Nivell®

on which machines are firmly based

Positioning systems
Vibration technology

Content

All solutions in this catalogue

Precision wedges,isolation elements,and levelling feet - the entire levelling product range provides all required components for professional and successful machine positioning technology.

Optimal vibration technology provides long-term protection for people,buildings,and machines.

Nivell products fulfil the special requirements of machine designers and facilitate service technicians when installing machines.

Content

Over 40 years of Nivell AG – over 40 years of innovations

We have been carrying out innovative developments in machine positioning technology sector for over 30 years.

During this time,the appearance of the company has changed,but the basic principles of our work have remained the same.Quality positioning technology solutions continue to show that our consistency with regard to the product development of high-quality products for individual applications has paid off.

1975 Market debut of the SK positioning wedge,still considered the basic precision levelling wedge on the market

1982 Winners of the 'Die gute Industrieform' award

1983 Aluminium wedge with patented guide,a wedge with just 35 Nm energy expenditure for 7 tons of lifting power

1985 Commencement of in-house vulcanisation for consistently high rubber quality

1986 Precision wedges with vulcanised laminated supports, reflection damping resulting from pairing of sound-reflecting and sound-absorbing materials

1987 Silent Delta,a patented solution for vibration isolation with low-frequency vertical-direction properties and concurrent horizontal stability

1990 Rustproof,stable hinged feet for the food and chemical industries

1992 Founding of the German subsidiary to enable the seamless supply of goods to our European customers

1995
Introduction of CAD drawings; each customer has a drawing with the number of the machine support used

1997
ISO 9001 certification

1998 Move into new business premises in Bremgarten

2000 Patenting of the new generation of double precision levelling wedges and start of production

2004
3D representation in the design process

2007 Introduction of large-area levelling wedges based on the double-wedge principle

Nivell quality in accordance with ISO 9001

Consistently high quality is absolutely essential for our products. For this reason, the entire production process at Nivell, from planning right through to product manufacture, is subject to ongoing monitoring.

Our quality management system is certified to ISO 9001 and QS 150 9001/ EN 29001.This certification is valid until April 2010.In addition,we are also certified on a sector-specific basis for market-leading manufacturers.

The right solution for every machine

Each machine has different positioning technology requirements, whether rigid or flexible, fixed or free-standing, rough or precise levelling, heavy or lightweight...

We have many years of experience in positioning technology and can meet these various requirements with our products.

- Individual guidance from our experienced field staff – our own mechanical engineers and vibration specialists
- Highly technical,patented quality products
- The development of made-to-measure solutions using modern CAD tools
- Close co-operation with leading machine builders
- In-house production
- Flexibility for special requirements
- Highly consistent delivery quality
- Punctual and correct deliveries

These are typical benefits of using Nivell to provide safe supports for your production plant:

- Precision and accurate functioning for the entire lifetime of the machine
- Efficient installation and relocation of equipment
- Vibration protection for high-precision machines
- Compliance with legal regulations on noise levels for machines that are subject to high vibration or impacts

The central double wedge principle - for the best possible vertical and horizontal rigidity

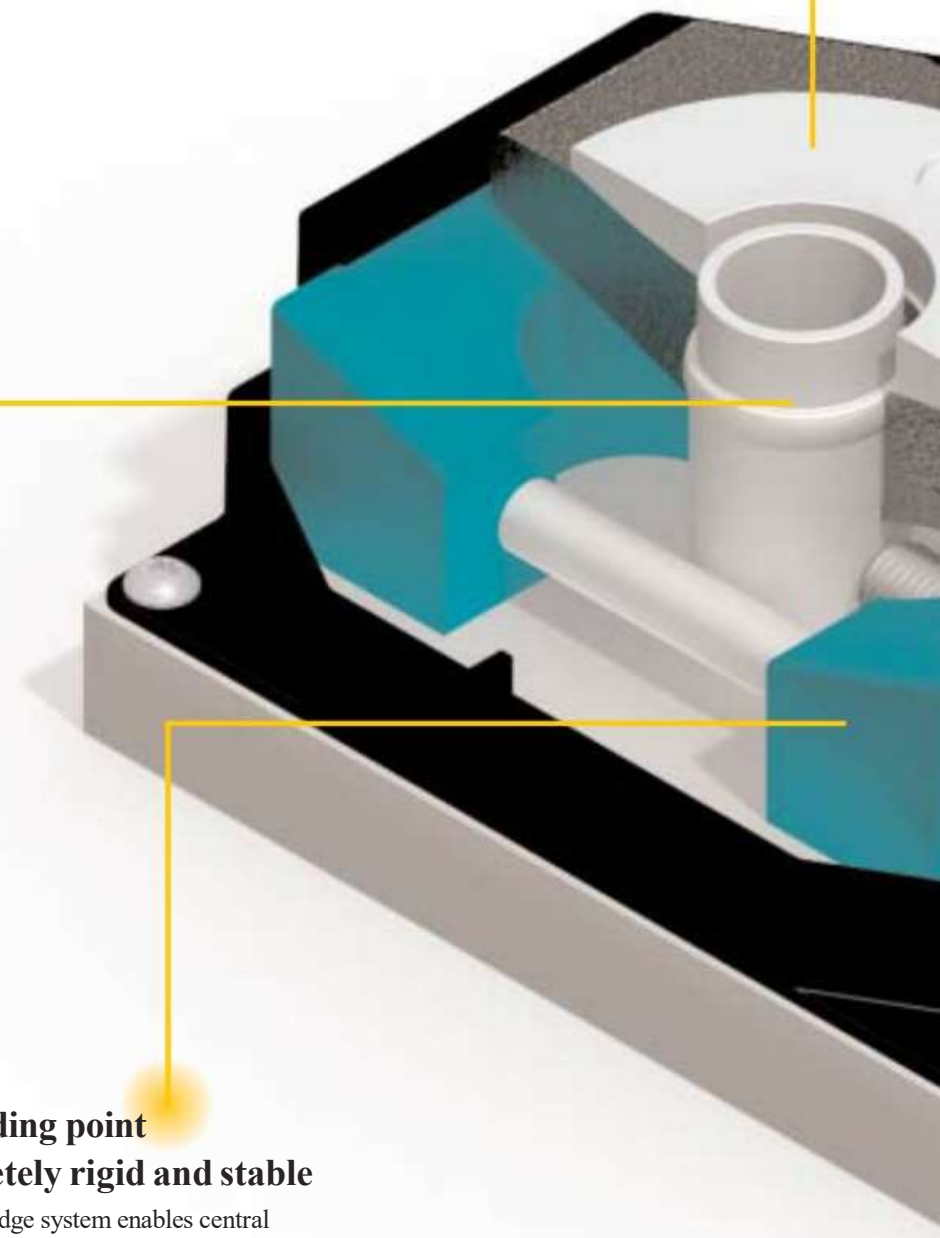
The development of this precision wedge was based on the new double wedge principle.This involves the use of two wedges to provide levelling, rather than one. Both wedges move towards or away from the loading centre symmetrically and with zero clearance.The central loading point remains completely rigid and stable.

The distribution of the load over two wedges halves the forces exerted on the lifting mechanism, enabling the effortless and precise levelling of extremely heavy machines.

The torque for the setting screw is just 4 to 6 Nm per ton.The maximum levelling load per support point is an impressive 15 tons for DK-2, 25 tons for DK-3, and 40 tons for DK-4.

Full-surface and stable machine positioning

Spherical machine supports using large,spherical discs (calottes) to compensate for uneven floors.



No horizontal machine movement

Central fixation of bearing parts thanks to stable centring sleeve through which the floor bolt passes.The levelling screw and centring sleeve are on a single axis and prevent asymmetrical forces from acting on the lifting mechanism.

The central loading point remains completely rigid and stable

The patented double wedge system enables central attachment and bolting.The adjusting screw and levelling screw are in the centre.Both wedges move towards or away from the central loading point symmetrically and with zero clearance.

The central double wedge principle

Levelling safety

Easy determination of the lowest and highest wedge position,since these positions are blocked with stops.

Application

Heavy machine tools for processing crankshafts and camshafts or rollers,high-speed milling machines,boring and milling machines,horizontal and vertical machining centres, transfer machines,surface grinding and laser cutting machines, die-casting and plastic injection moulding machines.

Machines remain precise and stable for their entire service life

The solid DK-2 double wedge provides a vertical rigidity of 5000 N/µm or 7500 N/µm with the DK-4 and ensures precise production over many years.

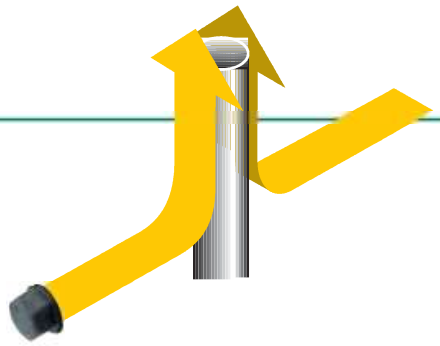
Aesthetically pleasing, modern design

Cover to prevent dirt penetration.

Reduced installation time thanks to effortless and precise levelling

Low torque for high levelling,which takes place with zero clearance and with a force starting at just 4 to 6 Nm per ton;thanks to the distribution of the load over two wedges, the forces are halved;zero clearance when changing the levelling direction.

DK-2, DK-3, and DK-4 double wedges



In the case of DK double wedges, the load-bearing parts are fixed in the centre.A stable centring sleeve, through which the floor bolt passes, prevents horizontal movement of the wedge components.

The vertical rigidity of the DK element is between 5,000 N/µm and 7,500 N/µm. Machines therefore remain completely precise and stable in their location for their entire service life.

Technical data for DK precision levelling wedges		DK-2/10	DK-2	DK-3	DK-4
Maximum adjustment load	kN	120	150	250	400
Fine adjustment	mm	10	7	7	9
Adjusting screw torque per 10kN	Nm	6	4	6	5
Adjusting screw torque at max.adjustment load	Nm	72	60	150	200
Height adjustment per adjusting screw turn	mm	0.546	0.375	0.444	0.375
Flexibility/rigidity	N/µm	5000	5000	6000	7500
Weight of basic design	kg	6.3	6.3	8	21

Important information on loading DK wedges with anchor rods		M20	M24	M30	M36
Torque on foundation bolt nut per kN	Nm	3.4	4	5	6
Pretensioning force for hand-tight foundation bolt nut	kN	38	40	50	53
Torque on hand-tight foundation bolt nut	Nm	129.2	160	250	318
Torque on hand-tight foundation bolt nut at yield point Extension anchor bolt	Nm	275	460	910	1590
Pretensioning force for extension anchor bolt at yield point	kN	81	115	185	265

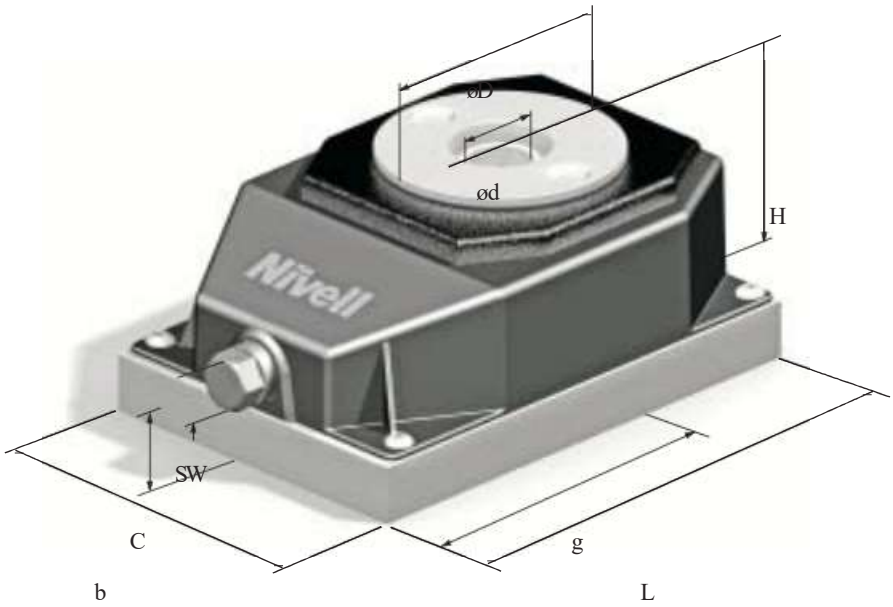
Please note:Do not merely take the proportional machine load into account to comply with the maximum adjustment load.The total of all occurring loads, including the proportional machine load, dynamic loads,alternating loads,and pre-stresses on the extension anchor bolt (anchor rod) must not exceed the maximum permitted load for the DK double wedge.Moreover,make sure that,during the levelling process,more weight is normally applied to a point than is accounted for by the proportional machine load.

DK-2 with adjustment load to 15 t

DK-3 with adjustment load to 25 t

The central double wedge principle

Data on DK precision levelling wedge	mm	DK-2 and DK-2/10	DK-3	DK-4
Length	**L**	175	200	260
Width	**W**	120	160	240
Distance to centre of through-hole	**g**	110	113	150
Unloaded height in lowest position	**H**	71	87	102
Height of centre of levelling screw	**C**	33	31	43
Diameter of spherical support surface	**D**	80	80	120
Diameter of central hole	**d**	δ 24.5	δ 31	δ 36.5
Hexagonal wrench for adjustment	**SW**	17	24	24



Application

- Machine tool industry
- Printing industry
- Automotive industry
- Food industry
- Electrical and electronics industry
- Punching and pressing industry
- Plastics industry
- Clean rooms

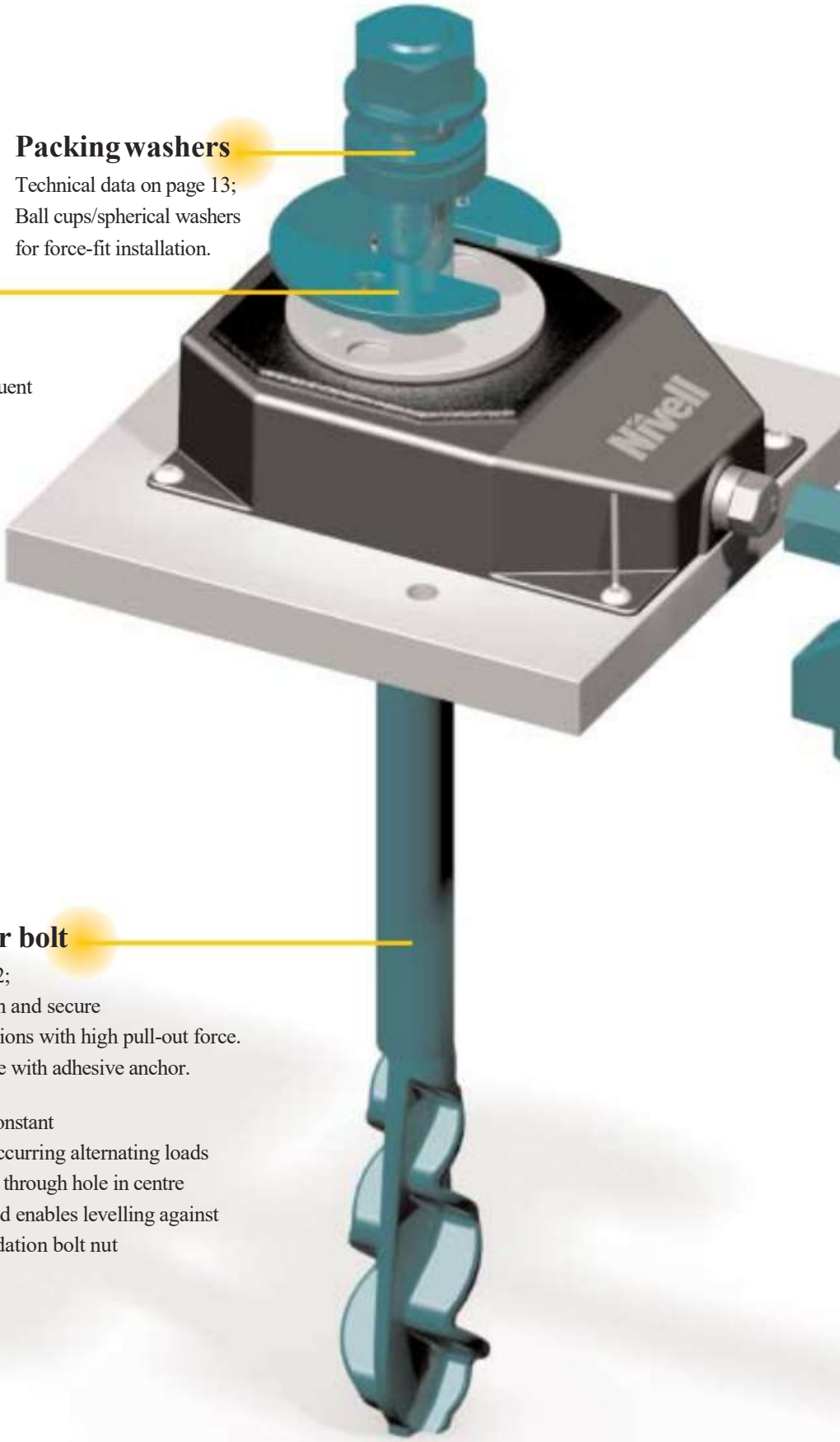
Used for the following machines

- Machine tools
- Lathes
- Milling machines
- Machining centres
- Transfer machines
- Grinding machines
- Gear-cutting machines
- Planing, slotting, and broaching machines
- Sawing and friction sawing machines
- Honing, lapping, and polishing machines
- Sheet metal processing machines

DK-4 with adjustment load to 40 t

The double wedge principle is patented in Europe and in the United States.
European Patent No.1236006;
USA Patent No.US 6 889 946 B2

Accessories for DK double wedge with central floor bolting



Packing washers

Technical data on page 13;
Ball cups/spherical washers
for force-fit installation.

D4 spacing washer

Technical data on page 13;
Rustproof spacing washers increase the adjusting range by means of simple subsequent insertion,or enable the base height to be adjusted in advance.Secure position thanks to push-in cam.
Recommendation:At least one spacing washer for extending the adjusting range for each DK.

