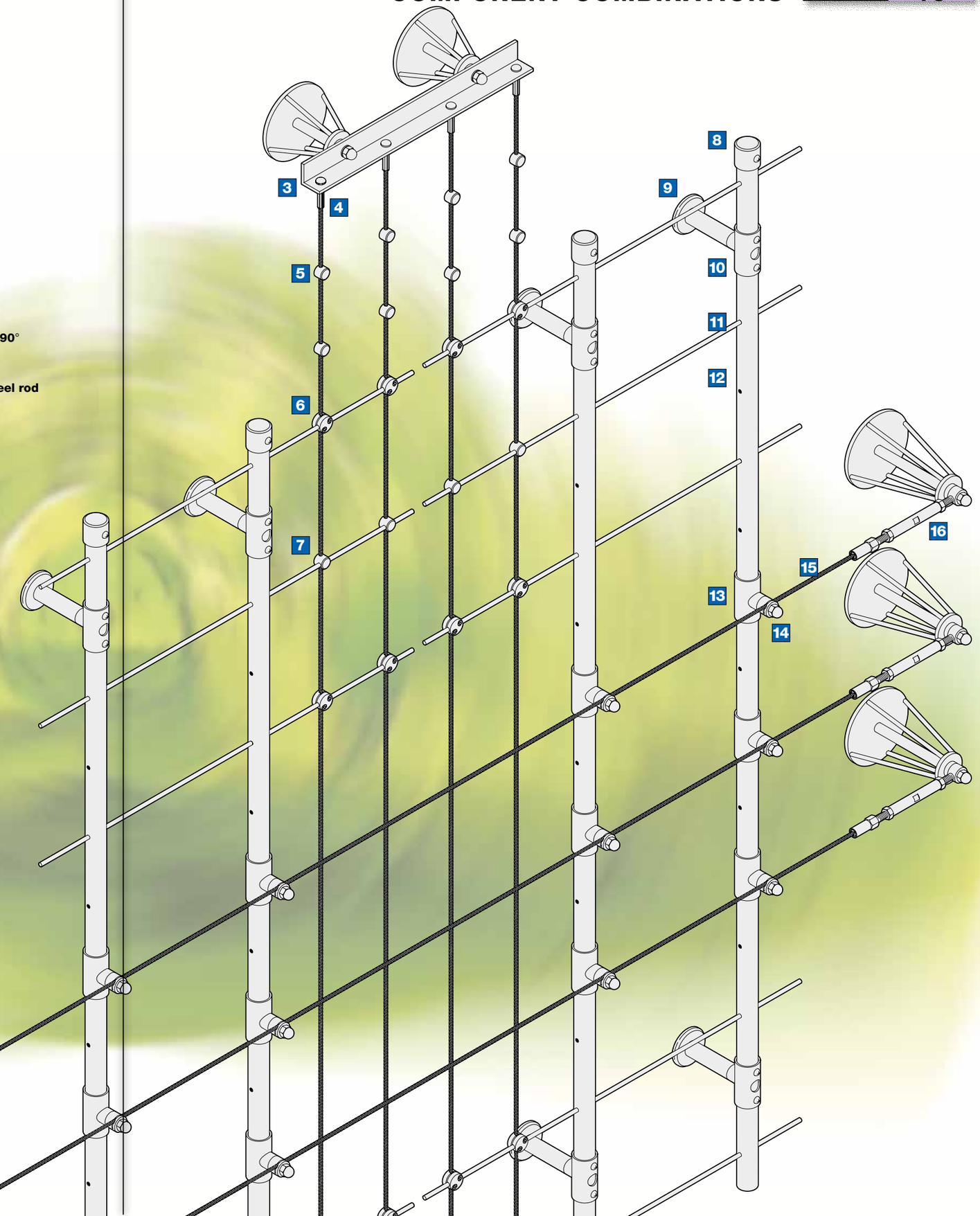
62 **13 Wooden rod holder**
accepts rope guide point

65 **14 GreenGuide overload clamp**
as a rope guide point

44 **15 Stainless steel rope Ø 4**
Construction 6x7+SE

47 **16 Turnbuckle with GreenGuide eye LT2**
for on-site assembly

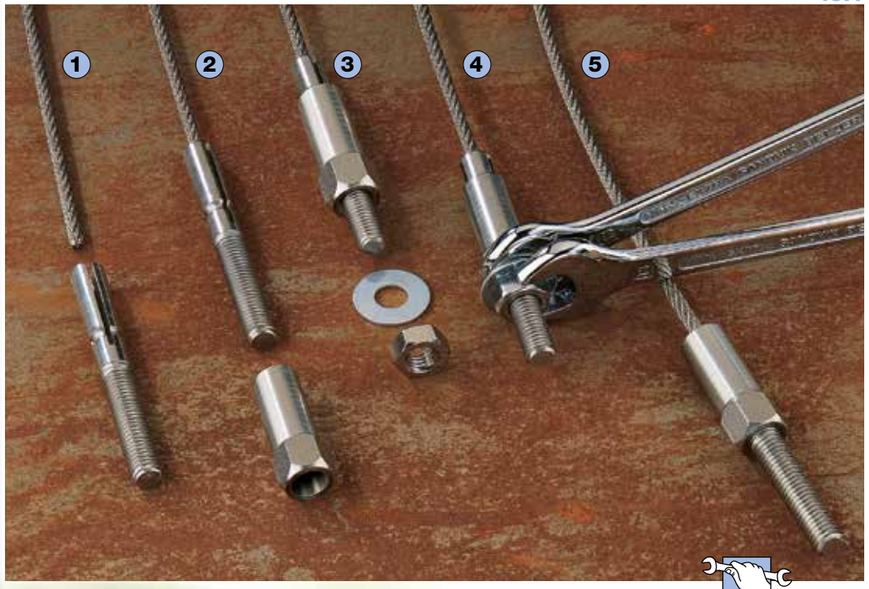
COMPONENT COMBINATIONS



44.1

44.2

45.1



For on-site assembly

The user is responsible for choosing **the correct assembly method** and the proper rope diameter. **Functionality** is guaranteed only by Jakob rope **No. 10820–**0400 with the yellow code filament.

⊕⊖Tensioning range information: both thread ends are screwed halfway into the turnbuckle body.

←⊕→ = make longer (relax)
→⊖← = make shorter (tension)

Swaged external thread
The swaging process **lengthens** dimension **b** by about 3%.

R Right-hand thread
L Left-hand thread

We assemble all end connectors with wire ropes that **are manufactured in-house. Jakob®** wire ropes are subject to strict quality inspections. All components are carefully matched. This assures superior functionality and **compliance with guaranteed breaking loads.** For safety reasons, use only **Jakob®** wire ropes in combination with items designed for **on-site assembly.** See description on page 21.

