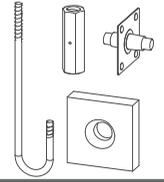
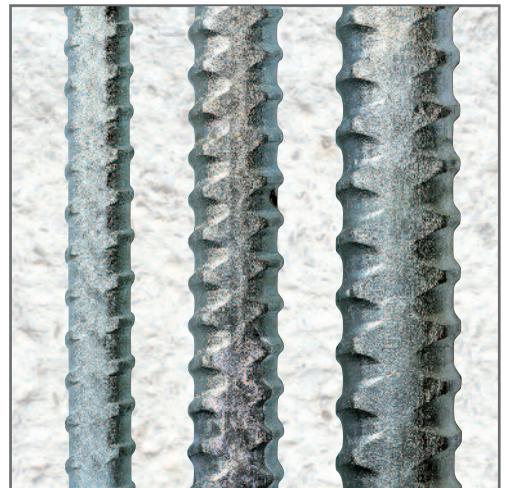


5

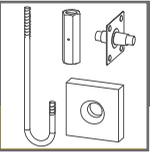
5.2. ANCHOR TIE BARS and accessories



ACCESSORIES FOR FORMWORK CONSTRUCTION



ROBUSTA
GAUKEL



INDEX

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Accessories

- Hexagonal and flange nuts 5
- Wing nuts, counter plates
and free wheel wrench 6 + 7

Anchors before concreting

- Plate anchor, fix anchor and
shuttering sleeve 8 + 9

Anchors after concreting

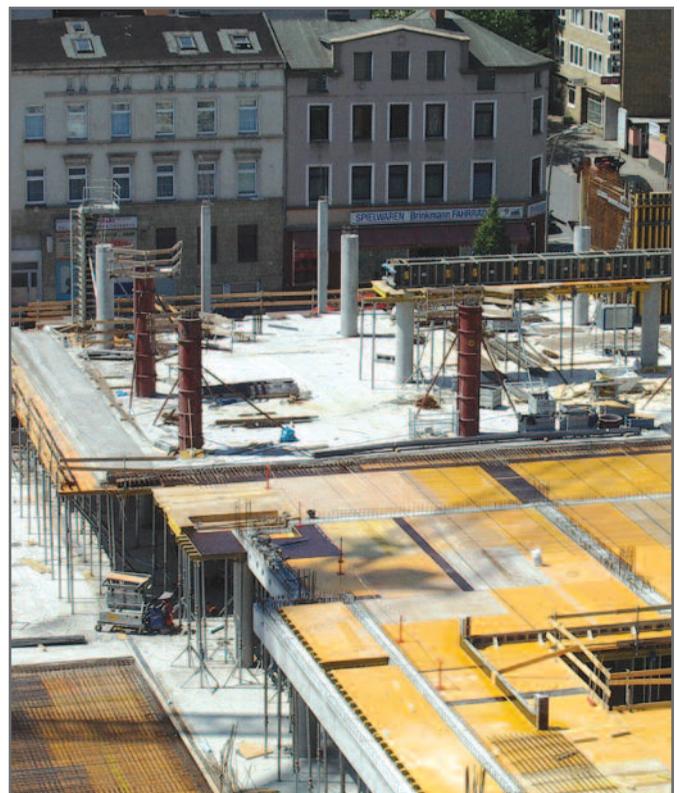
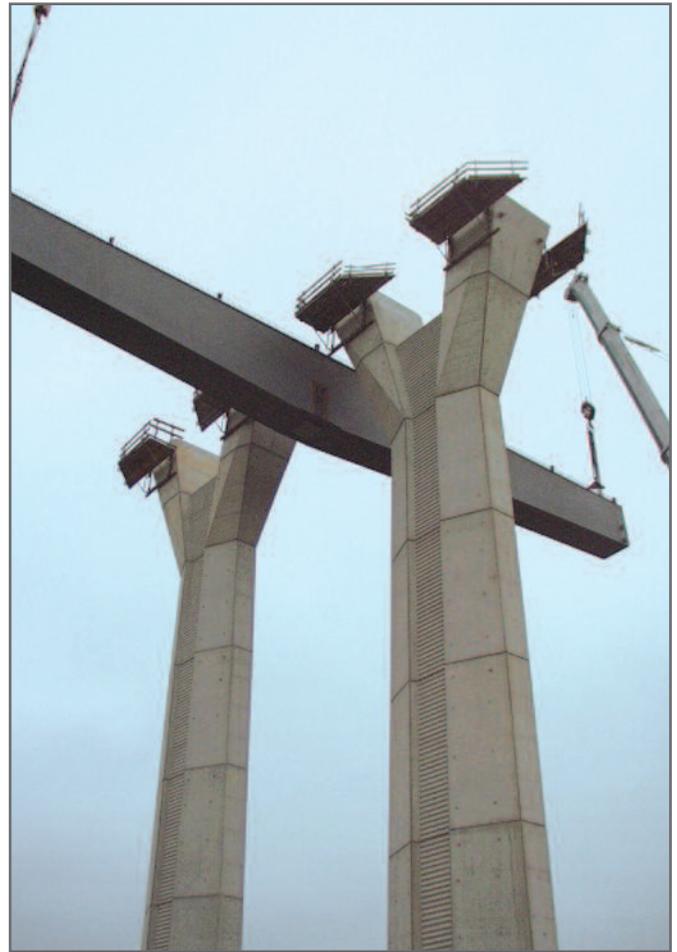
- Impact dowel and scrwe-in set 10 + 11
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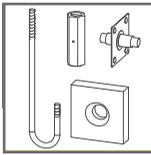
Accessories at one-sided formwork

- V-holder and anchor-holder L 13
- Anchor nuts, wobble anchor, hook anchor
and loop anchor 14 + 15

Waterproof tightenings

- Waterstops: system 1 16 + 17
- Waterstops: system 2 18 + 19





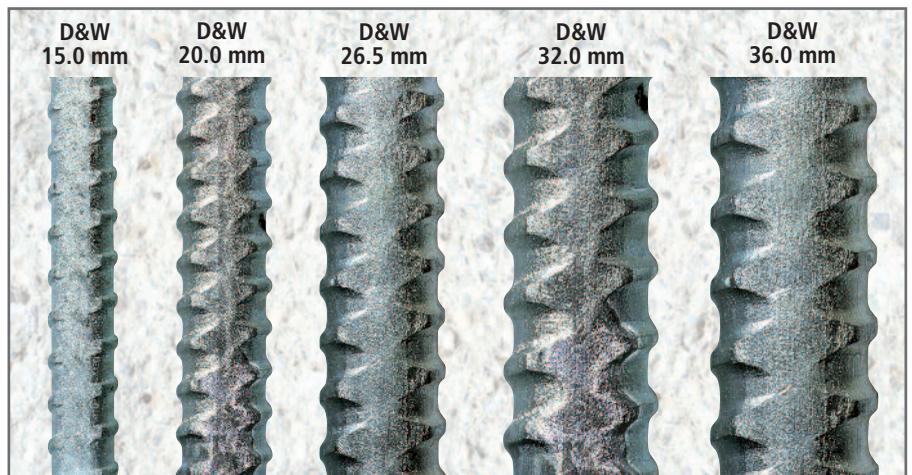
Your benefits at a glance:

- For connecting and anchoring formwork
- For in-situ and precast component construction work
- 5 different anchors Ø from Ø 15.0 mm up to Ø 36.0 mm
- Bars can be supplied in hot-rolled or cold-rolled versions
- Permissible service loads from 85 kN up to 549 kN
- Comprehensive range of hexagonal and wing nut accessories plus bolts

Hot-rolled thread

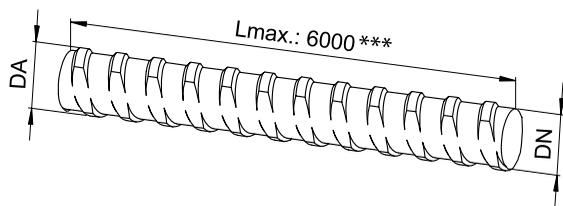
In concrete and formwork construction the formwork anchors have proved themselves because of the practical robust **DYWIDAG-coarse thread**.

For the use on site the hot-rolled tie bars with the so called "self cleaning" thread are preferred. When turning the nut on the tie bar sticking rests of concrete are removed and can trickle off through the free space, which results from the flattening at the tie rod on both sides



Please note that the hot-rolled tie rods may not be heated, bent or stressed with shear loads!