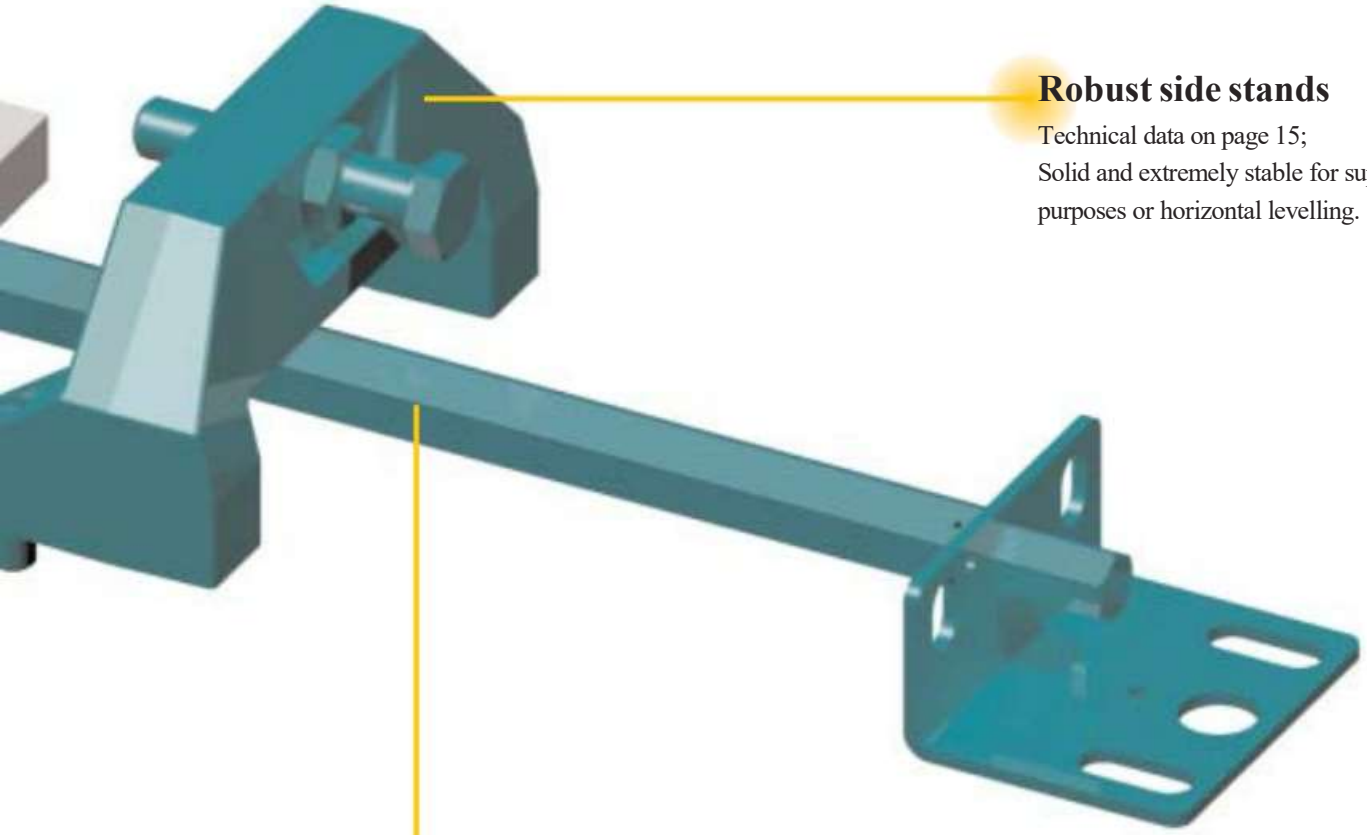
Extension anchor bolt

Technical data on page 12;
for permanent pre-tension and secure connection to the foundations with high pull-out force.
Floor bolting also possible with adhesive anchor.

- High rigidity for a constant machine bed with occurring alternating loads
- Levelling screw and through hole in centre
- High adjustment load enables levelling against the hand-tight foundation bolt nut

Application

- Long,heavy machines with high alternating loads
- Machines with high levels of horizontal loading
- Machines that are not twist-resistant and/or that consist of multi-section base elements
- Machines with support points that are difficult to access



Robust side stands

Technical data on page 15;
Solid and extremely stable for support purposes or horizontal levelling.

Extension

Technical data on page 14;
If the support point is so far under the machine that the levelling wedge is no longer accessible,an extension is required. This assembly aid extends the levelling screw.

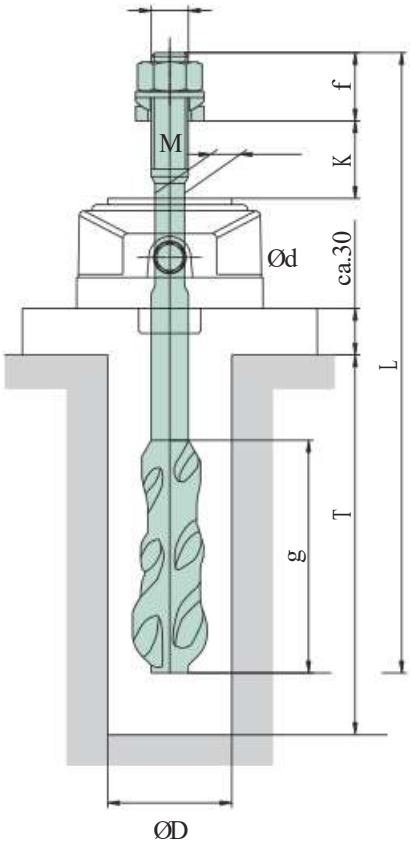
Extension anchor bolts and adhesive anchors

Extension anchor

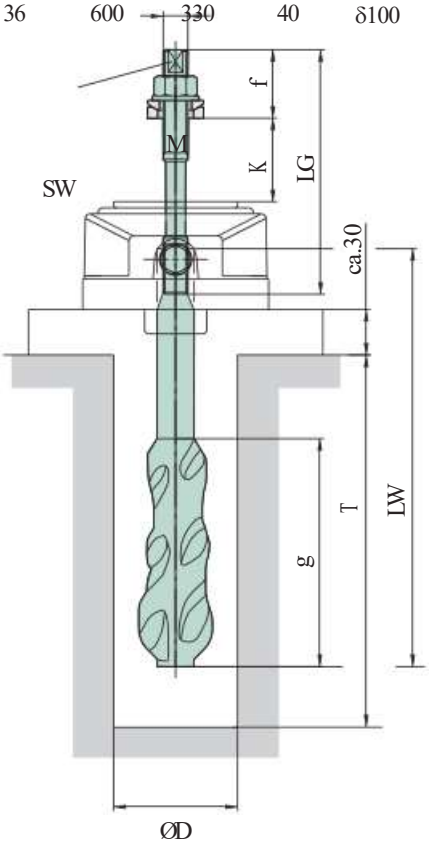
Extension anchor bolt	M	L	g	Ød	ØD	T	K	f	Pull-out force
		mm	mm	mm	mm	mm	mm	mm	kN
DK-2,DK-2/10,DKG-2	20	400	100	16	80	275	δ60	31	96
	24	500	135	19	100	360	δ70	40	135
DK-3,DKG-3	24	500	135	19	100	340	δ70	40	135
	30	600	150	24	120	430	δ80	46	216
DK-4	30	600	150	24	120	420	δ80	46	216
	36	800	180	29	150	610	δ80	58	316

Extension anchor bolt	M	SW	LW	LG	T	ØD	K	f	g	Pull-out force
Split design		mm	mm	mm	mm	mm	mm	mm	mm	kN
DK-2,DK-2/10,DKG-2	16	10	200	175	160	80	δ60	28	100	96
DK-3,DKG-3	20	13	300	195	250	100	δ60	31	135	135
DK-4	24	17	350	235	300	120	δ80	40	150	216

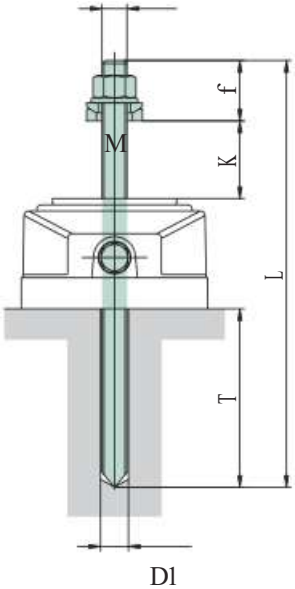
Chemical adhesive anchor (adhesive anchor)	M	L	T	ØD1	K	f	Pull-out force
		mm	mm	mm	mm	mm	kN (B35/25 concrete)
DK-2,DK-2/10,DKG-2	16	300	125	18	δ60	28	26
	20	350	170	24	δ60	31	47.1
DK-3,DKG-3	24	420	210	28	δ70	40	67.9
	27	460	240	30	δ80	44	83.2
DK-4	30	510	270	35	δ80	46	109.2
	36	600	330	40	δ100	58	152.5



Extension anchor bolt



Extension anchor bolt Spit design



Adhesive anchor

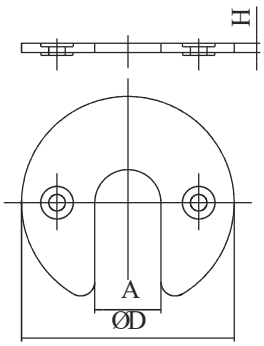
The scope of supply of the extension anchor bolt includes a nut and washer and a adjusting ring

The scope of supply of the adhesive anchor includes the threaded rod, nut,and packing washer.

D-4/90 spacing washers

D-4 spacing washer for extending adjusting range

- **Several spacing washers can be combined**
- **They can be easily inserted later on**
- **Secure position thanks to push-in cam**
- **Adaption to the required base height**
- **Additional adjusting range**



Spacing washer		ØD	H	A	Material
D-4/90 spacing washer	mm	90	4	28	1.4301 stainless
D-4/90 spacing washer	mm	90	4	28	Steel 37,galvanized
D-4/90 spacing washer,flat	mm	90	4	28	Steel 52,turned flat
D-6/90 spacing washer	mm	90	6	28	Steel 37,galvanized

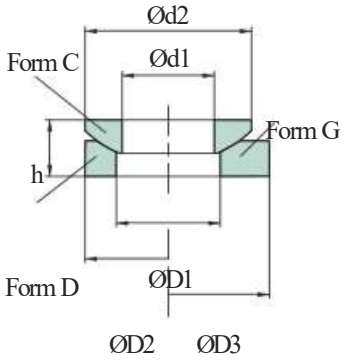
Recommendation:Use at least one spacing washer to extend the adjusting range for each double wedge DK.

Compensation washers

Compensation washers for force-fit tightening of foundation bolt nut

Spherical washers/ball cups (in accordance with DIN 6319)

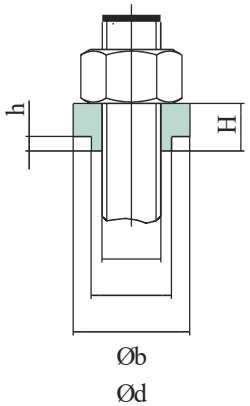
	Spherical washer		Ball cup		Height		
	Style C		Style D		Style G		Style C+D/C+G
	Ø d1	Ø d2	ØD1	ØD2	ØD1	ØD3	h
	mm	mm	mm	mm	mm	mm	mm
M16	17	30	19	30	19	44	10
M20	21	36	23	36	23	50	12
M24	25	44	28	44	28	60	15
M30	31	56	35	56	35	68	18
M36	37	68	42	68	—	—	23



Centring sleeves

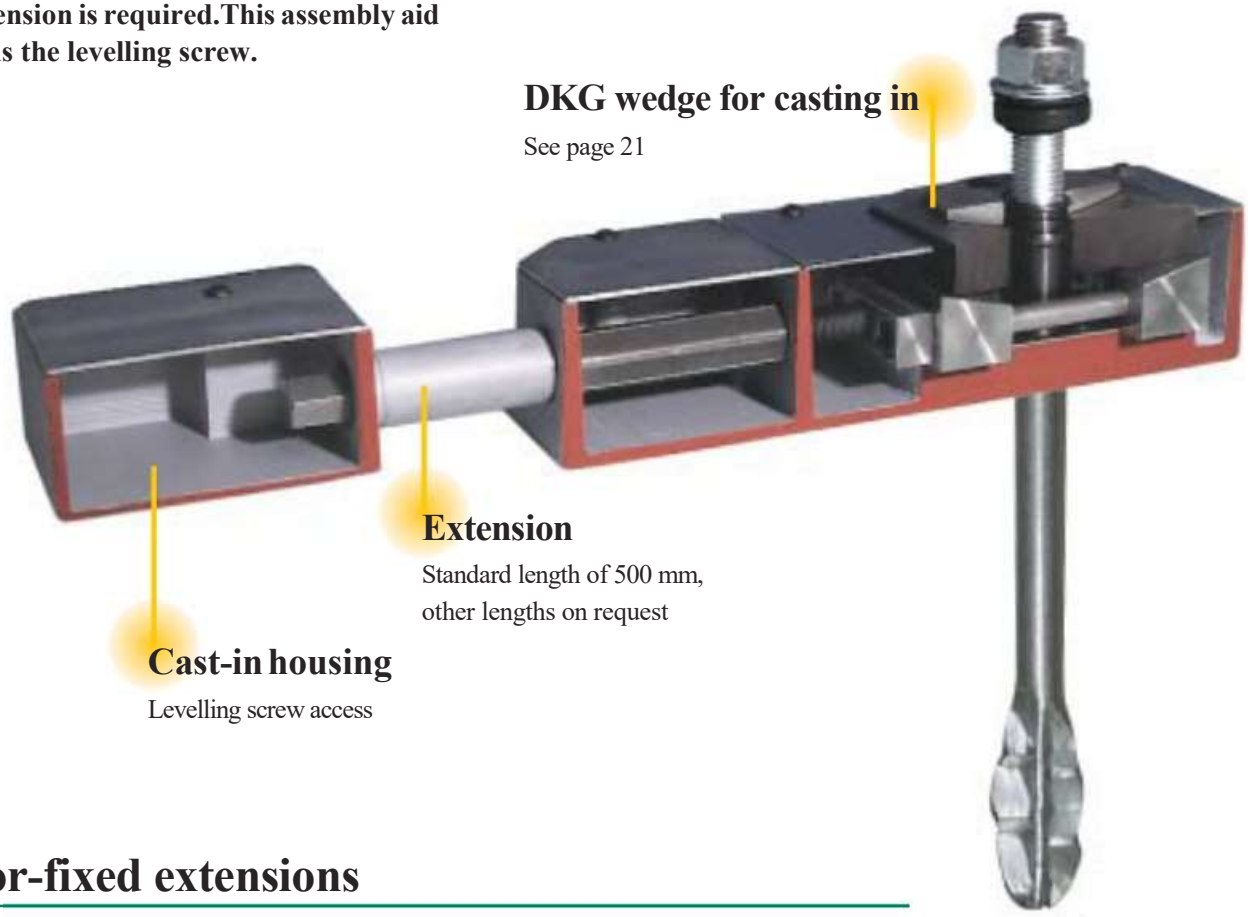
Sleeve for central positioning of foundation bolt

Centring sleeves	Ø b	Ø d	Ø D	H	h
Centring sleeve for M12mm	12.2	18	26	12	3
Centring sleeve for M16mm	16.2	22	32	13	4
Centring sleeve for M20mm	20.2	28	40	14	4
Centring sleeve for M24mm	24.2	32	44	18	5
Centring sleeve for M30mm	30.2	42	54	21	5



Extensions for casting in

If the support point is so far under the machine that the levelling wedge cannot be accessed, an extension is required.This assembly aid extends the levelling screw.

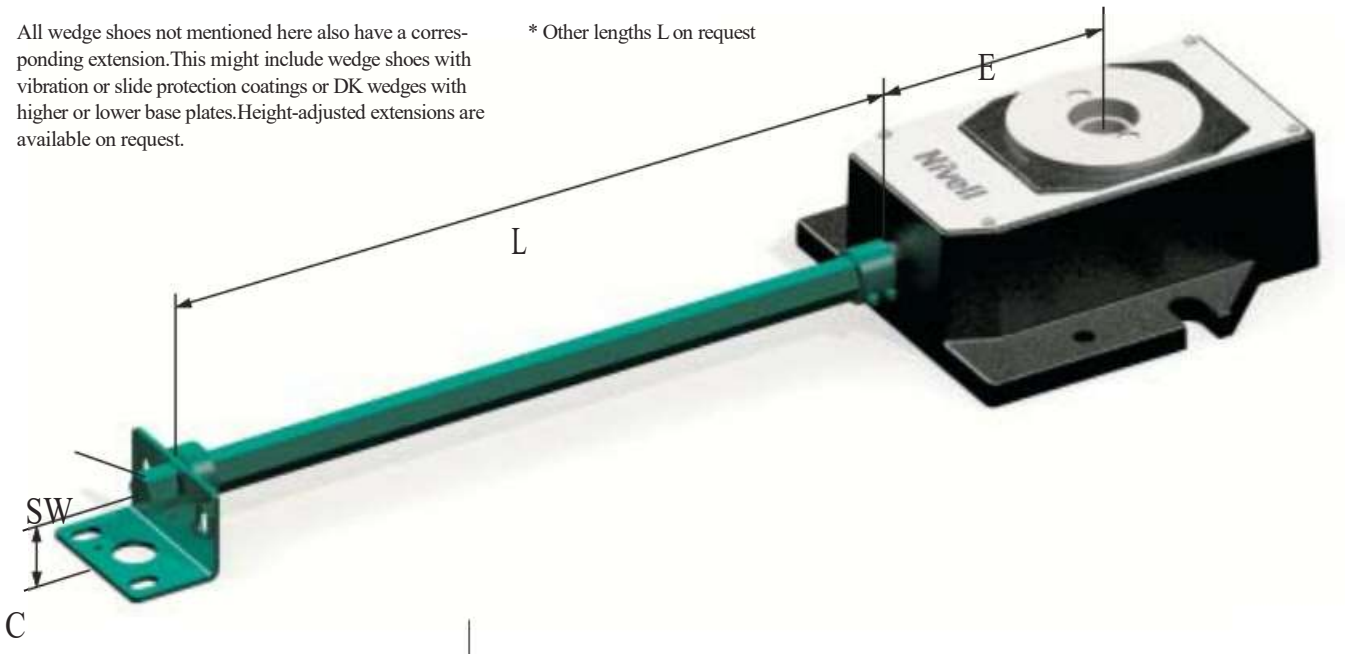


Floor-fixed extensions

Data on extensions		DK(E/A)-2	DK(A)-3	DK(A)-4
For floor anchorage version	**mm**	**DK(E/A)-2/10**		
Standard extension length*	**L**	500	500	500
Ground clearance to centre of levelling screw	**C**	33	31	43
Distance to fixing hole/through hole	**E**	110	113	150
Hexagonal wrench for adjustment	**SW**	17	24	24

All wedge shoes not mentioned here also have a corresponding extension.This might include wedge shoes with vibration or slide protection coatings or DK wedges with higher or lower base plates.Height-adjusted extensions are available on request.

