

PIPE CONNECTION PARTS

4

CONTENTS

PAGE

Pipe clamps and clamp bases _____	4.1
Horizontal clamps type 42, 43, 44 _____	4.3
Riser clamps type 45, 46, 48 _____	4.4
Clamp bases, type 49 _____	4.5
Special designs _____	4.7
U-bolts, type 40 _____	4.8
Weld-on lugs for pipes, type 41 _____	4.9
Weld-on lugs for pipe elbows, type 41 _____	4.10
Selection of pipe clamps and clamp bases _____	4.11
Selection overview OD 21.3 - OD 914.4 _____	4.12
Selection overview, temp. 610 – 650°C, OD 33.7 – OD 914.4 _____	4.46
Lift-off restraints for clamp bases, type 49 _____	4.54
Connection plates, type 77 _____	4.55
Installation instructions _____	4.56

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1

2

3

PRODUCT
GROUP 4

5

6

7

8

9

PIPE CLAMPS AND CLAMP BASES, PRODUCT GROUP 4

In high temperature piping systems, pipe clamps and clamp bases are the most highly stressed and therefore most vulnerable components in the support system, owing to the additional effects of high temperatures. In spite of this, pipe clamps are seldom checked, as access is difficult after commissioning due to the surrounding insulation.

Standardization

Pipe clamps, clamp bases, pipe weld-on lugs and U-bolts constitute the group of pipe connection components. Regarding these products, the design criteria for piping systems lead to a wide variation and hence to a particularly large number of components. The dynamic clamps in Product Group 3 (see page 3.19) also belong in principle to this group. The design of both horizontal and vertical piping is determined by

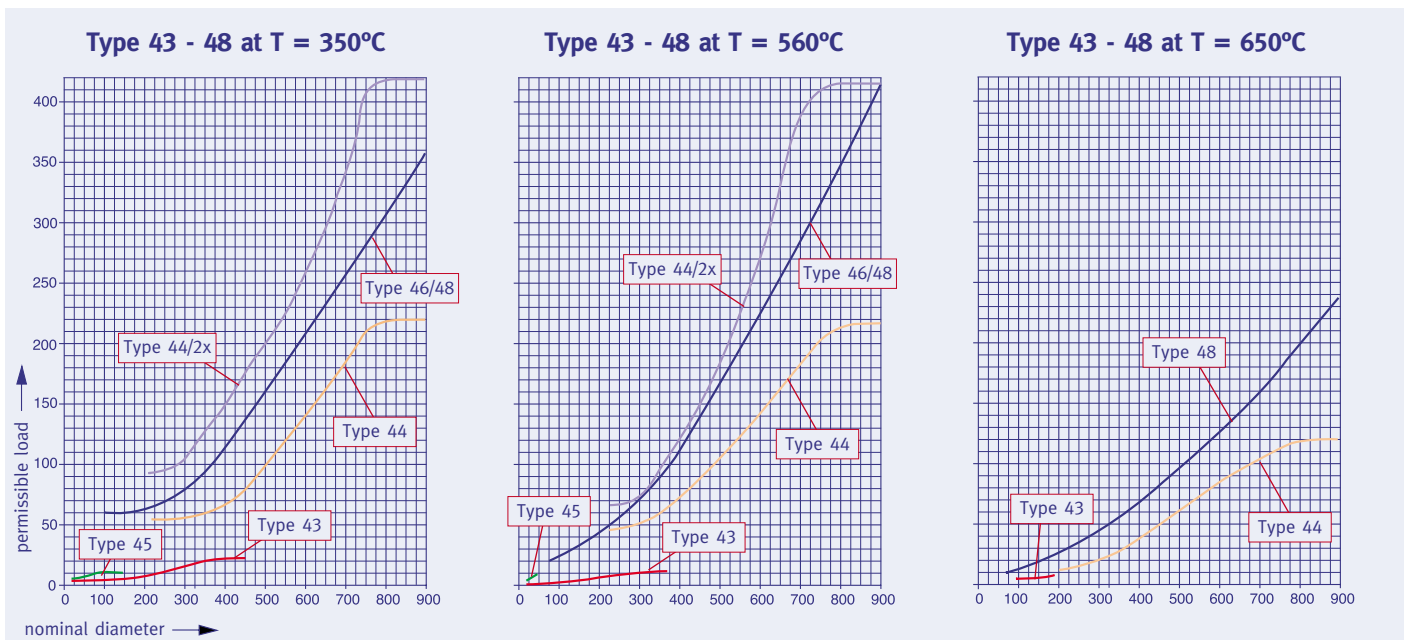
- diameters
- loads
- temperature of the medium

For appropriate coverage of the whole spectrum with safe products, LISEGA provides a complete program of standardized products for the whole field of application. In line with the special requirements of the field of application, the corresponding ideal design shape has been developed. Diameters range from OD 21.3 to OD 914.4, the temperature range extends to 650°C and the loads – divided into economical areas of operation –



cover the highest level of the practical field of application.

Fields of application of standardized pipe clamps





These standardized components are an integral part of the LISEGA modular system, so connection and load compatibility to the load groups are correspondingly assured.

Quality

Because of their exposed field of application, the design and construction of the pipe connection components require particular attention. Just as much care should be spent on the pipe supports as on the piping itself, since:

Piping can never be better than its supports!

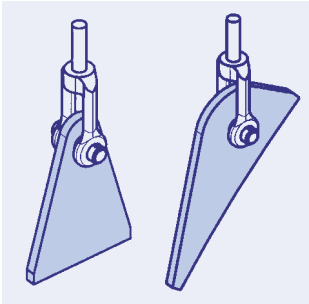
The most important prerequisite for dependable component quality is general standardization.

When purchasing pipe connection components, confidence should only be placed in products of proven suitability.

Through standardization of the entire application spectrum with sophisticated designs, plant designers, constructors and operators can draw equal profit:

- **Comprehensive and clearly structured data tables simplify planning work**
- **all supplies from a single source through integration into a complete support program (LISEGA modular system)**
- **superior quality at competitive prices through rational series production and favorable designs**
- **consistent standardization enables instant availability**
- **favorable performance/weight ratios, easy to install designs and connection compatibility of LISEGA components allow rational installation**
- **the uniform design with guaranteed safety factors ensures maximum operational safety**
- **a correspondingly compact design prevents excessive heat loss**
- **certification from type tests by independent authorities is on hand**

HORIZONTAL CLAMPS WITH CONNECTION PARTS TYPE 41, 42, 43, 44



1. Weld-on lug type 41

This type is used principally as a pipe connection for piping under 80°C on horizontal pipes or elbows.

Material: S235JRG2

2. Horizontal clamp type 42

This clamp can be used as a construction component or hanger clamp in cold piping systems. For larger pipe diameters the load range is limited.

Material: S235JRG2

Heat resistant materials
(Construction component clamp)

Type 42 .. 29 - 16Mo3

Type 42 .. 39 - 13CrMo4-5

Type 42 .. 49 - 13CrMo9-10/A387 Gr.22

3. Horizontal clamp type 43

This hanger clamp corresponds to the traditional shape made from flat steel. Its use is limited to an economical range up to a unit weight of approx. 25kg. Connection to the load chain is made via connecting pins and LISEGA eye nut type 60.

Through the temperature dependence, the load-related application range of the pipe clamps can be extended over a number of LISEGA load groups.

For this, the eye nuts are so designed that at least 3 corresponding pin diameters can be accommodated.

Material: S235JRG2, 16Mo3
13CrMo 4-5, 10CrMo9-10
F91(1.4903)

4. Horizontal clamp type 44

A rigid yoke takes on the load from a pipe-surrounding U-bolt with an inlay plate. From certain diameters, temperatures or load ranges, a flat steel strap is used instead of a U-bolt.

Dispensing completely with weldings, the individual parts are form-fitted with non-welded connections and bolted together with threaded securing studs.

(Patent-No. DE3817059)

The horizontal clamp type 44 is used where type 43 reaches its economic limits.

This is essentially the high temperature, large diameter or high load range.

Connection to the load chain is made via a lug and LISEGA clevis type 61. The connection lug is designed to accommodate connection pins of a number of LISEGA load groups.

Material: S235JRG2 / S355J2G3

16Mo3

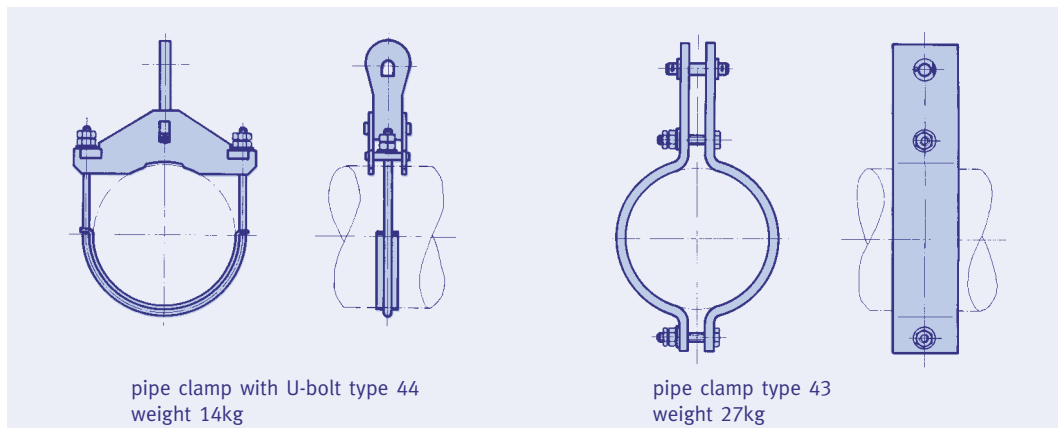
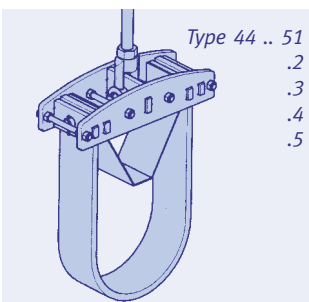
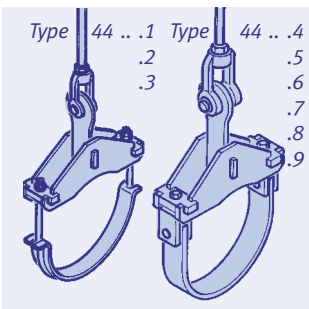
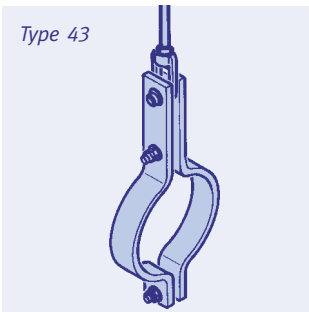
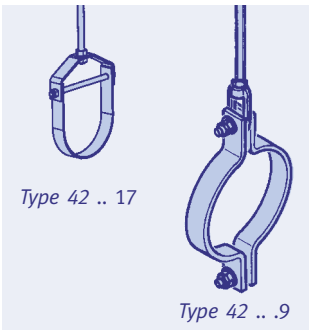
13CrMo4-5

21CrMoV5-7

10CrMo9-10

F91(1.4903)

*Comparison of a LISEGA pipe clamp type 44 with a clamp of traditional design following the same criteria.
(Load 32kN, temperature 300°C) ▼*



RISER CLAMPS TYPE 45, 46, 48

1. Riser clamp type 45

With the riser clamp type 45, the lower range suited to this design is covered.

Connection to the vertical piping is made via the shear lugs welded to the pipe. The design and application of the lugs is the responsibility of the piping manufacturer.

Connection to the load chain is made via connection pins and LISEGA eye nuts type 60. Up to 3 LISEGA load groups can be accommodated.

When ordering, the desired span (dimension L) is to be given.

Material: S235JRG2
13CrMo4-5

2. Riser clamp type 46/48

The design of this riser clamp exploits the box shape as the best precondition for the economical use of material. The individual parts are bolted together without weldings via socket connections.

(Patent no. DE3817015)

Connection to the vertically assembled piping can be made in two different ways and therefore demands two different designs:

- **Type 46 for load support through either 4 or 2 shear lugs welded to the pipe. In general, two lugs are used only at $ND \leq 150\text{mm}$ and are to be so arranged that they lie laterally to the longitudinal axis.**
- **Type 48 for load support through trunnions welded to the pipe.**

The bore diameter for the trunnions is approximately 1/3 of the pipe diameter, based on ASME Code case N-392-3 and DIN EN 13480-3.

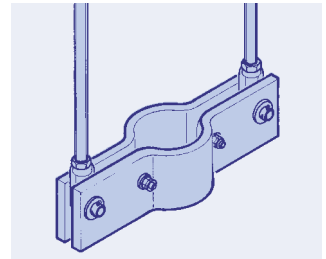
Connection to the load chain is formed by integrated lugs designed for connection to LISEGA clevises, type 61.

The connection lugs are designed to accommodate the connection pins for a number of LISEGA load groups.

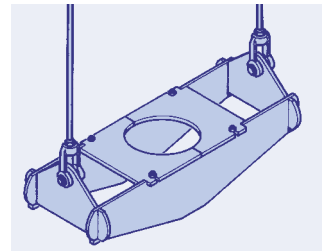
Material: S235JRG2
S355J2G3
16Mo3
13CrMo4-5
10CrMo9-10
Only for type 48
F91(1.4903)

3. Special designs

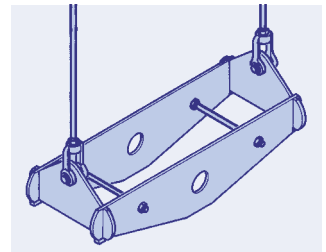
- **For equipping austenitic pipe systems, all pipe clamps can be fitted with austenitic inlay plates.**
- **For special diameters not contained in the selection table, corresponding intermediate sizes are available or, for minimal diameter differences, appropriate inlay plates are supplied.**
- **The riser clamp type 48 can quite easily be supplied as a special design in conjunction with LISEGA rigid struts type 39 as an axial stop for both directions, also for dynamic loads (see "Special Designs" on page 4.7).**



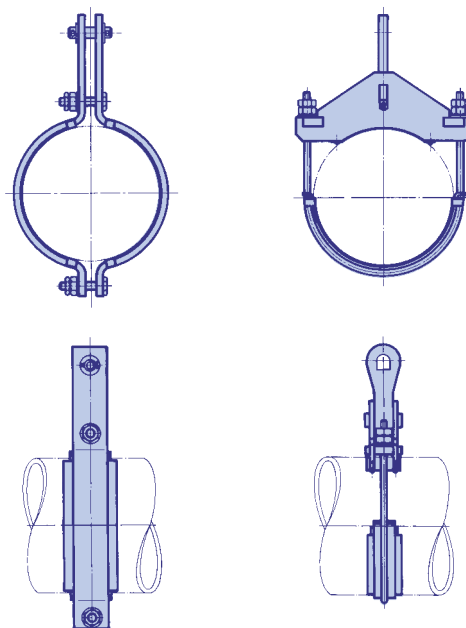
Riser clamp type 45 with connecting parts



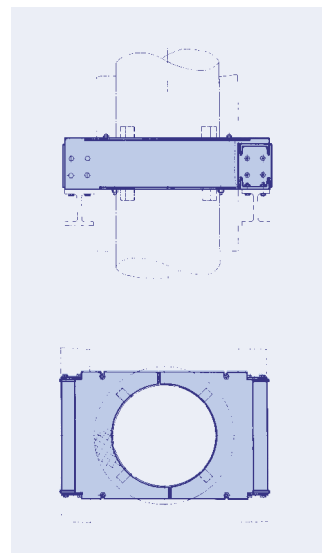
Riser clamp type 46 with connecting parts



Riser clamp type 48 with connecting parts

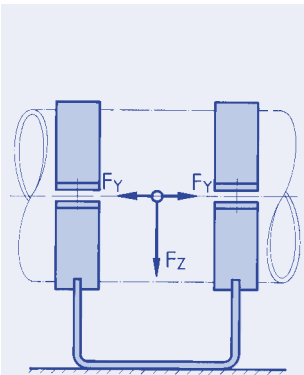


▲ Type 43 with inlay plate ▲ Type 44 with inlay plate

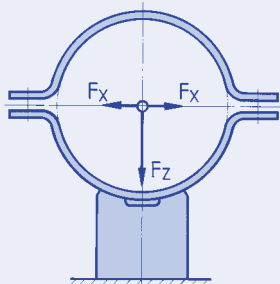


Special design of a riser clamp type 46

CLAMP BASE TYPE 49



$$F_y = \mu \cdot F_z$$



$$F_x = \mu \cdot F_z$$

Possible stress effects on a clamp base

The load limits in the selection tables on pages 4.12 to 4.45 can be exceeded by 80%, if the arrangement of the clamp bases involves seating them on a trapeze or a PTFE slide pad.

Example:
Type 49 32 14 at 100°C
20kN acc. to table
page 4.32;
for use as trapeze bases
or on PTFE slide plates the
permissible load amounts
to 36kN

Clamp bases are generally used as slide bearings (loose supports) for horizontally arranged piping systems.

As with pipe clamps, the application spectrum embraces a diameter range of OD 21.3 to OD 914.4mm and a temperature range up to 600°C.

Besides the support load, the operational temperature of the piping is an essential design criterion in the design of clamp bases. The material to be used is determined by this. The installation height is governed by the thickness of the heat insulation.

To keep within a clear level of available sizes, fixed installation heights are assigned to the temperature ranges.

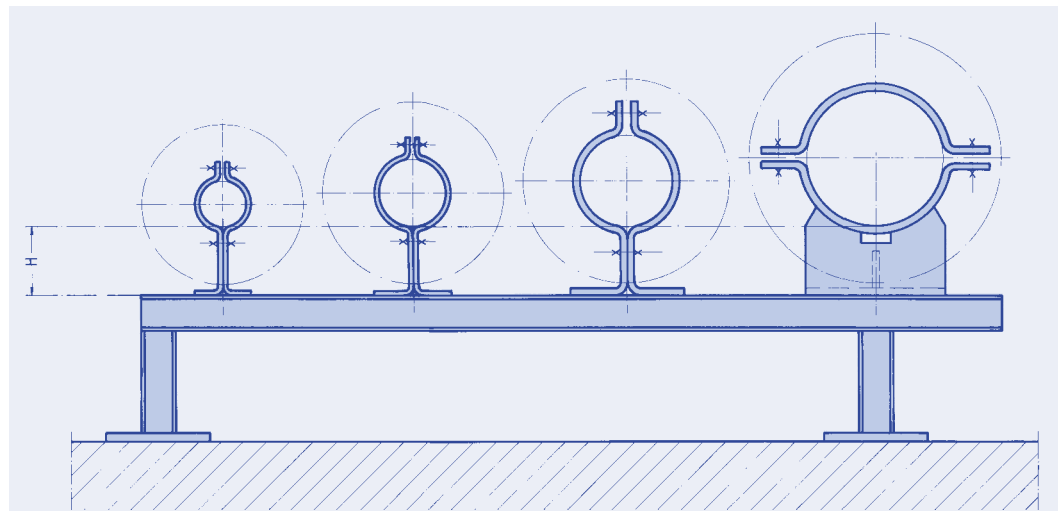
The fixed installation heights relate, for all diameters, to the respective lower rim of the pipe and have a dimension range of 50 or 100mm increments.