TECHNICAL DATA:



Threaded tie rod D&W, hot rolled, not weldable*

D&W Ø [mm]**	Version	Weight [kg/m]	Item No.
15.0	raw material	1.40	511500
15.0	galvanized	1.40	511700
20.0	raw material	2.53	512000
26.5	raw material	4.50	512600
32.0	raw material	6.53	513200
36.0	raw material	8.30	513600

** größere Längen bis 15,0 m auf Anfrage

*exception: tie rods with longitudinal groove between the thread (see photo)



Bearing load table

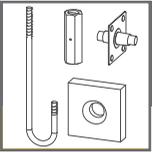
Core-Ø [mm]	External-Ø [mm]	Pitch [mm]	Adm. load [kN]	Load at the yield point [kN]	Breaking load [kN]
15.0	17.0	10	91	159	195
20.0	22.0	10	162	283	345
26.5	30.0	13	300	525	580
32.0	37.0	17	434	760	850
36.0	41.5	18	549	960	1070



5

ANCHOR TIE BARS AND ACCESSORIES

TIE BARS



Cold rolled thread

As an alternative the tie rods with **cold rolled thread** can be used. These can be distinguished from the hot rolled tie rod easily by the revolving thread profile. This type of tie rod is less critical when using. This material is **weldable under certain conditions**, also shearing loads and bending stress are possible. Because of these mentioned reasons this type is used preferred in prefab element plants and steel formwork manufacturers.

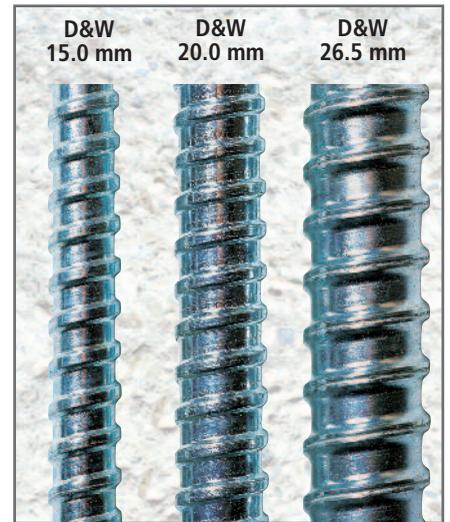
Delivery:

We keep all diameters on stock in lengths of **at least 6.0 m**.

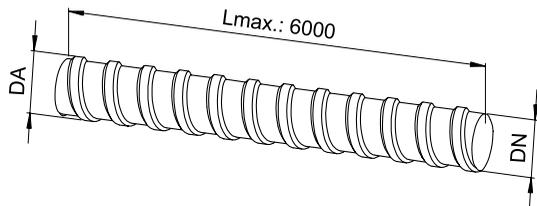
The special advantage for you:

When ordering shortened tie bars the cutting edges will get a **strong chamfering** in a second working step.

By this the nuts can be turned more easy and the tie rods will not bulge that much, when striking with a hammer on to the ends.



TECHNICAL DATA:



Threaded tie rod D&W, cold rolled, weldable and bendable under certain conditions

D&W** [mm]	Material*	Weight [kg/m]	Item No.
15,0	roh	1,50	511600
20,0	roh	2,60	512100
26,5	roh	4,60	512700

*D&W 12.5 mm available on request

Bearing load table

Core Ø D&W [mm]	Outer-Ø [mm]	Pitch [mm]	Adm. load [kN]	Load at the yield point [kN]	Breaking load [kN]
15.0	17.0	10	85	149	170
20.0	22.0	10	140	245	275
26.5	30.0	13	240	419	500

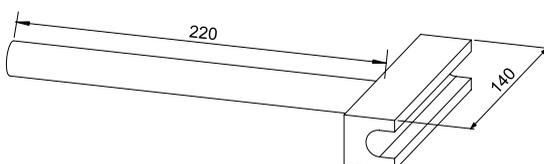
Turning wrench

On sites normally stuck tie rods will be detached by striking on to the end of the bar by hammer. By this the ends will thicken, the setting and turning of nuts will be complicated or not possible at all. For a **gentle removing** or when the tie rods have to be turned without nut we do recommend our turning wrench.

for inserting on to the narrow side of the hot rolled tie rod

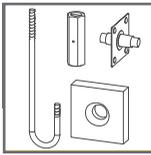


TECHNICAL DATA:



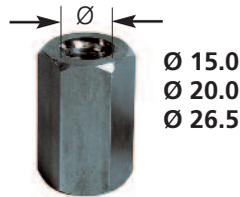
Turning wrench

Discription	Weight [kg/unit]	Item No.
only for hot rolled D&W-tie rods Ø 15 mm	0,90	511567



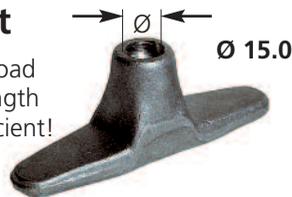
Hexagonal nuts

These are suitable for **welding** and are used preferred for steel form-work construction.



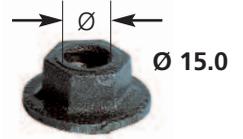
Weldable flange nut

For the transmission of the full load of the tie rod the continuous length of the welding seam is not sufficient! Therefore in this case the weldable flange nut with a bigger contour has to be used. Because of the contour length the necessary welding seam for an anchoring load of 90 kN is guaranteed. When planning it has to be considered, that the connected steel element can withstand the load. Static indication available on request.



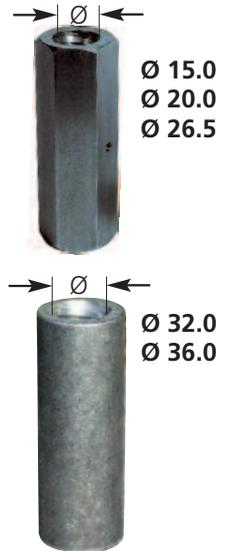
Flange nut

Inexpensive nut with flange made of tempered cast for minor loads, for example usable for the production of connecting bolts

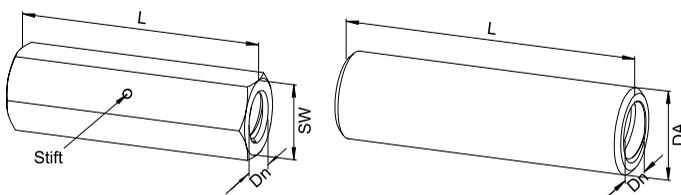
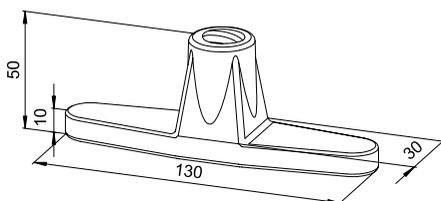
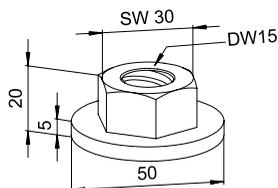
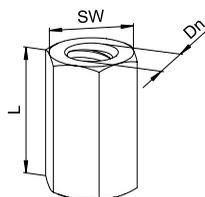


Coupler

For connection and extension of tie rods we are offering nuts with center pin in diameters from 15.0 to 26.5 mm. Therefore it is guaranteed that both ends of the tie rods will be screwed in with the **correct and identical measurement** without rechecking at the back stop. At the big tie rod diameters 32.0 and 36.0 mm and the according heavy loads the installation of a center pin is not possible because of the notch effect. Here the correct screwing depth has to be controlled on both sides with markings at the tie rods.



TECHNICAL DATA:



Hexagonal nuts, steel, weldable, raw material

D&W Ø [mm]	SW [mm]	Length [mm]	Weight [kg/unit]	Item No.
15.0	30	30	0.13	511565
15.0	30	50	0.21	511552
15.0	30	70	0.30	511554
20.0	36	60	0.40	512050
26.5	46	60	0.54	512650

Hexagonal flange nut, tempered cast, raw material

D&W Ø [mm]	SW [mm]	Length [mm]	Weight [kg/Stck.]	Item No.
15.0	30	20	0.13	511564

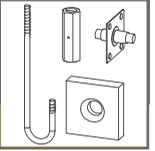
Weldable flange nut, forged, raw material

D&W Ø [mm]	Weight [kg/unit]	Item No.
15.0	0.39	511558

Couplers, steel, weldable, raw material

D&W Ø [mm]	SW or Ø [mm]	Length [mm]	Weight [kg/unit]	Item No.
15.0	SW 30	103	0.46	511556
20.0	SW 36	110	1.00	512051
26.5	SW 46	150	1.36	512652
32.0	Ø 62	180	3.00	513251
36.0	Ø 67	220	4.20	513651





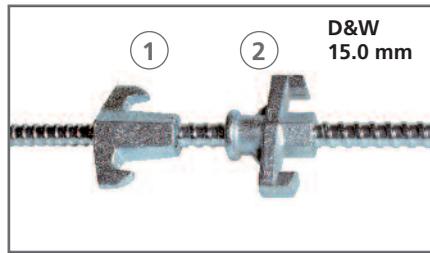
Wing nuts and counter plates

For the bracing of wall formworks on building sites wing nuts have approved themselves. They can easily be tightened and loosened by hammer strikings.