* Other lengths L on request

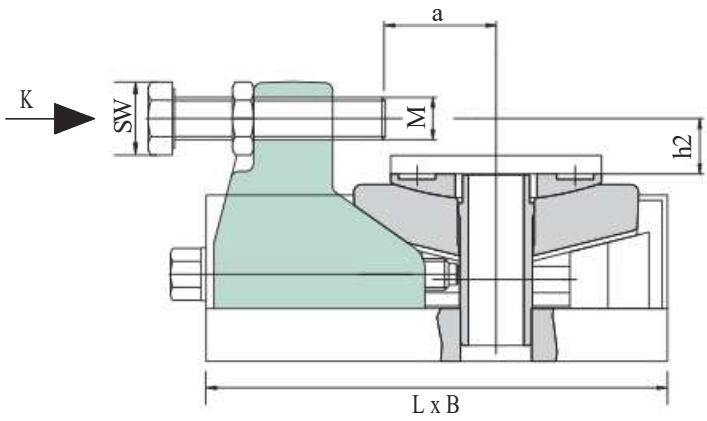


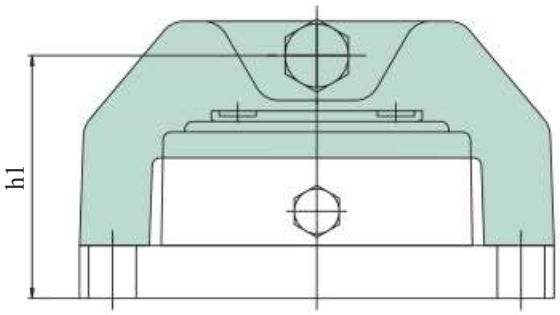
Double wedge side stand

Robust side stand that also enables horizontal levelling. Can be supplied with hinge stop. 40 mm in diameter, compensates for uneven floors (see below).

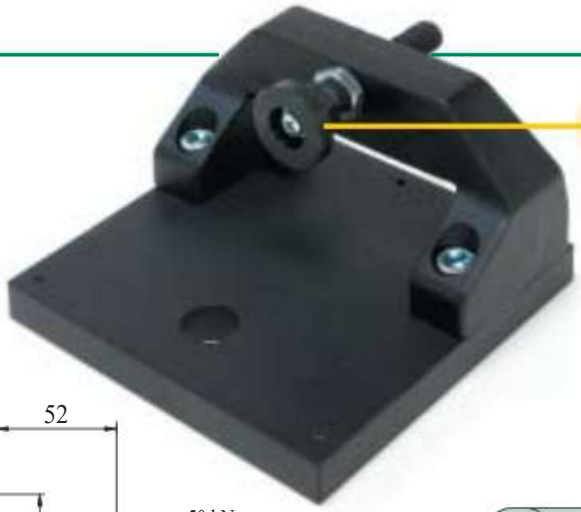
Side stand data, DK version

mm	DK-2	DK-2/10	DK-3	DK-4
M	16	16	16	20
SW	24	24	24	30
h1	92	92	117	132
h2	14 – 21	11 – 21	21 – 30	21 – 30
a	22 – 61	22 – 61	22 – 62	44 – 81
K in kN	50	50	50	80



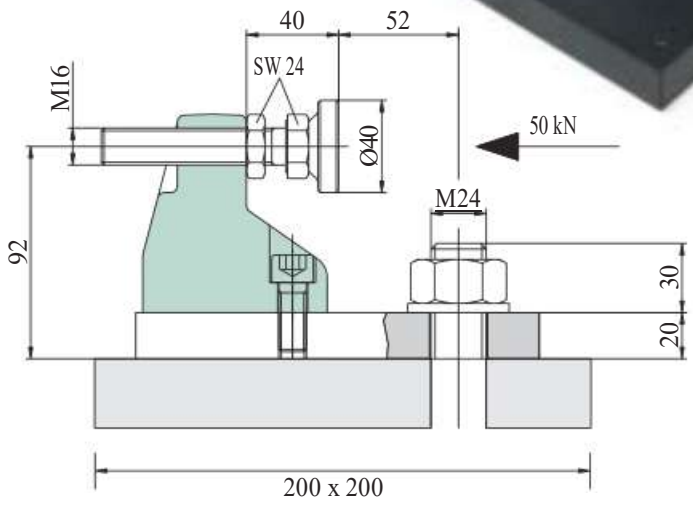


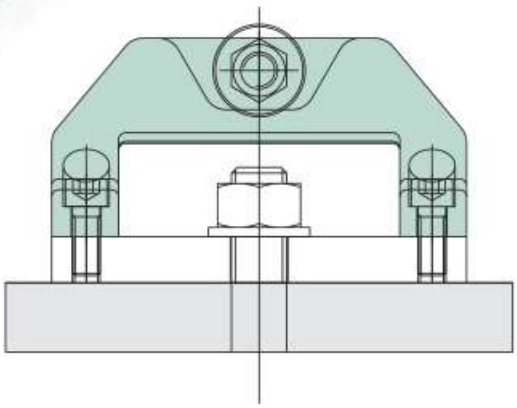
Side stand



Hinged foot

For full-surface horizontal support; compensates for uneven floors.





Assembly aids to provide a secure floor connection

G aluminium wedge

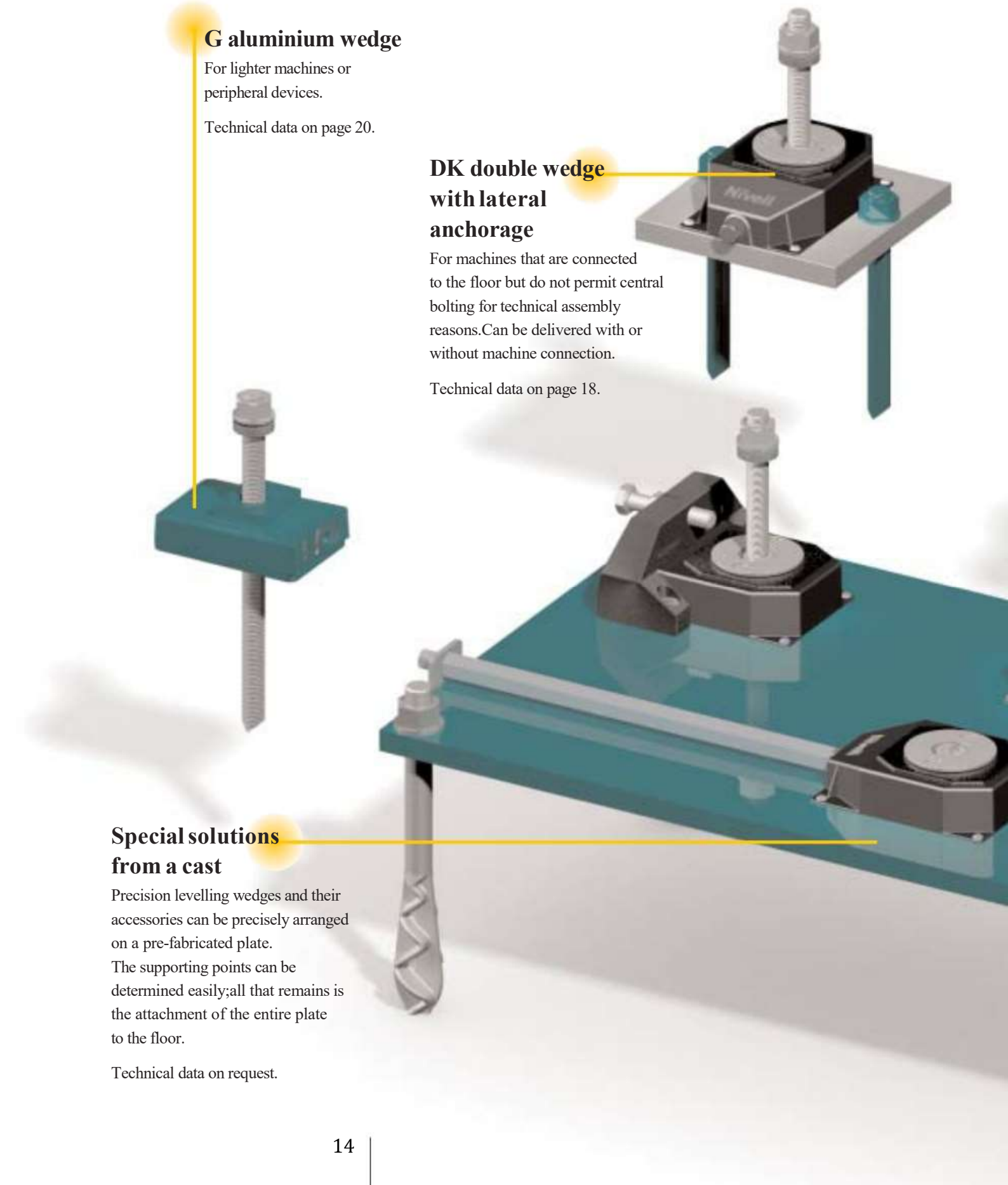
For lighter machines or peripheral devices.

Technical data on page 20.

DK double wedge with lateral anchorage

For machines that are connected to the floor but do not permit central bolting for technical assembly reasons.Can be delivered with or without machine connection.

Technical data on page 18.



Special solutions from a cast

Precision levelling wedges and their accessories can be precisely arranged on a pre-fabricated plate.
The supporting points can be determined easily;all that remains is the attachment of the entire plate to the floor.

Technical data on request.

AP10x10 adaptor plate with moveable fixing

Easier installation thanks to the screw-on bolt being moveable in all directions.

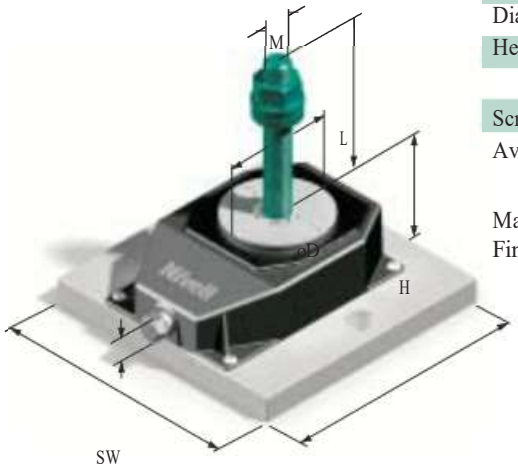
Technical data on page 19.

DKG double wedge for complete casting in

Machine support and floor at same height.Used preferably for-foundation solutions,since the required cut-outs can be easily provided when the foundations are being constructed.

Technical data on page 21.

Double wedge with screw-on bolt



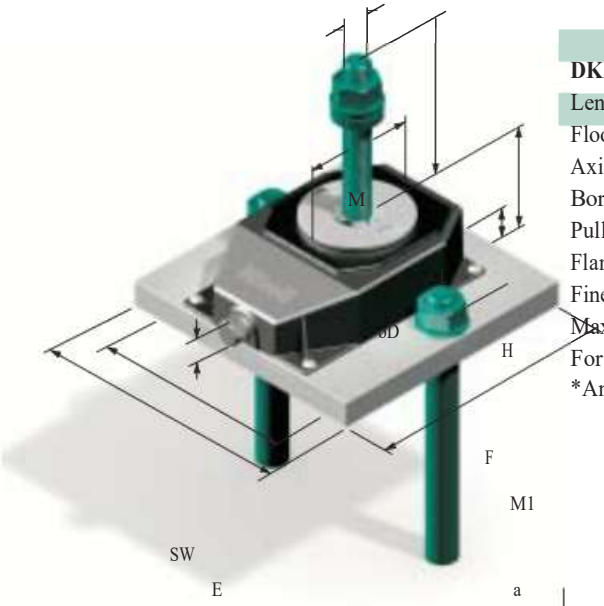
Data on screw-on DKA	mm	DKA-2	DKA-2/10	DKA-3	DKA-4
Length x width	a x b	200 x 200	200 x 200	200 x 160	260 x 240
Unloaded height in lowest position	H	71	71	87	102
Diameter of spherical support surface	D	80	80	80	120
Hexagonal wrench for adjustment	SW	17	17	24	24
Screw-on bolt	M	M16/M20	M16/M20	M20/M24	M24/M30
Available screw-on bolt thread	L	100	100	100	100
Maximum adjustment load	in kN	150	120	250	400
Fine adjustment		7	10	7	9

DKE-4
Adjustment
load of 40 tons

DKE-2
Adjustment
load of 15 tons

DKE-3
Adjustment load of 25 tons

Double wedge with screw-on bolt and lateral anchoring possibilities

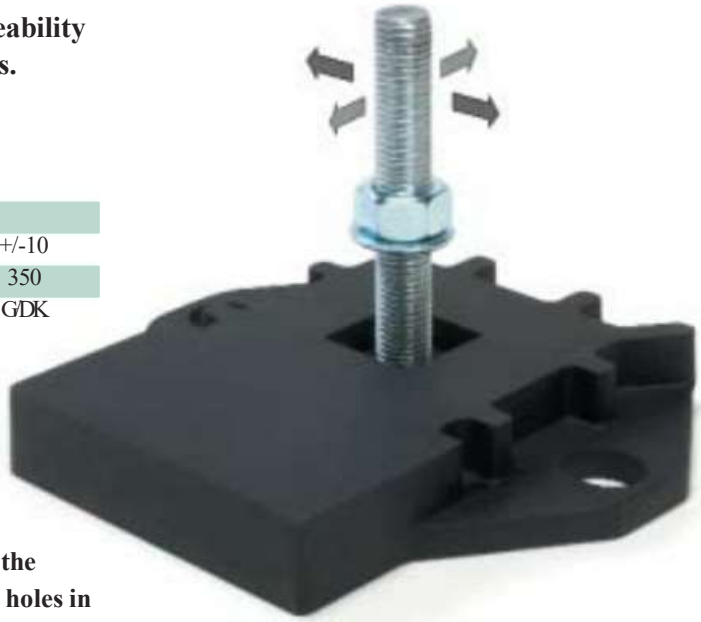


DKE with adhesive anchor*	mm	DKE-2	DKE-2/10	DKE-3	DKE-4
Length x width	a x b	200 x 200	200 x 200	200 x 160	260 x 240
Floor bolt dimension	M1	16	16	16	20
Axial pitch of side holes	E	155	155	130	200
Bore for adhesive anchor	T	Ø18 x 125	Ø18 x 125	Ø18 x 125	Ø24 x 170
Pull-out forces	N	2 x 26,000	2 x 26,000	2 x 26,000	2 x 47,000
Flange height	F	20	20	15	17
Fine adjustment		7	10	7	9
Maximum adjustment load in kN		150	120	250	400

For data on H,L,ØD,M,and SW,see table,at the top.
*Anchor bolt variant with cut-out plan on request

AP adaptor plate

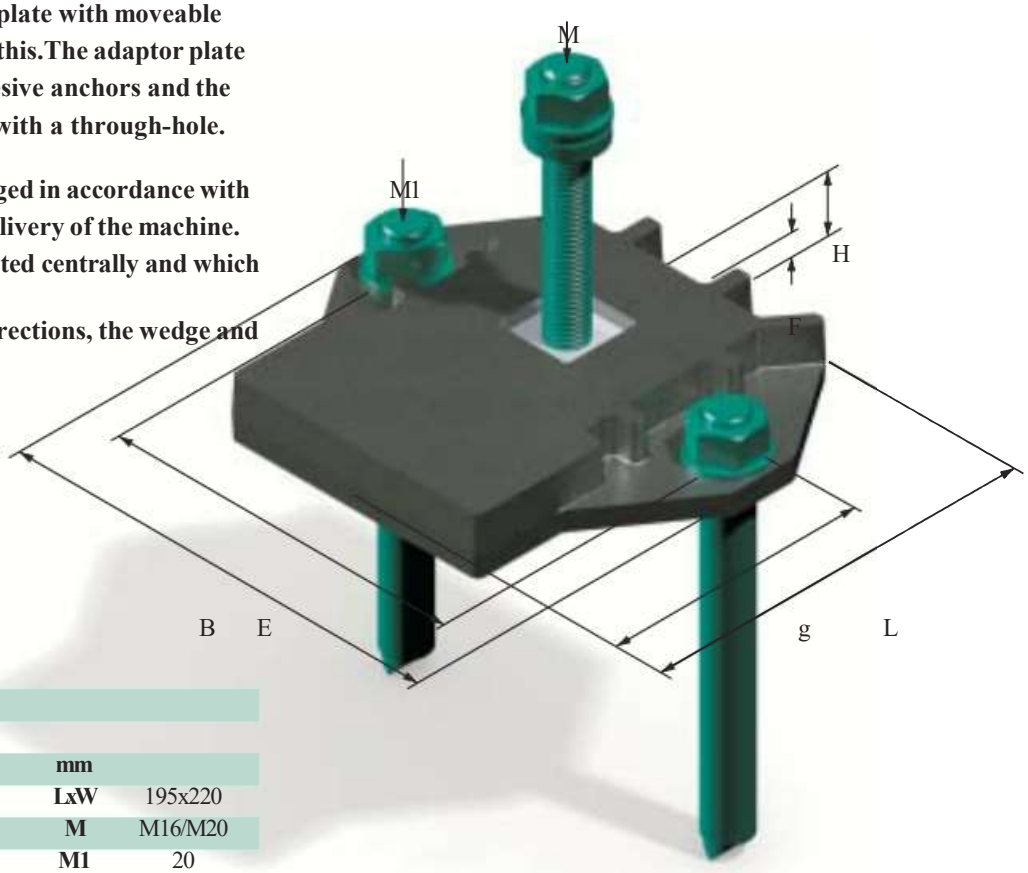
- **No prior placing of machine to exactly mark floor holes required.**
- **Reduction in installation time due to moveability of screw-on bolt by 10 mm in all directions.**



Technical data for 10x10 adaptor plate	
Horizontal adjusting range in mm	+/-10
Maximum load in kN	350
Corresponding precision levelling wedge	GDK

Anchoring with adhesive anchors is practical but the threaded pins must be screwed into the provided holes in a way that does not allow them to move.
Imprecise hole pitching or holes that 'wander' are almost impossible tocorrect.The adaptor plate with moveable threaded pin provide a way round this.The adaptor plate is fixed to the floor using two adhesive anchors and the wedge shoe is placed on the plate with a through-hole.