The standard dimensions selected for the support height of pipes as well as the length of the slide bases cover the most common cases of application.

Different application conditions through temperature and loading demand different clamp base designs.

If required, components with special dimensions can be supplied (see also "Special Designs", page 4.7).

▼ Clamp base heights dependent on temperature of the medium and pipe diameter.



Temp. up to 350°C	H	50	100	150	200
	pipe Ø	21.3-88.9	21.3-558.8	108-914.4	323.9-914.4

Temp. up to 500°C	H	100	150	200	250	300
	pipe Ø	21.3-26.9	33.7-76.1	88.9-193.7	219.1-457.2	508-914.4

Temp. up to 560°C	H	150	200	250	300
	pipe Ø	21.3-76.1	88.9-168.3	193.7-323.9	355.6-914.4

Temp. up to 600°C	H	150	200	250	300
	pipe Ø	21.3-76.1	88.9-168.3	193.7-323.9	355.6-914.4

1. Design for lower temperatures and smaller pipe diameters

The design for this field of application consists of two shaped halves. On installation with the piping, the lower section of both halves is bolted on firmly and provides the slide base.

In the upper section the pipe is secured in position via a preset screw.

Through the free space under the pipe allowed by the design of the component, constant ventilation of the area is assured. This is essential for cold piping systems, because otherwise permanent moisture would develop here after only a short time, causing corrosion of the piping.

Material: S235JRG2
S380MC

2. Design for medium and high temperatures

This design consists of a shaped lower metal part firmly welded to two pipe clamps. The lower section is fitted, according to the respective design load, with a reinforcement gusset.

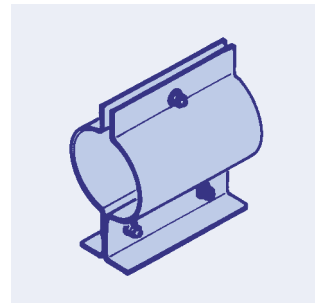
The clamp bases are versatile in application. By the use of two lower sections set against each other, a double guide can easily be produced. By the additional application of lateral guides, a manifold guiding system can be provided. The shape of the support plate permits the simple mounting of lift-off restraints. The lower section is so designed that it can be equipped with a stainless steel plate as a sliding surface for a PTFE bearing.

Material: S235JRG2
16Mo3
13CrMo4-5
10CrMo9-10

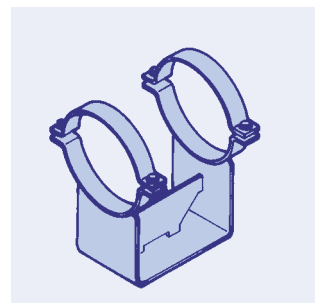
Applications of clamp bases on trapezes or PTFE see page 4.5.

3. Special designs

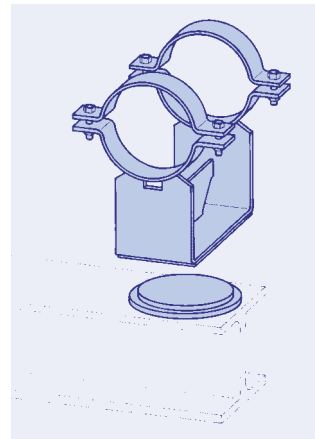
- For the support of austenitic piping systems, all clamp bases can be fitted with corresponding stainless steel inlay plates.
- Special lengths or heights are possible if required. In cases of great expansion it might be more expedient to arrange for correspondingly long support surfaces on site.
- The slide bearings of all clamp bases can be supplied as sliding surfaces for a PTFE or graphite bearing.
- For special diameters not contained in the selection table, corresponding intermediate sizes are supplied. For minimal diameter differences suitable inlay plates are provided.
- The clamp bases can if required be fitted with lift-off restraints.
- Two-fold or manifold guidings using standard clamp bases can be supplied if required (see "Special Designs" on page 4.7).



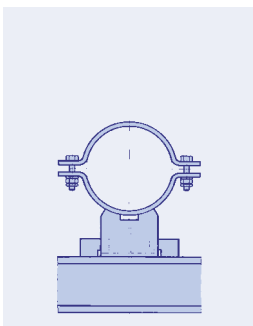
Clamp base for smaller pipe diameters type 49 .. .1, 49 .. .2



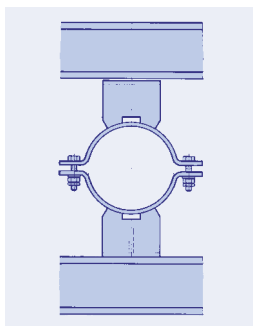
Clamp base for medium and high temperatures type 49 .. .3, .. .4, .. .5



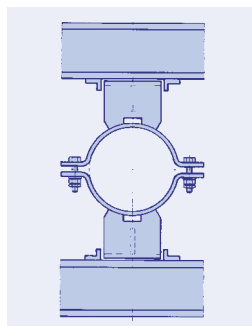
Clamp base type 49 with PTFE slide bearing to standard design.



(Fig. 1)



(Fig. 2)



◀◀◀ Clamp base with lift-off restraints, permissible loads and dimensions, see page 4.54 (Fig. 1)

◀◀ Clamp base as double guide (horizontal application) (Fig. 2)

◀ Clamp base as manifold guide (vertical application) (Fig. 3)

(Fig. 3)

SPECIAL DESIGNS

The use of standard components in the field of pipe supports has long since proven its superiority, leading to enormous savings in time and costs associated with engineering, delivery and installation. This especially includes pipe clamps and clamp bases.

However, because of an extremely wide range of applications and the complexity of piping, in some cases special designs are required. In such situations it is important to have experts on hand to ensure tried and tested solutions and to profit from proven calculation procedures.

Special designs

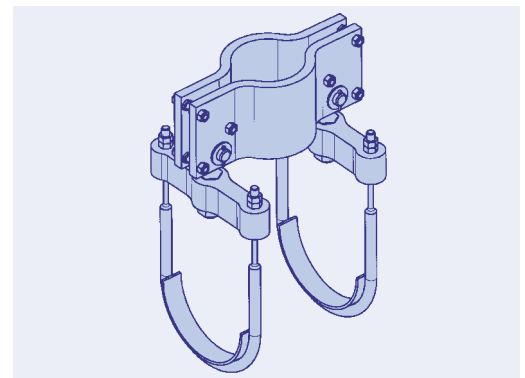
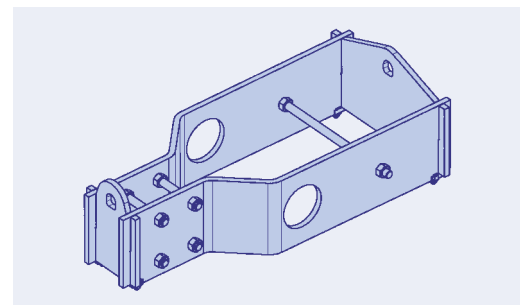
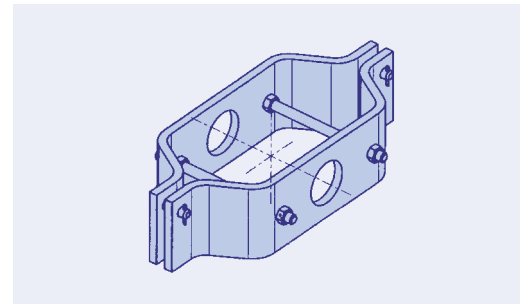
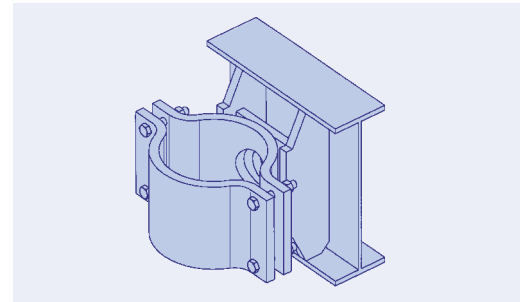
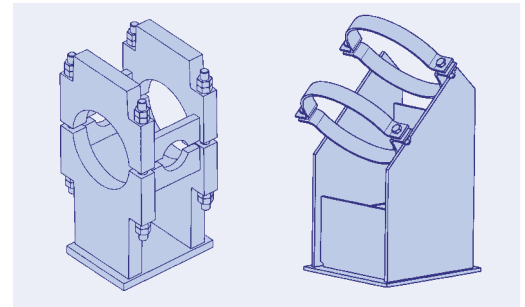
Although the standardized LISEGA range of pipe surrounding support components is comprehensive and covers all common areas of application, more complicated cases sometimes arise where only a special solution can solve the problem.

Among other cases, special designs are most often required especially for the following specific applications:

- exceptionally restricted areas
- interferences insurmountable by common techniques
- tailor-made fixed point designs
- exceptionally high load requirements
- especially high temperatures (up to 1000°C)
- abnormal insulation thicknesses
- irregularly inclining pipes
- special trunnion diameters

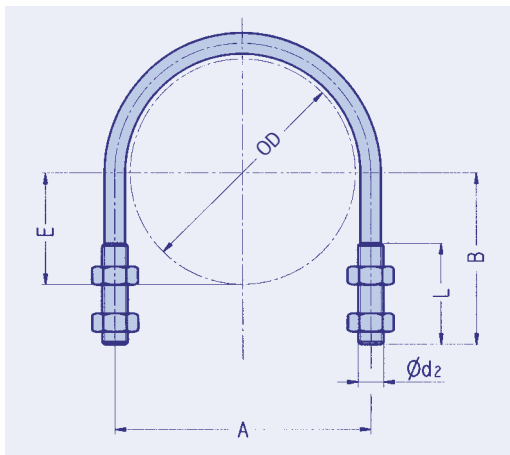
LISEGA's customers are not left on their own in this regard. For such particular assignments an experienced team of technicians and engineers is available, ready to react speedily and flexibly with appropriate solutions. They are supported by a kit of special tools such as modern CAD programs and individual in-house calculation software. In addition to this, a broad repertoire of well proven basic designs is on hand.

Every problem has a solution – this conviction motivates LISEGA's experts in support technology. For our clients this can be demonstrated as required at any time!



U-BOLTS TYPE 40

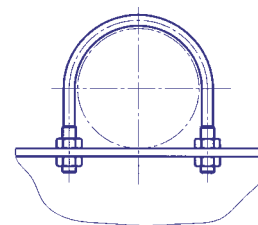
4



U-bolts type 40 01.8 to 40 91.8

Type 40 serves mainly to secure piping of max. 80°C temp. to secondary steel structure.

Type	OD	A	B	d2 x L	E	weight (kg)
40 01.8	21.3	30	70	M6 x 65	11	0.05
40 02.8	26.9	35	70	M6 x 65	13	0.05
40 03.8	33.7	40	70	M6 x 65	17	0.05
40 04.8	42.4	53	75	M10 x 65	21	0.15
40 05.8	48.3	60	75	M10 x 65	24	0.16
40 06.8	60.3	72	85	M10 x 70	30	0.18
40 07.8	73.0	87	95	M12 x 75	37	0.30
40 09.8	88.9	103	100	M12 x 75	44	0.32
40 10.8	108.0	123	115	M12 x 75	54	0.36
40 11.8	114.3	130	115	M12 x 75	57	0.37
40 14.8	139.7	155	130	M12 x 75	70	0.42
40 17.8	168.3	188	155	M16 x 95	84	0.91
40 22.8	219.1	238	180	M16 x 95	110	1.08
40 27.8	273.0	295	215	M20 x 110	137	2.07
40 32.8	323.9	350	245	M20 x 110	162	2.35
40 36.8	355.6	381	260	M20 x 110	178	2.55
40 41.8	406.4	432	285	M20 x 110	203	2.80
40 46.8	457.2	485	320	M24 x 125	229	4.55
40 51.8	508.0	537	345	M24 x 125	254	4.90
40 61.8	609.6	638	395	M24 x 125	305	5.70
40 71.8	711.2	740	450	M24 x 125	356	6.50
40 76.8	762.0	790	475	M24 x 125	381	6.90
40 91.8	914.4	943	550	M24 x 125	457	8.00



→ 5. digit: 1 = S235JRG2 (St 37)
3 = stainless steel 1.4301



WELD-ON LUGS FOR PIPES TYPE 41

Weld-on lugs for pipes Type 41 D9 11 to 41 79 12

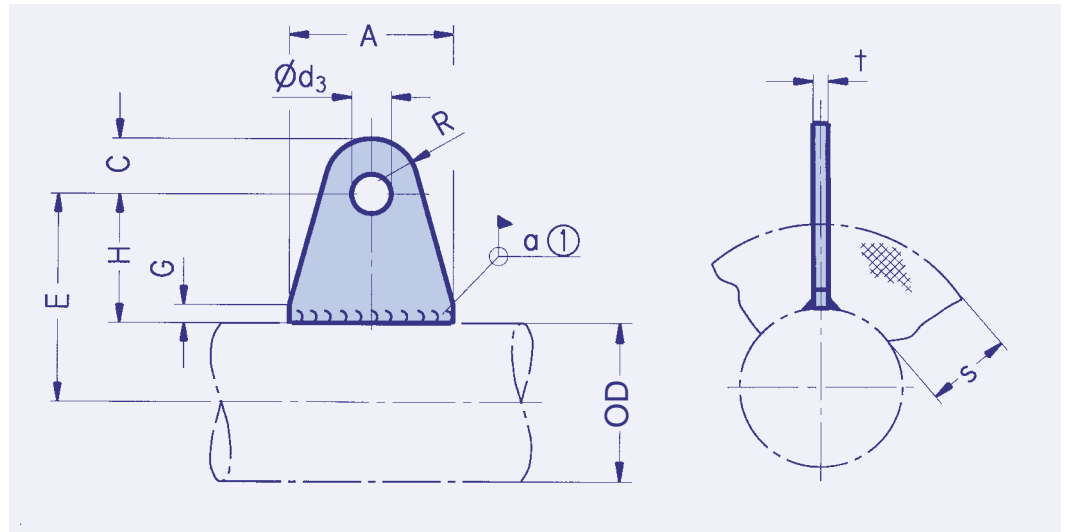
① Permissible load at 80°C
= normal load (load case A)
of the corresponding load
group (3rd digit of the type
designation, see “Max.
permissible load for static
components”, page 0.5)

Stress present in the given
welding seam $< 50\text{N/mm}^2$
at 4° load angle.

Material: S235JRG2

Type 41 .. 11 $S_{\text{max}} = 10\text{mm}$

Type 41 .. 12 $S_{\text{max}} = 100\text{mm}$



Type	A	d ₃	H	R	C	G	t	a	weight (kg)
41 D9 11	30	10.5	25	15	15	10	8	3	0.06
41 D9 12	30	10.5	115	15	15	10	8	3	0.23
41 29 11	35	12.5	25	17.5	22	10	10	3	0.11
41 29 12	65	12.5	115	17.5	22	10	10	3	0.49
41 39 11	45	16.5	30	22.5	28	10	12	4.5	0.21
41 39 12	70	16.5	120	22.5	28	10	12	4.5	0.75
41 49 11	80	20.5	40	30	37	10	15	4.5	0.53
41 49 12	120	20.5	125	30	37	10	15	4.5	1.60
41 59 11	85	24.5	40	32.5	40	10	20	5.5	0.75
41 59 12	130	24.5	130	32.5	40	10	20	5.5	2.30
41 69 11	120	34	50	40	50	10	25	6.5	1.60
41 69 12	165	34	140	40	50	10	25	6.5	4.10
41 79 11	170	41	60	50	65	10	30	6.5	3.20
41 79 12	230	41	150	50	65	10	30	6.5	7.30

Reduction factors of the
permiss. load at increased
temperatures:

T	F perm. (T)
250°C	0.7 F perm. (80°C)
350°C	0.5 F perm. (80°C)

Order details:

Weld-on lug for pipes,
type 41 .9 1.

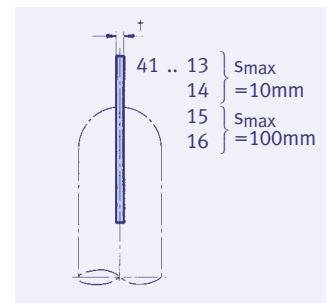
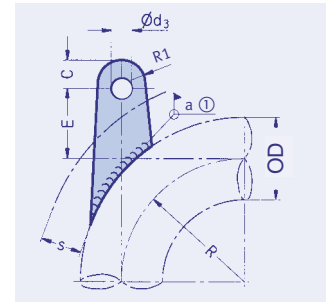
WELD-ON LUGS FOR PIPES TYPE 41

S _{max} = 10mm			
Type	E	a	weight (kg)
41 06 13	35	3	0.12
41 07 13	30	3	0.11
41 08 13	35	3	0.11
41 09 13	30	3	0.11
41 09 14	35	3	0.21
41 10 13	30	3	0.11
41 10 14	35	3	0.21
41 11 13	30	3	0.11
41 11 14	35	3	0.21
41 13 13	25	3	0.11
41 13 14	30	3	0.21
41 14 13	25	3	0.11
41 14 14	40	4.5	0.56
41 16 13	25	3	0.11
41 16 14	40	4.5	0.57
41 17 13	25	3	0.78
41 17 14	40	5.5	0.45
41 19 13	20	3	0.21
41 19 14	35	5.5	0.79
41 22 13	20	3	0.2
41 22 14	35	5.5	0.77
41 24 13	15	3	0.2
41 24 14	30	5.5	0.78
41 26 13	10	3	0.21
41 26 14	25	5.5	0.78
41 27 13	15	3	0.2
41 27 14	25	5.5	0.76
41 32 13	15	4.5	0.54
41 32 14	25	6.5	1.2
41 36 13	-10	4.5	0.55
41 36 14	5	6.5	1.2
41 37 13	0	4.5	0.55
41 37 14	15	6.5	1.2
41 41 13	-15	4.5	0.55
41 41 14	-5	6.5	1.2
41 42 13	-10	4.5	0.55
41 42 14	5	6.5	1.2
41 46 13	-20	5.5	0.77
41 46 14	0	6.5	3.1
41 51 13	-30	5.5	0.77
41 51 14	-10	6.5	3.1
41 56 13	-40	5.5	0.76
41 56 14	-20	6.5	3
41 61 13	-45	5.5	0.76
41 61 14	-30	6.5	3
41 66 13	-55	5.5	0.76
41 66 14	-35	6.5	3
41 71 13	-65	5.5	0.76
41 71 14	-45	6.5	2.9
41 76 13	-75	5.5	0.76
41 76 14	-55	6.5	2.9