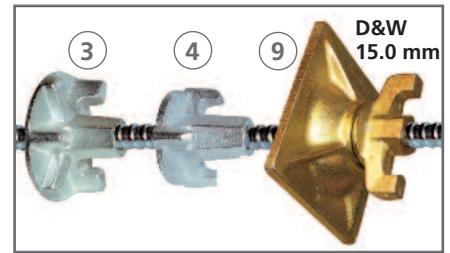
These nuts are available in two versions: made of **tempered cast**, with or without flange

Alternatively we offer wing nuts which are **forged of steel**, generally with flange.

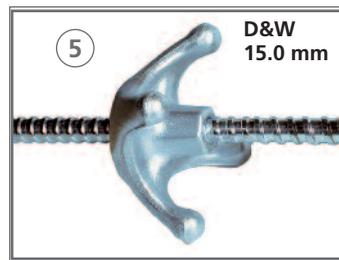
For these the purchase price is more expensive than for the tempered cast nuts, but because of the better quality of material they are more stable and resistant.



wing nuts without flange, tempered cast

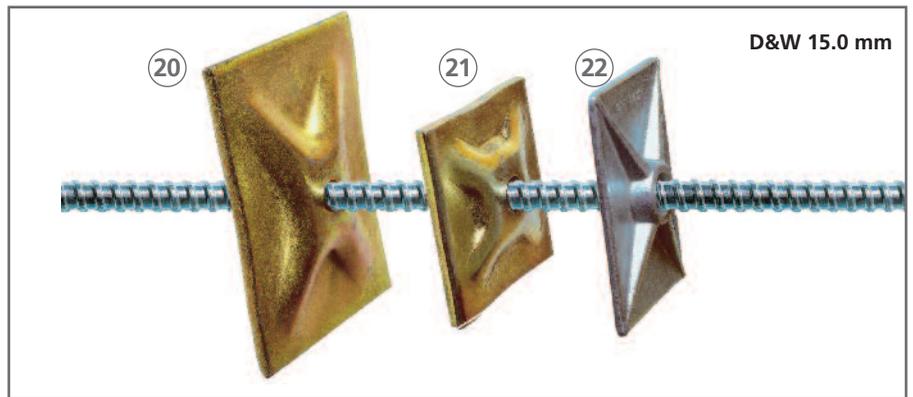


wing nuts with flange, tempered cast



wing nuts with flange, forged

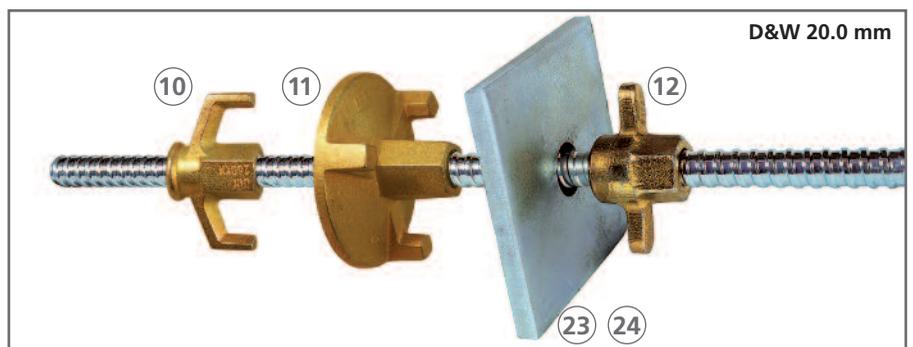
The counter plates are a completion to the wing nuts without flange, to reduce surface pressure and the friction between nut and base support. For panel formwork with steel profiles and girder wall formwork with U-flange the square plate 120 x 120 x 10 and the rectangle plate 100 x 140 mm are suitable. For placing on square timbers we recommend the plate 200 x 150 mm with a bigger bearing area.



Wing nuts and counter plates for tie rod diameter \varnothing 20.0 mm (hole diameter \varnothing 30.0 mm).

This plate is also available for the tie rod diameter \varnothing 26,0 mm (hole diameter \varnothing 32.0 mm).

At this tie rod diameter hexagonal nuts are used instead of wing nuts.



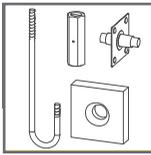
Accessory: free wheel wrench

The deformation of the wing nuts is quite high because of working with a hammer. To avoid this we want to mention our ratchet spanner:

by using this wrench with a long lever arm the energy consumption is less, the annoyance of noise, danger of damage and injury will clearly be reduced.

Also a higher and accurate tension can be applied to the tie rod.





ANCHOR TIE BARS AND ACCESSORIES

5

WING NUTS, COUNTER PLATES AND FREE WHEEL WRENCH

TECHNICAL DATA:

Wing nuts SW 27, tempered cast, galvanized

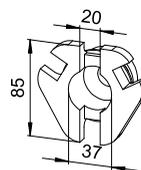
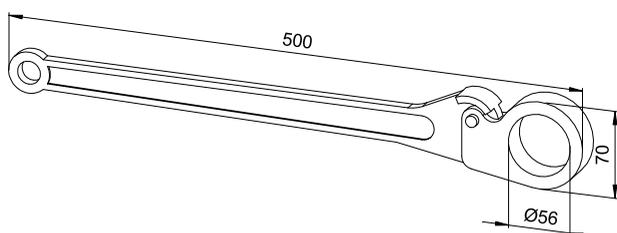
Type	D&W [mm]	Version	SW [mm]	Length [mm]	Weight [kg/unit]	Item No.
①	15.0	2-armed without flange	27	65	0,30	511559
②	15.0	2-armed without flange	27	60	0,33	511551
③	15.0	3-armed with flange Ø 100 mm	27	55	0,78	511563
④	15.0	3-armed with flange Ø 70 mm	27	60	0,46	511560
⑨	15.0	combination wing nut, spherical supported counter plate 120x120 mm	27	65	1,15	511576
⑩	20.0	2-armig ohne Bund	36	60	0,48	512060
⑪	20.0	3-armig mit Bund Ø 130 mm	36	65	1,30	512061

Wing nuts, forged steel, galvanized

Type	D&W [mm]	Version	SW [mm]	Length [mm]	Weight [kg/unit]	Item No.
⑤	15.0	4-armed with clamp handle and flange Ø 60 mm	27	50	1.15	511561
⑫	20.0	2-armed without flange	36	56	0.43	512053

Counter plates, galvanized

Type	D&W [mm]	Version	Size [mm]	Hole-Ø [mm]	Weight [kg/unit]	Item No.
⑳	15.0	counter plate for wooden flanges, steel sheets, stiffening corrugation	200x150x 8	17	2.30	511571
㉑	15.0	counter plate for steel flanges, steel sheets, stiffening corrugation	120x120x10	17	1.00	511569
㉒	15.0	counter plate for steel flanges, steel, forged	140x100x 6	17	0.75	511570
㉓	20.0	counter plate, even	120x120x20	25	2.25	512054
㉔	26.5	counter plate, even	120x120x20	32	2.55	512653



Free wheel wrench
with universal insert for
2- and 3-armed wing nuts

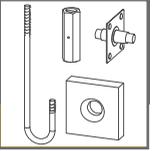
Weight [kg/unit]	Item No.
1.90	511575



5

ANCHOR TIE BARS AND ACCESSORIES

PLATE ANCHOR, FIX ANCHOR AND SHUTTERING SLEEVE



For anchoring of loads at small thickness of construction elements we are offering several possibilities of non recoverable installation parts made of steel and plastic.

The load is depending on the concrete strength, the installation depth and the existing reinforcement.

Test reports are available on request.

① Plate anchor

consisting of anchor bar with big anchoring plate and pressed nut.