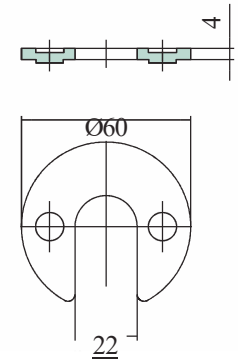
Adaptor plates can be easily arranged in accordance with the foundation drawing prior to delivery of the machine. Thanks to a fixing rod that is mounted centrally and which can be moved horizontally in all directions, the wedge and rod can be moved by hand.



Data on 10x10 adaptor plate	mm	
Length x width	**LxW**	195x220
100 mm long screw-on bolt	**M**	M16/M20
Floor bolt dimension	**M1**	20
Axial pitching of side holes	**E**	176-184
Bore for adhesive anchor	**T**	Ø24 x 170
Unloaded height	**H**	31
Flange height	**F**	12

GN35+TS15 precision levelling wedge

Floor bolts for machines or peripheral devices such as pallet changers, robots, radial drills, etc.



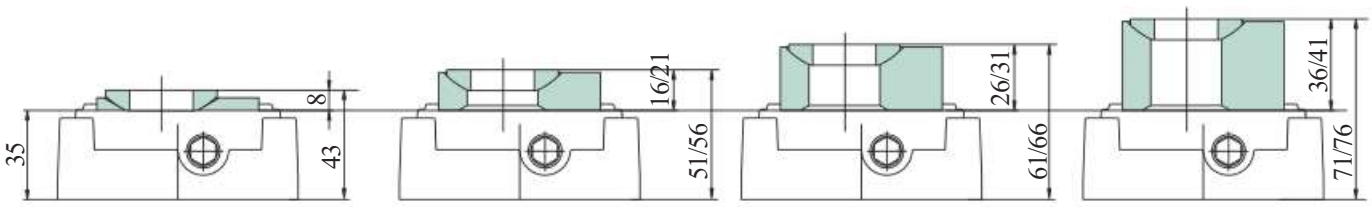
D-4/60 spacing washer

GN35+TS15/D-4 data	mm
Length	x width
145 x 95	
Unloaded height	50
Floor bolt dimension	M16x320
Hole for adhesive anchor	Ø18 x 125
Available thread length	145
Machine support	Ø60
Insertable spacing washer	Ø60
Height of spacing washer	4
Maximum torque in N/m	35
Maximum adjustment load in kN	70
Torque per 10kN in N/m	5

D-4/60 spacing washers are practical assembly aids for extending the adjusting range.They can be easily inserted later on and provide a secure position thanks to push-in cams.

Further support plate inserts for extending the adjusting range

The application of TW inserts changes the base height and adjusting range by 5 mm in each case.

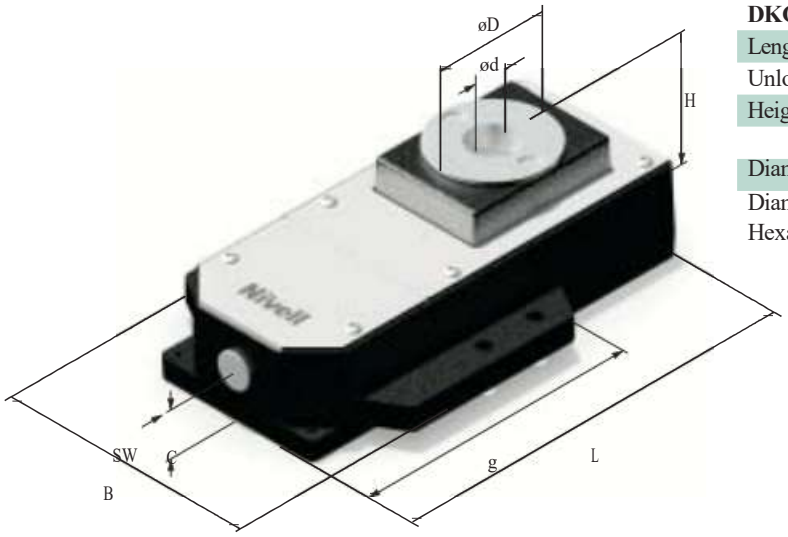


GN35 + TK8 | **GN35 + TW16/21** | **GN35 + TW26/31** | **GN35 + TW36/41**

DKG precision levelling wedge for casting in

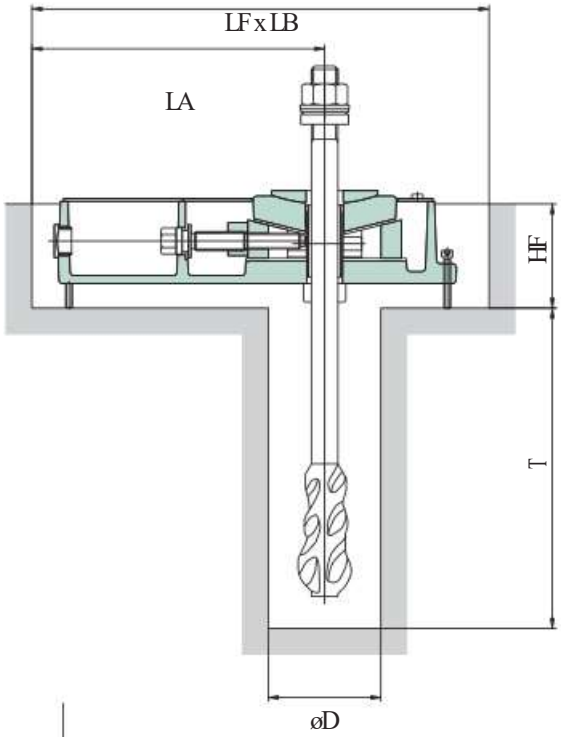
DKG technical data	DKG-2	DKG-3
Fine adjustment in mm	7	7
Adjusting screw torque per 10kN in Nm	4	6
Torque at max.adjustment load in Nm	60	150
Height adjustment per turn in mm	0.375	0.444
Flexibility/rigidity in N/µm	5000	6000
Maximum adjustment load in kN	150	250

In many cases,no foundation cut-outs can be made. This means that the wedges have to be grouted under the machine to achieve the maximum possible connection rigidity.As a rule, the DK basic types are sufficient for this.



DKG data	mm	DKG-2	DKG-3
Length x width	LxB	286 x 180	286 x 180
Unloaded height in lowest position	H	70	88
Height of centre of levelling screw	C	31	33
Diameter of spherical support surface	D	80	80
Diameter of central hole	d	δ24.5	δ31
Hexagonal wrench for adjustment	SW	17	24

Side stand,see page 15
Extension,see page 14
Spacing washers,see page 13



Complete casting-in in foundation cut-outs

Cut-out casting-in data for DKG	mm	DKG-2	DKG-2	DKG-3	DKG-3
Anchor bolt dimension		M20	M24	M24	M30
Anchor bolt length		400	500	500	600
Cut-out depth	HF	80	80	80	80
Hole depth	T	280	330	330	380
Hole diameter	D	80	100	100	120
Cut-out length	LF	350	350	350	350
Cut-out width	LB	210	210	210	210
Distance from centre	LA	230	230	230	230

Non-slip machine positioning for mobile machinery

Permanently stable level

Only a filler-free rubber mixture can provide perfect elasticity and,like water,cannot be compressed. For this reason,no material is displaced by the static load of the machine following the spring deflection.

Ensures long-term stability with no loss of adhesion

The rubber/metal combination vulcanised at high pressure and with simultaneous application of heat achieves this result – even in cases where there are constant horizontal loads.

High coefficient of friction

Even wet-skid behaviour tested with fluids containing oil and coolant remains over a value of 1 with soft compounds. This means that a horizontal force is cancelled out by an equal vertical force.Ask for the friction coefficient for the rubber compound you use.

Oil resistance

The acrylonitrile-butadiene rubber compounds used are especially resistant to mineral oil products such as petrol,oil, and grease and to heat.Ask for the list of resistance data.

Rubber – it all depends on the mixture

The property spectrum of rubber is a lot more varied and extreme than for other materials. In machine positioning technology,it is important to combine high elasticity,good heat resistance,and good resistance to aggressive media.The ideal rubber compound consists of a variety of types of rubber and chemicals.

Each compound is subjected to a rigorous quality control to the relevant DIN standards to check hardness,tensile strength,elongation at fracture,tear propagation strength,rebound elasticity,abrasion,and compression strain residue and behaviour with respect to fluids, vapours,and gases.

The coating and concrete tips form one unit. Loss of rigidity caused by the vulcanised non-slip protection coating is minimised.

DKP double-wedges, screw-on to 15 t / 25 t / 40 t

Extended adjusting range
using D-4/90 compensation packing washers.

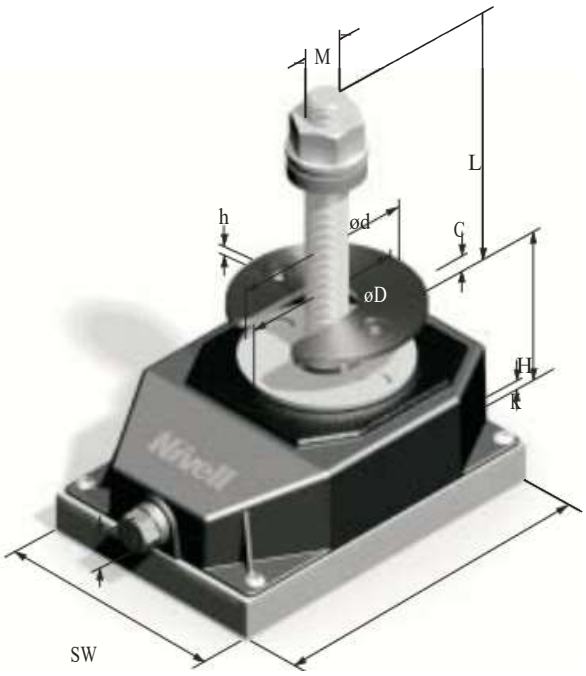
Compensation for uneven floors
Force-fit installation by using spherical machine support.

Aesthetically pleasing design
also prevents the penetration of dirt.

Different floor surfaces
to determine the optimum surface pressure.

Lasting slip resistance
by vulcanised vibration-protection coating made of oil-resistant nitrile in different shore hardnesses.

Effortless lifting of loads of up to 40 t
thanks to the low torque level on the adjusting screw.



Data on screw-on DKP	mm	DKP-2	DKP-3	DKP-4
Length	a	175	200	260
Width	b	120	160	240
Unloaded height	H	73	89 7	104
Fine adjusting range	C	7*		9
Height adjustment per turn		0.375	0.444	0.375
Available thread length,M16/M20	L	100	100	100
Machine support	D	80	80	120
Insertable spacing washer	d	90	90	90 4
Height of spacing washer	h	4	4	24
Hexagonal wrench for adjustment	SW	17	24	200
Maximum torque	(in Nm)	60	150	
Torque per 10kN	(in Nm)	4	6	5
Maximum adjustment load	(inkN)	150	250	400
80° Shore nitrile,vulcanised on**	K	2	2	2

*Can also be supplied with 10 mm adjusting range
** further 50° and 90° standard Shore hardnesses

Non-slip GP37 + TS15, screw-on

Non-slip precision levelling wedge for screwing to the machine.

Extended adjusting range

thanks to D-4/60 compensation washers.

Spherical machine supports

for force-fit installation and in order to compensate for uneven floors.

Lasting slip resistance

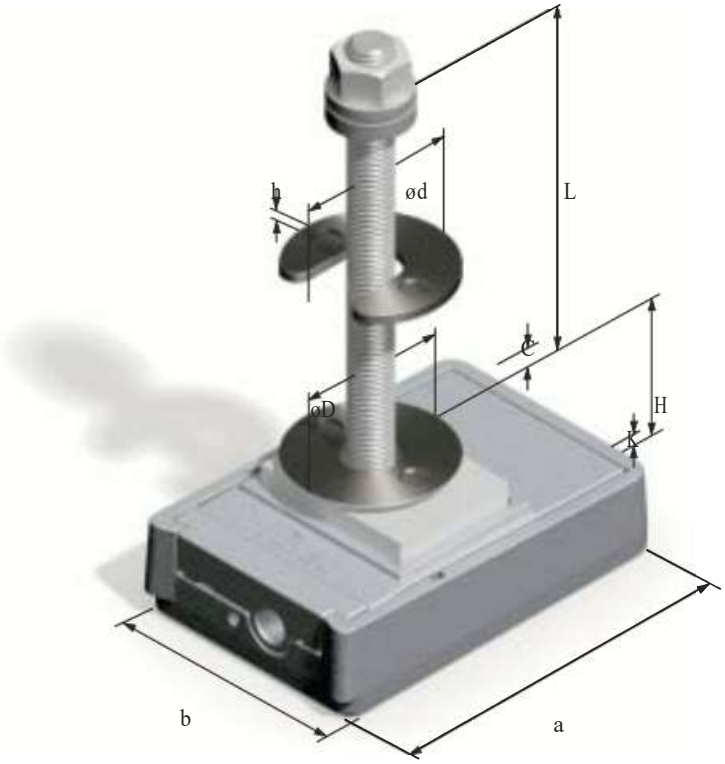
thanks to vulcanised vibration-protection coating made of oil-resistant nitrile in different shore hardnesses.

Aesthetic design in aluminium

prevents dirt penetration.

Effortless lifting of loads of up to 7 t

thanks to the low torque level on adjusting screw.



GP37 + TS15 data	mm	
Length	**a**	145
Width	**b**	95
Unloaded height	**H**	52
Fine adjusting range	**C**	7
Height adjustment per turn		0.275
Available thread length,M16	**L**	145
Machine support	**D**	60
Insertable spacing washer	**d**	60
Height of spacing washer	**h**	4
Maximum torque in Nm		35
Torque per 10kN in Nm		5
Maximum adjustment load in kN		70
80° Shore nitrile,vulcanised on*		2

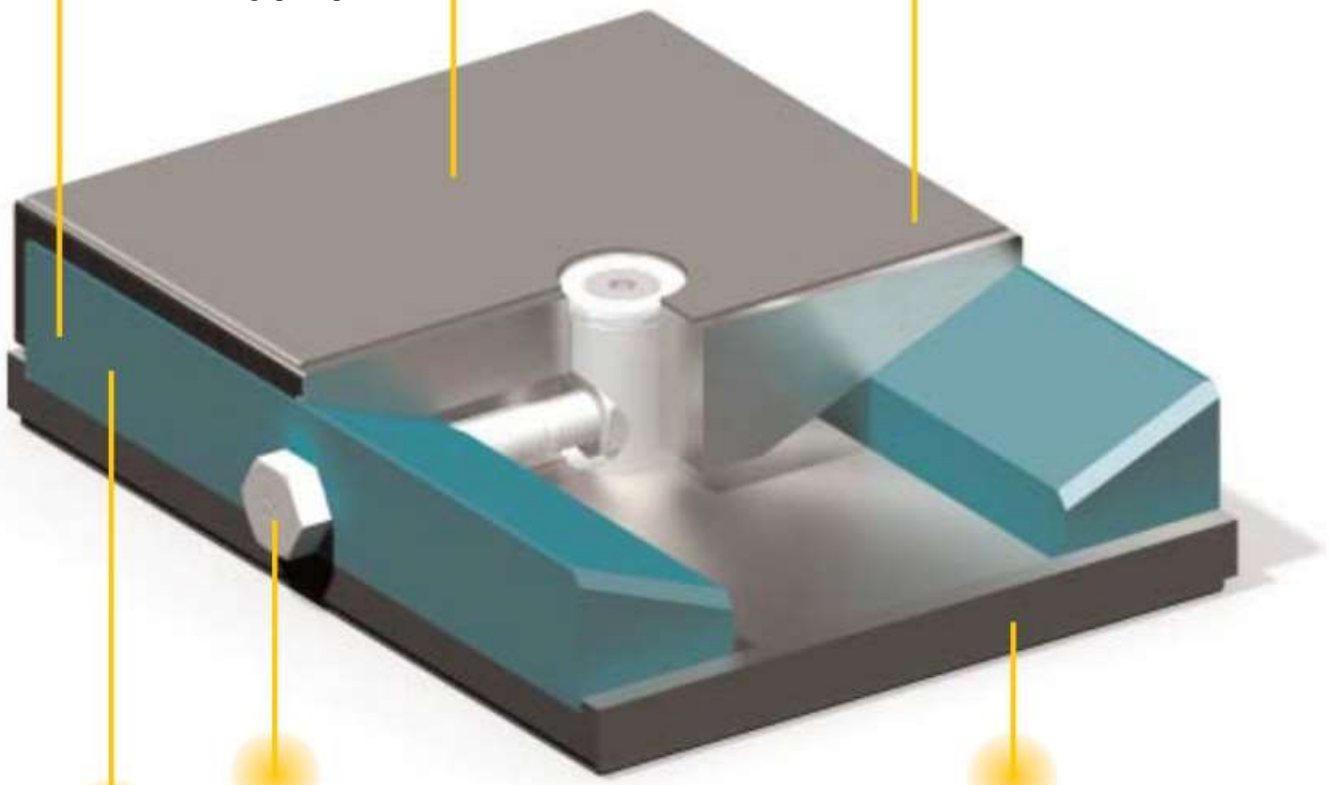
* Further 50° and 90° standard Shore hardnesses

FKP-3 to FKP-6 free-standing double wedges

No jamming when supporting partial loads
A further advantage of the Nivell double wedge principle.

No bending despite large support surface
This applies even if the load is only applied in the centre.

Vulcanised slide protection
Both the machine and floor support provide a high coefficient of friction.



20 mm adjusting range
Infinitely variable.