STAINLESS STEEL ROPE Ø 4 / 6x7+SE

Minimum breaking load: 9.1 kN (kN x 102 = kp)

No. 10820–	
0400	1.4401 / AISI 316

WIRE ROPE END CAP

Soft plastic, colour black

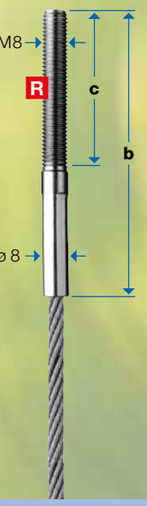
No. 30804–	
0400	

FELCO C7 WIRE ROPE CUTTER

No. 30740–
0500

SWAGED EXTERNAL THREAD END

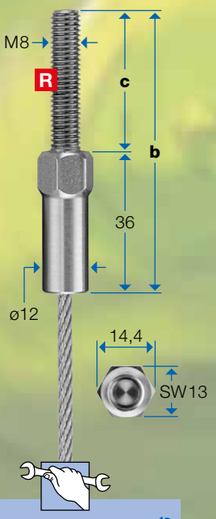
Breaking strength: 90% of minimum rope-breaking load



No. 30850–	b	c	
0400–031	67	30	1.4404 / AISI 316
0400–062	97	60	
0400–081	117	80	

EXTERNAL THREAD LT2

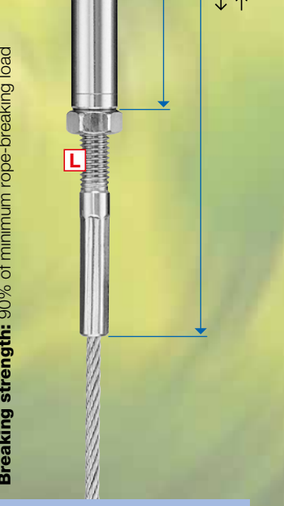
For on-site assembly / Patent/DBGM pending
Breaking strength: 90% of minimum rope-breaking load



No. 30910–	b	c	
0400–30	66	30	1.4404 / AISI 316
0400–60	96	60	

SWAGED TURNBUCKLE WITH EXTERNAL THREAD

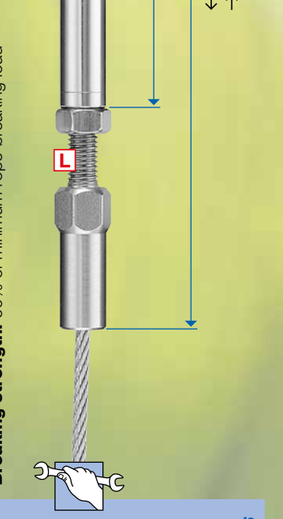
Breaking strength: 90% of minimum rope-breaking load



No. 30911–	b	
0400–01	197,5 Tension range: lengthen + 8 shorten –24	1.4404 / AISI 316

TURNBUCKLE WITH EXTERNAL THREAD LT2

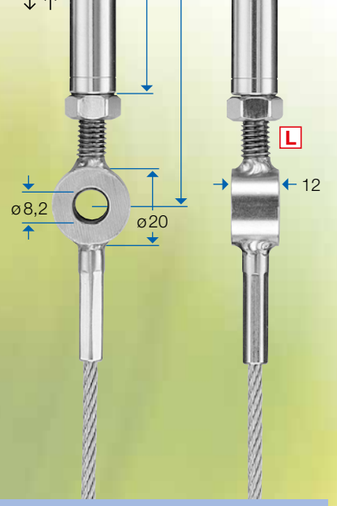
For on-site assembly / Patent/DBGM pending
Breaking strength: 90% of minimum rope-breaking load



No. 30911–	b	
0400–02	197,5 Tension range: lengthen + 8 shorten –24	1.4404 / AISI 316

SWAGED EXTERNAL THREAD WITH GREENGUIDE EYE AND TURNBUCKLE

Breaking strength: 90% of minimum rope-breaking load



No. 30911–	b	
0400–03	108 Tension range: lengthen + 4 shorten –12	1.4404 / AISI 316

46.1

47.1

47.2

47.3

⊕⊖ Tensioning range information: both thread ends are screwed halfway into the turnbuckle body.

←⊕→ = make longer (relax)
→⊖← = make shorter (tension)

R Right-hand thread
L Left-hand thread

The user is responsible for choosing **the correct assembly method** and the proper rope diameter. **Functionality** is guaranteed only by Jakob rope **No. 10820–**0400 with the yellow code filament.

Swaged parts: The swaging process **lengthens** the compression sleeve by about 3%.

S **Without** thimble
t **With** thimble

SWAGED RADIUS HEAD END STOPS

Breaking strength: 90% of minimum rope-breaking load

No. 30869–	
0400	1.4404 / AISI 316

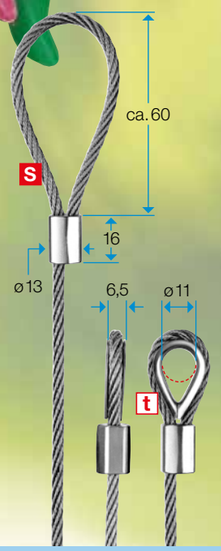
SWAGED GREENGUIDE EYE

Breaking strength: 90% of minimum rope-breaking load

No. 30914–	
0400	1.4404 / AISI 316

COMPRESSED LOOP

Breaking strength: 90% of minimum rope-breaking load



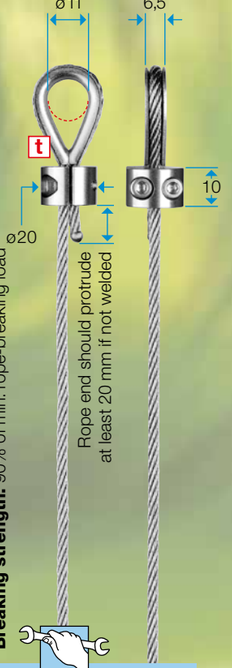
No. 20803–	No. 20804–	
0400 without thimble	0400 with thimble	1.4404 / AISI 316

WELDED WIRE ROPE END

No. 30905–	
0400	1.4401 / AISI 316

LIGHT LOOP CLAMP

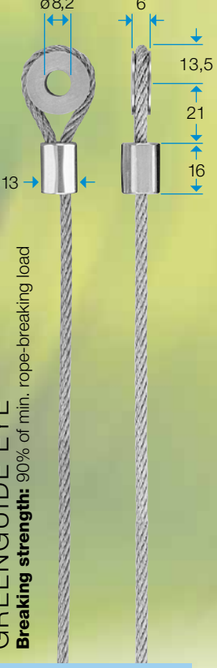
Breaking strength: 90% of min. rope-breaking load



No. 30874–	
0400–01	1.4404 / AISI 316

SWAGED LOOP WITH GREENGUIDE EYE

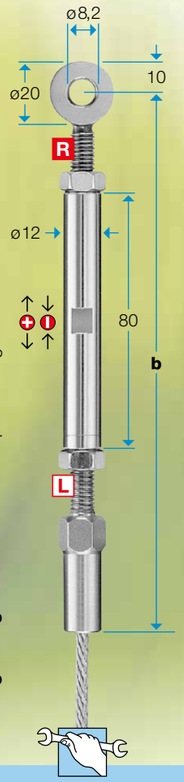
Breaking strength: 90% of min. rope-breaking load



No. 30915–	
0400	1.4404 / AISI 316

TURNBUCKLE WITH GREENGUIDE EYE LT2

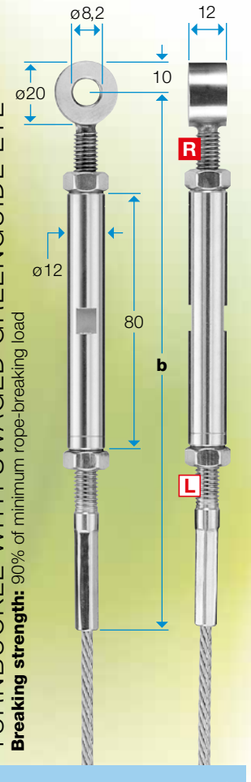
For on-site assembly / Patent/DBGM pending
Breaking strength: 90% of minimum rope-breaking load