For fixing to the formwork a metal cone is necessary (see page 17).

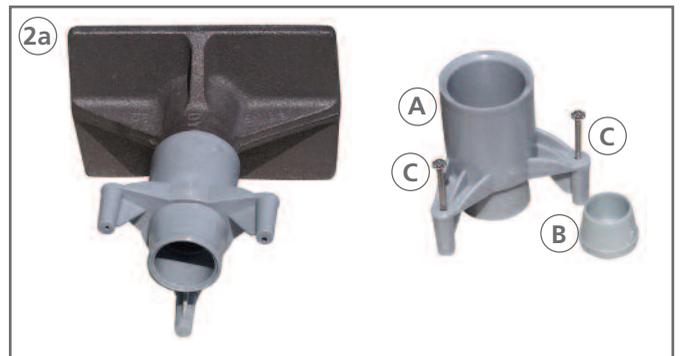


② Fix anchor made of cast steel with mounting part and 3 legs

completely consisting of:

- ② cast anchor
- Ⓐ plastic base
- Ⓑ plastic plug
- Ⓒ 3 refined steel nails

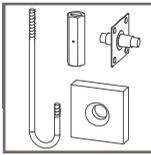
The plastic base is non-recoverable, the nails sticking out of the concrete surface are cut off with tongs.



Shuttering sleeve made of glass fibre and strengthened plastic

complete with nailing flange and plastic plug.





ANCHOR TIE BARS AND ACCESSORIES

5

PLATE ANCHOR, FIX ANCHOR AND SHUTTERING SLEEVE

TECHNICAL DATA:

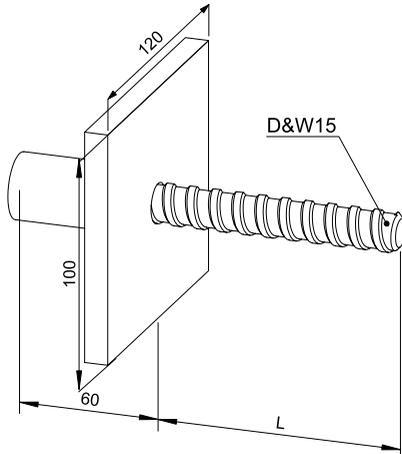
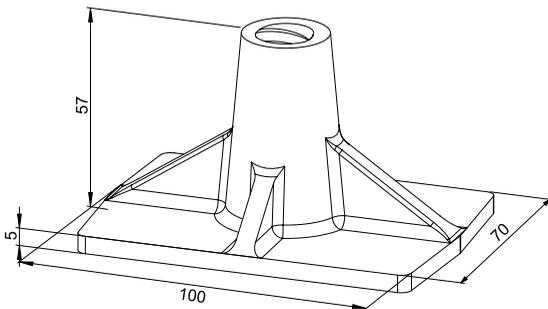


Plate anchor for anchor bars \varnothing 15 mm

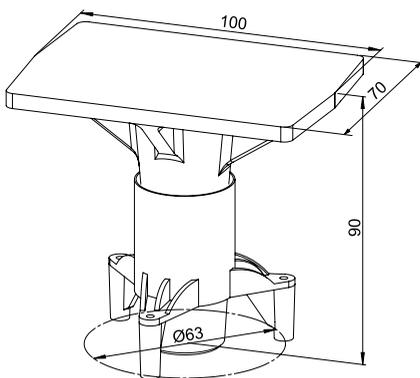
Length [mm]	Weight [kg/unit]	Item No.
100	1.28	511593

other lengths "L" on request.



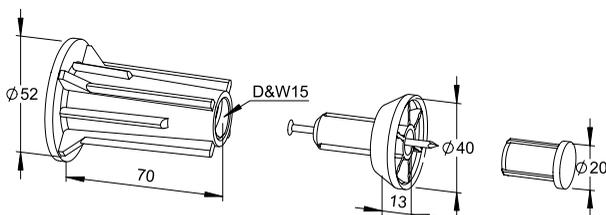
Fix anchor

Weight [kg/unit]	Item No.
0.49	511578



Fix anchor with plastic base, 3 nails and plugs

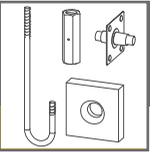
Installation depth [mm]	Weight [kg/unit]	Item No.
90	0,51	511579



Shuttering sleeve with nailing flange and plug

Depth of installation [mm]	Weight [kg/100 sets]	Item No.
83	6.20	511592





Impact dowel D&W 15 mm

This special impact dowel with a Dywidag-internal thread is used by foremen over and over again with enthusiasm.

For subsequent anchoring on sites with low loads there is nothing better available, because the according tie bars with a practical coarse thread are used on every site. With the tie bars in suitable length any clamping widths for all kinds of use can be realized.

Bearing load table

recommended admissible load for short time anchoring during construction

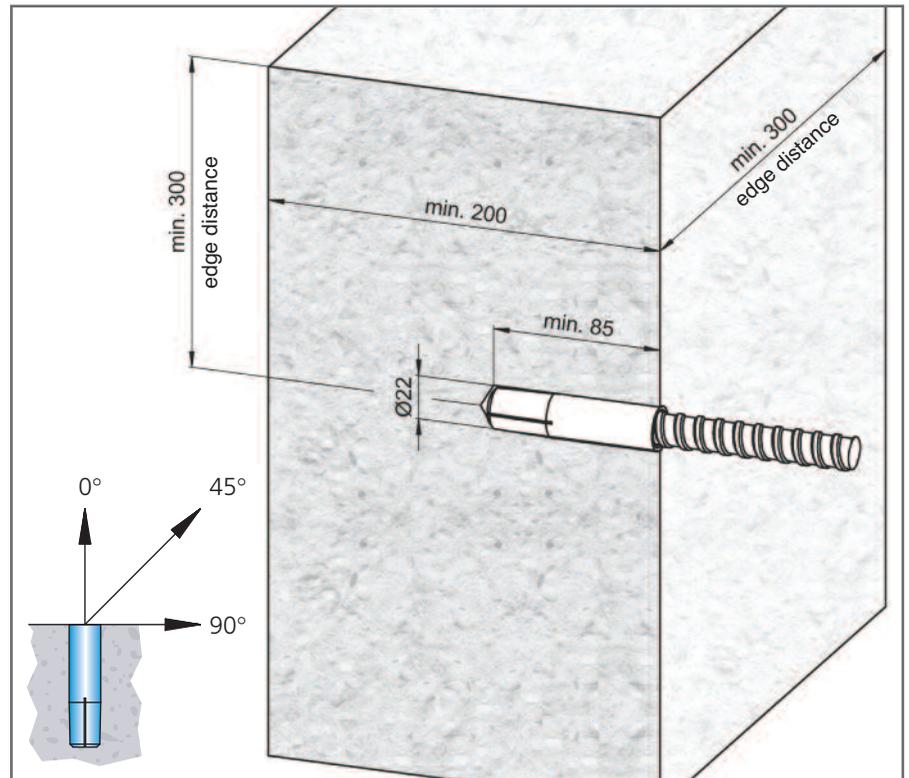
Load direction	Concrete strength		
	15 N/mm ²	25 N/mm ²	35 N/mm ²
Axial tension 0°	17.0	21.9	26.0
Diagonal pull 45°	21.5	27.8	32.8
Shearing 90°	27.5	35.5	42.0

For safety reasons we state the admissible loads for a low concrete strength of 15 N/mm².

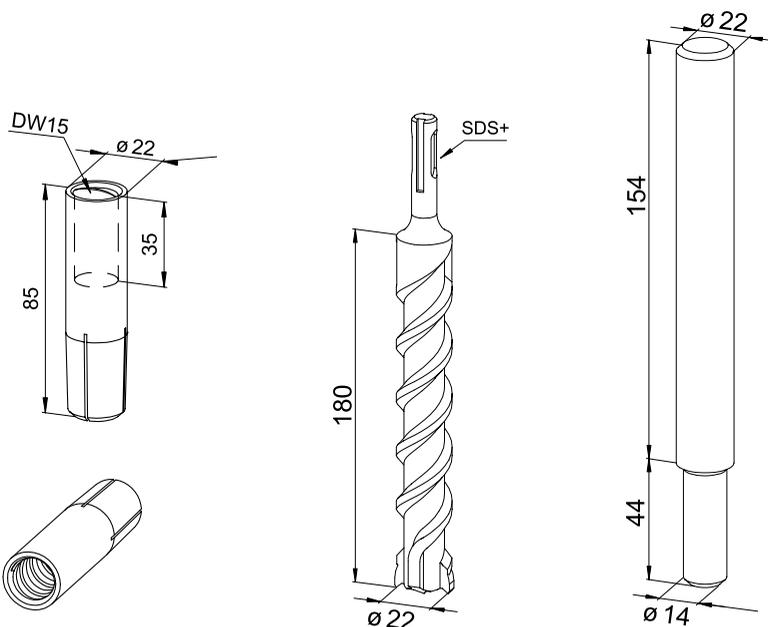
That means in practice that the anchors are often installed the next day after concreting and are already loaded.