S _{max} = 100mm			
Type	E	a	weight (kg)
41 06 15	135	3	0.42
41 07 15	135	3	0.41
41 08 15	135	3	0.41
41 09 15	135	3	0.41
41 09 16	140	4.5	0.66
41 10 15	135	3	0.43
41 10 16	140	4.5	0.69
41 11 15	135	3	0.42
41 11 16	140	4.5	0.66
41 13 15	135	3	0.44
41 13 16	140	4.5	0.69
41 14 15	135	3	0.43
41 14 16	145	4.5	1.6
41 16 15	135	3	0.44
41 16 16	145	4.5	1.7
41 17 15	140	4.5	0.68
41 17 16	150	5.5	2.1
41 19 15	135	4.5	0.7
41 19 16	145	5.5	2.2
41 22 15	135	4.5	0.69
41 22 16	145	5.5	2.2
41 24 15	130	4.5	0.71
41 24 16	145	5.5	2.2
41 26 15	125	4.5	0.71
41 26 16	140	5.5	2.2
41 27 15	130	4.5	0.7
41 27 16	145	5.5	2.2
41 32 15	130	4.5	1.6
41 32 16	145	6.5	3.3
41 36 15	115	4.5	1.7
41 36 16	125	6.5	3.3
41 37 15	120	4.5	1.7
41 37 16	130	6.5	3.3
41 41 15	105	4.5	1.7
41 41 16	115	6.5	3.3
41 42 15	115	4.5	1.7
41 42 16	125	6.5	3.3
41 46 15	100	5.5	2.2
41 46 16	120	6.5	6.7
41 51 15	95	5.5	2.3
41 51 16	110	6.5	6.7
41 56 15	85	5.5	2.3
41 56 16	105	6.5	6.7
41 61 15	80	5.5	2.3
41 61 16	95	6.5	6.6
41 66 15	70	5.5	2.3
41 66 16	85	6.5	6.6
41 71 15	60	5.5	2.3
41 71 16	80	6.5	6.6
41 76 15	50	5.5	2.3
41 76 16	70	6.5	6.6

OD	Load group ①	C	R ₁	t	d ₃
60.3	C-2	22	17.5	8	12.5
73	C-2	22	17.5	8	12.5
76.1	C-2	22	17.5	8	12.5
88.9	C-2	22	17.5	8	12.5
88.9	2-3	28	22.5	10	16.5
108	C-2	22	17.5	8	12.5
108	2-3	28	22.5	10	16.5
114.3	C-2	22	17.5	8	12.5
114.3	2-3	28	22.5	10	16.5
133	C-2	22	17.5	8	12.5
133	2-3	28	22.5	10	16.5
139.7	C-2	22	17.5	8	12.5
139.7	3-4	37	30	15	20.5
159	C-2	22	17.5	8	12.5
159	3-4	37	30	15	20.5
168.3	2-3	28	22.5	10	16.5
168.3	4-5	40	32.5	18	24.5
193.7	2-3	28	22.5	10	16.5
193.7	4-5	40	32.5	18	24.5
219.1	2-3	28	22.5	10	16.5
219.1	4-5	40	32.5	18	24.5
244.5	2-3	28	22.5	10	16.5
244.5	4-5	40	32.5	18	24.5
267	2-3	28	22.5	10	16.5
267	4-5	40	32.5	18	24.5
273	2-3	28	22.5	10	16.5
273	4-5	40	32.5	18	24.5
323.9	3-4	37	30	15	20.5
323.9	5-6	50	40	20	34
355.6	3-4	37	30	15	20.5
355.6	5-6	50	40	20	34
368	3-4	37	30	15	20.5
368	5-6	50	40	20	34
406.4	3-4	37	30	15	20.5
406.4	5-6	50	40	20	34
419	3-4	37	30	15	20.5
419	5-6	50	40	20	34
457.2	4-5	40	32.5	18	24.5
457.2	6-7	65	50	25	41
508	4-5	40	32.5	18	24.5
508	6-7	65	50	25	41
558.8	4-5	40	32.5	18	24.5
558.8	6-7	65	50	25	41
609.6	4-5	40	32.5	18	24.5
609.6	6-7	65	50	25	41
660.4	4-5	40	32.5	18	24.5
660.4	6-7	65	50	25	41
711.2	4-5	40	32.5	18	24.5
711.2	6-7	65	50	25	41
762	4-5	40	32.5	18	24.5
762	6-7	65	50	25	41

Weld-on lugs for pipes
(R ≈ 1.5 OD)
type 41 06 13
up to 41 76 16



Reduction factors of the
perm. load at increased
temperatures:

T	F perm. (T)
250°C	0.7 F perm. (80°C)
350°C	0.5 F perm. (80°C)

Order details:

Weld-on lugs for pipes
R ≈ 1.5 OD
type 41 .. 1.

① Permissible load at 80°C is normal load (load case A) of the highest of the load groups indicated (see “Max. permissible

loads for static components”, page 0.5). Stress present in the given welding seam < 50N/mm² at 4° load angle.

SELECTION OF PIPE CLAMPS AND CLAMP BASES

The selection tables on the following pages offer a general view of the fields of application. They have been arranged in ascending order according to pipe diameters. All pipe clamps and clamp bases to be considered for a given design of pipe system can therefore be found clearly set out on one page.

The following points are important for application purposes:

1. In the selection table, all the information can be found that is required for determining the correct component and placing an order free of uncertainty.
2. The component with the lowest permissible load to cover in the appropriate temperature range is at the same time the most economical of all those listed.
3. The geometrical values of the connections are compatible with those of LISEGA connection components. Via the wide load application range, connections in various LISEGA load groups can be linked up.
4. The lengths of connection lugs are so designed that the connection points lie outside the economical insulation thicknesses.

5. For use in pipe systems made of austenitic material, all pipe clamps and clamp bases can be equipped with corresponding inlay plates.

6. In selecting an appropriate pipe clamp, the following procedure should be followed:

- 6.1 Determination of the correct page for the external dimensions (OD) of the piping to be supported.
- 6.2 Determination of the correct temperature range in the column for the desired support type, horizontal or vertical.
- 6.3 Determination of the permissible load to be covered.

6.4 Checking of the installation dimension E and width B for agreement with the installation conditions prevailing.

6.5 For riser clamps, checking of the span (L-dimension).

6.6 For riser clamps of Type 46/48, the decision as to whether shear lugs or trunnions should be used.

6.7 On the basis of the properly fitting LISEGA load group ranges provided, the conformity of the connection with the load chain required can be ascertained.

6.8 Determination of the selected component through specification of the appropriate LISEGA type designation.

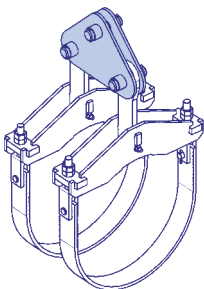
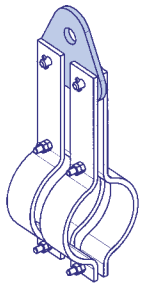
7.0 In selecting a suitable clamp base, proceed according to points 6.1 – 6.3.

In addition, attention should be paid to the choice of the correct height (dimension H) which is determined by the thickness of the heat insulation.

7.1 The heights given (dimension H) as well as the lengths (dimension A) are standard dimensions and cover the most common application cases. If required, components of different dimensions can be supplied.

8. The supply of pipe clamps and clamp bases is possible as special designs for particular uses and conditions (see pages 4.4 and 4.6 in this regard).

9. In the design and construction of LISEGA pipe clamps and clamp bases, nuclear applications have also been considered. However, separate fabrication is required in this case with strict adherence to the LISEGA quality management system. The type designation hereby differs in the 5th digit by addition of a 5 (see also page 0.7 in this respect).



By coupling two pipe clamps with type 77 (see page 4.55), the loads can be doubled

SELECTION TABLE OD 21.3

Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 21.3 (ND 15), types 42, 43, 45, 49

Type	permissible load (kN)										600°C	d4	E	A	B	kg	load group
	100	250	350	450	500	510	530	560	580	600							
42 01 17	2.5											10.5	22	43	26	0.14	C-D

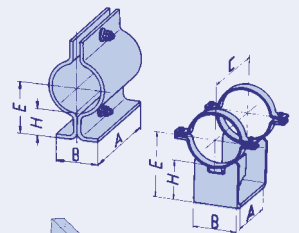
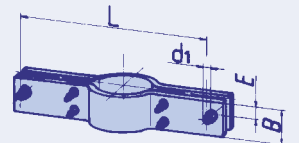
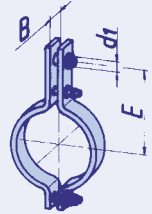
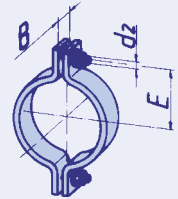
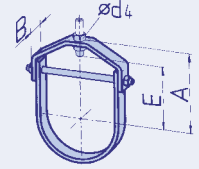
Type	permissible load (kN)										600°C	d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600						
42 01 19	5.5	4.0	3.0									M10	28	30	0.3	C-2

Heat resistant materials see page 4.3

Type	permissible load (kN)										600°C	d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600						
43 01 19	6.0	4.5	3.0									12	100	30	0.5	C-2
43 01 39			5.8	5.2	3.5	3.0	2.2	1.2				12	135	30	0.6	C-2
43 01 49								2.4	1.8	1.3		12	135	30	0.6	C-2

Type	permissible load (kN)										600°C	d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600							
45 01 11	4.4	3.6	2.5									12	25	50	250	2.0	C-4
45 01 11	3.7	2.9	2.1									12	25	50	300	2.3	C-4
45 01 11	2.7	2.2	1.5									12	25	50	400	3.0	C-4
45 01 11	2.1	1.7	1.2									12	25	50	500	3.6	C-4
45 01 11	1.9	1.4	1.0									12	25	50	600	4.2	C-4
45 01 31			8.0	7.2	4.8	4.2	3.0	1.6				12	25	70	300	3.9	C-4
45 01 31			5.9	5.4	3.6	3.1	2.2	1.2				12	25	70	400	5.0	C-4
45 01 31			4.7	4.3	2.8	2.5	1.7	0.9				12	25	70	500	6.1	C-4
45 01 31			3.9	3.5	2.3	2.0	1.4	0.8				12	25	70	600	7.2	C-4

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600						
49 01 11	1.1	0.8	0.6								61	100	40	-	50	0.6
49 01 12	1.6	1.2	0.9								111	150	65	-	100	1.3
49 01 25			1.0	0.9	0.6						111	175	65	225	100	1.5
49 01 35				2.2	1.6	1.4	1.0	0.6			161	175	90	225	150	2.0
49 01 45								1.2	0.9	0.6	161	175	90	225	150	2.3



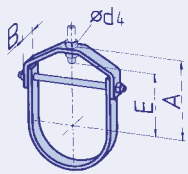
SELECTION TABLE

OD 26.9

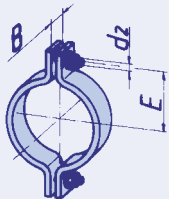
Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 26.9 (ND 20), types 42, 43, 45, 49

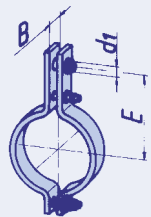


Type	permissible load (kN)										d4	E	A	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
42 02 17	2.5										10.5	25	48	26	0.15	C-D

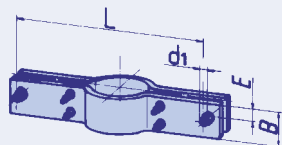


Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 02 19	5.5	4.0	3.0								M10	33	30	0.3	C-2

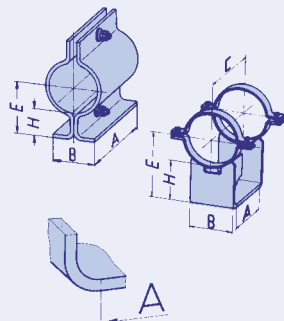
Heat resistant materials see page 4.3



Type	permissible load (kN)										d1	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
43 02 19	6.0	4.5	3.0								12	110	30	0.5	C-2	
43 02 39	5.8			5.2	3.5	3.0	2.2	1.2				12	135	30	0.6	C-2
43 02 49								2.4	1.8	1.3	12	135	30	0.6	C-2	



Type	permissible load (kN)										d1	E	B	L	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C							
45 02 11	4.6	3.7	2.6								12	25	50	250	2.0	C-4	
45 02 11	3.7	3.0	2.1								12	25	50	300	2.3	C-4	
45 02 11	2.7	2.2	1.6								12	25	50	400	3.0	C-4	
45 02 11	2.2	1.7	1.2								12	25	50	500	3.6	C-4	
45 02 11	1.8	1.4	1.0								12	25	50	600	4.2	C-4	
45 02 31	8.2			7.4	5.0	4.3	3.1	1.7				12	25	70	300	3.9	C-4
45 02 31	6.1			5.5	3.6	3.2	2.3	1.2				12	25	70	400	5.0	C-4
45 02 31	4.8			4.3	2.9	2.5	1.8	1.0				12	25	70	500	6.1	C-4
45 02 31	4.0			3.6	2.4	2.1	1.5	0.8				12	25	70	600	7.2	C-4



Type	permissible load (kN)										E	A	B	C	H	kg	
	100	250	350	450	500	510	530	560	580	600°C							
49 02 11	1.1	0.8	0.6								63	100	40	-	50	0.6	
49 02 12	1.6	1.2	0.9								113	150	65	-	100	1.4	
49 02 25	1.0			0.9	0.6						113	175	65	225	100	1.6	
49 02 35	2.2				1.6	1.4	1.0	0.6				163	175	90	225	150	2.1
49 02 45								1.2	0.9	0.6	163	175	90	225	150	2.3	

SELECTION TABLE OD 33.7

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 33.7 (ND 25), types 42, 43, 45, 49

Type	permissible load (kN)										d4	E	A	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
42 03 17	2.5										10.5	32	54	26	0.16	C-D

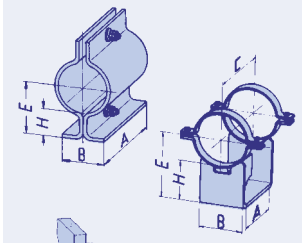
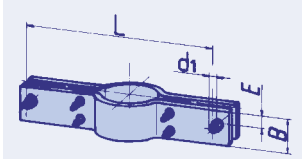
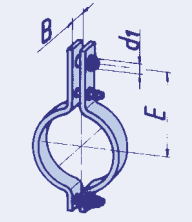
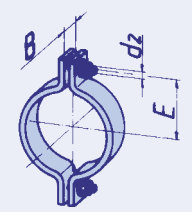
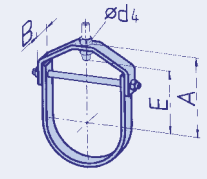
Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 03 19	5.5	4.0	3.0								M10	36	30	0.4	C-2

Heat resistant materials see page 4.3

Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 03 19	6.0	4.5	3.0								12	120	30	0.6	C-2
43 03 39			5.8	5.2	3.5	3.0	2.2	1.2			12	165	30	0.8	C-2
43 03 49							2.8	2.1	1.6		12	165	40	1.1	C-2

Type	permissible load (kN)										d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
45 03 11	5.8	4.6	3.3								12	25	60	250	2.4	C-4
45 03 11	4.7	3.8	2.7								12	25	60	300	2.8	C-4
45 03 11	3.4	2.7	2.0								12	25	60	400	3.5	C-4
45 03 11	2.6	2.2	1.5								12	25	60	500	4.3	C-4
45 03 11	2.2	1.8	1.3								12	25	60	600	5.0	C-4
45 03 31		8.5	7.7	5.1	4.5	3.2	1.7				12	25	70	300	3.9	C-4
45 03 32		9.6	8.1	7.8	7.7	7.6	7.4				12	25	90	300	10.1	C-4
45 03 31		6.2	5.6	3.7	3.3	2.3	1.3				12	25	70	400	5.0	C-4
45 03 32		9.6	8.1	7.8	7.7	7.6	6.5				12	25	90	400	12.9	C-4
45 03 31		4.9	4.4	2.9	2.6	1.8	1.0				12	25	70	500	6.1	C-4
45 03 32		9.6	8.1	7.8	7.7	7.6	5.1				12	25	90	500	15.7	C-4
45 03 31		4.0	3.6	2.4	2.1	1.5	0.8				12	25	70	600	7.2	C-4
45 03 32		9.6	8.1	7.8	7.7	7.6	4.2				12	25	90	600	18.6	C-4

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 03 11	1.1	0.8	0.6								67	100	45	-	50	0.7
49 03 12	1.6	1.2	0.9								117	150	70	-	100	1.5
49 03 25			1.2	1.0	0.7						167	175	100	225	150	2.3
49 03 35				2.5	1.9	1.6	1.2	0.7			167	175	100	225	150	2.3
49 03 45							1.4	1.1	0.7		167	175	100	225	150	2.5



SELECTION TABLE

OD 42.4

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 42.4 (ND 32), types 42, 43, 45, 49

Type	permissible load (kN)										d4	E	A	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
42 04 17	2.5										10.5	45	66	26	0.19	C-D

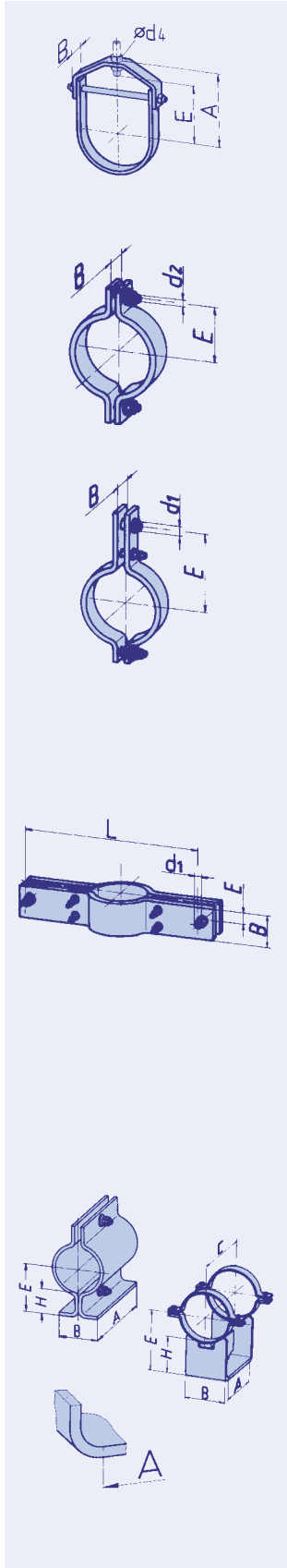
Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 04 19	5.5	4.0	3.0								M10	40	30	0.4	C-2

Heat resistant materials see page 4.3

Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 04 19	6.0	4.5	3.0								12	135	30	0.7	C-2
43 04 39			5.8	5.2	3.5	3.0	2.2	1.2			12	180	30	0.9	C-2
43 04 49								2.8	2.1	1.6	12	180	40	1.2	C-2