No. 30911–	b	
0400–04	156 Tension range: +8 –24	1.4404 / AISI 316

TURNBUCKLE WITH SWAGED GREENGUIDE EYE

Breaking strength: 90% of minimum rope-breaking load



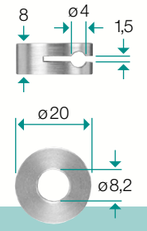
No. 30911–	b	
0400–05	156 Tension range: +8 –24	1.4404 / AISI 316

48.1

48.2

49.1

GREENGUIDE ROPE GUIDE



No. 30920–

0400–00

1.4404 / AISI 316

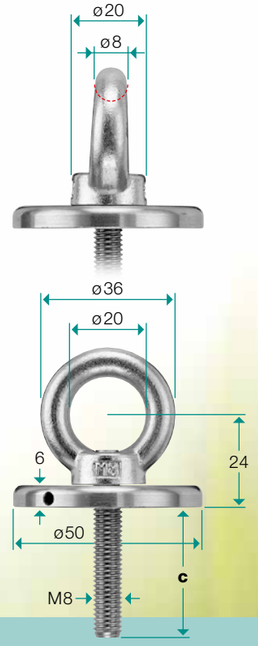
HOLE SAW

No. 30912–

0044

Threaded extender
see page 51

RING NUT WITH SUPPORT WASHER

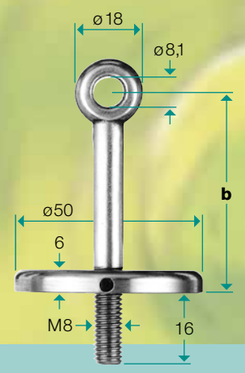


No. 30918–	c	
0800–01	variable	*1.4404 / AISI 316*

EYE BOLT, SLOTTED WITH SUPPORT WASHER
Patent / DBGM pending

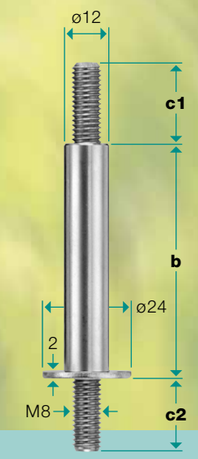
No. 30836–	b	
0044–01	44	*1.4404 / AISI 316*
0064–01	64	
0084–01	84	

EYE BOLT WITH SUPPORT WASHER



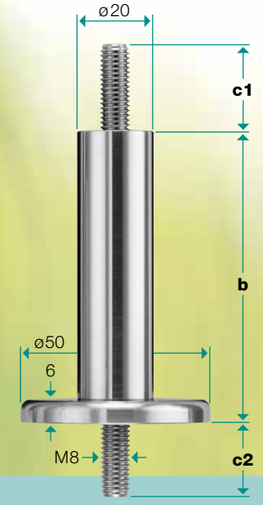
No. 30836–	b	
0044	44	*1.4404 / AISI 316*
0064	64	
0084	84	

SPACER Ø 12 / 24



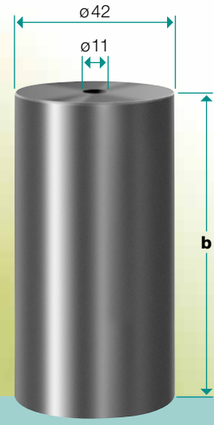
No. 30919–	b	c1 / c2	
0800–01	variable max. 75	variable	*1.4404 / AISI 316*

GREENGUIDE SPACER Ø 20 / 50



No. 30919–	b	c1 / c2	
0058	58	variable	*1.4404 / AISI 316*
0075	75		
0100	100		

SUPPORT TUBE
POM (Delrin) black



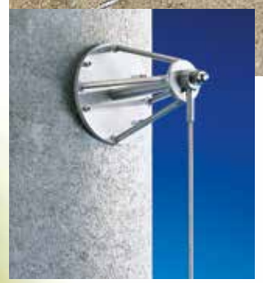
Costs per cut and drilling: **No. 20800–**0001

No. 30919–	b	
0800–03	variable	

50.1

51.1

51.2

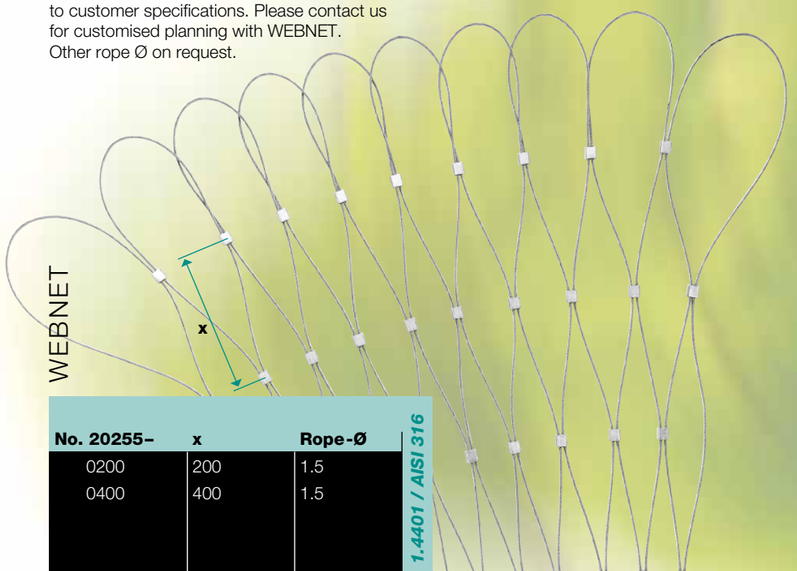


Curved mounting surface
see pages 58/59.

Correct wall mounting (see page 20) is the responsibility of the user. **Strength ratings** and permissible loads based on the application must be calculated by a qualified engineer (see page 21).

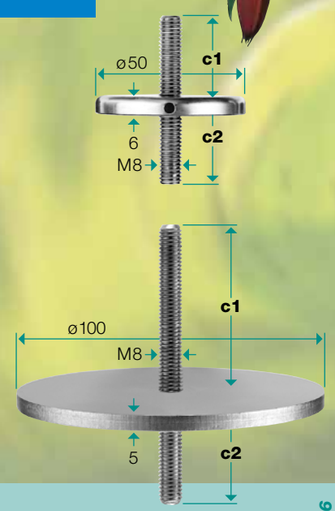
WEBNET
This multifunctional mesh is made of stainless steel wire rope dimensioned to customer specifications. Please contact us for customised planning with WEBNET.
Other rope Ø on request.