These data are based on extensive tests of the official laboratory "bautest" in Augsburg.

Additionally the admissible loads for concrete strength 25 and 35 N/mm² are stated for using the dowels in hardened concrete.



TECHNICAL DATA:



Impact dowel D&W 15, galvanized

Weight [kg/100 units]	Item No.
16.5	121515

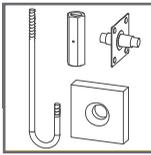
Hard metal drill

Weight [kg/100 units]	Item No.
40,0	121517

Punching pin, galvanized

Weight [kg/100 units]	Item No.
45,0	121516





Screw-in set

Wide range applicable bolt with nut, which allows independence in multiple ways:

User defined clamping thickness, regardless of clamping a steel plate with 5 mm or 5 cm thickness.

User defined screwing depth, regardless of screwing the bolt into the dowel 35 mm or into the threaded sleeve 100 mm.

User defined hole diameter between 17 and 30 mm, the tightening of the conical shaped nut guarantees automatic centering without any tolerance in the middle of the hole. A shifting is not possible.

Tightening without any special tool – just use second scrwe-in set.

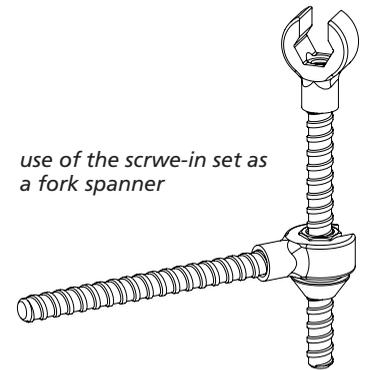
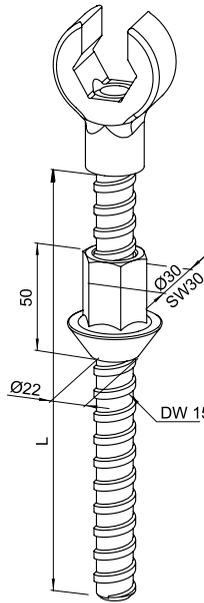
No additional costs for adapter sleeves or washers.

TECHNICAL DATA:

Screw-in set D&W 15 mm galvanized

Length* [mm]	Weight [kg/unit]	Item No.
180	0.46	111818
300	0.78	111830

*other lengths available upon request



use of the scrwe-in set as a fork spanner

Easy mounting of scrwe-in set:



1. Place clamping part over the anchoring point.



2. Screw bolt into the anchoring ground.



3. Tighten hexagonal nut by hand, in this way the nut will center the clamping part without tolerances.



4. Final tightening of the screw by simply turning it with second scrwe-in set. Because of the form of a screw spanner of the scrwe-in set also a conical flange nut can be tightened.





Concrete anchor – rock anchor

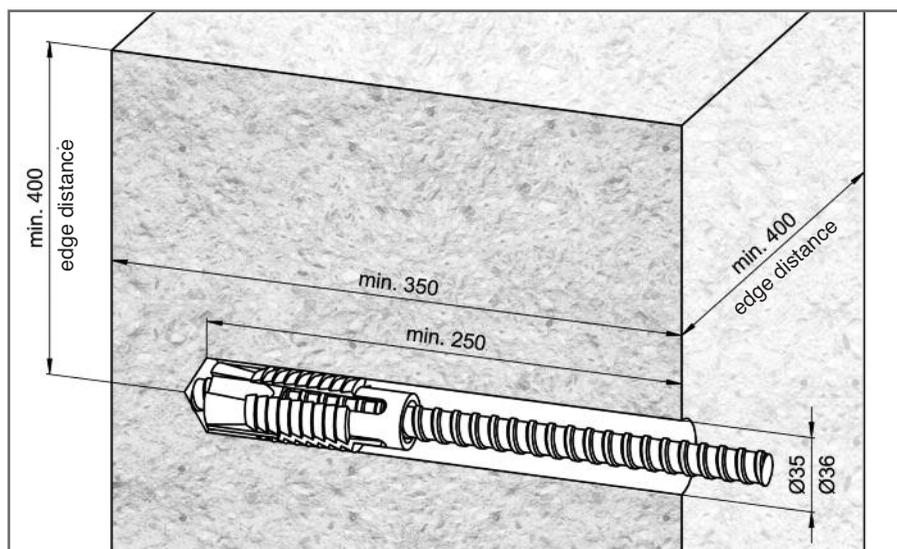
With the help of these dowels it is possible to anchor the tie rods subsequently with **up to 100% of the admissible load** of 90 kN. The premises for that are that the concrete strength and the measurements of the concrete element are sufficient.

Frequent use for example during concreting of single headed walls against existing buildings.

Because of the traction force in the tie rod the conical thread piece is pulled into the expanding sleeve and is so spreading the dowel inside the bore hole.



Concrete anchor with three-part expanding sleeve and fine tothing



As the stability of the anchorage often cannot be stated exactly, we recommend to install the dowel using a hollow plunger.

So the dowel can be spread with strong force inside the bore hole, also the bearing load can be proved free from doubt.

Test reports on request.

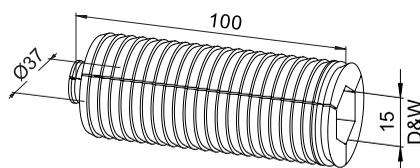
For fixing scaffoldings in Germany it is necessary to use anchors with an official approval. With the anchor type "AHS" we offer the optimum solution for the subsequent fixing of scaffoldings and consoles.

Especially in bridge construction and renovation works it is very easy to prove the anchoring of the cantilever girders without any problem.

Approval and data sheet on request.

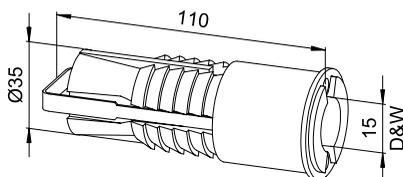
Rock anchor with two-part expanding sleeve, connected with spring clip, which covers the thread hole from loose stones.

TECHNICAL DATA:



Concrete anchor with official approval

D&W [mm]	L [mm]	F adm. [kN]	Weight [kg/unit]	Item No.
15.0	100	90	0.45	121526

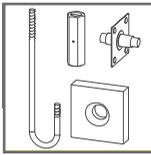


Rock anchor

D&W [mm]	L [mm]	F adm. [kN]	Weight [kg/unit]	Item No.
15.0	110	90	0,31	121522

Hollow plunger

Description	Weight [kg/unit]	Item No.
to spread and test the anchors		

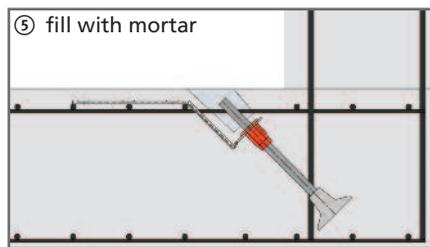
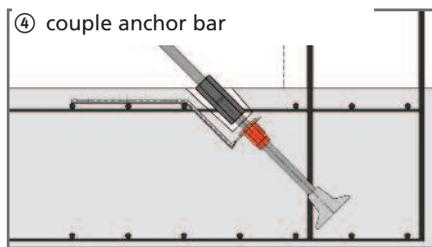
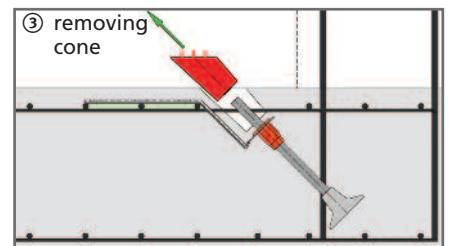
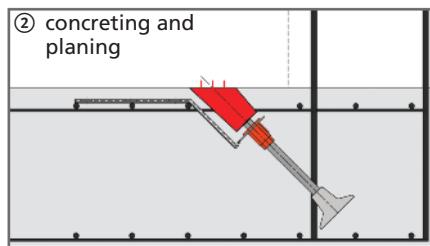
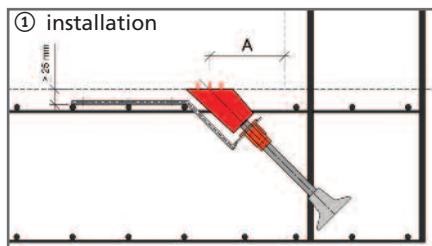