Type	permissible load (kN)										d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
45 04 11	9.0	7.2	5.1								12	25	70	300	4.2	C-4
45 04 11	6.5	5.2	3.7								12	25	70	400	5.3	C-4
45 04 11	5.1	4.0	2.9								12	25	70	500	6.4	C-4
45 04 11	4.1	3.3	2.4								12	25	70	600	7.5	C-4
45 04 39						5.0	3.4				12	25	70	350	7.1	C-D
45 04 31			15	13	9.8	8.7	6.2	3.4			16	30	70	350	7.1	1-4
45 04 32			22	19	18	18	15	8.7			16	30	100	350	13.3	1-4
45 04 39						5.0	4.7	2.6			12	25	70	450	8.8	C-D
45 04 31			11	10	7.5	6.6	4.7	2.6			16	30	70	450	8.8	1-4
45 04 32			22	19	18	16	12	6.6			16	30	100	450	16.4	1-4
45 04 39						5.0	3.8	2.1			12	25	70	550	10.4	C-D
45 04 31			9.3	8.4	6.0	5.3	3.8	2.1			16	30	70	550	10.4	1-4
45 04 32			22	19	15	13	9.6	5.3			16	30	100	550	19.5	1-4
45 04 39					5.0	4.4	3.1	1.7			12	25	70	650	12.1	C-D
45 04 31			7.8	7.0	5.0	4.4	3.1	1.7			16	30	70	650	12.1	1-4
45 04 32			19	17	12	11	8.0	4.4			16	30	100	650	22.7	1-4

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 04 11	1.1	0.8	0.6								71	100	45	-	50	0.7
49 04 12	1.6	1.2	0.9								121	150	70	-	100	1.6
49 04 25			1.2	1.0	0.7						171	175	100	225	150	2.4
49 04 35				2.5	1.9	1.6	1.2	0.7			171	175	100	225	150	2.4
49 04 45								1.4	1.1	0.7	171	175	100	225	150	2.6



SELECTION TABLE OD 48.3

Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 48.3 (ND 40), types 42, 43, 45, 49

Type	permissible load (kN)										600°C	d4	E	A	B	kg	load group
	100	250	350	450	500	510	530	560	580	600							
42 05 17	2.5											10.5	54	77	26	0.25	C-D

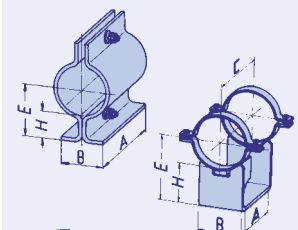
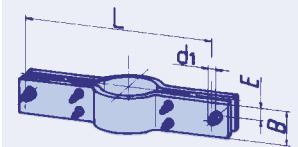
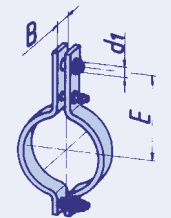
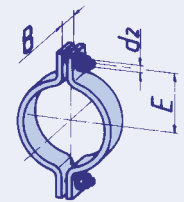
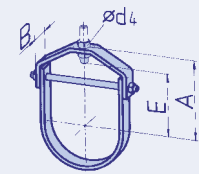
Type	permissible load (kN)										600°C	d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600						
42 05 19	5.5	4.0	3.0									M10	45	30	0.4	C-2

Heat resistant materials see page 4.3

Type	permissible load (kN)										600°C	d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600						
43 05 19	6.0	4.5	3.0									12	140	30	0.7	C-2
43 05 39			5.8	5.2	3.5	3.0	2.2	1.2				12	185	30	0.9	C-2
43 05 49								2.8	2.1	1.6		12	185	40	1.2	C-2

Type	permissible load (kN)										600°C	d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600							
45 05 11	10	8.1	5.8									12	25	80	300	4.8	C-4
45 05 11	7.7	5.9	4.2									12	25	80	400	6.1	C-4
45 05 11	5.9	4.6	3.3									12	25	80	500	7.3	C-4
45 05 11	4.9	3.7	2.7									12	25	80	600	8.6	C-4
45 05 39							5.0	4.0				12	25	80	350	8.2	C-D
45 05 31			18	16	11	10	7.3	4.0				16	30	80	350	8.2	1-4
45 05 32			22	19	18	18	18	10				16	30	120	350	16.0	1-4
45 05 39							5.0	3.0				12	25	80	450	10.1	C-D
45 05 31			13	12	8.8	7.7	5.5	3.0				16	30	80	450	10.1	1-4
45 05 32			22	19	18	18	14	8.1				16	30	120	450	19.8	1-4
45 05 39						5.0	4.4	2.4				12	25	80	550	12.0	C-D
45 05 31			10	9.8	7.1	6.2	4.4	2.4				16	30	80	550	12.0	1-4
45 05 32			22	19	18	16	11	6.5				16	30	120	550	23.5	1-4
45 05 39						5.0	3.7	2.0				12	25	80	650	13.9	C-D
45 05 31			9	8.2	5.9	5.1	3.7	2.0				16	30	80	650	13.9	1-4
45 05 32			22	19	15	13	9.8	5.4				16	30	120	650	27.3	1-4

Type	permissible load (kN)										E	A	B	C	H	kg	
	100	250	350	450	500	510	530	560	580	600							
49 05 11	1.1	0.8	0.6									74	100	50	-	50	0.8
49 05 12	1.6	1.2	0.9									124	150	75	-	100	1.7
49 05 25			1.3	1.1	0.8							174	175	100	225	150	2.4
49 05 35				2.9	2.2	1.9	1.4	0.8				174	175	100	225	150	2.4
49 05 45								1.5	1.1	0.8		174	175	100	225	150	2.6



SELECTION TABLE

OD 60.3

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 60.3 (ND 50), types 42, 43, 45, 49

Type	permissible load (kN)										d4	E	A	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
42 06 17	2.5										10.5	75	94	26	0.27	C-D

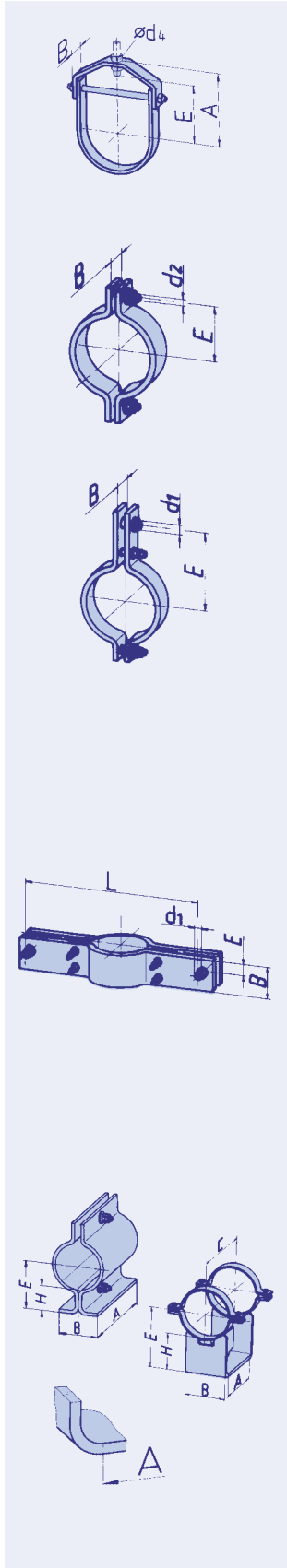
Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 06 19	7.5	5.5	4.0								M12	55	40	0.8	C-2

Heat resistant materials see page 4.3

Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 06 19	7.5	5.5	4.0								12	155	40	1.2	C-4
43 06 39			8.7	7.9	5.2	4.6	3.3	1.8			12	200	50	1.6	C-4
43 06 49								4.0	2.9	2.2	12	200	50	2.1	C-4

Type	permissible load (kN)										d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
45 06 11	9.0	6.7	4.8								12	25	70	300	4.3	C-4
45 06 12	24	18	13								16	30	80	300	7.3	1-4
45 06 11	6.5	4.8	3.4								12	25	70	400	5.4	C-4
45 06 12	17	13	9.4								16	30	80	400	9.2	1-4
45 06 11	5.1	3.8	2.7								12	25	70	500	6.5	C-4
45 06 12	13	10	7.4								16	30	80	500	11.1	1-4
45 06 11	4.1	3.1	2.2								12	25	70	600	7.6	C-4
45 06 12	11	8.5	6.1								16	30	80	600	13.0	1-4
45 06 39							5.0	4.4			12	25	100	400	11.4	C-D
45 06 31			20	17	12	11	7.9	4.4			16	30	100	400	11.4	1-4
45 06 32			22	19	18	18	17	9.7			16	30	120	400	18.0	1-4
45 06 39							5.0	3.4			12	25	100	500	13.8	C-D
45 06 31			15	13	9.9	8.6	6.2	3.4			16	30	100	500	13.8	1-4
45 06 32			22	19	18	18	13	7.5			16	30	120	500	21.8	1-4
45 06 39							5.0	2.8			12	25	100	600	16.2	C-D
45 06 31			12	11	8.1	7.1	5.0	2.8			16	30	100	600	16.2	1-4
45 06 32			22	19	17	15	11	6.1			16	30	120	600	25.6	1-4
45 06 39							5.0	4.3	2.3		12	25	100	700	18.5	C-D
45 06 31			10	9.5	6.8	6.0	4.3	2.3			16	30	100	700	18.5	1-4
45 06 32			22	19	15	13	9.3	5.1			16	30	120	700	29.3	1-4

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 06 11	1.2	0.9	0.7								80	150	50	-	50	1.3
49 06 12	1.7	1.3	0.9								130	200	75	-	100	2.4
49 06 25			1.3	1.1	0.8						180	225	110	285	150	3.5
49 06 35				2.9	2.2	1.9	1.4	0.8			180	225	110	285	150	3.5
49 06 45								1.8	1.2	0.8	180	225	110	285	150	3.8



SELECTION TABLE OD 73

Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 73 (ND 65), types 42, 43, 45, 46, 48, 49

Type	permissible load (kN)										d4	E	A	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
42 07 17	5										13	95	120	32	0.52	C-2

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 07 19	7.5	5.5	4.0								M12	60	40	0.8	C-2

Heat resistant materials see page 4.3

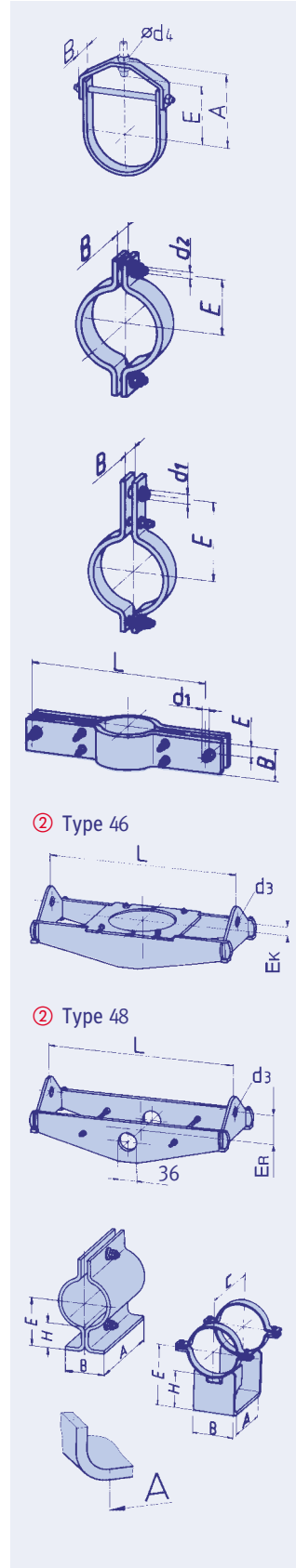
Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 07 19	7.5	5.5	4.0								12	165	40	1.2	C-4
43 07 39			8.7	7.9	5.2	4.6	3.3	1.8			12	215	50	1.8	C-4
43 07 49								4.0	2.9	2.2	12	215	50	2.3	C-4

Type	permissible load (kN)										d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
45 07 19			5.0								12	25	70	300	6.2	C-D
45 07 11	17	13	9.2								16	30	70	300	6.2	1-4
45 07 12	27	23	16								16	30	100	300	8.8	1-4
45 07 19			5.0								12	25	70	400	7.8	C-D
45 07 11	14	10	7.5								16	30	70	400	7.8	1-4
45 07 12	22	16	11								16	30	100	400	11.1	1-4
45 07 19			5.0								12	25	70	500	9.5	C-D
45 07 11	11	8.3	6.0								16	30	70	500	9.5	1-4
45 07 12	17	12	9.1								16	30	100	500	13.5	1-4
45 07 19			5.0	4.7							12	25	70	600	11.1	C-D
45 07 11	9.0	6.6	4.7								16	30	70	600	11.1	1-4
45 07 12	13	10	7.3								16	30	100	600	15.8	1-4

Type	permissible load (kN)										d3	E _k	E _r	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4.②07 31		16	15	11	10	7	4				21	15	70	350	750	8	14	C-4
4. 07 32			21	20	15	13	10	6			21	25	75	350	750	9	17	C-4
4. 07 33			43	35	26	23	17	10			25	30	100	350	750	12	25	3-5
4. 07 41							7	5	4		21	15	70	350	750	7	15	C-4
4. 07 42								11	8	6	21	25	85	350	750	9	19	C-4
4. 07 43								18	13	10	25	30	115	350	750	11	26	3-5

① Weights for Type 46 - for Type 48 approx. 12% less..

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 07 11	1.2	0.9	0.7								87	150	55	-	50	1.5
49 07 12	1.7	1.3	0.9								137	200	80	-	100	2.6
49 07 25			1.7	1.4	1.0						187	225	110	285	150	3.7
49 07 35				4.3	3.3	2.9	2.1	1.2			187	225	110	285	150	3.7
49 07 45								2.4	1.7	1.2	187	225	110	285	150	3.9



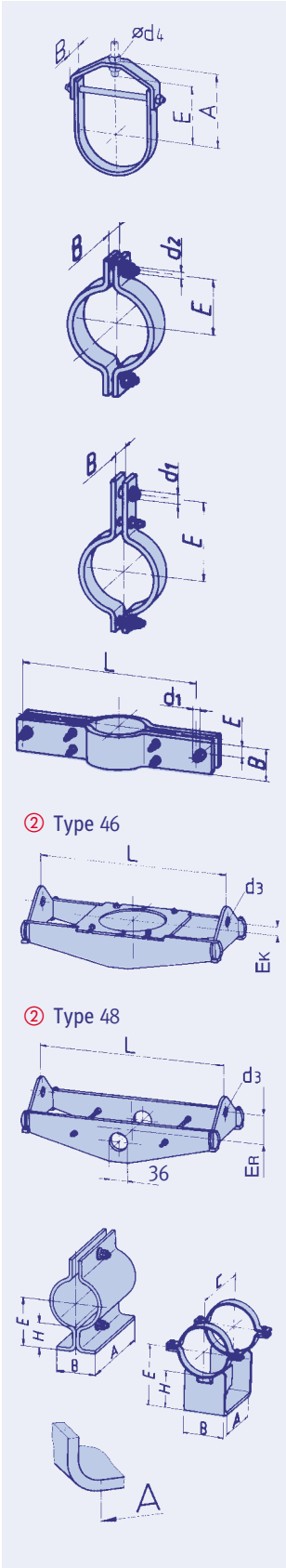
SELECTION TABLE

OD 76.1

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 76.1 (ND 65), types 42, 43, 45, 46, 48, 49



Type	permissible load (kN)										d4	E	A	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
42 08 17	5										13	95	120	32	0.54	C-2

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 08 19	7.5	5.5	4.0								M12	60	40	0.9	C-2

Heat resistant materials see page 4.3

Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 08 19	7.5	5.5	4.0								12	165	40	1.2	C-4
43 08 39			8.7	7.9	5.2	4.6	3.3	1.8			12	215	50	1.8	C-4
43 08 49								4.0	2.9	2.2	12	215	50	2.3	C-4

Type	permissible load (kN)										d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
45 08 19			5.0								12	25	70	300	6.6	C-D
45 08 11	17	13	9.2								16	30	70	300	6.6	1-4
45 08 12	27	23	16								16	30	100	300	9.3	1-4
45 08 19			5.0								12	25	70	400	8.2	C-D
45 08 11	14	10	7.5								16	30	70	400	8.2	1-4
45 08 12	22	16	11								16	30	100	400	11.6	1-4
45 08 19			5.0								12	25	70	500	9.9	C-D
45 08 11	11	8.3	6.0								16	30	70	500	9.9	1-4
45 08 12	17	12	9.1								16	30	100	500	14.0	1-4
45 08 19			5.0	4.7							12	25	70	600	11.5	C-D
45 08 11	9.0	6.6	4.7								16	30	70	600	11.5	1-4
45 08 12	13	10	7.3								16	30	100	600	16.3	1-4

Type	permissible load (kN)										d3	Ek	ER	L		kg ^①	load group	
	100	250	350	450	500	510	530	560	580	600°C				min.	max.			min.
4.②08 31			16	15	11	10	7	4			21	15	70	350	750	8	14	C-4
4. 08 32			21	20	15	13	10	6			21	25	75	350	750	10	17	C-4
4. 08 33			43	35	26	23	17	10			25	30	100	350	750	14	25	3-5
4. 08 41							7	5	4		21	15	70	350	750	7	15	C-4
4. 08 42							11	8	6		21	25	85	350	750	9	19	C-4
4. 08 43							18	13	10		25	30	115	350	750	13	27	3-5

① Weights for Type 46 - for Type 48 approx. 14% less.