WEBNET



No. 20255–	x	Rope-Ø	1.4401 / AISI 316
0200	200	1.5	
0400	400	1.5	

SUPPORT WASHER WITH HEADLESS SCREW



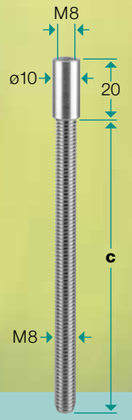
No. 30919–	ø	c1/c2	1.4404 / AISI 316
0050–01	50	variable	
0100–01	100	variable	

SPACER BASKET Ø 40/100

European patent pending

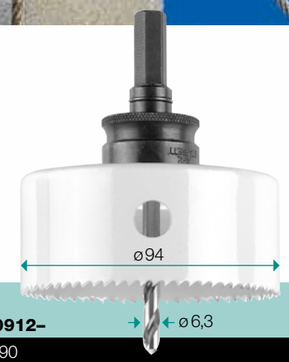
No. 30897–	b	c1	c2	1.4404 / AISI 316
0075	75	variable	variable	
0100	100			
0150	150			
0200	200			

THREADED EXTENDER



No. 30919–	c	1.4404 / AISI 316
0800–05	variable	

HOLE SAW

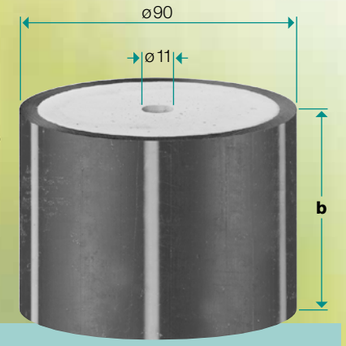


No. 30912–
0090

Costs for cut and drilling: **No. 30897–**0020–01

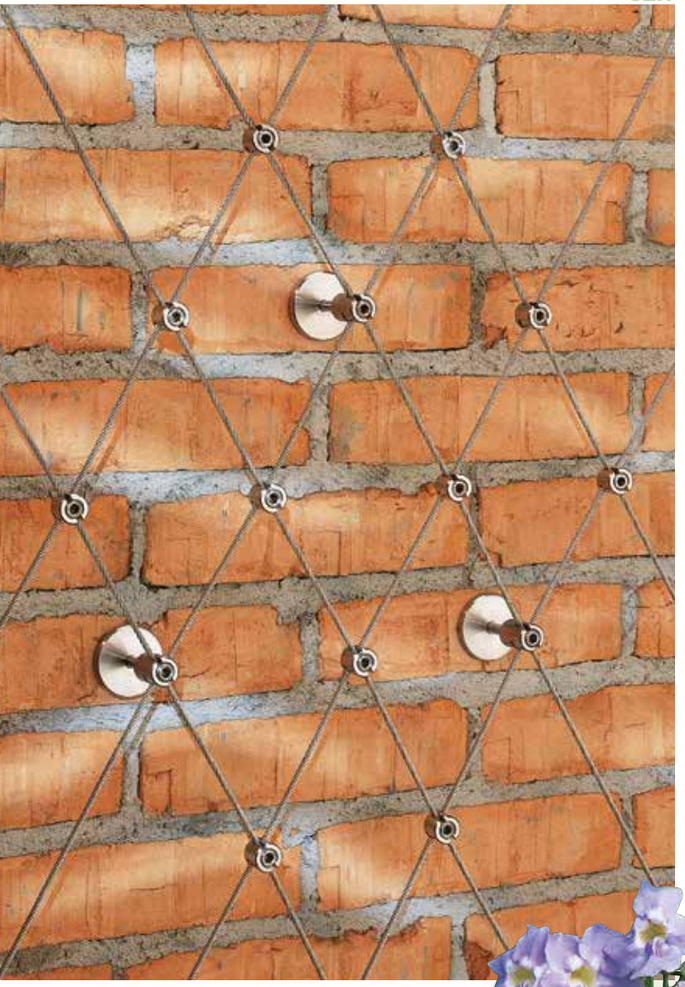
SUPPORT TUBE

Patent / DBGM pending

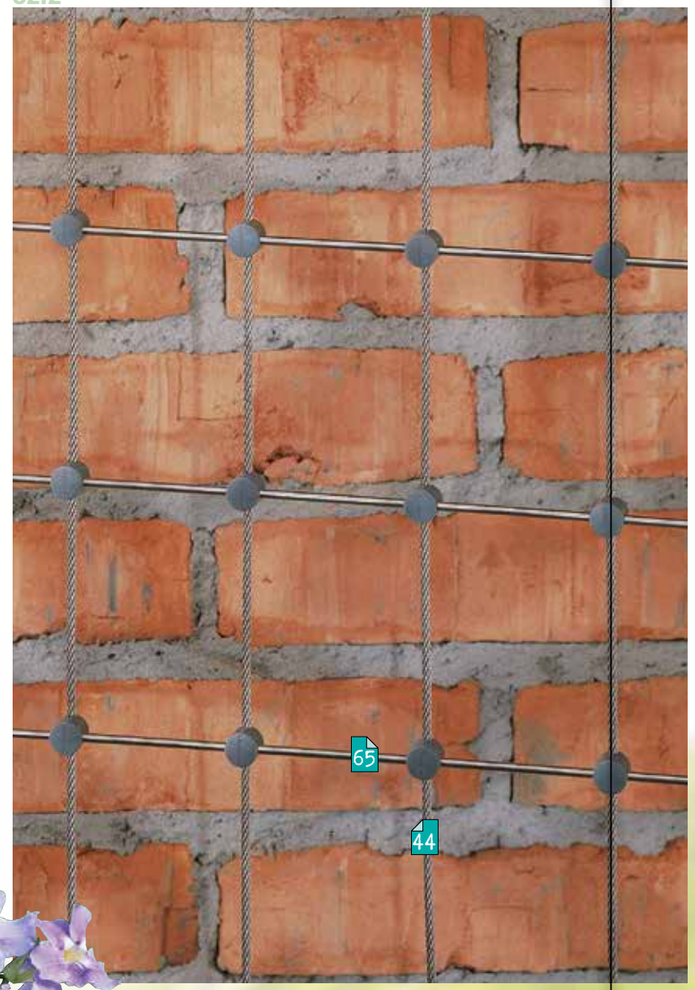


No. 30897–	b
0020–10 foam-filled	variable
0020–11 unfilled	variable

52.1



52.2



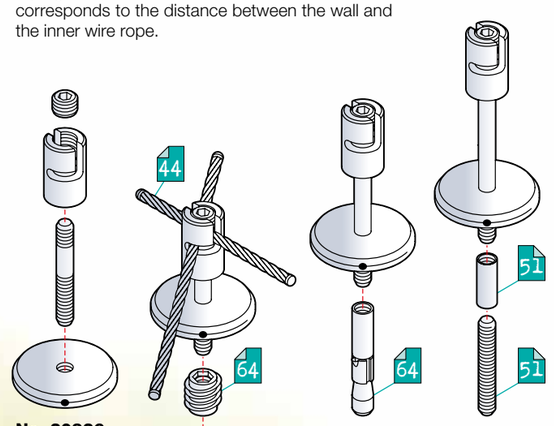
53.1

53.2

53.3

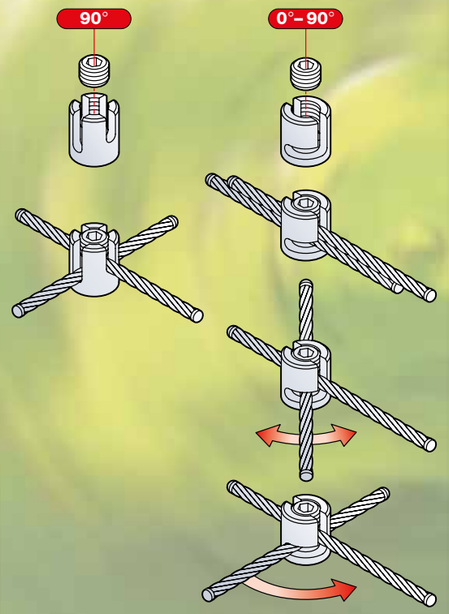
53.4

Adjustable cross clamp with support washer
This product may be used only as an intermediate rope guide (not as an end connector). Dimension **b1** corresponds to the distance between the wall and the inner wire rope.