V-holder and anchor holder L with finishing cone

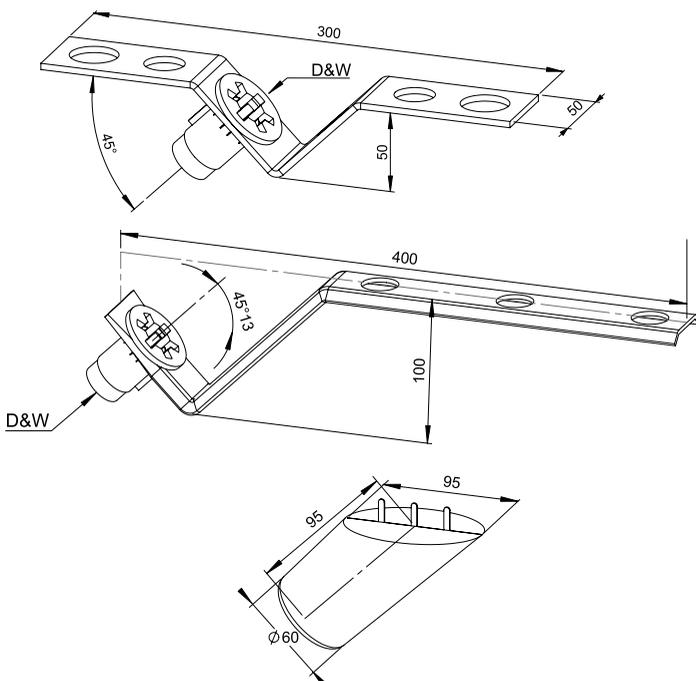
As an accessory for exact installation and for a safe fixing during concreting for the base plate the V-holder and the anchor-holder L with finishing cone is an optimized solution.

Both holders will be layed onto the upper layer of the reinforcement and racked. The plastic sleeve will be inserted into the steel holders according to the anchoring diameter. By clamping (D&W 15 mm) or screwing (Ø 20 and 26.5 mm) the anchoring depth can be adjusted exactly inside the sleeve.

The anchor-holder L in connection with the finishing cone offers the possibility to plane the concrete surface without faults. It will be installed flush to the surface and will spare the necessary space for the installation of the coupler. By this it can be planned around the anchor points without standing out parts. Markings will mark the installation point.



TECHNICAL DATA:



V-holder

D&W Ø [mm]	Weight [kg/unit]	Item No.
15	0.45	511591
20	0.45	512056
26.5	0.45	512657

Anchor-holder L

D&W Ø [mm]	Weight [kg/unit]	Item No.
15	0.52	511541
20	0.52	512041
26.5	0.52	512641

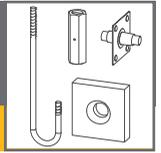
Finishing cone

D&W Ø [mm]	Colour	Weight [kg/unit]	Item No.
15	red	0.08	511542
20	yellow	0.08	512042
26.5	white	0.08	512642

Removing tool

Weight [kg/unit]	Item No.
0.25	514042





When choosing the type of anchoring you have to attend several criterions:

- 1) definition of the diameter of the anchor bar regarding the existing traction load
- 2) definition of the anchor type according to the space possibilities in the foundation or in the base plate.

Anchor nut

At **straight tie rods** the anchor nut is used. The anchoring of the traction loads results in the big plate, which is screwed on to the lower end of the tie rod. This anchor type can be cut out of the normal tie bars to the according length. The length depends on the traction load, the diameter of the tie rod and the actual strength of the concrete.



In praxis the following empirical values have been approved:

D&W 15.0 mm	length of tie rod 500 mm
D&W 20.0 mm	700 mm
D&W 26.5 mm	1000 mm

The subsequent installation through the upper reinforcement layer is possible without problem.

A further advantage which can only be used with this system is the possibility to recover the tie rod after using.

For that you only have to install a plastic tube between anchoring nut and the installation help (V-holder and anchor-holder L see page 13).

Wobble anchor

The anchoring in the concrete results in the profiling of the corrugated tie bar.

An additional anchor plate or anchor nut is not necessary. The subsequent installation through the upper reinforcement layer is possible without problem.



Hook anchor

The anchoring in the concrete results in the profiling of the bent anchoring bar.

An additional anchor plate or anchor nut is not necessary. Only with the short version of the hook anchor D&W 15.0 mm for thin base plates we recommend the addition of a transverse bar into the bent loop on the part of the builder.

The subsequent installation through the upper reinforcement layer is possible by mounting of the hook.



Attention:

The installation has to be done before the placing of the upper reinforcement layer.

If the ends of the tie rods are standing out long enough out of the surface, the extension tie rods can be connected directly with the coupling nuts.

The standing out tie rods have to be cut flush after removing the A-frames.

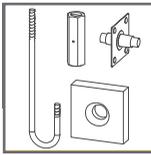
This method should only be used, if later an additional screed will cover the cut ends.

If the ends of the tie rods are sunk in at thicker concrete slabs the steel cones have to be added as recoverable couplers.

After removing the cones the remaining openings can be filled up with mortar.

Therefore no danger of rusting.



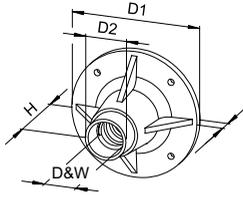


ANCHOR TIE BARS AND ACCESSORIES

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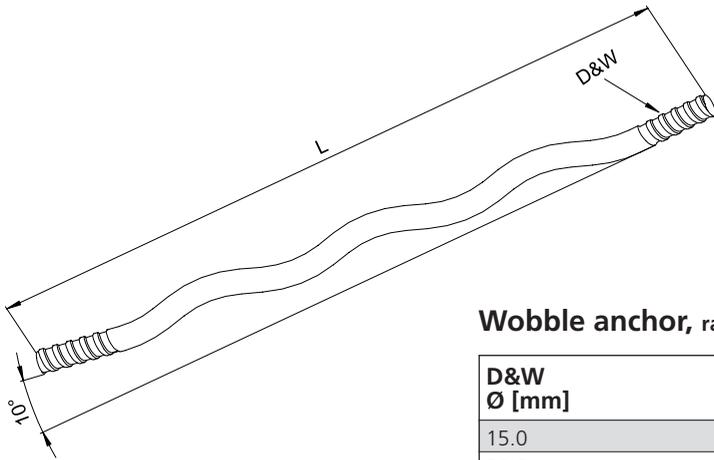
ANCHORING FOR A-FRAMES

TECHNICAL DATA:



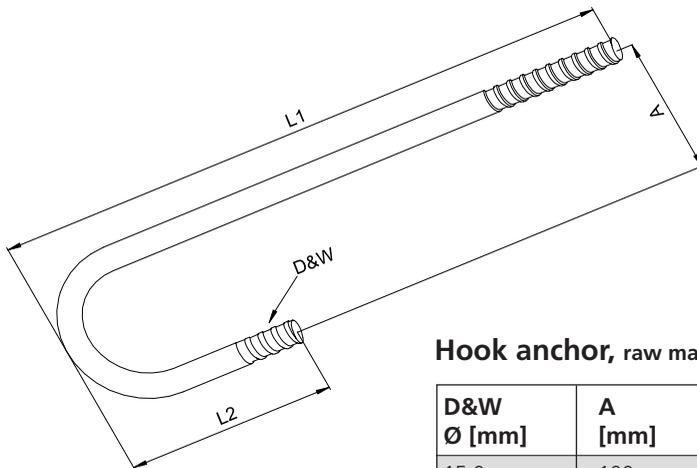
Anchor nut for D&W-tie rods

D&W Ø [mm]	D1 [mm]	D2 [mm]	H [mm]	F adm. [kN]	Weight [kg/unit]	Item No.
15.0	80	26	70	90	0.48	511573
20.0	100	32	80	160	0.82	512055
26.5	120	40	80	300	1.34	512654



Wobble anchor, raw material

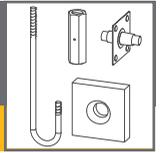
D&W Ø [mm]	L [mm]	F adm. [kN]	Weight [kg/unit]	Item No.
15.0	550	90	0.79	511547
20.0	700	150	1.82	512059
26.5	800	250	3.70	512660



Hook anchor, raw material

D&W Ø [mm]	A [mm]	L1 [mm]	L2 [mm]	F adm. [kN]	Weight [kg/unit]	Item No.
15.0	100	250	150	85	0.68	511595
15.0	100	450	150	85	1.00	511596
20.0	150	600	175	150	2.20	512058
26.5	200	800	200	250	5.00	512658





Water stop tightenings

The demand for waterproof walls always means an extra effort and needs special care when installing and removing of the formwork anchors with water stops to tighten doubleside formwork elements.