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 08 11	1.2	0.9	0.7								88	150	55	-	50	1.5
49 08 12	1.7	1.3	0.9								138	200	80	-	100	2.6
49 08 25			1.7	1.4	1.0						188	225	110	285	150	3.7
49 08 35				4.3	3.3	2.9	2.1	1.2			188	225	110	285	150	3.7
49 08 45								2.4	1.7	1.2	188	225	110	285	150	4.0

SELECTION TABLE

OD 88.9

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 88.9 (ND 80), types 42, 43, 45, 46, 48, 49

Type	permissible load (kN)										d4	E	A	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
42 09 17	5.0										13	100	121	32	0.60	C-2

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 09 19	6.5	4.5	3.5								M12	70	40	1.0	C-2

Heat resistant materials see page 4.3

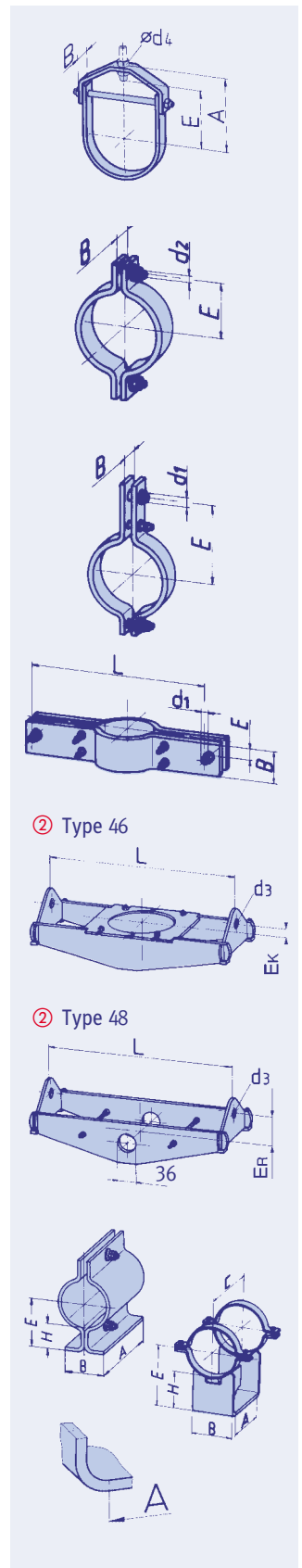
Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 09 18			2.5								12	170	40	1.4	C-D
43 09 19	7.5	5.5	4.0								16	170	40	1.4	1-4
43 09 38							2.5	1.8			12	235	50	1.9	C-D
43 09 39			8.7	7.9	5.2	4.6	3.3	1.8			16	235	50	1.9	1-4
43 09 49							4.0	2.9	2.2		12	235	50	2.5	C-4

Type	permissible load (kN)										d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
45 09 19			5.0								12	25	70	300	6.7	C-D
45 09 11	17	13	9.5								16	30	70	300	6.7	1-4
45 09 12	27	23	16								16	30	100	300	9.4	1-4
45 09 19			5.0								12	25	70	450	9.1	C-D
45 09 11	12	8.9	6.4								16	30	70	450	9.1	1-4
45 09 12	19	14	10								16	30	100	450	12.9	1-4
45 09 19			5.0								12	25	70	600	11.6	C-D
45 09 11	9.0	6.6	4.7								16	30	70	600	11.6	1-4
45 09 12	13	10	7.3								16	30	100	600	16.5	1-4
45 09 19		5.0	3.7								12	25	70	750	14.1	C-D
45 09 11	7.1	5.2	3.7								16	30	70	750	14.1	1-4
45 09 12	10	7.9	5.6								16	30	100	750	20.0	1-4

Type	permissible load (kN)										d3	E _K	E _R	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4.② 09 31		16	15	11	10	7	4				21	15	75	350	850	9	19	C-4
4. 09 32		21	20	15	13	10	6				21	25	85	350	850	9	25	C-4
4. 09 33		43	35	26	23	17	10				25	35	100	350	850	13	32	3-5
4. 09 41							7	5	4		21	15	75	350	850	8	18	C-4
4. 09 42							11	8	6		21	25	100	350	850	9	24	C-4
4. 09 43							19	13	10		25	35	105	350	850	12	35	3-5

① Weights for Type 46 - for Type 48 approx. 15% less.

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 09 11	1.8	1.4	1.0								94	150	60	-	50	2.3
49 09 12	2.5	1.9	1.3								144	200	85	-	100	3.8
49 09 25			2.3	1.9	1.4						244	275	145	335	200	5.4
49 09 35				5.2	3.9	3.4	2.5	1.5			244	275	145	335	200	5.6
49 09 45							2.9	2.2	1.5		244	275	145	335	200	5.7



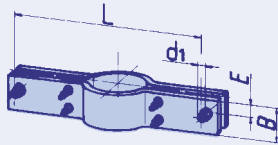
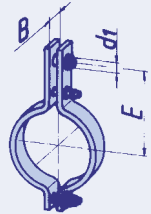
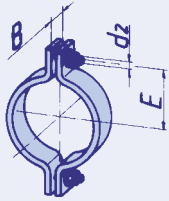
SELECTION TABLE

OD 108

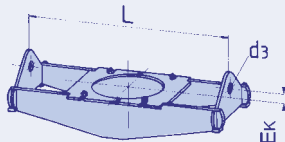
Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

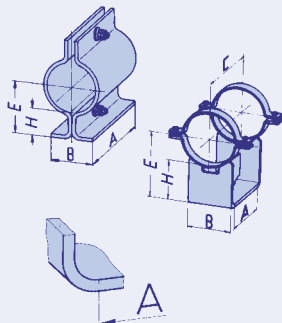
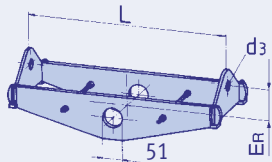
Pipe clamps, clamp bases, OD 108 (ND 100), types 42, 43, 45, 46, 48, 49



② Type 46



② Type 48



Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 10 19	10	7.6	6.0								M16	90	50	2.0	1-4

Heat resistant materials see page 4.3

Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 10 19	10	7.6	6.0								16	200	50	2.5	1-4
43 10 29				2.9	1.8						12	240	40	1.3	C-4
43 10 38							2.5	2.4			12	270	50	3.0	C-D
43 10 39			11	10	7.1	6.2	4.3	2.4			16	270	50	3.0	1-4
43 10 49								6.0	4.4	3.3	16	270	70	4.1	1-4

Type	permissible load (kN)										d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
45 10 19			5.0								12	25	80	350	8.4	C-D
45 10 11	17	13	9.7								16	30	80	350	8.4	1-4
45 10 19			5.0								12	25	80	500	11.2	C-D
45 10 11	12	9.3	6.7								16	30	80	500	11.2	1-4
45 10 19			5.0								12	25	80	650	14.0	C-D
45 10 11	9.4	7.0	5.0								16	30	80	650	14.0	1-4
45 10 19		5.0	4.0								12	25	80	800	16.9	C-D
45 10 11	7.5	5.6	4.0								16	30	80	800	16.9	1-4

Type	permissible load (kN)										d3	Ek	Er	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4.② 10 12	18	14	10								25	5	70	350	800	9	18	3-5
4. 10 31			21	20	17	15	11	6			21	15	85	350	950	10	26	C-4
4. 10 32			36	30	23	20	15	8			25	25	85	350	950	15	36	3-5
4. 10 33			62	50	40	35	25	15			34	35	120	350	950	17	46	3-6
4. 10 41								11	8	6	21	15	100	350	950	10	28	C-4
4. 10 42								14	10	8	25	25	110	350	950	14	36	3-5
4. 10 43								24	18	15	34	35	130	350	950	18	53	3-6

① Weights for Type 46 - for Type 48 approx. 16% less.

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 10 11	2.3	1.8	1.3								154	150	95	-	100	4.0
49 10 12	3.2	2.4	1.8								204	200	125	-	150	6.3
49 10 25			3.1	2.7	2.0						254	275	150	345	200	7.9
49 10 35				5.4	4.8	4.1	3.1	1.8			254	275	150	345	200	8.1
49 10 45								3.3	2.4	1.8	254	275	150	345	200	8.2

SELECTION TABLE

OD 114.3

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 114.3 (ND 100), types 42, 43, 45, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 11 19	10	7.6	6.0								M16	90	50	2.1	1-4

Heat resistant materials see page 4.3

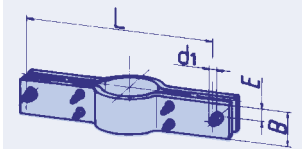
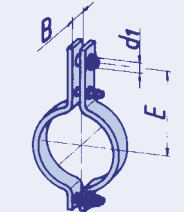
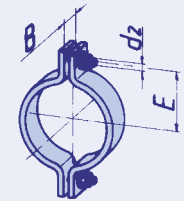
Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 11 19	10	7.6	6.0								16	200	50	2.6	1-4
43 11 29				2.9	1.8						12	240	40	1.5	C-4
43 11 38							2.5	2.4			12	270	50	3.0	C-D
43 11 39			11	10	7.1	6.2	4.3	2.4			16	270	50	3.0	1-4
43 11 49							6.0	4.4	3.3		16	270	70	4.2	1-4

Type	permissible load (kN)										d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
45 11 19			5.0								12	25	80	350	8.7	C-D
45 11 11	17	13	9.7								16	30	80	350	8.7	1-4
45 11 19			5.0								12	25	80	500	11.5	C-D
45 11 11	12	9.3	6.7								16	30	80	500	11.5	1-4
45 11 19			5.0								12	25	80	650	14.3	C-D
45 11 11	9.4	7.0	5.0								16	30	80	650	14.3	1-4
45 11 19		5.0	4.0								12	25	80	800	17.2	C-D
45 11 11	7.5	5.6	4.0								16	30	80	800	17.2	1-4

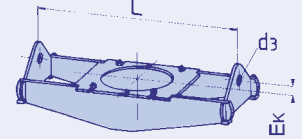
Type	permissible load (kN)										d3	E _k	E _r	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4.②1112	18	14	10								25	5	70	350	800	9	18	3-5
4. 11 31			21	20	17	15	11	6			21	15	85	350	950	10	28	C-4
4. 11 32			36	30	23	20	15	8			25	25	85	350	950	15	36	3-5
4. 11 33			62	50	40	35	25	15			34	35	120	350	950	18	47	3-6
4. 11 41							11	8	6		21	15	100	350	950	10	29	C-4
4. 11 42							14	10	8		25	25	110	350	950	15	36	3-5
4. 11 43							24	18	15		34	35	130	350	950	19	53	3-6

① Weights for Type 46 - for Type 48 approx. 17% less.

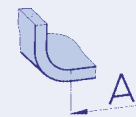
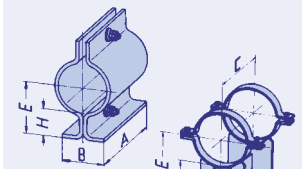
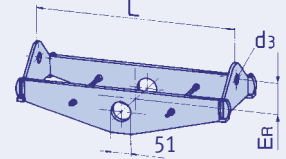
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 11 11	2.3	1.8	1.3								157	150	95	-	100	4.1
49 11 12	3.2	2.4	1.8								207	200	125	-	150	6.4
49 11 25			3.1	2.7	2.0						257	275	150	345	200	7.9
49 11 35				5.4	4.8	4.1	3.1	1.8			257	275	150	345	200	8.1
49 11 45							3.3	2.4	1.8		257	275	150	345	200	8.3



② Type 46



② Type 48



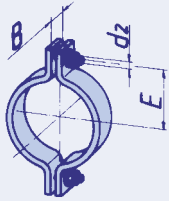
SELECTION TABLE

OD 133

Temperatures up to 650°C from page 4.46

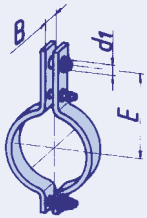
Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 133 (ND 125), types 42, 43, 45, 46, 48, 49

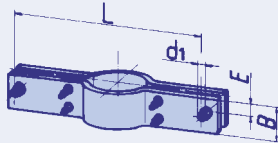


Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 13 19	10	7.6	5.6								M16	100	50	2.2	1-4

Heat resistant materials see page 4.3

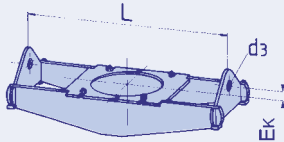


Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 13 19	10	7.6	6.0								16	220	50	2.8	1-4
43 13 28					2.5						12	270	50	2.3	C-D
43 13 29				4.6	2.8						16	270	50	2.3	1-4
43 13 38								2.5			12	290	60	3.9	C-D
43 13 39			12	11	7.5	6.5	4.7	2.6			16	290	60	3.9	1-4
43 13 49								6.0	4.4	3.3	16	290	70	5.6	1-4



Type	permissible load (kN)										d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
45 13 19			5.0								12	25	90	400	10.7	C-D
45 13 11	18	14	10								16	30	90	400	10.7	1-4
45 13 19			5.0								12	25	90	550	13.9	C-D
45 13 11	13	9.7	6.9								16	30	90	550	13.9	1-4
45 13 19			5.0								12	25	90	700	17.1	C-D
45 13 11	9.9	7.4	5.3								16	30	90	700	17.1	1-4
45 13 19		5.0	4.2								12	25	90	850	20.2	C-D
45 13 11	8.0	5.9	4.2								16	30	90	850	20.2	1-4

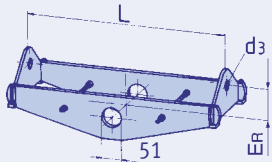
② Type 46



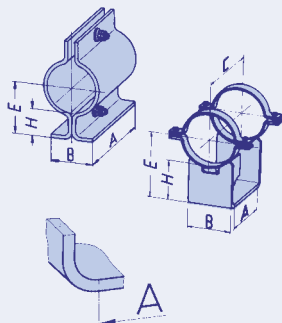
Type	permissible load (kN)										L		kg ^①		load group			
	100	250	350	450	500	510	530	560	580	600°C	d3	Ek	ER	min.		max.	min.	max.
4.②13 12	22	18	13								25	10	70	400	850	12	22	3-5
4. 13 31			23	20	20	17	12	7			21	15	95	400	1000	13	35	C-4
4. 13 32			37	35	26	23	17	10			25	30	100	400	1000	17	42	3-5
4. 13 33			65	55	45	40	29	17			34	40	130	400	1000	26	57	4-6
4. 13 41								12	9	7	21	15	105	400	1000	13	34	C-4
4. 13 42								18	13	10	25	30	115	400	1000	18	45	3-5
4. 13 43								31	23	17	34	40	145	400	1000	26	67	4-6

① Weights for Type 46 - for Type 48 approx. 18% less.

② Type 48



Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 13 11	2.5	2.0	1.4								167	150	105	-	100	5.3
49 13 12	3.8	3.0	2.0								217	200	130	-	150	8.3
49 13 25			4.5	3.7	2.7						267	275	160	350	200	9.6
49 13 35				8.6	6.5	5.7	4.2	2.4			267	275	160	350	200	9.8
49 13 45								4.4	3.3	2.4	267	275	160	350	200	9.7



SELECTION TABLE OD 139.7

Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 139.7 (ND 125), types 42, 43, 45, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 14 19	10	7.4	5.3								M16	105	50	2.4	1-4

Heat resistant materials see page 4.3

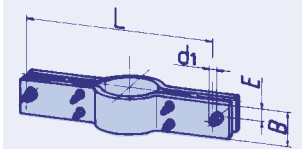
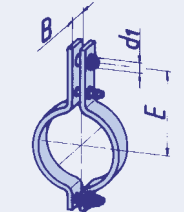
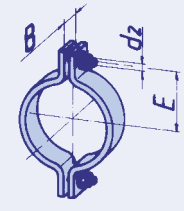
Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 14 19	10	7.6	6.0								16	225	50	2.9	1-4
43 14 28					2.5						12	275	50	2.5	C-D
43 14 29				4.6	2.8						16	275	50	2.5	1-4
43 14 38								2.5			12	295	60	4.1	C-D
43 14 39			12	11	7.5	6.5	4.7	2.6			16	295	60	4.1	1-4
43 14 49							6.0	4.4	3.3		16	295	70	5.7	1-4

Type	permissible load (kN)										d1	E	B	L	kg	load group
	100	250	350	450	500	510	530	560	580	600°C						
45 14 19			5.0								12	25	90	400	11.1	C-D
45 14 11	18	14	10								16	30	90	400	11.1	1-4
45 14 19			5.0								12	25	90	550	14.3	C-D
45 14 11	13	9.7	6.9								16	30	90	550	14.3	1-4
45 14 19			5.0								12	25	90	700	17.5	C-D
45 14 11	9.9	7.4	5.3								16	30	90	700	17.5	1-4
45 14 19		5.0	4.2								12	25	90	850	20.6	C-D
45 14 11	8.0	5.9	4.2								16	30	90	850	20.6	1-4

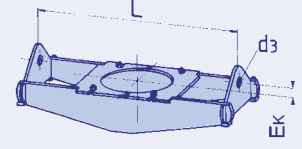
Type	permissible load (kN)										L		kg ^①		load group			
	100	250	350	450	500	510	530	560	580	600°C	d3	E _k	E _r	min.		max.	min.	max.
4.② 14 12	22	17	12								25	10	70	400	850	11	24	3-5
4. 14 31		23	20	20	17	12	7				21	15	95	400	1000	13	35	C-4
4. 14 32		37	35	26	23	17	10				25	30	100	400	1000	20	41	3-5
4. 14 33		65	55	45	40	29	17				34	40	130	400	1000	24	57	4-6
4. 14 41						12	9	7	21	15	105	400	1000	14	35			C-4
4. 14 42						18	13	10	25	30	115	400	1000	20	47			3-5
4. 14 43						31	23	17	34	40	145	400	1000	26	66			4-6

① Weights for Type 46 - for Type 48 approx. 19% less.

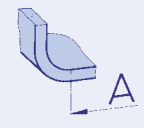
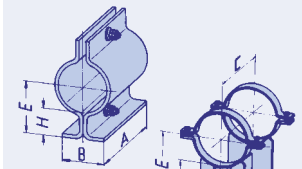
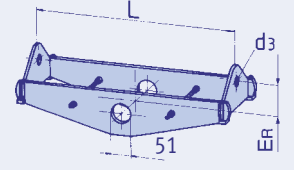
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 14 11	2.5	2.0	1.4								170	150	105	-	100	5.5
49 14 12	3.8	3.0	2.0								220	200	130	-	150	8.5
49 14 25			4.5	3.7	2.7						270	275	160	350	200	9.7
49 14 35				8.6	6.5	5.7	4.2	2.4			270	275	160	350	200	9.8
49 14 45							4.4	3.3	2.4		270	275	160	350	200	9.8



② Type 46



② Type 48

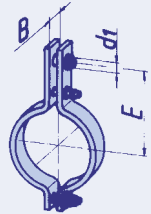
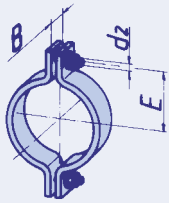


SELECTION TABLE OD 159

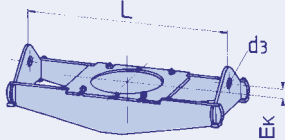
Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

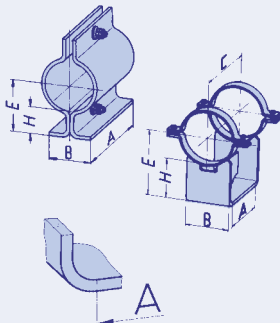
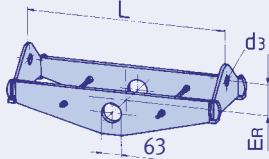
Pipe clamps, clamp bases, OD 159 (ND 150), types 42, 43, 46, 48, 49



② Type 46



② Type 48



Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 16 19	9.0	6.6	4.8								M16	115	50	2.5	1-4

Heat resistant materials see page 4.3

Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 16 19	10	7.5	5.4								16	245	50	3.1	1-4
43 16 29			7.5	5.5	3.5						16	300	50	3.4	1-4
43 16 39			15	14	12	10	7.5	4.2			16	315	80	6.9	1-4
43 16 49							8.2	6.1	4.5		16	315	80	8.4	1-4

Type	permissible load (kN)										d3	Ek	ER	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4.② 16 11	18	14	10								21	15	90	450	900	12	23	C-4
4. 16 12	28	22	16								25	15	85	450	900	13	33	3-5
4. 16 31			23	20	19	17	13	7			21	25	100	450	1050	16	35	C-4
4. 16 32			46	40	31	27	20	11			25	40	120	450	1050	20	48	3-5
4. 16 33			75	58	53	46	34	20			34	50	150	450	1050	30	72	4-6
4. 16 41								12	9	7	21	25	110	450	1050	17	38	C-4
4. 16 42								19	14	11	25	40	130	450	1050	22	51	3-5
4. 16 43								35	26	20	34	50	165	450	1050	33	80	4-6

① Weights for Type 46 - for Type 48 approx. 16% less.