No. 30836–

The user is responsible for choosing **the correct assembly method** and the proper rope diameter.



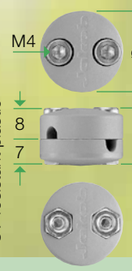
ROPE CLIP FOR HORIZONTAL ROD Ø 3.7

UV-resistant plastic

No. 30920–
0400–01

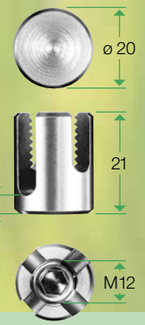
GREENGUIDE CROSS CLAMP 90°

UV-resistant plastic



No. 30920–
0400–02

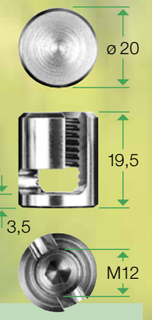
CROSS CLAMP 90°



No. 30858–	
0400	*1.4404 / AISI 316*

ADJUSTABLE CROSS CLAMP

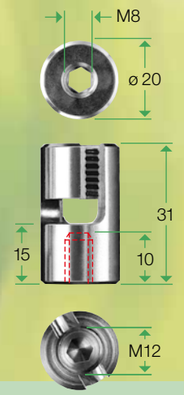
Patent/DBGM pending



No. 30858–	
0400–01	*1.4404 / AISI 316*

ADJUSTABLE CROSS CLAMP WITH INTERNAL THREAD

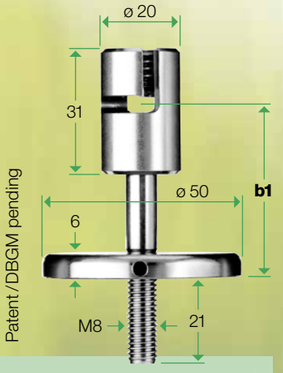
Patent/DBGM pending



No. 30858–	
0400–02	*1.4404 / AISI 316*

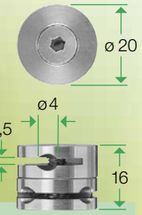
ADJUSTABLE CROSS CLAMP WITH SUPPORT WASHER

Patent/DBGM pending



No. 30836–	b1	
0044–40	44	*1.4404 / AISI 316*
0064–40	64	
0084–40	84	

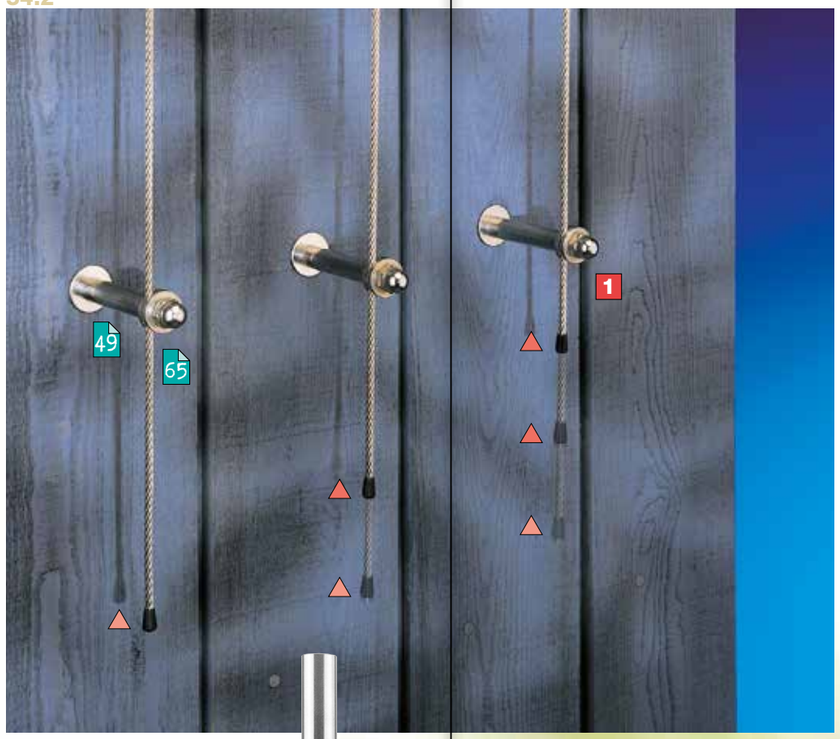
GREENGUIDE ADJUSTABLE CROSS CLAMP



No. 30920–	
0400–03	*1.4404 / AISI 316*

54.1

54.2



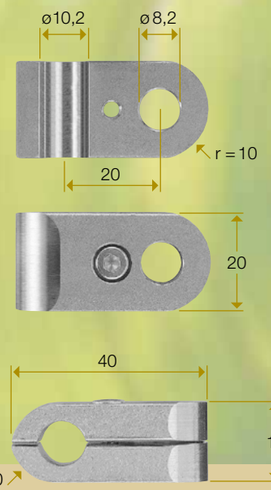
55.1

54.3

54.4

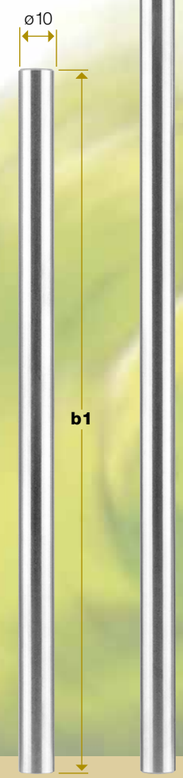
The user is responsible for choosing **the correct assembly method. Strength ratings** and permissible loads based on the application must be calculated by a qualified engineer (see page 21).

GREENGUIDE ROD HOLDER



No. 30921–	
1000–01	1.4404 / AISI 316

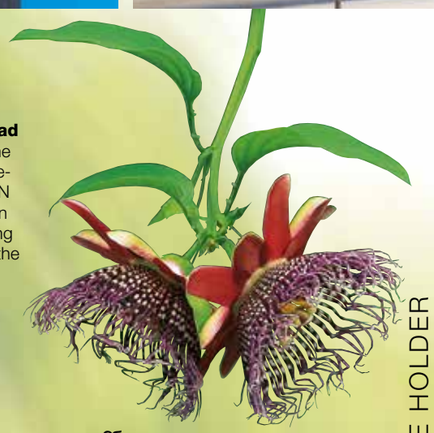
GROUND STAINLESS STEEL ROD Ø 10



No. 30921–	b1	
1000	max. 2500	1.4404 / AISI 316

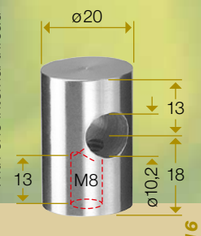
Costs per cut: **No. 20800–**0002

1 Fig 54.2:
The GreenGuide overload clamp (page 65) clamps the end of the wire rope. The defined clamping force of 1 kN allows the rope to slip when gripped by vigorously twining climbers, thus lengthening the rope (see page 19, item E).