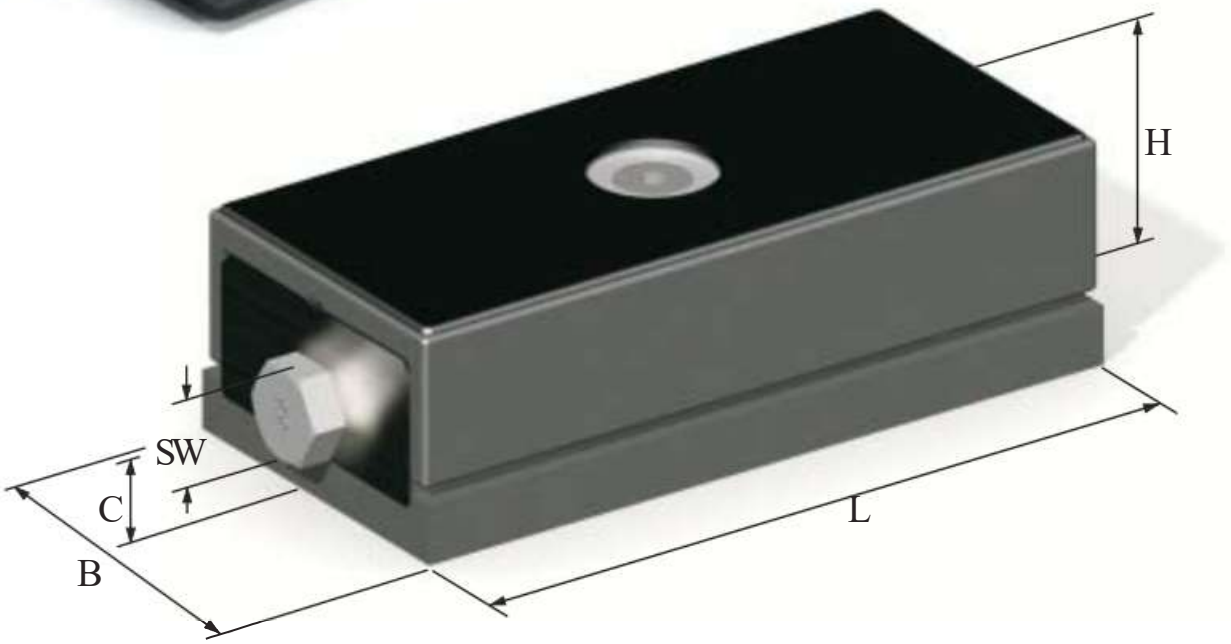
Effortless lifting of loads up to 25 tons
With low torque.

Compact
Does not fall apart.

- **All types have the same basic height and the same width across the flats on the levelling screw.**

FKP-3 to FKP-6 free-standing double wedges

Size of the vulcanised,
non-slip floor support surface
275 cm2,372 cm2 and 518 cm2



Free-standing FKP data	mm	FKP-3	FKP-4	FKP-6
Length	**L**	250	250	250
Width	**B**	120	160	220
Unloaded height	**H**	79	79	79
Height of centre of levelling spindle	**C**	33	33	33
Hexagonal wrench for adjustment	**SW**	30	30	30

Technical data for free-standing FKP		FKP-3	FKP-4	FKP-6
Max.adjustment load	kN	120	160	250
Fine adjusting range	mm	20	20	20
Adjusting screw torque at max.load	Nm	120	160	250
Adjusting screw torque per 10kN (1,000daN)	Nm	10	10	10
Height adjustment per turn	mm	0.6	0.6	0.6

Free-standing DKPK positioning wedges

High-load precision levelling wedges with vulcanised, non-slip joint support.

Adjustment for uneven floors

thanks to spherical machine support with vulcanised slip protection

Aesthetic design

prevents dirt penetration

High adjustment load

with low energy expenditure

Vibration protection

The vulcanised slide protection is oil-resistant,protects from vibration, absorbs structure-borne noise,and is resistant to aggressive media.

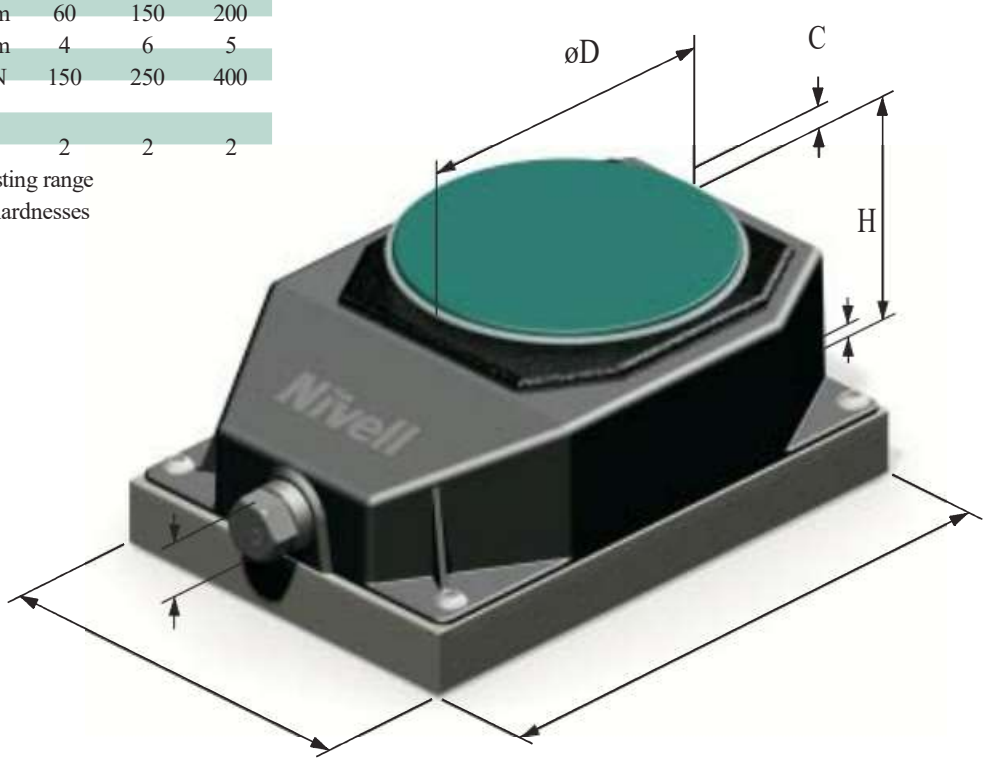
mm	DKPK-2	DKPK-3	DKPK-4
a	175	200	260

Technical data for DKPK

Length				
Width	b	120	160	240
Unloaded height	H	80	96	106
Fine adjusting range	C	7*	7	9
Height adjustment per turn		0.444	0.375	0.375
Machine support	D	100	100	120
Hexagonal wrench for adjustment	SW	17	24	24
Maximum torque	in Nm	60	150	200
Torque per 10kN	in Nm	4	6	5
Maximum adjustment load	in kN	150	250	400
80° Shore nitrile,vulcanised on**	K	2	2	2

*Can also be supplied with 10 mm adjusting range

** further 50° and 90° standard Shore hardnesses



Free-standing SK positioning wedges

Particularly low and non-slip precision levelling wedges for loads up to 2 tons.

SK 20 AV data	mm
Length	137
Width	92
Unloaded height	29
Fine adjusting range	6.5
Height adjustment per turn	0.15
Machine support with dimples	80 x 100

Technical data for SK 20 AV	
Maximum torque in Nm	20
Torque per 10kN in Nm	10
Maximum adjustment load in kN	20
Vulcanised 80° Shore* nitrile	3 mm thick
Machine support	1.5 mm thick

*Further 50° and 90° standard Shore hardnesses
Can also be supplied in all-metal

Large support surface

with vulcanised dimpled pattern

Precise fine adjustment

thanks to shallow displacement angle with just 0.15 mm height adjustment per turn of the screw

Long-term damping

The vulcanised slide protection is oil-resistant,protects against vibrations,and absorbs structure-borne noise. It is also resistant to aggressive media.

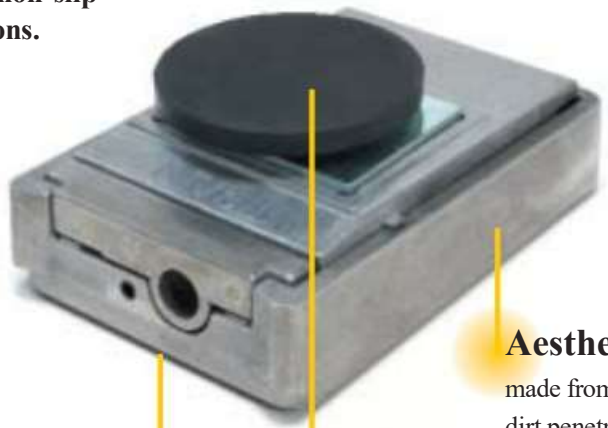
Free-standing GP37+TH15 positioning wedges

Compact precision levelling wedges with non-slip joint support for lifting loads of up to 7 tons.

GP37+TH15 data	mm
Length	145
Width	95
Unloaded height	52
Fine adjusting range	7
Height adjustment per turn	0.275
Machine support	Ø 70

Technical data for GP37+TH15	mm
Maximum torque in Nm	35
Torque per 10kN in Nm	5
Maximum adjustment load in kN	70
80° Shore nitrile,vulcanised on*	2 mm thick
Machine support	2 mm thick

* Further 50° and 90° standard Shore hardnesses
Can also be supplied all in metal



Aesthetic design

made from aluminium,prevents dirt penetration

Spherical support surface

vulcanised,compensates for uneven floors, variable basic height thanks to interchangeable support plate inserts (see page 20).

Long-term damping

The vulcanised slide protection is oil-resistant,protects against vibration,absorbs structure-borne noise,and is resistant to aggressive media.

Effective damping coupled with durability

Structure-borne noise can negatively effect the precision of machines. Precision levelling wedges are effectively protected against vibration by a vulcanised layer.This provides separation between the building and the machine.

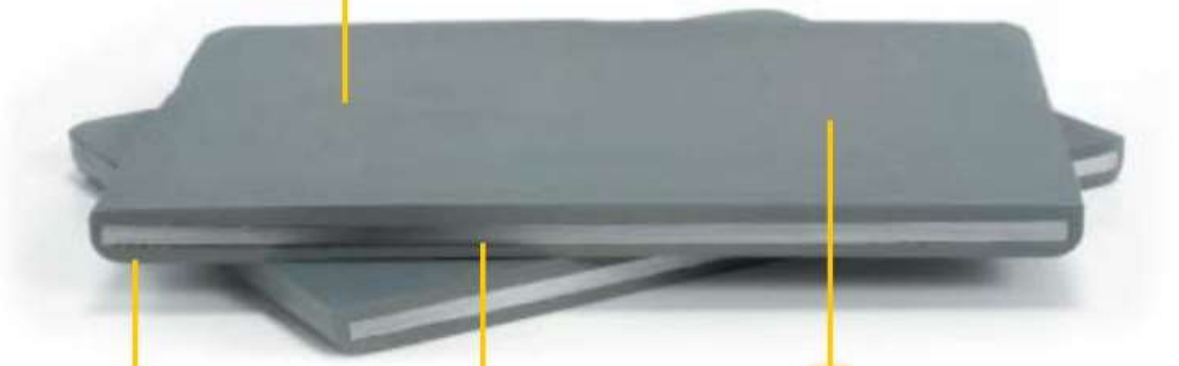
Reflection damping

To provide vibration damping despite the fact that stability is required,we normally use laminated supports.

Air and rubber are sound-absorbing materials,whereas materials such as metal are sound-reflecting.If sound-reflecting and sound-absorbing materials are layered (rubber/metal combination), extremely good isolation properties can be achieved since the sound waves at the interface between the materials are largely reflected and the interface layer is subject to low penetration.

Machine stability

thanks to filler free rubber compound that prevents the machine from settling.



Non-slip

thanks to high coefficient of friction (see page 22 onwards).

Oil-resistant

and resistant to fluids,vapours,gases, and other aggressive media; ask for the list of resistance data for your application.

Long-term stability with no loss of adhesion

This is guaranteed even for ongoing horizontal loading - thanks to the vulcanised rubber/metal combination.

Structure-borne noise affects all buildings. It is caused by other machines, cranes, and fork-lift trucks. Even nearby train tracks or road traffic can cause vibrations.

Precision levelling wedges with vulcanised layer

GS and DKS for screwing to the machine

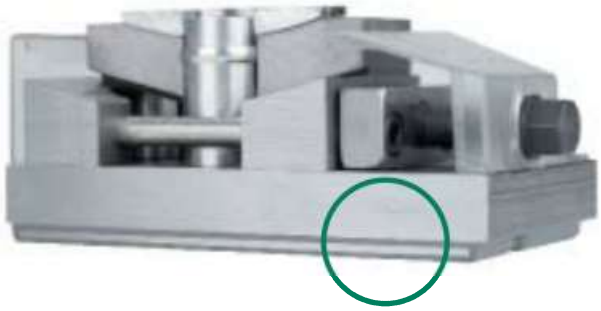
- **Full area vibration protection coating thanks to spherical machine support**
- **Suitable for high loads, low energy expenditure for adjustment process**
- **Diverse accessories for adjusting the basic height or extending the adjusting range**

GS41 levelling wedge

Technical data on GS41+TW16/21		
Length of vulcanised layer	mm	136
Width of vulcanised layer	mm	90
Height of layer,unloaded	mm	6
Height of vulcanised steel inlay	mm	2
Standard layer hardnesses	Shore °	50/80/90
Basic heights of precision levelling wedge*	mm	57 + 5
Diameter of machine support	mm	44
Hexagonal Allen key for adjustment	SW	10
Adjusting range + TW	mm	7 + 5
Maximum torque	Nm	35
Torque per 10kN	Nm	5
Maximum load	kN	70
Screw connection to machine	M	16

*For further support plate inserts,see the bottom of page 22.

Technical data for DKS		DKS-2	DKS-3	DKS-4
Length of vulcanised layer	mm	175	200	260
Width of vulcanised layer	mm	120	160	240
Height of laminated support,unloaded	mm	6	6	6
Height of vulcanized steel inlay	mm	2	2	2
Standard layer hardnesses	Shore °	50/80/90	50/80/90	50/80/90
Basic height of precision levelling wedge	mm	77	93	108
Diameter of machine support	mm	80	80	120
Hexagonal wrench for adjustment	SW	17	24	24
Adjusting range	mm	7 or 10	7	9
Maximum torque	Nm	60 or 72	150	200
Torque per 10kN	Nm	4 or 6	6	5
Maximum load	kN	150 or 120	250	400
Screw connection to machine	M	16/20	20/24	24/30

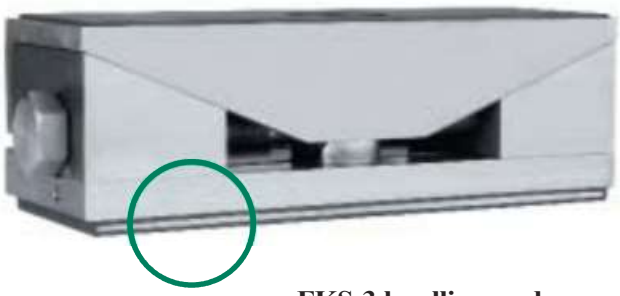


DKS-2 double wedge

FKS for free-standing machine positioning

- **Large support surface**
  Identical heights and width across flats of adjusting screws enable trouble-free combination of all types

Technical data for FKS		FKS-3	FKS-4	FKS-6
Length of vulcanised layer	mm	243	243	243
Width of vulcanised layer	mm	113	153	213
Height of layer,unloaded	mm	6	6	6
Height of vulcanised steel inlay	mm	2	2	2
Standard layer hardnesses	Shore °	50/80/90	50/80/90	50/80/90
Basic height of precision levelling wedge	mm	83	83	83
Machine support surface	cm2	275	372	518
Hexagonal wrench for adjustment	SW	30	30	30
Adjusting range	mm	20	20	20
Maximum torque	Nm	120	160	250
Torque per 10kN	Nm	10	10	10
Maximum load	kN	120	160	250



FKS-3 levelling wedge

Customised damping for specific vibration requirements

Applied vibration technology provides customised solutions. Different coating thicknesses and Shore hardnesses for different design shapes and all possible loads result in customer-specific solutions.

Our manufacturing range already provides numerous standard solutions. Frequently, new requirements result in the development of a new standard design. Below is a sample selection of solutions for specific isolation requirements.

Vulcanised isolation for DKS

DKS90-2 200 x 200

Layer with steel inlay

Technical data for DKS90-2 200 x 200

Dimensions of layer		mm	200x200x6
Hardness of layer		Shore °	90
Load at 60 kN	Resonant frequency in Hz		64
Rigidity		N/µm	2400

For data on the DK-2 precision levelling wedge,see page 8.

DKS50-3

with dimpled layer

Technical data for DKS50-3

Dimensions of coating		mm	200x160x15
Hardness of vibration-protection coating		Shore °	50
Load at 12 kN	Resonant frequency in Hz		10

For data on the DK-3 precision levelling wedge,see page 8.

DKS90-4

Layer with steel inlay

Technical data for DKS90-4

Dimensions of layer		mm	700x500x6
Hardness of layer		Shore °	90
Load at 560 kN	Resonant frequency in Hz		48
Rigidity		N/µm	2.400

For data on the DK-4 precision levelling wedge,see page 8*.

* Strengthened design for 56 ton adjustment load

Vulcanised vibration protection for SK, GS, and FKS

SK10 AV

Vibration-protection coating on bottom,dimpled layer on top

Technical data for SK10 AV

Vibration-protection coating	mm	115x84x6
Hardness of vibration-protection coating	Shore °	80
Load at 10 kN Resonant frequency in Hz		23

For data on the SK20 AV precision levelling wedge, see page 29.

GS56 + TS15

Layer with three steel inlays

Technical data for GS56 + TS15

Dimensions of layer	mm	150x100x21
Hardness of layer	Shore °	50
Load at 40 kN Resonant frequency in Hz		17

For data on the GN35 + TS15 precision levelling wedge, see page 20.

FKS-3 DP615

Dimpled layer on bottom and top

Technical data for FKS-3 DP615		
Vibration-protection coating	mm	120x250x15
Hardness of vibration-protection coating	Shore °	50
Load at 30 kN Resonant frequency in Hz		7

For data on the FKP precision levelling wedge,see page 27

We keep your machines quiet

Machine vibrations and impacts make it difficult to achieve a smooth and quality-oriented production process.They significantly increase building static loadings.As well as causing disturbances on adjacent machines, they can also affect offices and any residential and industrial premises in the vicinity.