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 16 11	2.5	2.0	1.4								180	200	115	-	100	6.7
49 16 14	4.4	3.7	3.5								230	250	140	340	150	9.8
49 16 25			5.6	5.2	3.8						280	320	170	395	200	11.0
49 16 35				12	9.1	8.0	5.9	3.4			280	320	170	400	200	12.3
49 16 45								6.4	4.8	3.4	280	320	170	400	200	12.4

SELECTION TABLE OD 168.3

Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 168.3 (ND 150), types 42, 43, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 17 19	8.5	6.3	4.5								M16	120	50	2.6	1-4

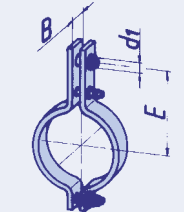
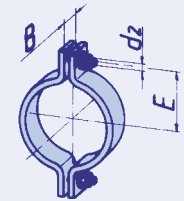
Heat resistant materials see page 4.3

Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 17 19	9.5	7.2	5.1								16	250	50	3.2	1-4
43 17 29			8.0	7.3	4.5						16	300	50	3.6	1-4
43 17 39			15	14	12	10	7.5	4.2			16	320	80	7.3	1-4
43 17 49							8.2	6.1	4.5		16	320	80	8.5	1-4

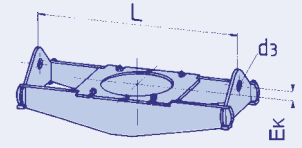
Type	permissible load (kN)										L		kg ^①		load group			
	100	250	350	450	500	510	530	560	580	600°C	d3	E _K	E _R	min.		max.	min.	max.
4.②1711	18	14	10								21	15	90	450	900	12	23	C-4
4. 17 12	28	22	16								25	15	85	450	900	17	33	3-5
4. 17 31			23	20	19	17	13	7			21	25	100	450	1050	16	38	C-4
4. 17 32			46	40	31	27	20	11			25	40	120	450	1050	22	50	3-5
4. 17 33			75	58	53	46	34	20			34	50	150	450	1050	31	72	4-6
4. 17 41						12	9	7			21	25	110	450	1050	17	39	C-4
4. 17 42						19	14	11			25	40	130	450	1050	23	53	3-5
4. 17 43						35	26	20			34	50	165	450	1050	34	81	4-6

① Weights for Type 46 - for Type 48 approx. 19% less.

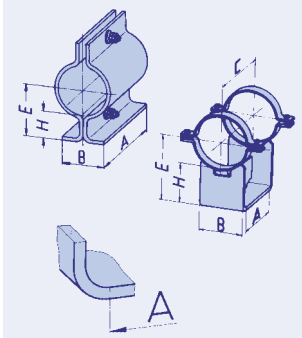
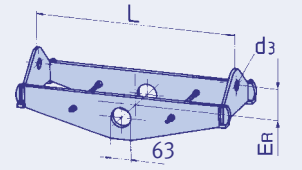
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 17 11	2.5	2.0	1.4								184	200	120	-	100	6.9
49 17 14	4.7	4.0	3.8								234	250	150	340	150	10.1
49 17 25			5.7	5.2	3.8						284	320	170	395	200	11.1
49 17 35				12	9.1	8.0	5.9	3.4			284	320	170	400	200	12.4
49 17 45							6.5	4.9	3.4		284	320	170	400	200	12.5



② Type 46



② Type 48



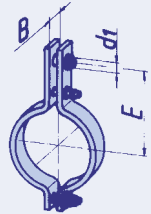
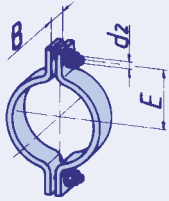
SELECTION TABLE

OD 193.7

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 193.7 (ND 175), types 42, 43, 46, 48, 49



Type	permissible load (kN)										d2	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
42 19 19	7.1	5.5	3.9									M16	135	50	2.9	1-4

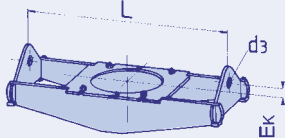
Heat resistant materials see page 4.3

Type	permissible load (kN)										d1	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
43 19 19	12	9.1	6.5									16	270	50	4.7	1-5
43 19 29				6.0	3.7							16	335	50	4.2	1-5
43 19 38			10	9.5	9.0	8.5	8.0	6.0				16	355	70	10.8	1-3
43 19 39			22	20	18	16	13	7.2				20	355	70	10.8	3-6
43 19 49							13	10	7.5			20	355	100	15.4	3-6

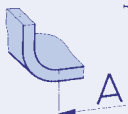
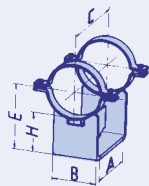
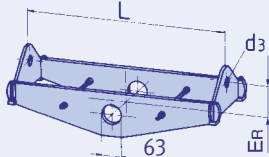
Type	permissible load (kN)										d3	Ek	Er	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4.②1911	24	19	13								21	15	80	500	950	14	28	C-4
4. 19 12	37	29	21								25	20	90	500	950	18	41	3-5
4. 19 21			25	22	16						21	15	100	500	1000	18	39	C-4
4. 19 22			40	34	25						25	30	110	500	1000	24	52	3-5
4. 19 31					15	10	6				21	25	110	550	1150	19	41	C-4
4. 19 32				28	25	18	10				25	30	110	550	1150	27	55	3-5
4. 19 33				39	34	25	14				25	40	130	550	1150	35	64	3-5
4. 19 34				71	58	43	25				41	50	160	550	1150	49	98	4-7
4. 19 41							10	8	6		21	25	115	550	1150	20	42	C-4
4. 19 42							17	13	10		25	30	130	550	1150	28	58	3-5
4. 19 43							24	18	14		25	40	140	550	1150	37	78	3-5
4. 19 44							45	33	25		41	50	160	550	1150	54	109	4-7

① Weights for Type 46 - for Type 48 approx. 19% less.

② Type 46



② Type 48



Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 19 13	4.4	3.8	3.6								197	250	130	345	100	9.3
49 19 14	7.1	6.1	5.8								247	250	150	350	150	12.1
49 19 25			8.2	6.9	5.0						297	320	180	400	200	13.6
49 19 35				16	12	11	7.7	4.5			347	320	200	415	250	19.0
49 19 45								9.1	6.8	4.5	347	320	200	415	250	18.7

SELECTION TABLE OD 219.1

Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 219.1 (ND 200), types 42, 43, 44, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 22 19	7.0	5.2	3.7								M16	145	50	3.1	1-4

Heat resistant materials see page 4.3

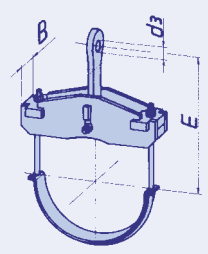
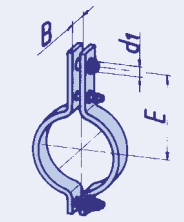
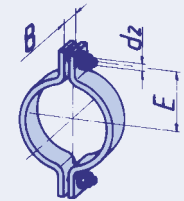
Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 22 19	12	9.1	6.5								16	295	50	5.0	1-5
43 22 29			9.0	8.0	5.0						16	365	50	5.6	1-5

Type	permissible load (kN)										d3	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
44 22 12	29	23	18								34	275	75	9	3-6
44 22 31				10	9	9	8	5			21	375	95	9	C-4
44 22 32			29	26	24	23	18	11			34	375	95	13	4-6
44 22 33			53	45	38	35	29	17			46	375	120	22	5-8
44 22 41								9	6	5	21	375	98	10	C-4
44 22 42								19	14	11	34	375	100	15	4-6
44 22 43								51	33	24	46	375	130	24	5-8

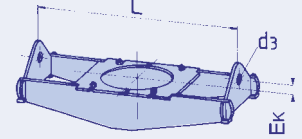
Type	permissible load (kN)										d3	E _K	E _R	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4. 22 11	24	18	13								21	15	105	500	1100	16	38	C-4
4. 22 12	42	32	23								25	25	110	500	1100	23	53	3-5
4. 22 21			33	31	22						25	35	120	500	1200	26	60	3-5
4. 22 22			47	42	31						34	40	150	500	1200	31	72	4-6
4. 22 31						15	10	6			21	25	130	550	1350	21	50	C-4
4. 22 32					36	31	23	13			25	40	150	550	1350	36	79	3-5
4. 22 33					51	42	31	18			41	50	170	550	1350	44	101	4-7
4. 22 34					88	72	53	31			46	60	200	550	1350	65	142	5-8
4. 22 41								10	8	6	21	25	130	550	1350	22	55	C-4
4. 22 42								23	17	13	25	40	155	550	1350	39	94	3-5
4. 22 43								32	24	18	41	50	185	550	1350	48	115	4-7
4. 22 44								55	41	31	46	60	200	550	1350	70	167	5-8

① Weights for Type 46 - for Type 48 approx. 18% less.

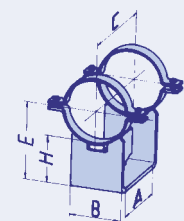
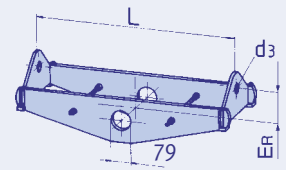
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 22 13	6.8	5.9	5.6								210	250	130	350	100	10.6
49 22 14	10	8.6	8.2								260	250	155	365	150	14.1
49 22 25			9.5	8.9	6.5						360	320	210	400	250	16.6
49 22 35				20	15	13	10	5.8			360	320	210	415	250	19.7
49 22 45								10	8.1	5.8	360	320	210	415	250	20.0



② Type 46



② Type 48



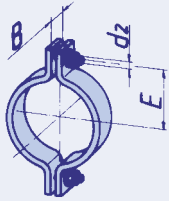
SELECTION TABLE

OD 244.5

Temperatures up to 650°C from page 4.46

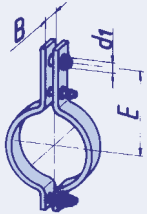
Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 244.5 (ND 225), types 42, 43, 44, 46, 48, 49

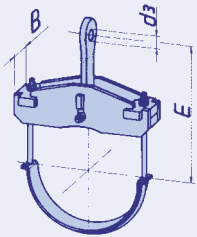


Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 24 19	6.3	4.7	3.4								M16	160	50	3.3	1-4

Heat resistant materials see page 4.3

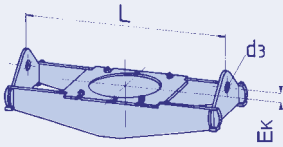


Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 24 19	12	11	8.4								16	310	50	6.1	1-5
43 24 29			9.0	8.0	5.0						16	390	50	5.8	1-5

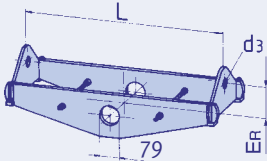


Type	permissible load (kN)										d3	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
44 24 12	20	16	12								34	300	75	9	3-6
44 24 13	38	35	29								46	330	80	12	5-8
44 24 31				9.5	9.0	8.5	8	5			21	390	95	10	C-4
44 24 32			30	26	24	23	18	11			34	390	95	14	4-6
44 24 33			52	45	38	35	29	17			46	390	120	23	5-8
44 24 41								9	6	5	21	390	98	11	C-4
44 24 42								18	14	11	34	390	100	16	4-6
44 24 43								51	33	24	46	390	130	25	5-8

② Type 46

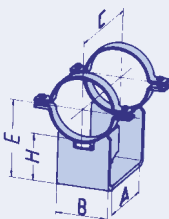


② Type 48



Type	permissible load (kN)										L			kg ^①		load group		
	100	250	350	450	500	510	530	560	580	600°C	d3	Ek	Er	min.	max.		min.	max.
4. 24 11	30	23	17								25	25	100	500	1100	20	46	3-5
4. 24 12	50	40	28								34	35	120	500	1100	27	60	4-6
4. 24 21			38	34	24						25	40	130	550	1200	30	66	3-5
4. 24 22			53	45	34						34	45	150	550	1200	39	77	4-6
4. 24 31					17	12	7				25	30	110	550	1350	25	59	3-5
4. 24 32				40	34	24	14				25	45	150	550	1350	40	85	3-5
4. 24 33				56	46	34	20				41	50	160	550	1350	51	111	4-7
4. 24 34				96	80	58	34				46	60	180	550	1350	73	155	5-8
4. 24 41							12	9	7		25	30	120	550	1350	26	61	3-5
4. 24 42							25	18	14		25	45	150	550	1350	43	101	3-5
4. 24 43							36	27	20		41	50	160	550	1350	54	125	4-7
4. 24 44							61	46	34		46	60	190	550	1350	78	180	5-8

① Weights for type 46 - for type 48 approx. 22% less.



Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 24 13	7.0	6.0	5.6								222	250	130	350	100	11.1
49 24 14	11	9.7	9.2								272	250	170	365	150	15.5
49 24 25			13	12	8.5						372	320	220	410	250	20.5
49 24 35				27	20	18	13	7.5			372	320	220	420	250	24.2
49 24 45								15	11	7.5	372	320	220	420	250	24.6

SELECTION TABLE

OD 267

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 267 (ND 250), types 42, 43, 44, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 26 19	6.6	4.9	3.5								M20	175	60	4.6	3-4

Heat resistant materials see page 4.3

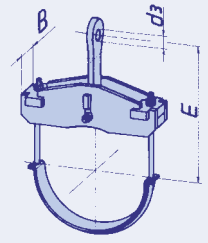
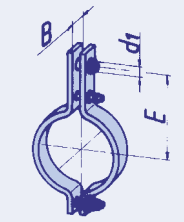
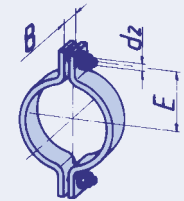
Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 26 18	9.3	9.0	8.5								16	340	70	12.0	1-3
43 26 19	29	18	14								24	340	70	12.0	3-6
43 26 29				11	7.5						24	410	70	10.5	3-6

Type	permissible load (kN)										d3	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
44 26 12	26	21	16								34	340	75	10	4-6
44 26 13	59	54	42								46	360	110	20	5-8
44 26 31				9	8.5	8	8	5			21	425	95	10	C-4
44 26 32				23	22	21	17	11			34	425	95	15	4-6
44 26 33			47	40	38	35	29	18			46	425	120	24	5-8
44 26 41								8	6	5	21	425	104	13	C-4
44 26 42								20	15	11	34	425	115	19	4-6
44 26 43								49	33	24	46	425	130	26	5-8

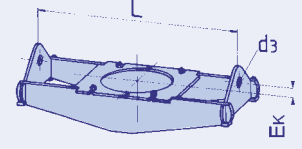
Type	permissible load (kN)										d3	E _K	E _R	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4. 26 11	35	28	20								25	35	105	550	1150	24	55	3-5
4. 26 12	53	41	30								34	45	130	550	1150	30	67	4-6
4. 26 21			40	36	26						25	45	140	600	1300	35	75	3-5
4. 26 22			54	50	36						34	50	150	600	1300	43	94	4-6
4. 26 31					20	15	8				25	30	120	600	1400	35	67	3-5
4. 26 32				41	35	25	15				25	50	150	600	1400	48	96	3-5
4. 26 33				59	49	36	21				41	50	160	600	1400	57	121	4-7
4. 26 34				100	84	61	36				46	70	185	600	1400	84	173	5-8
4. 26 41						14	10	8			25	30	140	600	1400	36	75	3-5
4. 26 42						27	20	15			25	50	175	600	1400	51	112	3-5
4. 26 43						38	28	21			41	50	165	600	1400	65	138	4-7
4. 26 44						65	49	36			46	70	205	600	1400	92	201	5-8

① Weights for type 46 - for type 48 approx. 20% less.

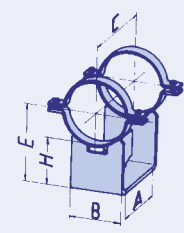
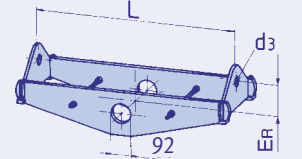
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 26 13	8.5	7.3	6.9								234	250	160	360	100	14.7
49 26 14	16	14	13								284	260	170	395	150	20.4
49 26 25			15	14	10						384	350	225	450	250	24.4
49 26 35				32	24	21	15	9.0			384	350	225	460	250	28.2
49 26 45							17	13	9		384	350	225	460	250	28.4



② Type 46



② Type 48



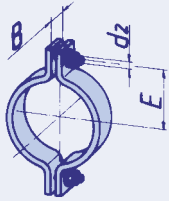
SELECTION TABLE

OD 273

Temperatures up to 650°C from page 4.46

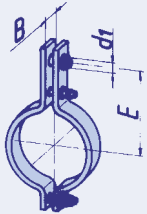
Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 273 (ND 250), types 42, 43, 44, 46, 48, 49

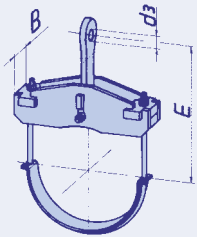


Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 27 19	6.4	4.7	3.4								M20	180	60	4.7	3-4

Heat resistant materials see page 4.3

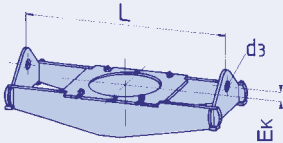


Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 27 18	9.3	9.0	8.5								16	340	70	12.5	1-3
43 27 19	29	18	14								24	340	70	12.5	3-6
43 27 29				13	8.8						24	415	70	11.0	3-6



Type	permissible load (kN)										d3	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
44 27 12	26	21	16								34	340	75	10	4-6
44 27 13	59	54	42								46	360	110	20	5-8
44 27 31				9	8.5	8.5	8	5			21	425	95	10	C-4
44 27 32				25	23	22	18	11			34	425	95	16	4-6
44 27 33			48	40	38	35	29	18			46	425	120	25	5-8
44 27 41								8	6	5	21	425	104	13	C-4
44 27 42								20	15	11	34	425	115	19	4-6
44 27 43								49	33	24	46	425	130	27	5-8

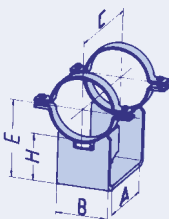
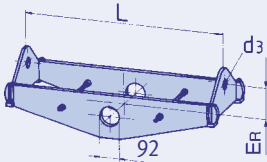
② Type 46



Type	permissible load (kN)										L		kg ^①		load group			
	100	250	350	450	500	510	530	560	580	600°C	d3	Ek	Er	min.		max.	min.	max.
4. 27 11	35	28	20								25	35	105	550	1150	27	57	3-5
4. 27 12	53	42	30								34	45	130	550	1150	33	70	4-6
4. 27 21			41	36	26						25	45	140	600	1300	37	76	3-5
4. 27 22			54	50	36						34	50	150	600	1300	47	95	4-6
4. 27 31					20	15	8				25	30	120	600	1400	36	68	3-5
4. 27 32				41	35	25	15				25	50	150	600	1400	48	96	3-5
4. 27 33				59	49	36	21				41	50	160	600	1400	58	122	4-7
4. 27 34				100	84	61	36				46	70	185	600	1400	90	175	5-8
4. 27 41							14	10	8		25	30	140	600	1400	37	76	3-5
4. 27 42							27	20	15		25	50	175	600	1400	52	113	3-5
4. 27 43							38	28	21		41	50	165	600	1400	66	139	4-7
4. 27 44							65	49	36		46	70	205	600	1400	96	206	5-8

① Weights for type 46 - for type 48 approx. 22% less.