ROD / ROPE CONNECTOR

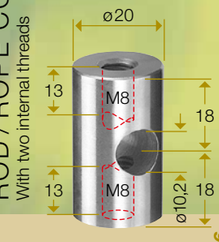
With one internal thread



No. 30921–	
1000–02	1.4404 / AISI 316

ROD / ROPE CONNECTOR

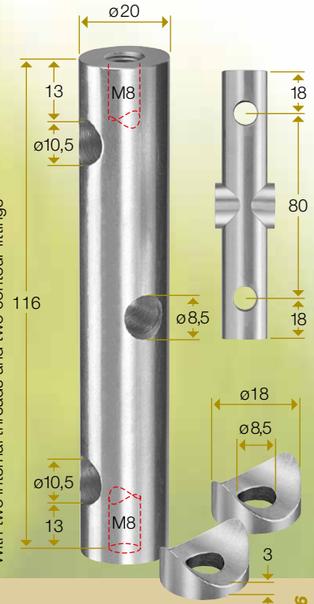
With two internal threads



No. 30921–	
1000–03	1.4404 / AISI 316

GREENGUIDE ROD / ROPE HOLDER

With two internal threads and two contour fittings

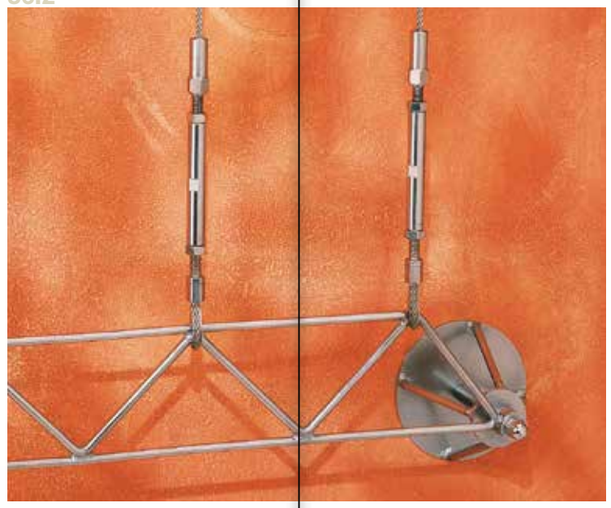


No. 30921–	
1000–04	1.4404 / AISI 316

ROD SETSCREW

No. 30921–	
0800	1.4404 / AISI 316

56.1 56.2



The user is responsible for choosing **the correct assembly method** and the proper rope diameter. **Functionality** is guaranteed only by Jakob rope **No.10820–**0400 with the yellow code filament. **Strength ratings** and permissible loads based on the application must be calculated by a qualified engineer (see page 21).

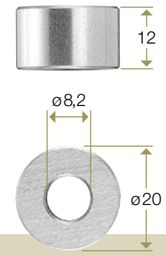
⊕⊖ **Tensioning range** information: both thread ends are screwed halfway into the turnbuckle body.

←⊕→ = make longer (relax)
→⊖← = make shorter (tension)

R Right-hand thread
L Left-hand thread

57.1

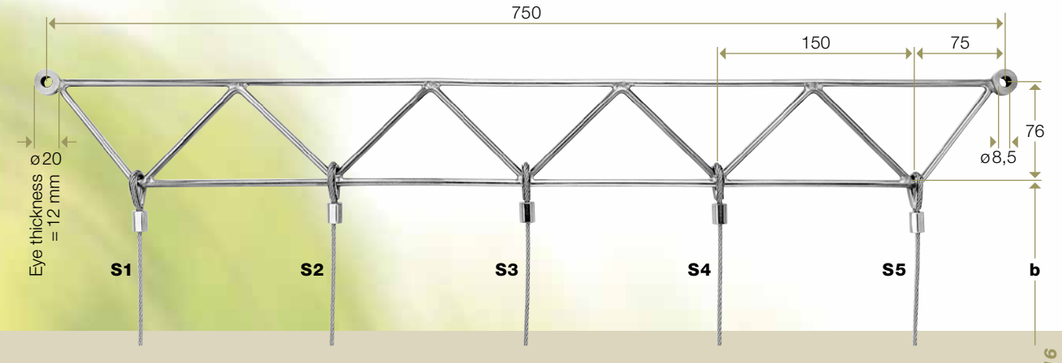
SPACER WASHER
For GreenGuide trelliswork



No. 30922–
0800

1.4404 / AISI 316

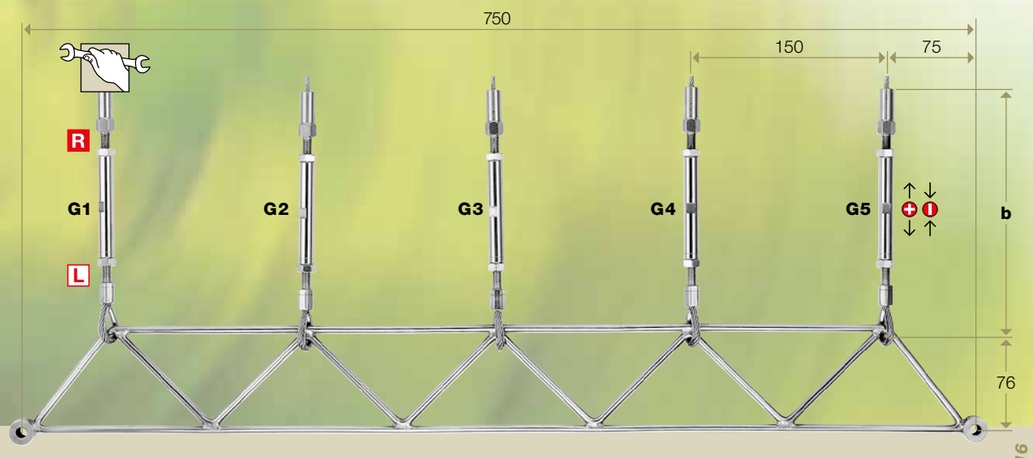
GREENGUIDE TRELLIS-WORK WITH SWAGED LOOPS



No. 30922–	b (rope length)	S (number of ropes)
0600–01	max. 6000	with 5 ropes (S1 / S2 / S3 / S4 / S5)
0600–03	max. 6000	with 3 ropes (S1 / S3 / S5)
0600		without ropes

1.4404 / AISI 316

GREENGUIDE TRELLIS-WORK WITH TENSIONER FITTINGS
For on-site assembly (without ropes)



No. 30922–	G (number of tensioner fittings)	b
0600–02	with 5 tensioner fittings (G1 / G2 / G3 / G4 / G5)	200
0600–04	with 3 tensioner fittings (G1 / G3 / G5)	Tension range: lengthen +8 shorten –24

1.4404 / AISI 316

58.1

58.2

58.3

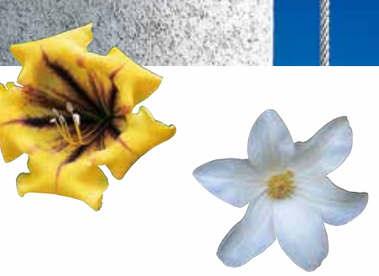
patent pending

59.1

patent pending

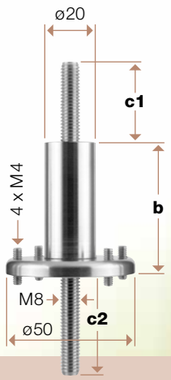
59.2

patent pending



GREENGUIDE SPACER Ø 20/50

For curved mounting surfaces



No. 30919–	b	c1/c2
0058–02	58	variable
0075–02	75	variable
0100–02	100	variable

1.4404 / AISI 316

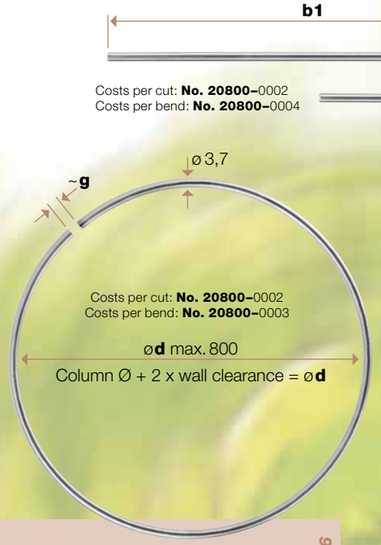
SPACER BASKET Ø 40/100

For curved mounting surfaces / European patent pending

No. 30897–	b	c1/c2
0075–01	75	variable
0100–01	100	variable
0150–01	150	variable
0200–01	200	variable