Silent Delta – a stable base for heavy vibrations

For rubber elements such as our Silent Delta components,the special design ensures the required horizontal stability of the machine.Isolation and cushioning is achieved with one material.

The Silent Delta system is particularly suited for loads between 5 and 100 kN per element and can be precisely levelled.

Damping plates for non-slip, anchor-free erection

Isolation with rubber springs enables non-slip,anchor-free erection of the machine.The damping plates are also ideally suited for use beneath the machine foundations.

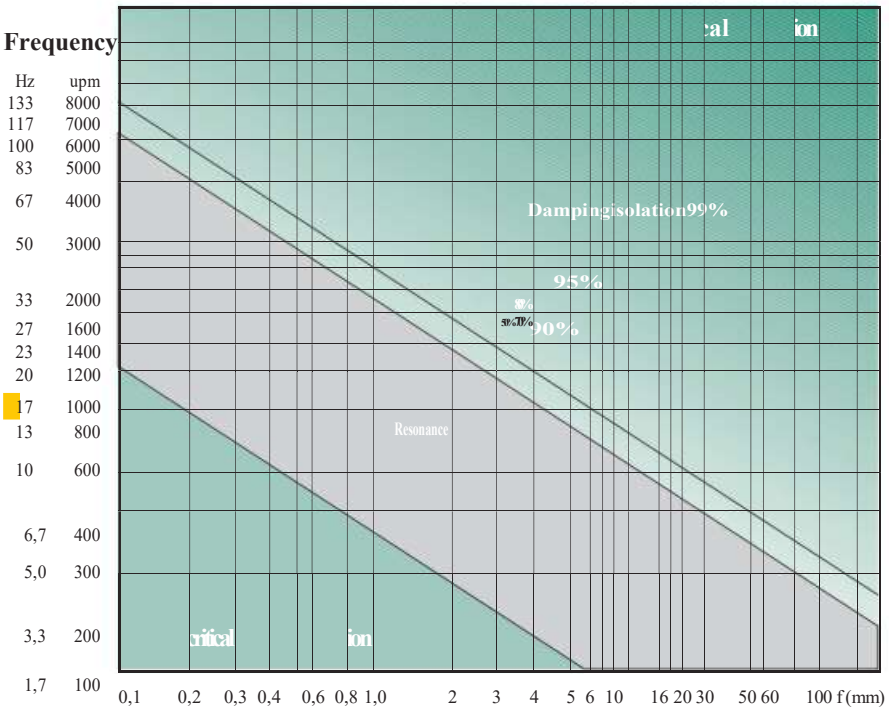
Vibration calculation made easy

Vibration diagram for determining the degree of isolation

Vibration isolation aims to position a machine so that no impermissible vibrations or impacts occur in the surrounding area. Theoretically,the machine must be mounted flexibly enough to ensure that it moves virtually freely under the influence of the mass forces that occur when it is operated.The use of an elastic spring system between the machine and the floor can yield an extremely good level of isolation.However,with over-critical suspension,the spring system must have a resonant frequency that is considerably lower than the interference frequency.

The diagram below enables simple calcu- lation of the spring deflection required to achieve the desired degree of isolation.
However,lasting alteration of the inter- ference frequency is only possible if springs remain elastic in the long term. Only materials that cannot be com- pressed or compacted (materials that are not displaced under constant dynamic loads) can ensure the specified degree of efficiency.

This diagram is obviously only valid for machines with constant output.Flexible machine suspension is not without risks. Not all machines can cope with self-motion and therefore require cushioning for isolation purposes.Many machines also require a degree of stability that cannot be achieved using soft springs. Numerous other options are available to the user,such as reflection damping (see page 31) or so-called subcritical suspension.The importance of the location of the machine should not be underesti-mated.The resonant frequency of the floor can be a decisive factor for isolation. The difference between a machine location on the first floor and a machine location on solid foundations at ground level is enormous.Yet other results can be achieved with foundation isolation. Ask us for advice - we are happy to find a satisfactory solution for your needs.



Isolation diagram

This diagram is based on the mathematical relationship.

$$100 \cdot \left[1 - \frac{1}{\left(\frac{2 \cdot \pi \cdot n}{60} \cdot \sqrt{\frac{1}{fst}}\right)^2 - 1}\right]$$

n = interference frequency (rpm)
fst = static spring deflection (mm)

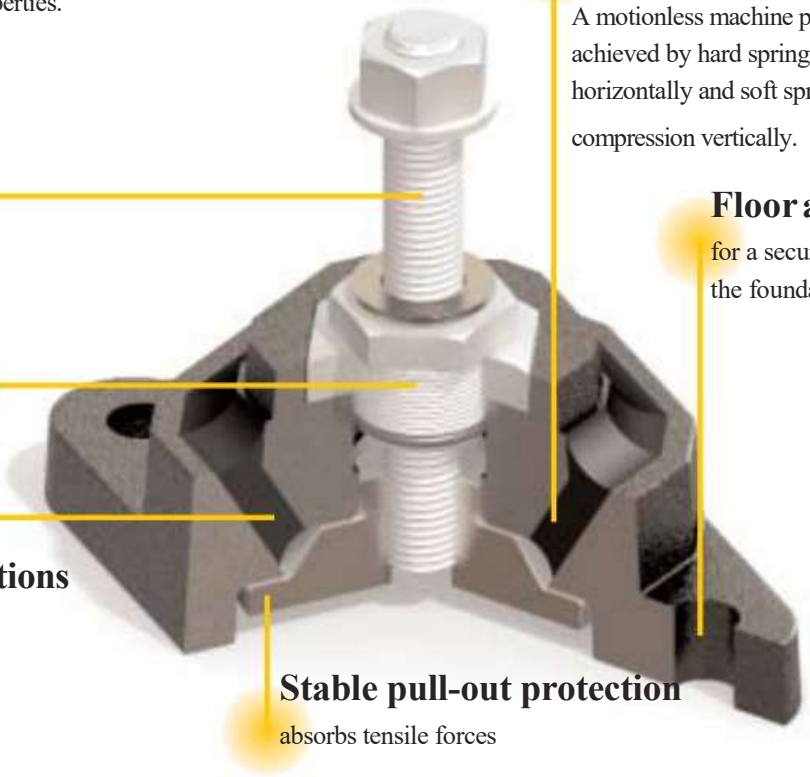
Resonance occurs if the resonant f requency and interference frequency are the same.Vibrations build up in the system and damage can occur.

Example:A die cutting machine runs at 1,600 strokes per minute.80% of the vibrations need to be isolated from the building.To the left of the diagram (interference frequency = 1,600 rpm),move downwards to the diagonal 80% transmission line.When you reach the point of intersection,move vertically downwards to determine a required spring deflection of 2 mm.

Silent Delta makes your machines quiet and protects their surroundings

The Silent Delta system isolates extremely heavy vibrations (high amplitudes) in the vertical direction and remains stable in the horizontal direction.

Rubber is a cushioning material and has a high isolating ability thanks to lasting elasticity.Silent Delta elements therefore have no additional cushioning properties.



Machine cannot vibrate freely

A motionless machine position is achieved by hard spring compression horizontally and soft spring compression vertically.

Screw-on

for fixing with the machine using different dimensions

Floor attachment

for a secure connection to the foundations.

Precise adjustment

thanks to large fine thread

High-quality vulcanised rubber/metal combinations

absorb lasting static and dynamic loads.

Stable pull-out protection

absorbs tensile forces

Heavy machines require heavyweight solutions

Application

Eccentric presses,punch presses,nibbling machines,shearing machines, mechanical brake presses,textile machines,carpet-making machines,diesel engines, compressors,pumps,or machine tools on floors above ground.

One principle – over one hundred standard solutions

Three standard sizes in various Shore hardnesses provide practically all natural frequencies between 3 and 30 HZ up to 25 kN.In addition,the Silent Delta elements can easily be connected to form double elements,thus doubling the spring deflection or forming a larger non-slip isolating element if connected in series.This makes them suitable for high loads and provides a variety of isolation elements.

Silent Delta SDS

- Vulcanised aluminium isolation element
- Oil-resistant rubber/metal combination
- Available in 4 Shore hardnesses Screw-
- on
- Vulcanised slip protection, but floor fixing also possible
- Can be used in combination

SDS M16

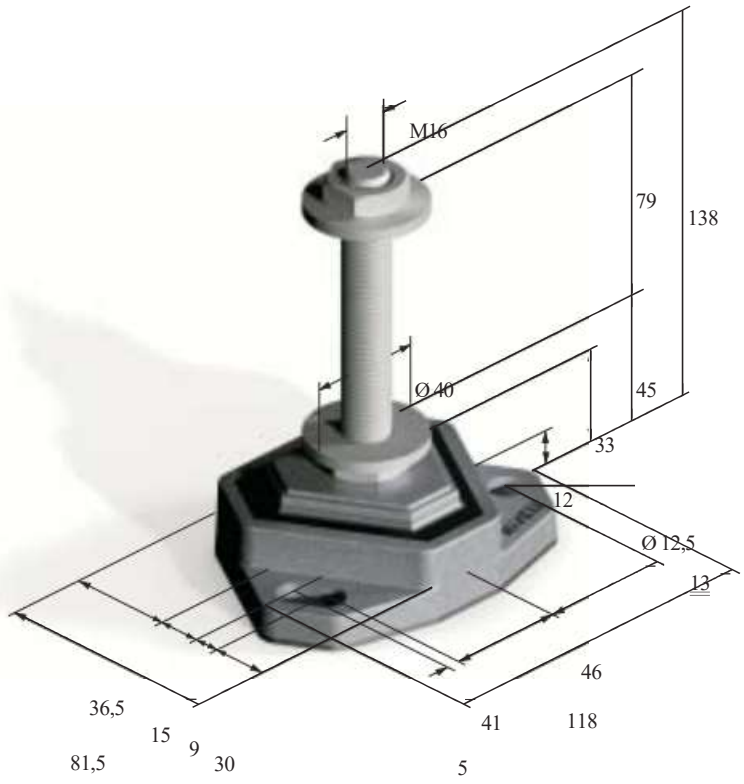
SDS-P

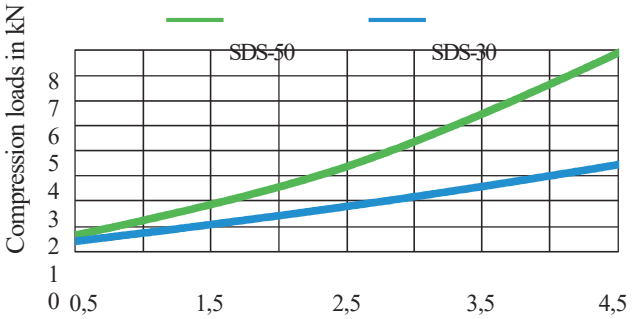
SDS section with thread

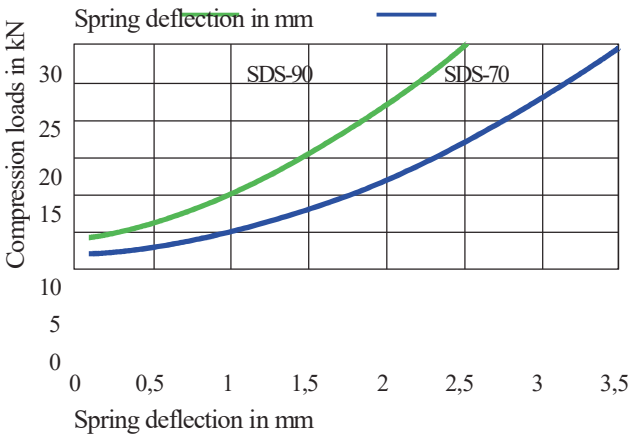
SDS

Technical data for Silent Delta SDS and SDS-P

Resonant frequency	For static loading in N							
in Hz	SDS-30	SDS-P30	SDS-50	SDS-P50	SDS-70	SDS-P70	SDS-90	SDS-P90
22	460	230	650	325	3250	1625	6500	3250
16	800	400	1300	650	5350	2675	11000	5500
13	1200	600	1900	950	6800	3400	16300	8150
11	1570	785	2800	1400	12500	6250	21000	10500
10	1700	850	3500	1750	16500	8250		14000
9	2000	1000	4000	2.000	2200	11000		16250
8	2800	1400	5600	2800		20000		
7		1700		3500				
6		2750		5000				







SDS dimensions M16x100

In the case of the Silent Delta SDS-P double element, the spring deflection is doubled for the same loading.

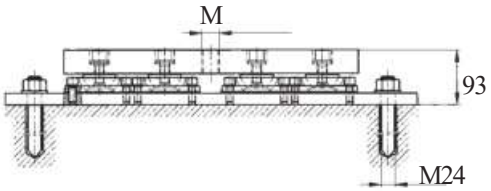
Special STS standard solution

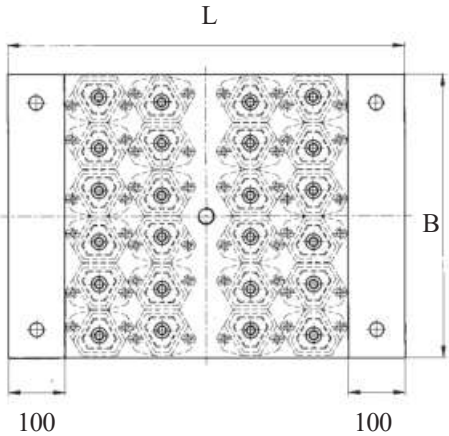
The loading of the elements multiplies by the number of used elements.The Silent Delta elements retain their horizontal stability even when arranged in series and thus form a large isolation element just as stable.

The isolation of screw presses and similar machines whose forces are not distributed torsionally over the floor normally requires customised solutions.Factors such as impact forces,cold and hot deformation,and the floor surface also determine the isolation.

The element depicted below shows a solution for screw presses with no foundations,directly bolted to the floor of the factory.A stable steel plate distributes the pressure evenly over the individual Silent Delta elements.They absorb the torsion force and only permit rotative motion of less than 1 mm.An additional base plate facilitates attachment to the floor.

STS-SDS90 Silent Teller discs





Technical data for STS-SDS90		STS-12	STS-24	STS-36	STS-48
Length L	mm	460	700	875	990
Width B	mm	450	500	500	590
Unloaded height	mm	93	93	93	93
Height at maximum load	mm	88.5	88.5	88.5	88.5
Maximum loading (static and dynamic)	kN	60	120	180	250

Silent Delta SDM

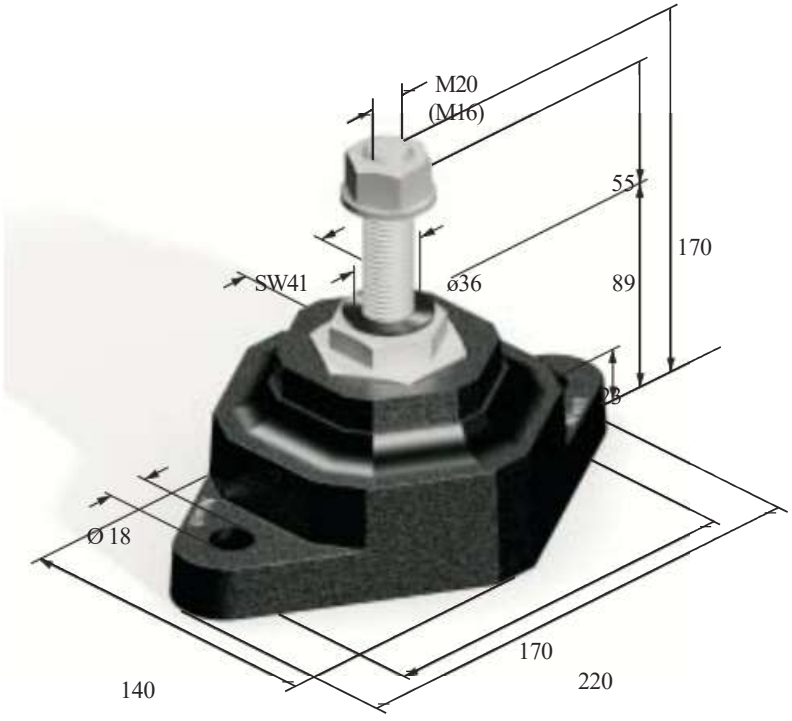
- Vulcanised isolation element with solid cast fitting
- Oil-resistant and in 3 Shore hardnesses
- Finish that passes the salt spray test
- Levelling using M36 fine thread
- Screw-on (with M20 threaded rod)
- Non-slip element that can be attached to the floor for large horizontal excitation without any reduction in the isolation effect
- Stable pull-out protection that absorbs tensile forces
- For the isolation of machines ranging from press equipment to diesel engines in shipbuilding

SDM-P

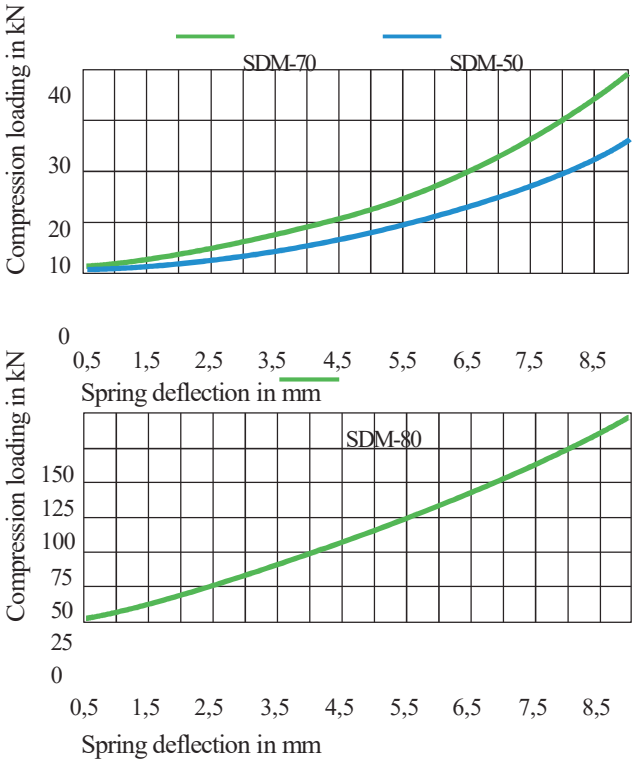
SDM with levelling

Technical data for Silent Delta SDM and SDM-P

Resonant frequency	For static loading in N					
in Hz	SDM-50	SDM-P50	SDM-70	SDM-P70	SDM-80	SDM-P80
16	1000	500	2000	1000	10000	5000
13	1500	750	3500	1750	15000	7500
11	2000	1000	4500	2250	18500	9250
10	2500	1250	5800	2900	22000	11000
9	4300	2150	7000	3500	31000	15500
8	6400	3200	9500	4750	50000	25000
7	8700	4350	11650	5850	68000	34000
6	11000	5500	22000	11000	105000	52500
5.6	19000	9500	29500	14750		61600
5		8700		11650		
4.6		11000		17000		
4		19000		2950		



SDM dimensions M20x100



In the case of the Silent Delta SDM-P double element, the spring deflection is doubled for the same loading.