② Type 48



Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 27 13	8.5	7.3	6.9								237	250	160	360	100	14.8
49 27 14	16	14	13								287	260	170	395	150	20.5
49 27 25			15	14	10						387	350	225	450	250	24.5
49 27 35				32	24	21	15	9.0			387	350	225	460	250	28.3
49 27 45								17	11	9	387	350	225	460	250	28.7

SELECTION TABLE

OD 323.9

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 323.9 (ND 300), types 42, 43, 44, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 32 19	5.7	4.2	3.0								M20	205	60	5.3	3-4

Heat resistant materials see page 4.3

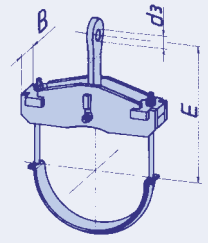
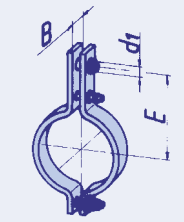
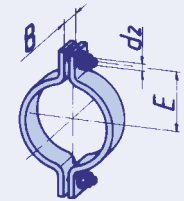
Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 32 18	9.3	9.0	8.5								16	375	80	16.0	1-3
43 32 19	30	22	16								24	375	80	16.0	3-6
43 32 29			18	17	11						24	440	70	15.0	3-6

Type	permissible load (kN)										d3	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
44 32 12	37	32	23								46	375	70	17	5-8	
44 32 13	70	60	50								51	390	115	28	6-9	
44 32 31				21	20	19	17	10			25	470	110	19	3-5	
44 32 32				37	35	32	27	17			41	470	115	27	5-7	
44 32 33			70	60	58	54	47	29			46	470	160	47	5-8	
44 32 41								20	15	10	25	470	115	22	3-5	
44 32 42								33	24	17	41	470	130	31	5-7	
44 32 43								59	55	41	29	46	470	170	52	5-8

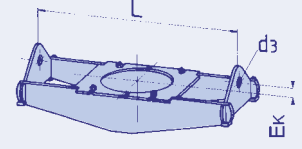
Type	permissible load (kN)										d3	E _K	E _R	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4. 32 11	30	23	17								25	35	120	600	1200	30	57	3-5
4. 32 12	53	42	30								34	40	140	600	1200	40	75	4-6
4. 32 13	84	62	46								41	55	135	600	1200	52	94	5-7
4. 32 21				27	20						25	30	120	700	1300	43	72	3-5
4. 32 22			60	51	37						34	30	150	700	1300	58	107	4-6
4. 32 23			83	70	51						46	30	160	700	1300	75	128	5-8
4. 32 31						28	21	12			25	50	150	700	1400	52	90	3-5
4. 32 32				63	51	38	22				41	50	180	700	1400	79	136	4-7
4. 32 33				85	69	51	30				46	50	195	700	1400	91	167	5-8
4. 32 34				110	95	70	39				46	50	205	700	1400	108	192	5-8
4. 32 35				145	119	88	51				51	50	200	800	1400	149	240	6-9
4. 32 41							21	16	12		25	50	165	700	1400	56	107	3-5
4. 32 42							40	29	22		41	50	180	700	1400	84	155	4-7
4. 32 43							54	40	30		46	50	210	700	1400	99	192	5-8
4. 32 44							70	53	39		46	50	225	700	1400	117	226	5-8
4. 32 45							93	70	51		51	50	235	800	1400	156	271	6-9

① Weights for type 46 - for type 48 approx. 22% less.

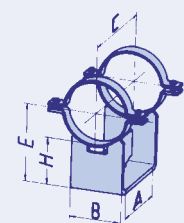
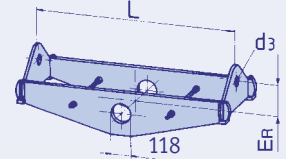
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 32 13	13	11	10								262	250	180	375	100	18.1
49 32 14	20	17	16								362	260	225	395	200	27.8
49 32 25			20	18	13						412	350	245	450	250	27.0
49 32 35				35	32	28	21	12			412	350	250	460	250	31.3
49 32 45								22	16	12	412	350	250	460	250	32.5



② Type 46



② Type 48



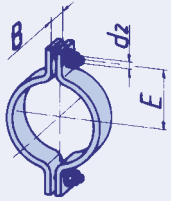
SELECTION TABLE

OD 355.6

Temperatures up to 650°C from page 4.46

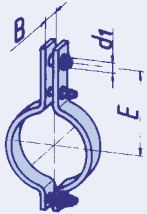
Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 355.6 (ND 350), types 42, 43, 44, 46, 48, 49

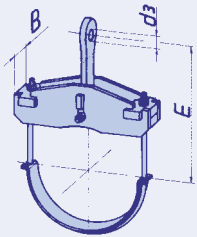


Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 36 19	5.3	3.9	2.8								M20	220	60	5.7	3-4

Heat resistant materials see page 4.3

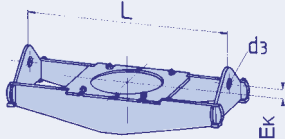


Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 36 18	9.3	9.0	8.5								16	390	90	19.0	1-3
43 36 19	31	23	16								24	390	90	19.0	3-6
43 36 29			22	20	13						24	470	90	20.5	3-6



Type	permissible load (kN)										d3	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
44 36 12	44	38	28								46	400	75	20	6-8	
44 36 13	70	60	53								51	420	115	30	6-9	
44 36 31				21	20	19	17	10			25	485	110	21	3-5	
44 36 32				39	37	35	28	17			41	485	120	31	5-7	
44 36 33			70	60	58	54	47	29			46	485	160	49	5-8	
44 36 41								20	15	10	25	485	115	24	3-5	
44 36 42								33	24	17	41	485	130	32	5-7	
44 36 43								59	55	42	29	46	485	170	55	5-8

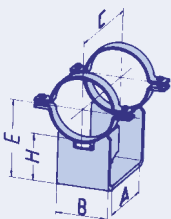
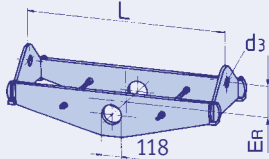
② Type 46



Type	permissible load (kN)										L				kg ^①	load group		
	100	250	350	450	500	510	530	560	580	600°C	d3	Ek	Er	min.			max.	min.
4. ② 36 11	37	29	21								34	35	120	700	1300	43	72	4-6
4. 36 12	66	50	38								34	40	130	700	1300	53	100	4-6
4. 36 13	93	73	53								46	60	145	700	1300	67	120	6-8
4. 36 21				24	17						25	30	115	700	1400	38	73	3-5
4. 36 22				33	24						34	40	140	700	1400	58	95	4-6
4. 36 23				75	65	47					41	40	155	800	1400	85	135	5-7
4. 36 24				94	80	59					51	45	160	800	1400	95	155	6-9
4. 36 31						24	17	10			25	40	135	700	1500	52	92	3-5
4. 36 32						32	24	14			34	50	160	700	1500	64	118	4-6
4. 36 33						67	56	41	24		41	60	180	800	1500	94	160	4-7
4. 36 34						113	95	69	40		46	60	205	800	1500	124	228	5-8
4. 36 35						166	135	100	59		51	70	230	800	1500	177	290	6-9
4. 36 41							18	13	10		25	40	155	700	1500	56	103	3-5
4. 36 42							25	19	14		34	50	170	700	1500	68	130	4-6
4. 36 43							43	32	24		41	60	190	800	1500	105	184	4-7
4. 36 44							72	54	40		46	60	240	800	1500	137	254	5-8
4. 36 45							107	80	59		51	70	245	800	1500	188	339	6-9

① Weights for type 46 - for type 48 approx. 23% less.

② Type 48



Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 36 13	22	19	18								278	300	230	440	100	26
49 36 14	27	23	22								378	300	235	455	200	35
49 36 25			26	23	17						428	400	260	510	250	34
49 36 35				45	41	36	26	15			478	400	280	525	300	44
49 36 45								28	21	15	478	400	280	525	300	46

SELECTION TABLE OD 368

Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 368 (ND 350), types 42, 43, 44, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 37 19	5.1	3.9	2.8								M20	225	60	5.8	3-4

Heat resistant materials see page 4.3

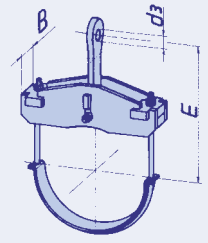
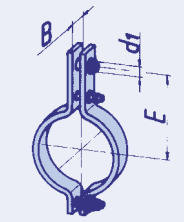
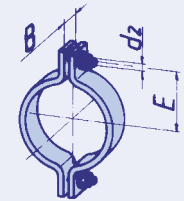
Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 37 18	9.3	9.0	8.5								16	395	90	18.5	1-3
43 37 19	30	22	16								24	395	90	18.5	3-6
43 37 29			22	20	13						24	475	90	20.5	3-6

Type	permissible load (kN)										d3	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
44 37 12	44	38	27								46	400	75	20	6-8
44 37 13	70	60	53								51	420	115	31	6-9
44 37 31				21	20	19	17	10			25	490	110	21	3-5
44 37 32				39	37	35	28	18			41	490	120	31	5-7
44 37 33			71	60	58	54	47	29			46	490	160	50	5-8
44 37 41								20	15	10	25	490	115	24	3-5
44 37 42								33	24	18	41	490	130	33	5-7
44 37 43								59	55	42	46	490	170	55	5-8

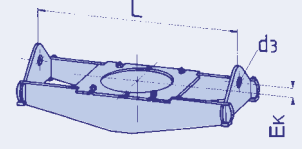
Type	permissible load (kN)										L		kg ^①		load group			
	100	250	350	450	500	510	530	560	580	600°C	d3	E _k	E _r	min.		max.	min.	max.
4. ② 37 11	37	29	21								34	35	120	700	1300	45	73	4-6
4. 37 12	66	50	38								34	40	130	700	1300	55	100	4-6
4. 37 13	93	72	53								46	60	145	700	1300	68	122	6-8
4. 37 21				24	17						25	30	115	700	1400	39	75	3-5
4. 37 22				33	24						34	40	140	700	1400	50	89	4-6
4. 37 23			75	65	47						41	40	155	800	1400	80	138	5-7
4. 37 24			94	80	59						46	45	160	800	1400	97	157	6-8
4. 37 31						24	17	10			25	40	135	750	1500	55	93	3-5
4. 37 32						32	24	14			34	50	160	750	1500	67	116	4-6
4. 37 33				69	56	41	24				41	60	180	750	1500	91	163	4-7
4. 37 34				113	95	69	40				46	60	220	750	1500	125	232	5-8
4. 37 35				166	135	100	59				51	70	230	850	1500	184	295	6-9
4. 37 41							18	13	10		25	40	155	750	1500	59	105	3-5
4. 37 42							25	19	14		34	50	170	750	1500	72	132	4-6
4. 37 43							43	32	24		41	60	190	750	1500	101	182	4-7
4. 37 44							72	54	40		46	60	240	750	1500	137	258	5-8
4. 37 45							106	80	59		51	70	245	850	1500	198	343	6-9

① Weights for type 46 - for type 48 approx. 23% less.

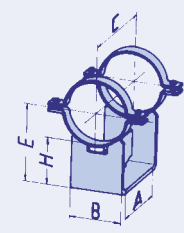
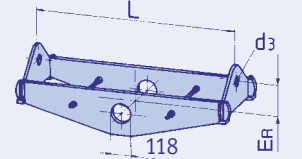
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 37 13	22	19	18								284	300	230	440	100	26
49 37 14	28	24	23								384	300	240	455	200	35
49 37 25			26	24	18						434	400	260	510	250	35
49 37 35				46	42	37	27	16			484	400	290	525	300	46
49 37 45								30	22	16	484	400	290	525	300	48



② Type 46



② Type 48



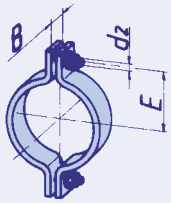
SELECTION TABLE

OD 406.4

Temperatures up to 650°C from page 4.46

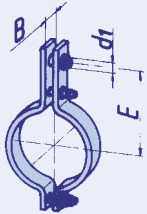
Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 406.4 (ND 400), types 42, 43, 44, 46, 48, 49

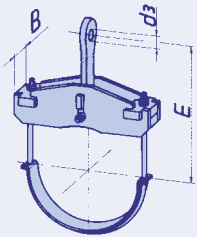


Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 41 19	8.0	6.3	4.5								M24	255	70	9.7	3-5

Heat resistant materials see page 4.3

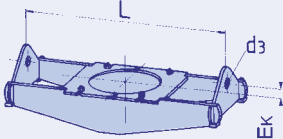


Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 41 18	9.3	9.0	8.5								16	430	100	23.0	1-3
43 41 19	31	23	16								24	430	100	23.0	3-6
43 41 29			22	20	13						24	500	100	24.5	3-6



Type	permissible load (kN)										d3	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
44 41 12	59	45	37								51	440	80	26	6-9	
44 41 13	86	76	61								61	450	115	34	7-10	
44 41 22				26	24						41	500	115	25	5-7	
44 41 23				48	38						51	500	130	38	6-9	
44 41 31						19	17	10			25	520	110	23	3-5	
44 41 35					40	38	34	23			46	520	140	43	5-8	
44 41 36					66	63	58	38			51	520	145	62	6-9	
44 41 41								19	14	10	25	520	115	26	3-5	
44 41 45								41	30	23	46	520	145	58	5-8	
44 41 46								97	62	46	34	51	520	185	89	6-9

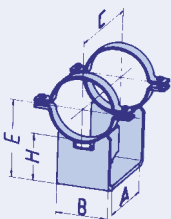
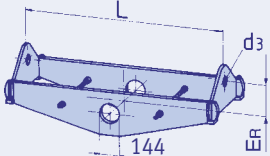
② Type 46



Type	permissible load (kN)										d3	Ek	Er	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4. ② 41 11	44	35	25								34	30	155	800	1400	59	89	4-6
4. 41 12	72	55	41								41	40	160	800	1400	71	122	5-7
4. 41 13	110	84	63								46	55	175	800	1400	94	142	6-8
4. 41 21			28	20							25	40	145	800	1500	58	92	3-5
4. 41 22			39	28							34	40	150	800	1500	75	120	4-6
4. 41 23		89	77	55							41	50	180	850	1500	108	176	5-7
4. 41 24		111	95	69							46	60	180	850	1500	121	200	6-8
4. 41 31				28	20	12					25	45	160	800	1600	70	117	3-5
4. 41 32				45	35	20					41	50	180	800	1600	99	165	4-7
4. 41 33				79	65	48	28				46	70	200	800	1600	121	208	5-8
4. 41 34				112	95	69	40				46	70	220	800	1600	149	250	5-8
4. 41 35				194	160	118	69				51	80	260	900	1600	227	380	6-9
4. 41 41							21	16	12		25	45	175	800	1600	77	136	3-5
4. 41 42							36	27	20		41	50	205	800	1600	108	189	4-7
4. 41 43							50	38	28		46	70	225	800	1600	132	236	5-8
4. 41 44							72	54	40		46	70	225	800	1600	166	292	5-8
4. 41 45							125	94	69		51	80	265	900	1600	250	426	6-9

① Weights for type 46 - for type 48 approx. 21% less.

② Type 48



Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 41 13	26	22	21								303	300	260	450	100	35
49 41 14	48	38	35								403	300	240	480	200	45
49 41 25			37	26	21						453	400	270	530	250	47
49 41 35				60	52	46	34	20			503	400	300	550	300	64
49 41 45								40	30	20	503	400	300	550	300	64

SELECTION TABLE OD 419

Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 419 (ND 400), types 42, 43, 44, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 42 19	8.0	6.2	4.4								M24	260	70	9.7	3-5

Heat resistant materials see page 4.3

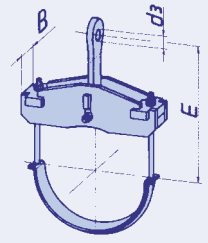
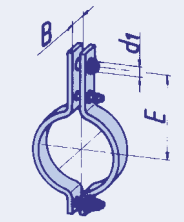
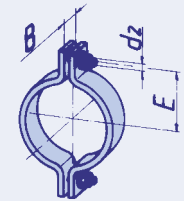
Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 42 18	9.3	9.0	8.5								16	435	100	23	1-3
43 42 19	30	23	16								24	435	100	23	3-6
43 42 29			22	20	13						24	500	100	24	3-6

Type	permissible load (kN)										d3	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
44 42 12	59	45	37								51	445	80	26	6-9	
44 42 15	150	110	82								61	460	145	60	7-10	
44 42 22				26	24						41	500	115	26	5-7	
44 42 25				56	50						51	500	140	45	6-9	
44 42 31						19	17	10			25	525	110	23	3-5	
44 42 35						40	34	24			46	525	140	43	5-8	
44 42 36					68	65	58	39			51	525	145	63	6-9	
44 42 41								19	14	10	25	525	115	27	3-5	
44 42 45								41	30	23	46	525	145	58	5-8	
44 42 46								98	62	46	34	51	525	185	93	6-9

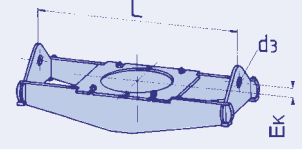
Type	permissible load (kN)										L		kg ^①		load group			
	100	250	350	450	500	510	530	560	580	600°C	d3	E _K	E _R	min.		max.	min.	max.
4. 42 11	44	35	25								34	30	155	800	1400	59	92	4-6
4. 42 12	72	55	41								41	40	160	800	1400	71	120	5-7
4. 42 13	110	84	63								46	55	175	800	1400	95	147	6-8
4. 42 21			28	20							25	40	145	800	1500	60	92	3-5
4. 42 22			39	28							34	40	150	800	1500	76	118	4-6
4. 42 23			89	77	55						41	50	180	850	1500	105	174	5-7
4. 42 24			111	95	69						46	60	180	850	1500	126	204	6-8
4. 42 31					28	20	12				25	45	160	800	1600	72	119	3-5
4. 42 32					45	35	20				41	50	180	800	1600	96	167	4-7
4. 42 33				79	65	48	28				46	70	200	800	1600	123	205	5-8
4. 42 34				113	95	69	40				46	70	220	900	1600	160	265	5-8
4. 42 35				194	160	118	69				51	80	260	900	1600	232	385	6-9
4. 42 41						21	16	12			25	45	175	800	1600	78	138	3-5
4. 42 42						36	27	20			41	50	205	800	1600	107	187	4-7
4. 42 43						50	38	28			46	70	225	800	1600	135	239	5-8
4. 42 44						72	54	40			46	70	225	900	1600	178	296	5-8
4. 42 45						125	94	69			51	80	265	900	1600	255	431	6-9

① Weights for type 46 - for type 48 approx. 21% less.