In general you have to attend several important points when producing sensible waterproof construction elements:

- Careful procedure with the vibrator during concreting. Because of the energy of vibration when immersing again into nearly stiffened concrete fine microflaws can occur around the water stop. A direct contact of the vibrator with the tie rod has to be avoided.
- While the concrete is hardening in the formwork, shocks onto the shuttering or scaffolding are the reason for subsequent leakage, because those shocks are transmitted to the formwork anchors.
- Please attend to longer terms of striking, because the wingnuts are often removed with hammer strikes. Therefore we want to refer to our free wheel wrench for wing nuts (see page 6). Besides when striking the first side of the encased wall the tension load onto the embedded tie bar in the middle of the wall is only effective in one direction to the still encased side of the wall. A sufficient concrete strength is necessary to exclude movements and microflaws.

In principle 2 classical systems are available:

Water stops: system 1

1.) non recoverable tie bar with welded intermediate sheet, available for tie rods Ø 15.0 / 20.0 and 26.5 mm

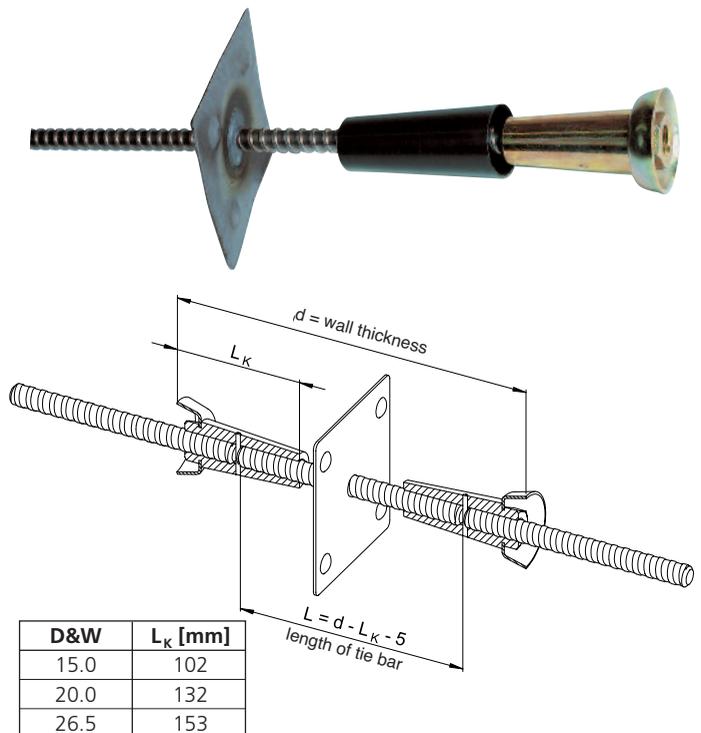
This method has the advantage, that after finishing the works no hollow space will remain in the concrete, in which the water can be collected.

The tie bar will be concreted without a wrapping plastic tube in the middle of the wall as a non recoverable part.

To prevent the additional water circulation a square sheet 120 x 120 mm is welded centered onto the tie rod. The non recoverable tie rod will be completed with steel cones as couplers on both sides and extended with the usual tie anchors.

After sufficient hardening of the concrete after striking of the formwork the cones will be removed with the help of free wheel wrenches with hexagonal nut.

Important: The use of the plastic conical sleeve will ease the removing!



Afterwards a conical cutout will remain, in which the non recoverable centered tie rod is placed with a concrete covering of min. 5 cm. This cutout will be filled with a non-shrinking mortar.

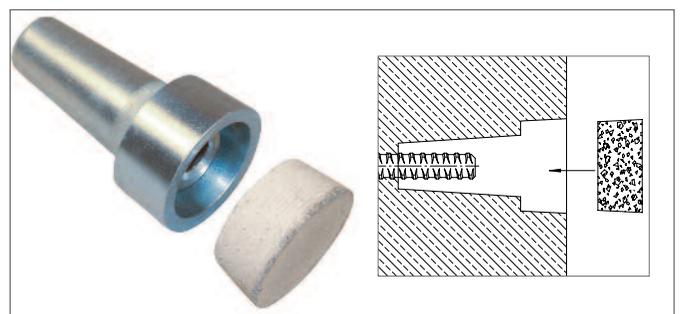
Please clarify before ordering of this type, whether the width of meshes of the reinforcement is wide enough to push through the square sheet 120 x 120 mm subsequently.

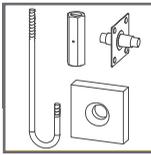
ROBUSTA-steel cone "RSK"

The special solution for waterproof walls with demand of exposed concrete quality:

The ROBUSTA-steel cone "RSK" with the special cone core with large area of contact prevents impressions in the wooden shuttering.

The dimensions of the cone are made in that way, that the standard ROBUSTA refined concrete cone can be glued into the remaining conical cavity.



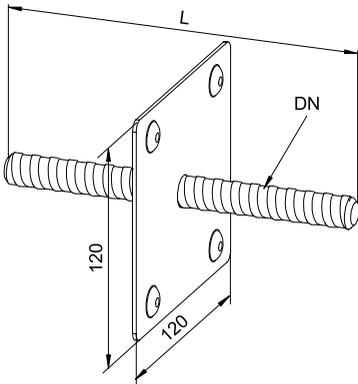


ANCHOR TIE BARS AND ACCESSORIES

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WATER STOP TIGHTENINGS

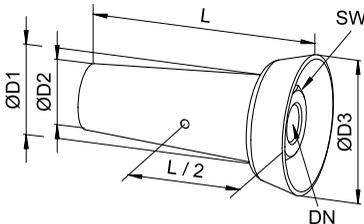
TECHNICAL DATA:



Water stops with centered core welded cam sheet 120 x 120 mm

D&W Ø [mm]	Weight [kg/unit]	Item No.
15.0	various	511587
20.0	various	512085
26.5	various	512682

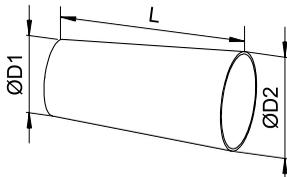
length of bars and weight depending on wall thickness.



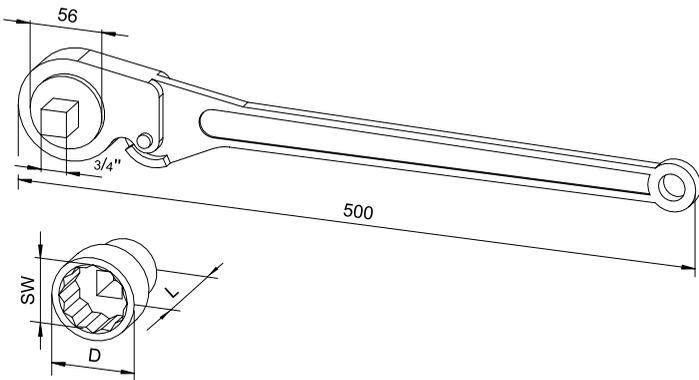
Steel cones, galvanized, with centered core and hexagon head, cone turnable

D&W Ø [mm]	L [mm]	SW [mm]	D1 [mm]	D2 [mm]	D3 [mm]	Weight [kg/unit]	Item No.
15.0	100	30	30	43	62	0.60	511584
20.0	130	36	33	46	62	0.95	512084
26.5	150	46	40	54	95	1.50	512681

Conical sleeve, plastic, for easy removing of the metal cones

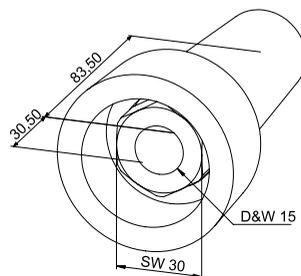


D&W Ø [mm]	L [mm]	D1 [mm]	D2 [mm]	Weight [kg/100 units]	Item No.
15.0	81	31	41	1.40	511588
20.0	110	34	44	1.60	512086
26.5	120	41	54	2.00	512683