Silent Delta SDMs in series

Silent Delta elements retain their excellent stability even when arranged in series,thus forming a larger non-slip isolation element.
A stable steel plate distributes the pressure evenly over the individual Silent Delta elements.

The Silent Teller discs enable the non-slip support of heavy press equipment.
To level heavy loads like these,we recommend the use of our levelling wedges.For up to 15 tons per support point,an additional basic height of just 50 mm is required.

Technical data for ST-SDM Silent Teller discs		ST2-SDM	ST3-SDM	ST4-SDM	ST6-SDM	ST8-SDM
Number of elements	Pieces	2	3	4	6	8
Shore hardnesses	Shore °	50 and 80	50 and 80	50 and 80	50	50
Support surface.	mm	260 x 120	250 x 250	250 x 250	400 x 250	420 x 390
Support surface with DK levelling wedge	mm	Ø80	Ø80	Ø80	Ø120	Ø120
Floor support	mm	356 x 131	285 x 265	356 x 271	516x271	516 x 411
Basic height	mm	103	103	103	103	103
Height with DK levelling wedge	mm	154	154	154	205	205
Levelling range	mm	10	10	7	9	9
Screw-on,M x 100 mm	M	20/24	20/24	20/24	24/30	24/30
Load range for 50° Shore	kN	10 to 40	15 to 60	20 to 80	30 to 120	40 to 160
Load range for 80° Shore	kN	40 to 90	60 to 120	80 to 150		

ST2-SDM

ST4-SDM

ST6-SDM

pro- duct group is completed by appropriate cushioning modules.

Plate damping without mechanical attachment

Our plates are made from a high-quality, oil-resistant rubber compound.

Application
Damping of disruptive vibrations without levelling or mechanical attachment

Increased damping

Dimples increase the deflection,thus improving the damping behaviour. These plates provide lasting vibration protection and are abrasion-resistant, tear-proof,and non-slip.

Non-slip

High coefficient of friction,even if wet.

Stable support

The layering of sound absorbent and non-absorbent damping materials provides stable support.See the information on reflection damping on page 31.

Slide protection plates

Layers

Damping plates for foundations

Simultaneous rigid and elastic suspension for machines

Not every machine permits direct isolation since elastic elements cannot always be installed directly under the machine.
If high precision with different interconnected units is required,foundation isolation might be an option.This mainly applies to rotary printing presses,surface grinding machines,and portal milling machines,but can also affect impact machines with high dynamics.
We measure the vibrations,calculate the static loading,make reinforcement and foundation plans,and design the foundation.All from one supplier! Simply ask us for advice.

Foundation isolation plates are large-area plates and are available in different qualities.Made-to-measure plates are available on request.We can also supply the additional adhesion material for tank isolation and the cover material.
The plates are water-resistant.
Depending on the resonant frequency requirement,they vary from very soft to hard.However, pure cushioning plates are also available.

High damping effect

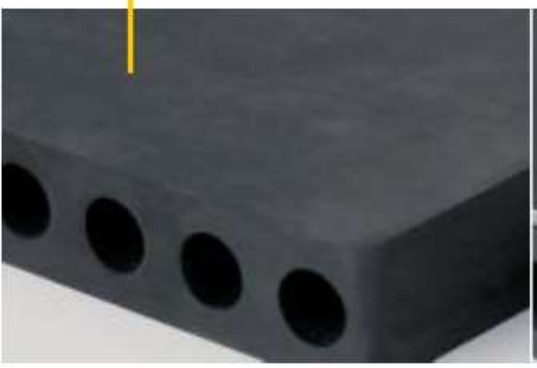
The hollow chambers provide high deflection rates - damping is also possible for low-frequency vibrations.

High compression loads

Hollow springs designed using steel plate and slide protection can distribute high loads.

Threaded rod isolation

Coated packing washers for damping,available in different dimensions.



Hollow springs

with steel plate

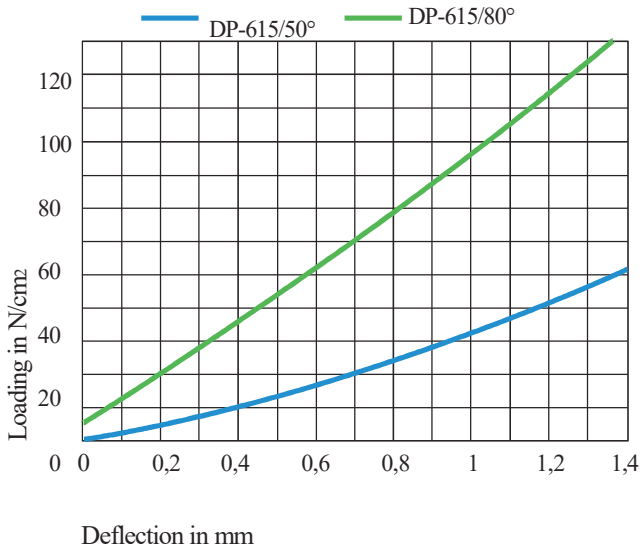
Isolating washers

DP dimpled plate

- **Permanently elastic damping plate Low-**
- **frequency thanks to dimpled support**
- **Non-slip with a coefficient of friction of 2, coefficient remains above 1 even if used in wet conditions**
- **Resistant to oil and other aggressive media**
- **Customised rectangular or round blanks**

DP dimpled plate
in two standard Shore hardnesses

The dimples on the damping plate have a simple but effective function:They reduce the supporting surface area.This increases the deflection/damping effect.The dimples provide support up to the specified load. Thereafter,they are completely compressed and damping takes place as before as a plate with a flat surface. This system enables improved damping values and provides additional loading security since it is practically impossible to overload the plate.



Technical data for DP-615 dimpled plate

Shore hardness	Shore °	50	80	50	80	50	80	50	80	50	80
Length of standard blanks	mm	100	100	200	200	250	250	500	500	500	500
Width of standard blanks	mm	100	100	200	200	250	250	250	250	400	400
Height	mm	15	15	15	15	15	15	15	15	15	15
Surface area	cm2	100	100	400	400	625	625	1250	1250	2000	2000
Degree of efficiency of dimples to max.	kN	4	12.5	16	50	25	78	50	156	80	250
Maximum loading	kN	10	40	40	200	62	250	125	500	200	800

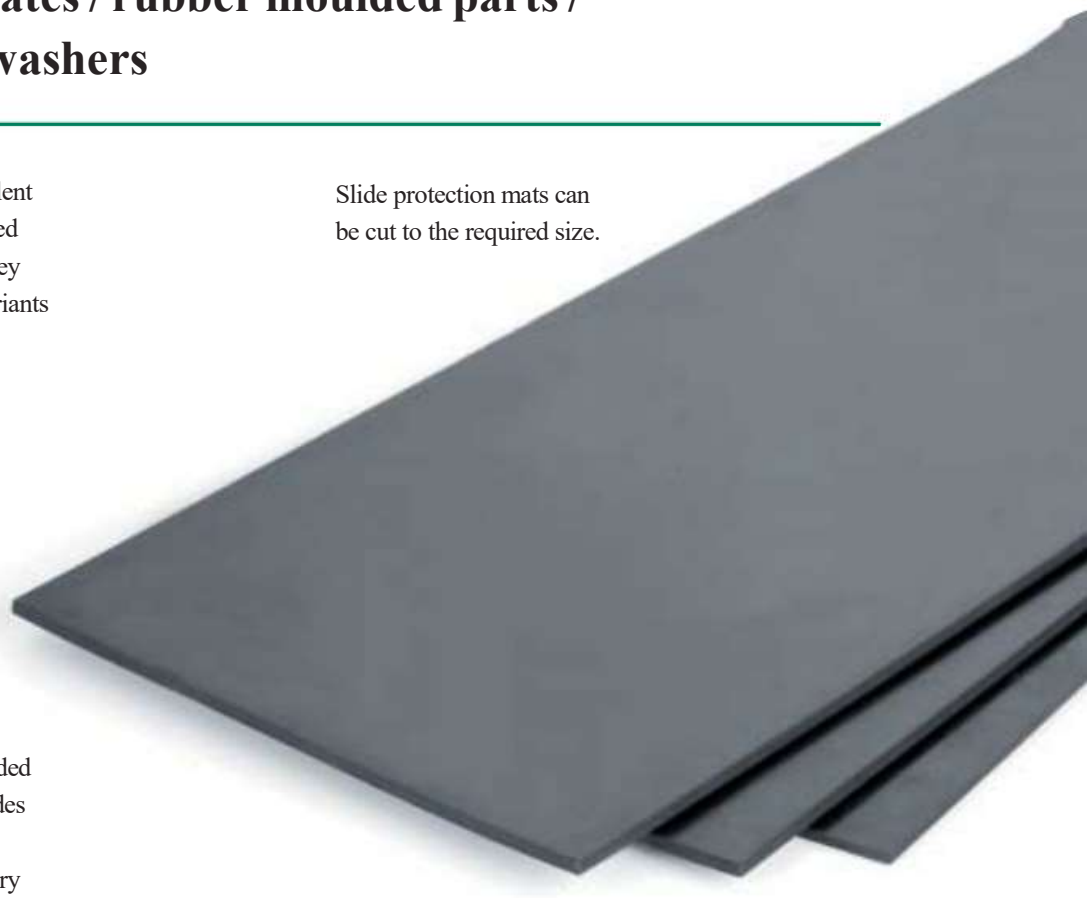
Other dimensions available,including round blanks.

Slide protection plates / rubber moulded parts / isolating packing washers

Slide protection mats

Our slide protection mats have excellent abrasion and tear resistance combined with high levels of slip protection.They are available in 2 and 4 mm thick variants for loads of up to 300 N/cm2.

Slide protection mats can be cut to the required size.



Rubber moulded parts

We produce all types of rubber moulded parts in different qualities.This includes products made from a special,white rubber compound for the food industry and for clean rooms.

Rubber/metal combinations

We produce this kind of combination product in many variants and large quantities on a daily basis.Perhaps we have what you need – just ask us!

Isolating washers

These washers complement elements with damping coatings that are anchored to the floor.They reduce the vibrations on the threaded rod.The washers are available in M16,M20,and M24 standard sizes.

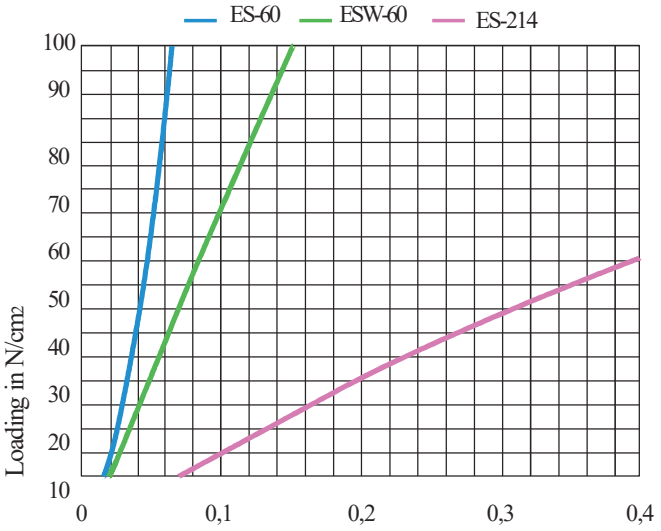
Layers – lasting stability at the same level

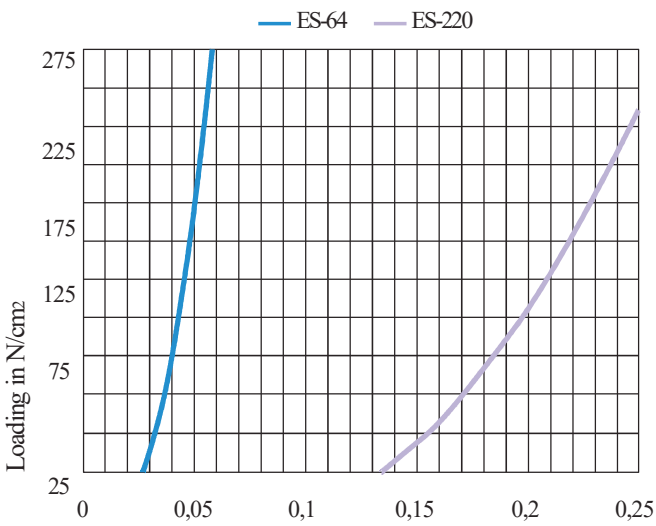
- **Settled machine position**
- **High degree of isolation for horizontal vibration forces**
- **Passive isolation**
- **Reflection damping**
- **High loading**

Application
Passive isolation of machine tools and active isolation of hydraulic press equipment and textile machines

The layering of sound non-absorbent (e.g. metal) and sound absorbent (e.g.rubber) materials results in additional reflection damping (see page 31).With a low degree of deflection,the layer achieves the best possible degree of damping for the smallest possible compliance.Layers are suitable for loads of 300 to 800 N/cm2.

Technical data for layers		ES-60	ESW-60	ES-64	ES-214	ES-220
Length	mm	144	144	217	150	217
Width	mm	97	97	137	100	137
Shore hardness	Shore °	80	50	80	50	50
Unloaded height	mm	6	6	100	21	21
Max.loading	kN	50	30		30	60





Hollow springs for vibrations from 5 Hz

- **High spring deflection**
- **Highly elastic**
- **Distributes pressure using steel plate**
- **Non-slip**

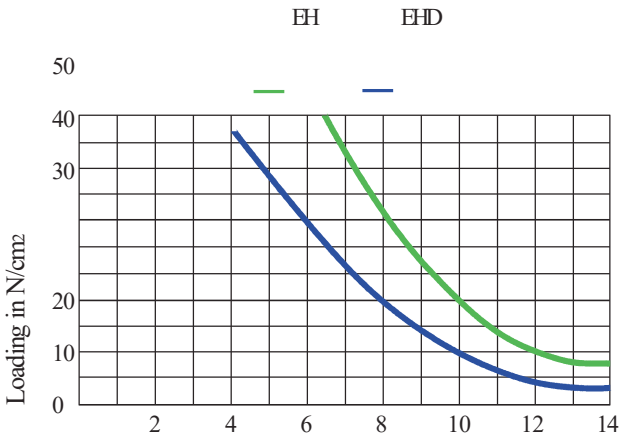
Technical data for EH hollow spring		EH-7	EH-15	EHB-7	EHB-15	EHD-7	EHD-15
Length	mm	75	150	72	150	75	150
Width	mm	75	150	81	159	75	150
Shore hardness	Shore °	50	50	50	50	50	50
Unloaded height	mm	30	30	36	36	65	65
Max. loading	kN	2.5	10	2.5	10	2.5	10

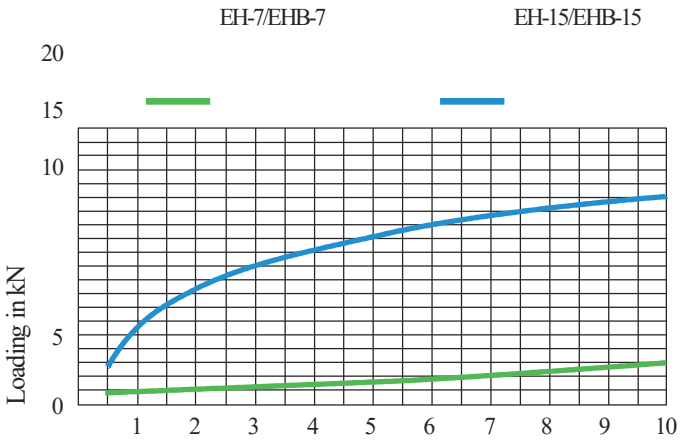
These damping elements are used for vibrations from 5 Hz and are often used for interference frequencies in buildings with air-conditioning units, compressors, pumps, heating systems, conveyors, or fans. They are made from high-quality natural rubber.

EH = natural rubber

EHD = double element in which the two layered EH elements are offset by 90 degrees. A steel insert is used for better stability.

EHB = special hollow spring design with steel pate and slide protection to distribute specific higher compression loads.





All-round stable levelling feet

Nivell round mounts are flexible and vibration-damping but remain robust and resilient.The body material is aluminium, cast steel, or stainless steel. A stable, pivotable levelling screw provides safety and stability even for large-area uneven floors.

The machine stands on a specially adapted, vulcanised damping cushion,subject to low vibration levels and non-slip.The feet are easy to clean and resistant to aggressive media.There is no fluid penetration.A wide selection of levelling screws with different lengths and dimensions facilitates the positioning and suspension of machines and provides the highest possible level of flexibility with regard to adapting the element to the machine in question.