1.4404 / AISI 316

CIRCULAR ROD Ø 3.7



No. 30922–	ød	g
0400–01	variable max. 800	approx. 10

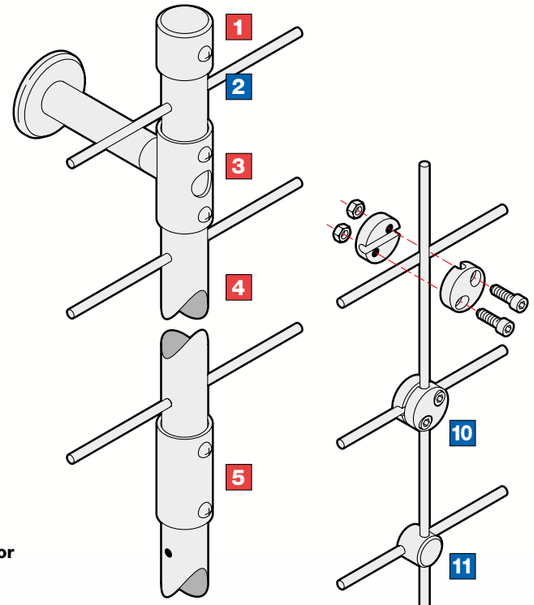
1.4404 / AISI 316

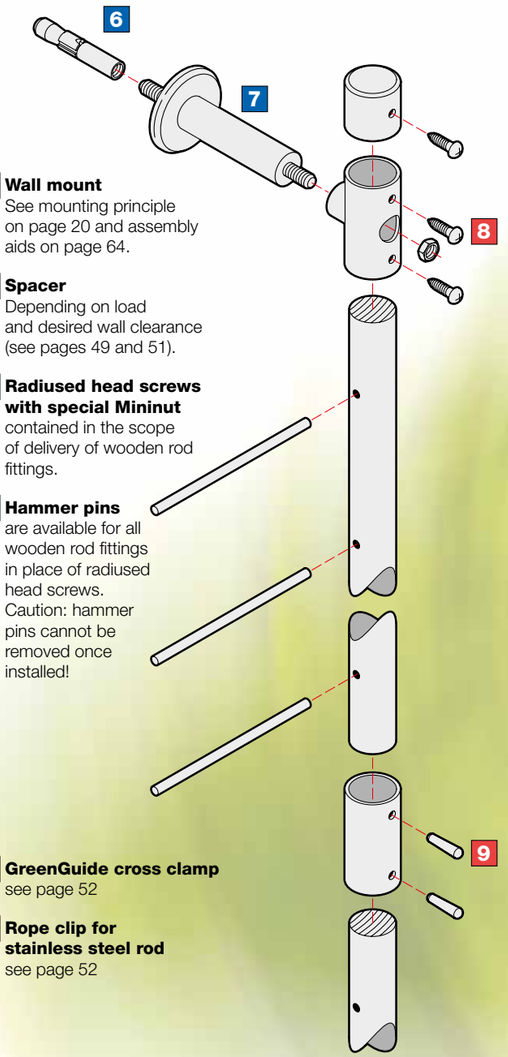
ANGLED ROD Ø 3.7

No. 30922–	b1 / b2
0400–02	variable b1 + b2 = max. 1000

1.4404 / AISI 316

The user is responsible for choosing **the correct assembly method** (see page 20).
Strength ratings and permissible loads based on the application must be calculated by a qualified engineer (see page 21).





1 **End cap**

2 **Stainless steel rod**
see page 65

3 **Wooden rod holder**

4 **Wooden rod**

5 **Wooden rod connector**

6 **Wall mount**
See mounting principle on page 20 and assembly aids on page 64.

7 **Spacer**
Depending on load and desired wall clearance (see pages 49 and 51).

8 **Radiused head screws with special Mininut**
contained in the scope of delivery of wooden rod fittings.

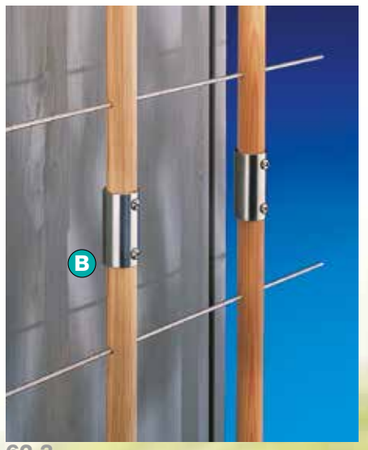
9 **Hammer pins**
are available for all wooden rod fittings in place of radiused head screws. Caution: hammer pins cannot be removed once installed!

10 **GreenGuide cross clamp**
see page 52

11 **Rope clip for stainless steel rod**
see page 52

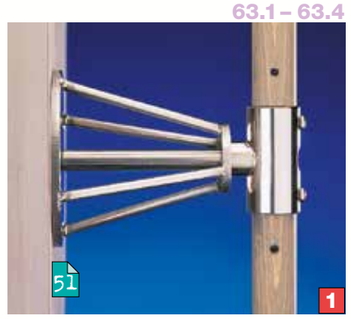
62.1

62.2



62.3

63.1 – 63.4

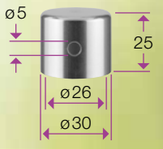


63.5

63.6

63.7

END CAP
For wooden rod



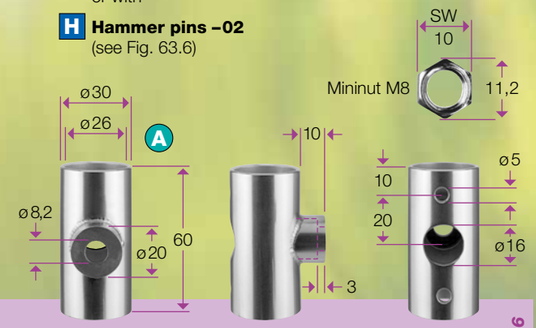
No. 30923–	
0003–01	
0003–02	

1.4404 / AISI 316

WOODEN ROD HOLDER
With special Mininut

Wooden rod fittings are available with

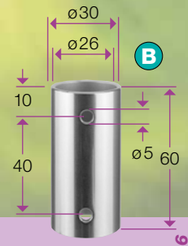
L **Radiused head screws –01**
or with
H **Hammer pins –02**
(see Fig. 63.6)



No. 30923–	
0001–01	with radiused head screws (–01)
0001–02	with hammer pins (–02)

1.4404 / AISI 316

WOODEN ROD CONNECTOR



No. 30923–
0002–01
0002–02

1.4404 / AISI 316

Possible wall clearances
(max. **lateral force** see page 21)

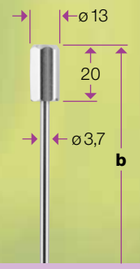
Spacer basket Ø 40/100 (page 51):
W = 100 / 125 / 175 / 225 mm **1**