Ratchet spanner with nut to remove the metal cones

D&W Ø [mm]	SW [mm]	D [mm]	L [mm]	Weight [kg/unit]	Item No.
15.0	30	42	56	0.28	511597
20.0	36	50	65	0.43	511598
26.5	46	62	65	0.60	511599

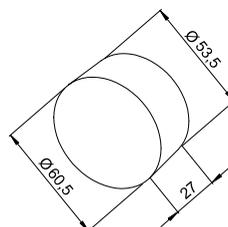


ROBUSTA-steel cone "RSK"

Weight [kg/unit]	Item No.
0.87	511548

Two component glue to glue in the refined concrete cone

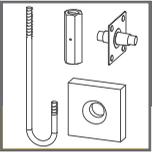
Weight [kg/unit]	Item No.
2 x 0.5	109931



Refined concrete cone fitting to ROBUSTA-steel cone RSK

Weight [kg/unit]	Item No.
0.14	109930





Water stops: system 2

Non recoverable couplers with centered wall, for tie rods \varnothing 15.0 and 20.0 mm

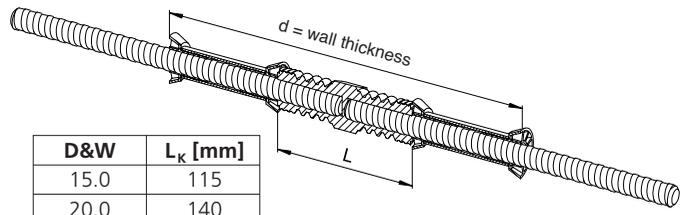
This method has the advantage, that the single parts of the system can be stocked and used independent to the wall thickness. The tie rods will be screwed into the couplers from both sides, by which the projecting length of the tie rods is of secondary importance and can alter depending on the kind of formwork and installation. But the plastic tubes as distance holders have to be cut according to the wall thickness, this is done quick and uncomplicated on the spot. After concreting the wall the tie rods are completely recoverable and the remaining holes are covered with the usual plug with grooves.

For this system we offer 3 different types:

a) water stop, profilated on the outside, for tie rods D&W 15.0 and 20.0 mm

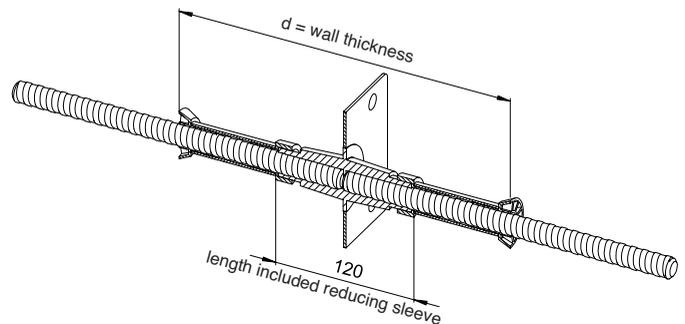
The large profiling on the outer contour increases the surface of the nut and extends the path for the water, in case it will come through to the outer side of the nut. Special advantage when reinforcing:

These nuts can be mounted subsequently without problem through the meshes of the already layed and plaited reinforcement.



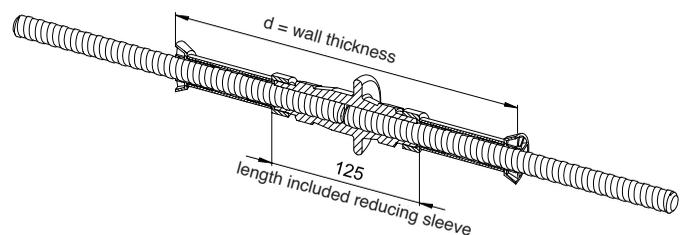
b) water stop with welded sheet 120 x 120 mm for tie rod D&W 15.0 mm

With this type the water circulation will be prevented with a welded square sheet 120 x 120 mm. This sheet has got extra cams to increase the compound effect with the concrete. To prevent the entering of concrete grout a reducing sleeve will be installed at the transition from the nut to the plastic tube. Please clarify before ordering of this type, whether the width of meshes of the reinforcement is wide enough to push through the square sheet 120 x 120 mm subsequently.



c) water stop with round sheet \varnothing 65 mm, for tie rod D&W 15 mm

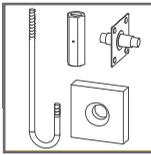
This type will be casted in one piece with the sheet. Because of this manufacturing process it is the most inexpensive in our assortment. To prevent the entering of concrete grout a reducing sleeve will be installed at the transition from the nut to the plastic tube.



Hint:

Alternatively to the standard cone we offer a longer version with a concrete covering of 50 mm.



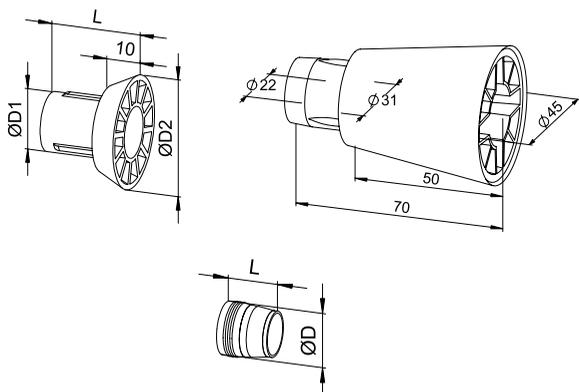
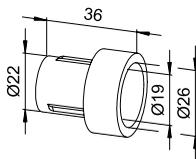
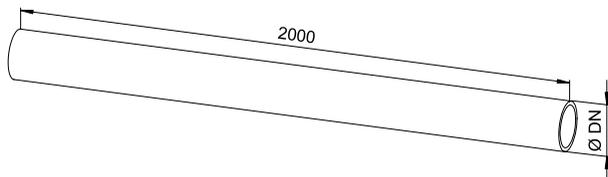
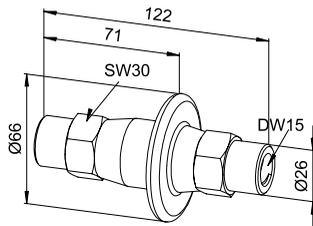
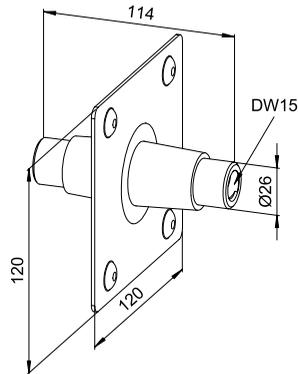
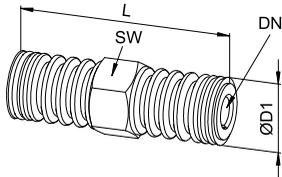


ANCHOR TIE BARS AND ACCESSORIES

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WATER STOP TIGHTENINGS

TECHNICAL DATA:



Water stop, tempered cast, profilated on the outside

D&W Ø [mm]	L [mm]	SW [mm]	D1 [mm]	Weight [kg/unit]	Item No.
15.0	115	36	35	0.55	511581
20.0	140	50	45	1.13	512081

Water stop, tempered cast, with welded sheet 120 x 120 mm

D&W Ø [mm]	Weight [kg/unit]	Item No.
15.0	0.65	511585

Water stop, tempered cast, with round sheet

D&W Ø [mm]	Length [mm]	Weight [kg/unit]	Item No.
15.0	122	0.54	511586

Plastic tube, grey

D&W Ø [mm]	DN [mm]	Weight [kg/unit]	Item No.
15.0	22/26	0.60	511582
20.0	26/30	0.95	512082
26.5	30/36	1.50	512682

Plastic adapter as reducing sleeve, water stop on plastic tube

D&W Ø [mm]	Weight [kg/100 units]	Item No.
22/26	0.30	511589

Plastic cones for plastic tube

D&W Ø [mm]	D1 [mm]	D2 [mm]	L [mm]	Weight [kg/100 units]	Item No.
15.0	22	42	32	0.61	511583
15.0	22	45	70	2.20	511543
20.0	26	50	32	0.90	512083

Plug for plastic tube

DN D&W	D mm	L mm	Weight [kg/100 units]	Item No.
15,0	22	32	0,28	511590
20,0	26	32	0,39	512090



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