Levelling and damping elements with cast steel cover

- Large support surfaces with 4 different diameters
- High levels of horizontal stability
- Levelling via fine thread on the screw head

Levelling and damping elements made from aluminium

- Pivotable levelling screw, fixed or on machine side
- Non-slip and vibration-damping

Levelling and damping elements made from cast steel

- Pivotable levelling screw, fixed or on machine side
- Vulcanised vibration-protection coating
- Non-slip and vibration-damping
- 4 different diameters
- Can be screwed to the floor

Levelling and damping elements made from stainless steel

- Large selection of pivotable levelling screws
- Vulcanised damping cushion made from food-grade rubber

Aluminium levelling and vibration-damping T elements

Non-slip due to rubber coating

Structure-borne noise damping

Technical data for TR-70 with pivotable levelling screw

		M12	M16	M20
Ø of aluminium body	mm	70	70	70
Height of aluminium body	mm	26	26	26
Basic height of machine support	mm	53	58	67
Length of galvanized levelling screw	mm	100	60/100/150	100
Length of stainless steel levelling screw	mm	100	100	100
Pivotable in all directions	°	5	5	5
Ø of vibration-protection coating	mm	66	66	66
Height of vibration-protection coating	mm	4	4	4
Shore hardness	Shore °	50	50	50
Maximum permanent load	kN	10	15	20

The scope of supply includes 2 nuts and 2 washers

Technical data for TM-70 with fixed threaded rod

		M10	M12	M16	M20
Ø of aluminium body	mm	70	70	70	70
Height of aluminium body	mm	26	26	26	26
Basic height of machine support	mm	38	40	43	46
Length of galvanized threaded rod	mm	100/150/200			
Length of rustproof threaded rod	mm	100/150/200			
Ø of vibration-protection coating	mm	66	66	66	66
Height of vibration-protection coating	mm	4	4	4	4
Shore hardness	Shore °	50	50	50	50
Maximum permanent load	kN	7.5	10	15	20
The scope of supply includes 2 nuts and 2 washers					

TM-70 machine feet

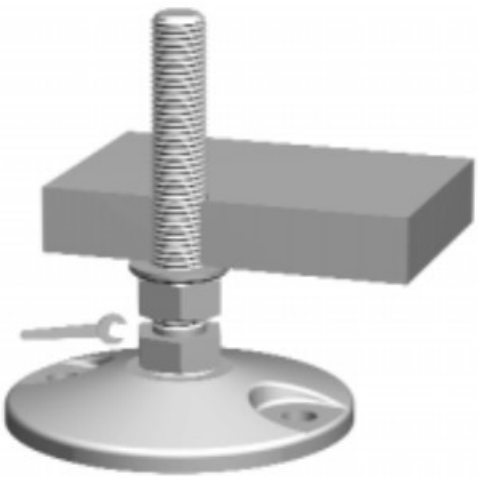
with fixed threaded pin

Technical data for TE-70 with hardened conical cup

		M12	M16	M20
Ø of aluminium body	mm	70	70	70
Height of aluminium body	mm	26	26	26
Ø of vibration-protection coating	mm	66	66	66
Height of vibration-protection coating	mm	4	4	4
Shore hardness	Shore °	50	50	50
Maximum permanent load	kN	10	15	20

Levelling screws available on request.

TE-70 positioning element with press-fitted, hardened conical cup for attaching setting screws on the machine



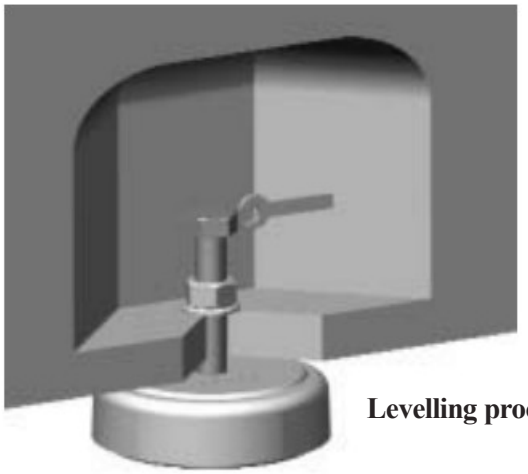
Levelling process with TR -
see the same principle on page 60

RT levelling and damping elements with cast steel cover

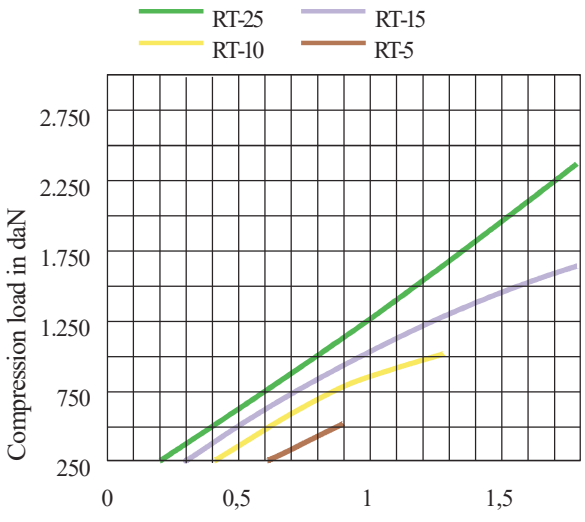
- **Large support surface that adjusts to uneven floors**
- **Levelling using fine thread**
- **Large damping mass of high-quality nitrile damps and protects against structure-borne noise**
- **Resistant to oil, coolant, and so on**
- **Cast fitting and hard damping cushion provide horizontal stability**
- **Damping body does not fall out when the machine is lifted**

Application
Injection moulding machines, automatic lathes,drilling machines,woodworking machines

Technical data for RT round elements		RT-5	RT-10	RT-15	RT-25
Ø of cast fitting	mm	76	92	115	148
Unloaded height of machine support	mm	39	38	43	47
Levelling screw dimension		M10	M12	M16x1.5	M20x1.5
Length of levelling screw with hexagonal head	mm	80	100	100	100
Length of levelling screw with square head	mm	100/160	100/160/200	100/160/200	100/160/200
Adjusting range	mm	10	12	16	17
Ø of damping cushion	mm	64	79	97	140
Shore hardness	Shore °	80	80	80	80
Maximum permanent load	daN	500	750	1500	2500



Levelling process with RT



Cast steel levelling and damping T elements

- **Flat cast steel body (low working height)**
- **Painted with paint that is resistant to salt spray (long-term rust protection)**
- **Vulcanised vibration-protection coating, non-slip and suitable for constant horizontal loads**

TR cast steel hinged feet

Hinged feet with different diameters

- **Pivotable levelling screw**
- **Joint cannot be pressed out since it it bolted togethe**

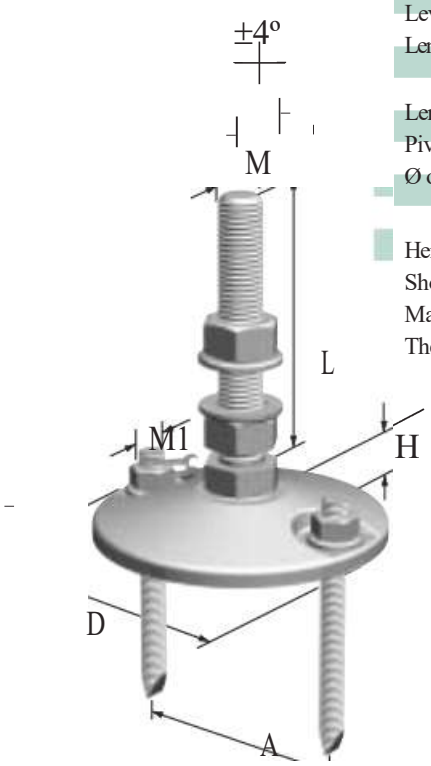
Application

Devices,drilling machines, automatic lathes,filing machines, assembly lines,woodworking machines,graphics machines, optical instruments,saws, welding machines,packaging machines

Technical data for TR elements with pivotable levelling screw

		TR-40	TR-100	TR-130	TR-170
Ø of cast body D	mm	40	100	130	170
Height of cast body H	mm	16	18	20	25
Levelling screw dimension		M12/M16	M12/M16/M20	M16/M20/M24	M20/M24/M30
Length of galvanized levelling screw L	mm	80	100	100	100
Length of rustproof levelling screw L	mm	100	100	100	100
Pivotable in all directions	°	4	4	4	4
Ø of vibration-protection coating	mm	—	96	126	165
Height of vibration-protection coating	mm	—	5 and 10	5 and 10	5 and 10
Shore hardness	Shore °	—	50/80	50/80	50/80
Maximum permanent load	kN	10	20	25	30

The scope of supply includes 2 nuts and 2 washers



TR levelling element with lateral anchoring

Technical data for TR elements with lateral anchoring

		TR-100	TR-130	TR-170
Ø of lateral hole	mm	9/11	11/13	13/17
Screw connection M1	mm	M8/10	M10/12	M12/16
Hole pitch A	mm	75	100	130

For technical data,see table above;floor bolts consist of threaded pin,adhesive anchor,nut,and washer.

TM cast steel threaded feet

- **Threaded feet with rigid threaded rod**
- **Removable threaded pin**
- **Large selection of screw dimensions**
- **Vulcanised vibration-protection coating**
- **Non-slip, suitable for constant horizontal load**

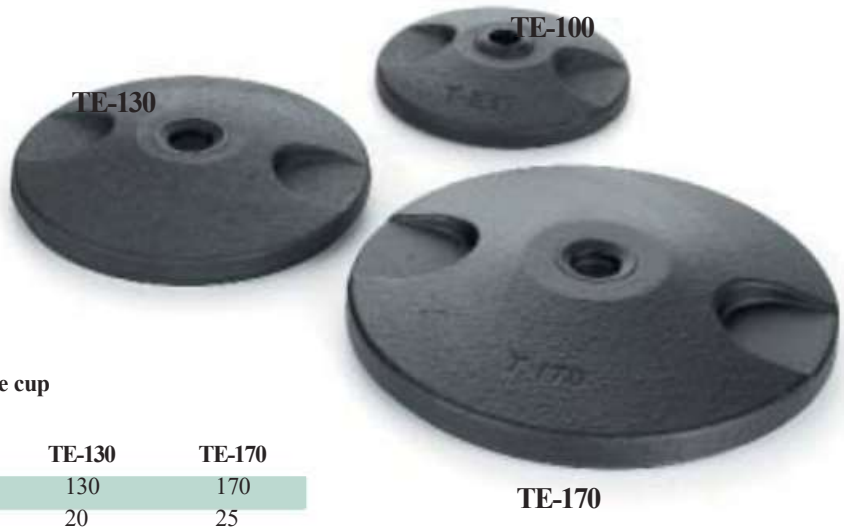
Technical data for TM elements with rigid threaded rod

		TM-100	TM-130	TM-170
Ø of cast body	mm	100	130	170
Height of cast body	mm	18	20	25
Threaded rod dimension		M12/M16/M20	M16/M20/M24	M20/M24/M30
Length of galvanized threaded rod	mm	100/150/200	100/150/200	100/150/200
Length of rustproof threaded rod	mm	100/150/200	100/150/200	100/150/200
Ø of vibration-protection coating	mm	96	126	165
Height of vibration-protection coating	mm	5 and 10	5 and 10	5 and 10
Shore hardness	Shore °	50/80	50/80	50/80
Maximum permanent load	kN	20	25	30

The scope of supply includes 2 nuts and 2 washers.

TE cast steel positioning feet

- **Hardened cone cup for attaching adjusting screws on the machine**
- **Vulcanised vibration-protection coating**
- **Different cone cups**



Technical data for TE elements with hardened cone cup

		TE-100	TE-130	TE-170
Ø of cast body	mm	100	130	170
Height of cast body	mm	18	20	25
Ball cup for threaded rod		M12/M16/M20	M16/M20/M24	M20/M24/M30
Ø of vibration-protection coating	mm	96	126	165
Height of vibration-protection coating	mm	5 and 10	5 and 10	5 and 10
Shore hardness	Shore °	50/80	50/80	50/80
Maximum permanent load	kN	20	25	30

Levelling screws available on request.

CR stainless steel levelling and vibration-damping elements

- Pivotable threaded pin for compensating for uneven floors
- Strong stainless steel mounting part for safe positioning even with high loads
- Vibration-damping thanks to large vulcanised damping cushion
- Non-slip even if used in wet conditions
- Food-grade rubber
- All metal parts are made of stainless steel
- Easy to clean, no fluid penetration

The materials used - stainless steel and vulcanised,food-grade rubber - make this element into the ideal positioning foot..

Technical data for CR elements with pivotable levelling screw

		CR-6	CR-11	CR-15
Ø of stainless steel body	mm	74	110	150
Levelling screw dimension		M12/M16/M20	M16/M20/M24	M20/M24/M30
Length of stainless steel levelling screw	mm	100	100	100
Pivotable in all directions	°	5	5	5
Ø of vibration-protection coating	mm	74	110	150
Shore hardness	Shore °	70	70	70
Maximum permanent load	kN	15	25	40

The scope of supply includes 2 nuts and 2 washers

Application
Electroplating,food, and chemical industries

CR stainless steel levelling and vibration-damping elements

CR elements with long threaded rod

- **Ideal threaded rod length in line with your requirements**
- **Threaded rod dimensions ranging from M16 to M30**
- **Removable (screw-in threaded rods)**
- **Light rubber coating for use in the food and chemical industries**

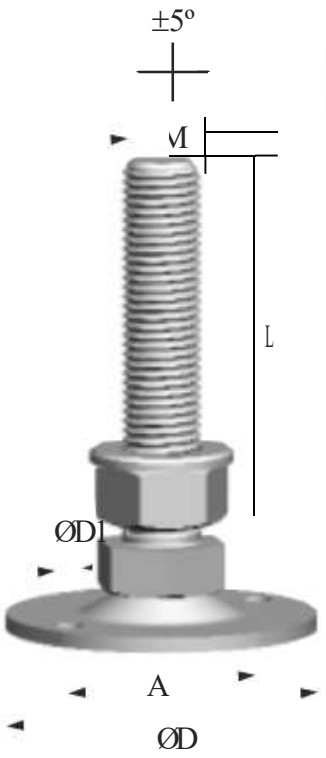
Technical data for CR elements with long levelling screw

		CR-6	CR-11	CR-15
Ø of stainless steel body	mm	74	110	150
Length of levelling screw	mm	From100	From100	From100
Height of machine support for M16	mm	64	74	81
Height of machine support for M20	mm	67	77	84
Height of machine support for M24	mm	71	81	88
Height of machine support for M30	mm	–	–	99
Pivotable in all directions	°	5	5	5
Maximum permanent load	kN	15	25	40

The scope of supply includes 2 nuts and 2 washers

CR elements with extra long threaded rod lengths

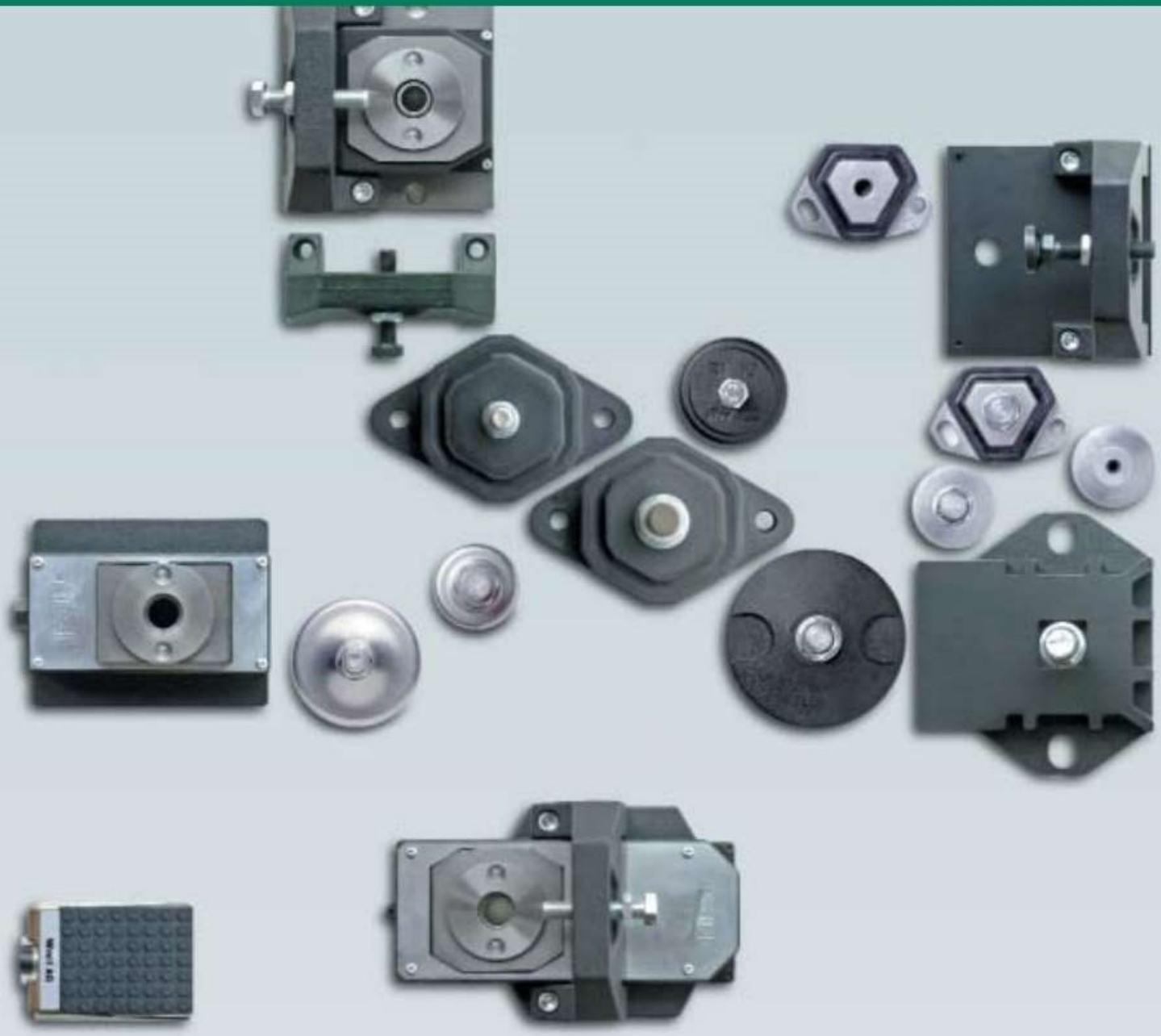
CRA elements with lateral bolting



Technical data for flat CRA elements with lateral anchorage

		CRA-6	CRA-11
Ø of stainless steel body D	mm	80	116
Levelling screw dimension M	mm	M12–M20	M12–M24
Length of levelling screw L	mm	100	100
Height of machine support H	mm	33–46	45–58
Floor bolt dimension	mm	M6–M10	M6–M12
Hole axis pitch A	mm	64	96
Ø of floor bolt hole D1	mm	9	11
Maximum permanent load	kN	10	15

The scope of supply includes 2 nuts and 2 washers



Nivell®

on which machines are firmly based

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