Spacer Ø 20/50 (page 49):
W = 83 / 100 / 125 mm **2**

Spacer Ø 12/24 (page 49):
W = variable, max. 80 mm **3**

Support washer Ø 50 (page 50):
W = 31 mm **4**

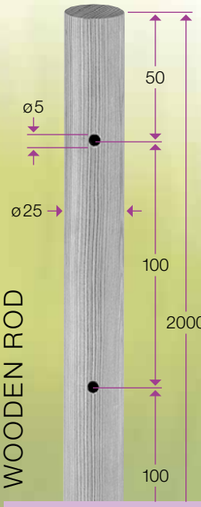
SWAGED END STOP
For stainless steel rod



No. 30923–	b
0004	max. 2000

1.4404 / AISI 316

WOODEN ROD



Costs per cut:
No. 20800–0002

No. 30923–	Fig.
0006	**C**
0007	**D**
0008	**E**
0009	**F**

C **Spruce**
glazed, grey, not drilled

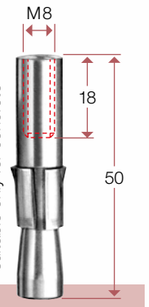
D **Spruce**
glazed, grey, drilled

E **Larch**
untreated, not drilled

F **Larch**
untreated, drilled

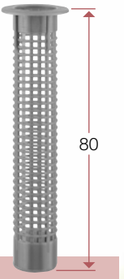
R Right-hand thread

BOLT ANCHOR
With internal thread
high-strength steel, galvanized
with stainless steel spreader
suitable only for concrete



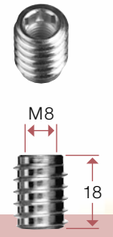
No. 30803–
0800–02

TVM MORTAR SH PERFORATED ANCHOR
For hollow and solid walls



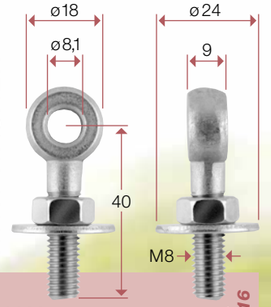
No. 30803–
0800–05
Mastic gun: 0800–051

RAMPA SCREW-IN NUT FOR WOOD
Galvanized steel with hexagon socket
Type SK



No. 30803–	~ DIN 7965
0800–04	

EYE BOLT WITH WASHER



No. 30888–	1.4404 / AISI 316
0800–05	

GreenGuide overload clamp:
see description on **page 19 + 29**

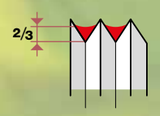
TVM mortar
is a two-component synthetic resin mortar. A mounting kit consists of:

- 1 cartridge 150 ml with press barrel
- 2 mixer tube
- 6 SH perforated anchors

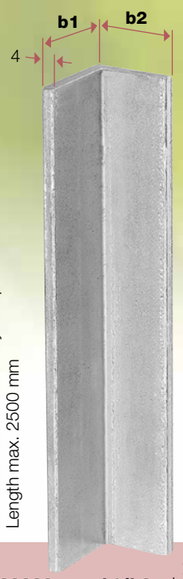
The perforated anchor is needed only for hollow walls. The threaded rod can be cemented directly into solid walls.

VC3 thread lock fluid
Lacquer-like coating which contains two separate micro-encapsulated components. The locking action becomes effective when a male and female thread pair is tightened. The connection becomes vibration-proof. The thread lock fluid **prevents self-loosening.**

Thread roots must be filled at least **2/3**.



ANGLE SECTION
Dimensions and holes to your specifications
Length max. 2500 mm



Costs per cut: **No. 20800–**0005 / Costs per drilling: **No. 20800–**0006

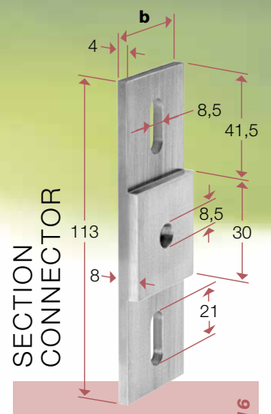
No. 30922–	b1/b2	1.4404 / AISI 316
3030	30/30	
4040	40/40	

FLAT SECTION
Dimensions and holes to your specifications
Length max. 2500 mm

Costs per cut: **No. 20800–**0005 / Costs per drilling: **No. 20800–**0006

No. 30922–	b	1.4404 / AISI 316
0030	30	
0040	40	

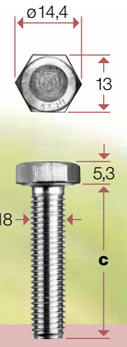
SECTION CONNECTOR



No. 30922–	b	1.4404 / AISI 316
3004	30	
4004	40	

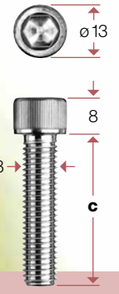
R Right-hand thread

HEXAGON HEAD CAP SCREW
DIN 933



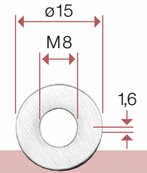
No. 30843–	c	1.4404 / AISI 316
0800–016	16	
0800–025	25	
0800	40	

SOCKET HEAD SCREW
DIN 912



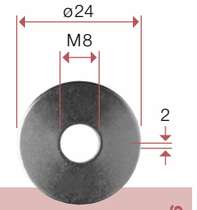
No. 30844–	c	1.4404 / AISI 316
0800–016	16	
0800–025	25	
0800	35	

WASHER
DIN 433



No. 30896–	1.4404 / AISI 316
0800	

WASHER FOR WOOD
DIN 9021 B



No. 30896–	1.4404 / AISI 316
0800–24	

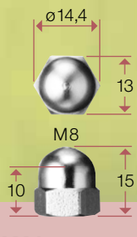
VC3 THREAD LOCK FLUID

No. 30879–
0001

HEXAGON NUT
DIN 934

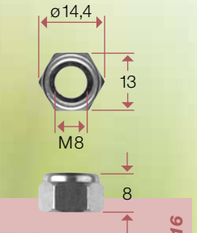
No. 30892–	1.4404 / AISI 316
0800	

DOME NUT
DIN 1587



No. 30894–	1.4404 / AISI 316
0800	

LOCK NUT
DIN 985



No. 30892–	1.4404 / AISI 316
0800–02	

HORIZONTAL ROD
Ø 3.7
Length max. 2500 mm

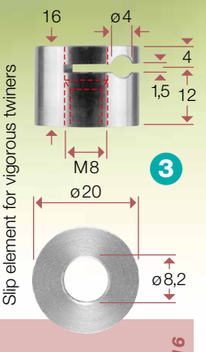
Costs per cut: **No. 20800–**0002

No. 30922–	1.4404 / AISI 316
0400–00	

CLIMBER STUD
UV-resistant plastic
Colour grey

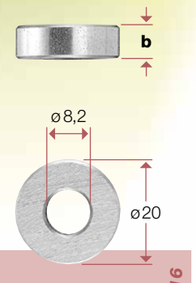
No. 30906–	PVC
0400	

GREENGUIDE OVERLOAD CLAMP
Slip element for vigorous twiners



No. 30920–	1.4404 / AISI 316
0400–10	

SPACER WASHERS
For GreenGuide eyes



No. 30922–	b	1.4404 / AISI 316
0800–02	4	
0800–01	6	
0800	12	

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