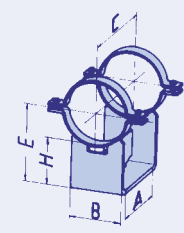
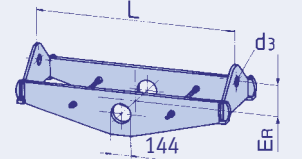
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 42 13	33	26	22								310	300	240	420	100	31
49 42 14	48	38	35								410	300	240	480	200	46
49 42 25			37	29	23						460	400	270	530	250	48
49 42 35				60	57	51	38	22			510	400	300	550	300	65
49 42 45							42	32	22		510	400	300	550	300	65



② Type 46



② Type 48



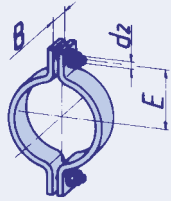
SELECTION TABLE

OD 457.2

Temperatures up to 650°C from page 4.46

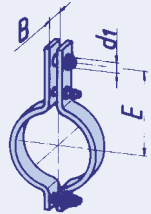
Twice the specified load is possible by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 457.2 (ND 450), types 42, 43, 44, 46, 48, 49

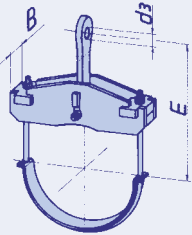


Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 46 19	7.7	5.8	4.1								M24	280	70	10.4	3-5

Heat resistant materials see page 4.3

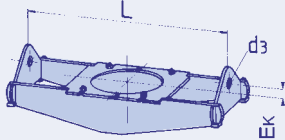


Type	permissible load (kN)										d1	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
43 46 18	9.3	9.0	8.5								16	450	100	24	1-3
43 46 19	29	21	15								24	450	100	24	3-6

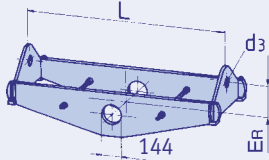


Type	permissible load (kN)										d3	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
44 46 12	59	50	38								51	470	110	30	6-9	
44 46 13	70	62	49								51	470	115	35	7-9	
44 46 15	150	110	82								61	480	145	62	7-10	
44 46 22				22	20						41	540	95	24	5-7	
44 46 23				44	37						51	540	120	35	6-9	
44 46 25				55	50						51	540	135	45	6-9	
44 46 31						14	13	10			25	560	100	25	3-5	
44 46 32						32	29	18			46	560	130	40	5-8	
44 46 35					62	60	57	35			51	560	145	65	6-9	
44 46 36					101	100	94	58			51	560	205	112	6-9	
44 46 41								18	14	10	25	560	115	29	3-5	
44 46 42								32	24	18	46	560	140	44	5-8	
44 46 45								62	46	34	51	560	185	93	6-9	
44 46 46								117	90	66	49	51	560	215	143	6-9

② Type 46



② Type 48



Type	permissible load (kN)										d3	Ek	Er	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4. 46 11	45	35	25								34	35	150	850	1450	68	106	4-6
4. 46 12	59	46	33								41	40	155	850	1450	75	115	5-7
4. 46 13	120	92	69								46	50	170	850	1450	112	166	6-8
4. 46 14	150	112	88								51	60	185	850	1450	122	199	6-9
4. 46 21				34	24						34	45	160	850	1600	80	125	4-6
4. 46 22				54	40						41	50	170	850	1600	103	162	5-7
4. 46 23				129	109	80					46	55	185	950	1600	161	247	6-8
4. 46 24				149	125	90					51	55	200	950	1600	175	289	7-9
4. 46 31					46	34	20				41	50	180	900	1700	118	185	4-7
4. 46 32					54	40	23				46	50	190	900	1700	133	208	5-8
4. 46 33					113	95	69	40			46	60	220	900	1700	186	290	5-8
4. 46 34					227	185	137	80			51	70	245	1000	1700	307	465	6-9
4. 46 35					257	210	154	90			61	85	250	1000	1700	340	520	7-10
4. 46 41							36	27	20		41	50	195	900	1700	130	213	4-7
4. 46 42							41	31	23		46	50	210	900	1700	143	244	5-8
4. 46 43							72	54	40		46	60	235	900	1700	199	329	5-8
4. 46 44							145	109	80		51	70	295	1000	1700	322	533	6-9
4. 46 45							163	122	90		61	85	295	1000	1700	361	584	7-10

① Weights for type 46 - for type 48 approx. 24% less.

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 46 13	36	32	23								329	350	240	485	100	36
49 46 14	67	51	37								429	350	260	500	200	49
49 46 25			40	34	27						479	400	290	535	250	51
49 46 35				67	64	61	45	26			529	400	320	550	300	68
49 46 45								48	36	26	529	400	320	550	300	69

SELECTION TABLE OD 508

Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 508 (ND 500), types 42, 44, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 51 19	7.2	5.4	3.8								M24	305	70	11.4	3-5

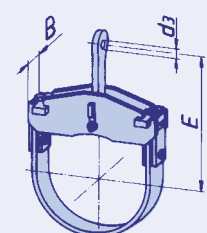
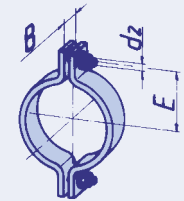
Heat resistant materials see page 4.3

Type	permissible load (kN)										d3	E	B	kg	load group		
	100	250	350	450	500	510	530	560	580	600°C							
44 51 14	10	8	7								21	500	80	25	1-4		
44 51 15	29	24	17								34	500	80	27	4-6		
44 51 16	57	46	35								51	500	90	35	6-9		
44 51 17	98	72	60								61	500	120	56	7-10		
44 51 18	196	150	120								71	520	195	106	8-30		
44 51 25				13	10						25	570	100	28	3-5		
44 51 26				22	20						41	570	100	31	5-7		
44 51 27				45	40						51	570	120	42	6-9		
44 51 28				95	80						61	570	160	75	7-10		
44 51 35						17	16	10			25	590	125	37	3-5		
44 51 36						36	33	20			46	590	140	48	5-8		
44 51 37						83	79	62	40		51	590	190	81	6-9		
44 51 38						131	110	94	60		61	590	195	115	7-10		
44 51 45									19	15	25	590	130	42	3-5		
44 51 46									38	29	46	590	145	62	5-8		
44 51 47									63	46	51	590	195	106	6-9		
44 51 48									181	121	90	65	61	590	235	183	7-10

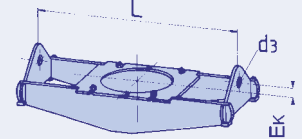
Type	permissible load (kN)										d3	E _K	E _R	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4.②5111	45	35	25								34	35	160	900	1500	84	120	4-6
4. 51 12	68	51	37								41	40	175	900	1500	89	139	5-7
4. 51 13	120	92	67								46	60	175	900	1500	128	175	6-8
4. 51 14	170	125	100								51	65	180	900	1500	143	215	6-9
4. 51 21				40	29						34	50	170	950	1650	104	149	4-6
4. 51 22				54	40						41	60	180	950	1650	122	185	5-7
4. 51 23				127	109	79					46	60	200	1050	1650	185	292	6-8
4. 51 24				156	134	98					61	60	220	1050	1650	230	325	7-10
4. 51 31						45	35	20			41	60	200	1000	1800	139	210	4-7
4. 51 32						54	40	23			46	70	200	1000	1800	155	235	5-8
4. 51 33						113	90	69	40		46	80	230	1000	1800	210	330	5-8
4. 51 34						227	185	137	80		51	80	265	1050	1800	330	518	6-9
4. 51 35						283	230	170	100		61	90	300	1050	1800	400	600	7-10
4. 51 41								36	27	20	41	60	210	1000	1800	152	239	4-7
4. 51 42								41	31	23	46	70	225	1000	1800	171	272	5-8
4. 51 43								72	54	40	46	80	250	1000	1800	232	383	5-8
4. 51 44								145	109	80	51	80	315	1050	1800	367	594	6-9
4. 51 45								182	137	100	61	90	315	1050	1800	434	693	7-10

① Weights for type 46 - for type 48 approx. 23% less.

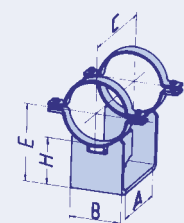
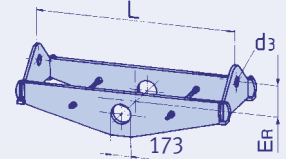
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 51 13	45	36	26								354	350	240	500	100	41
49 51 14	82	62	45								454	350	280	500	200	53
49 51 25			53	43	34						554	400	330	550	300	70
49 51 35				83	79	74	55	32			554	400	330	565	300	81
49 51 45								68	50	32	554	400	330	580	300	87



② Type 46



② Type 48

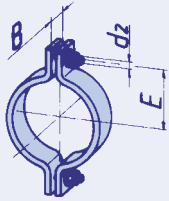


SELECTION TABLE OD 558.8

Temperatures up to
650°C from page 4.46

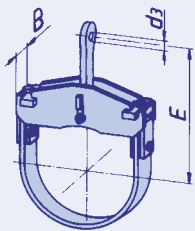
Twice the specified load is possible
by use of type 77 (see page 4.55)

Pipe clamps, clamp bases, OD 558.8 (ND 550), types 42, 44, 46, 48, 49



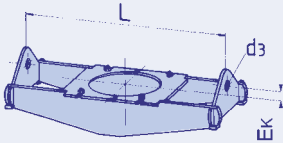
Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 56 19	18	13	9.9								M30	350	90	24	5-6

Heat resistant materials see page 4.3



Type	permissible load (kN)										d3	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
44 56 14	20	17	15								34	530	85	31	3-6	
44 56 15	44	35	26								46	530	90	35	5-8	
44 56 16	74	60	45								51	530	110	44	6-9	
44 56 17	100	77	62								61	530	120	60	7-10	
44 56 18	196	160	120								71	545	195	106	8-30	
44 56 25				19	18						34	600	100	33	4-6	
44 56 26				45	40						51	600	120	45	6-9	
44 56 27				53	50						51	600	130	49	6-9	
44 56 28				90	80						61	600	160	78	7-10	
44 56 35						36	33	20			46	620	135	50	5-8	
44 56 36					83	79	62	40			51	620	190	87	6-9	
44 56 37					120	105	82	55			61	620	195	118	7-10	
44 56 38					155	150	130	80			61	620	215	162	7-10	
44 56 45								40	29	20	46	620	145	67	5-8	
44 56 46								63	47	35	51	620	195	119	6-9	
44 56 47								141	90	66	50	61	620	205	148	7-10
44 56 48								200	127	94	70	61	620	245	206	7-10

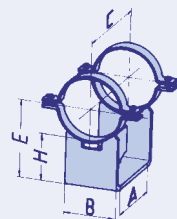
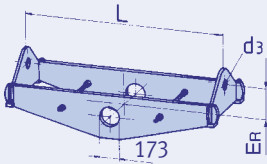
② Type 46



Type	permissible load (kN)										d3	Ek	Er	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4.②5611	45	34	25								34	40	170	950	1550	80	125	4-6
4. 56 12	68	52	38								41	50	185	950	1550	100	153	5-7
4. 56 13	130	97	77								51	60	195	950	1550	145	210	6-9
4. 56 14	207	153	122								51	65	205	950	1550	178	275	7-9
4. 56 21			41	30							34	55	180	1000	1700	116	167	4-6
4. 56 22			54	40							41	60	190	1000	1700	138	200	5-7
4. 56 23			130	110	80						51	65	205	1100	1700	230	315	6-9
4. 56 24			194	165	120						51	65	240	1100	1700	278	395	7-9
4. 56 31					53	38	22				41	60	200	1100	1900	169	255	4-7
4. 56 32					70	51	30				46	60	230	1100	1900	205	325	5-8
4. 56 33					90	69	40				46	70	240	1100	1900	241	365	5-8
4. 56 34				227	185	137	80				51	90	270	1100	1900	371	570	6-9
4. 56 35				342	280	200	120				61	100	320	1200	1900	514	755	7-10
4. 56 41						39	29	22			41	60	225	1100	1900	187	291	4-7
4. 56 42						54	40	30			46	60	220	1100	1900	230	351	5-8
4. 56 43						72	54	40			46	70	260	1100	1900	269	423	5-8
4. 56 44						145	109	80			51	90	285	1100	1900	415	660	6-9
4. 56 45						217	163	120			61	100	360	1200	1900	572	865	7-10

① Weights for type 46 - for type 48 approx. 25% less.

② Type 48



Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 56 13	54	43	31								380	400	240	570	100	70
49 56 14	95	80	58								480	400	290	585	200	89
49 56 25			63	53	42						580	450	340	620	300	102
49 56 35				105	100	89	65	38			580	450	350	635	300	115
49 56 45								73	54	38	580	450	350	650	300	121

SELECTION TABLE

OD 609.6

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

4

Pipe clamps, clamp bases, OD 609.6 (ND 600), types 42, 44, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 61 19	17	13	9.3								M30	375	90	26	5-6

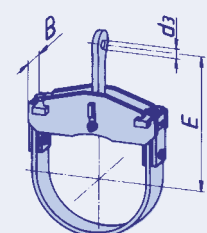
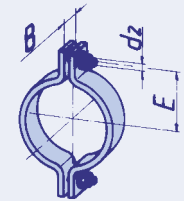
Heat resistant materials see page 4.3

Type	permissible load (kN)										d3	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
44 61 14	29	24	20								34	560	100	37	3-6
44 61 15	58	45	35								51	560	95	43	6-9
44 61 16	80	65	48								51	560	115	50	6-9
44 61 17	116	87	73								61	560	125	65	7-10
44 61 18	200	165	120								71	580	195	112	8-30
44 61 25				22	20						41	645	120	43	4-7
44 61 26				42	38						51	645	120	49	6-9
44 61 27				65	55						61	645	140	73	7-10
44 61 28				90	82						61	645	160	84	7-10
44 61 35						38	33	20			46	685	160	61	5-8
44 61 36							78	61	39		51	685	190	98	6-9
44 61 37								115	105	85	61	685	205	140	7-10
44 61 38								175	160	133	71	685	215	180	8-30
44 61 45										38	46	685	160	75	5-8
44 61 46										62	46	685	195	118	6-9
44 61 47										152	115	685	245	214	7-10
44 61 48										239	155	685	245	238	8-30

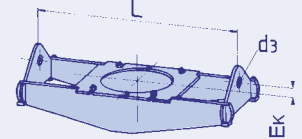
Type	permissible load (kN)										d3	E _k	E _r	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4. 61 11	60	47	34								41	40	185	1000	1600	114	168	4-7
4. 61 12	90	69	51								46	45	195	1000	1600	142	185	6-8
4. 61 13	127	96	76								51	50	190	1000	1600	166	220	6-9
4. 61 14	186	138	111								51	55	205	1000	1600	189	278	7-9
4. 61 15	223	165	132								61	65	230	1000	1600	232	320	7-10
4. 61 21				57	42						41	60	190	1100	1800	161	225	4-7
4. 61 22				110	80						51	60	220	1100	1800	254	350	6-9
4. 61 23				180	160	120					51	60	235	1100	1800	310	470	7-9
4. 61 24				230	200	150					61	70	265	1150	1800	382	525	8-10
4. 61 31						53	39	22			41	60	220	1200	2000	192	270	4-7
4. 61 32						90	69	40			46	70	235	1200	2000	277	400	5-8
4. 61 33						123	90	53			46	90	280	1200	2000	326	473	5-8
4. 61 34						220	180	132	78		51	90	285	1300	2000	431	620	6-9
4. 61 35						340	280	200	120		61	110	325	1300	2000	580	830	7-10
4. 61 36						420	350	260	150		71	110	360	1300	2000	691	970	8-30
4. 61 41							39	30	22		41	60	230	1200	2000	213	318	4-7
4. 61 42							72	54	40		46	70	275	1200	2000	304	466	5-8
4. 61 43							96	72	53		46	90	280	1200	2000	368	545	5-8
4. 61 44							141	106	78		51	90	295	1300	2000	490	715	6-9
4. 61 45							217	163	120		61	110	355	1300	2000	653	960	7-10
4. 61 46							272	205	150		71	110	365	1300	2000	774	1135	8-30

① Weights for type 46 - for type 48 approx. 26% less.

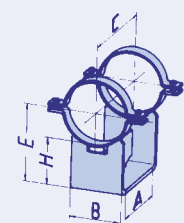
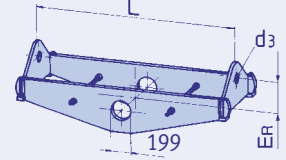
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 61 13	62	58	48								455	400	270	570	150	79
49 61 14	105	80	58								505	400	310	585	200	95
49 61 25			65	61	48						605	450	360	620	300	107
49 61 35				108	102	98	76	45			605	450	370	635	300	120
49 61 45							83	62	45		605	450	370	650	300	129



② Type 46



② Type 48



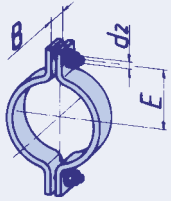
SELECTION TABLE

OD 660.4

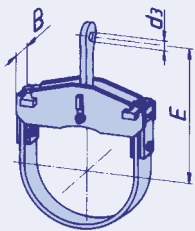
Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

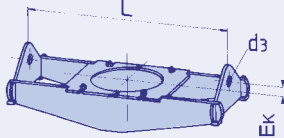
Pipe clamps, clamp bases, OD 660.4 (ND 650), types 42, 44, 46, 48, 49



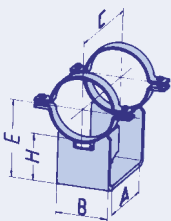
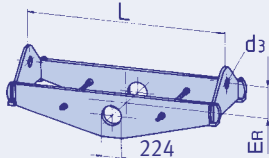
Heat resistant materials see page 4.3



② Type 46



② Type 48



Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 66 19	16	12	8.8								M30	400	90	28	5-6

Type	permissible load (kN)										d3	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
44 66 14	35	28	24								41	610	100	40	4-7	
44 66 15	56	44	34								51	610	95	47	6-9	
44 66 16	82	65	53								51	610	120	65	6-9	
44 66 17	128	95	78								61	610	150	77	7-10	
44 66 18	179	135	105								71	610	195	115	8-30	
44 66 19	304	240	180								71	635	215	170	9-30	
44 66 25				22	20						41	680	120	44	4-7	
44 66 26				45	40						51	680	130	54	6-9	
44 66 27				75	70						61	680	155	82	7-10	
44 66 28				132	120						71	680	195	133	8-30	
44 66 35						40	35	20			46	700	160	64	5-8	
44 66 36						83	70	42			51	700	195	124	6-9	
44 66 37						114	86	60			61	700	205	145	7-10	
44 66 38				175	160	133	90				71	700	215	188	8-30	
44 66 45								39	29	20	46	700	160	79	5-8	
44 66 46								77	58	42	51	700	205	157	6-9	
44 66 47								158	121	88	61	700	245	217	7-10	
44 66 48								242	157	115	86	71	700	245	244	8-30

Type	permissible load (kN)										L		kg ^①		load group			
	100	250	350	450	500	510	530	560	580	600°C	d3	E _k	E _r	min.		max.	min.	max.
4. 66 11	60	46	33								41	40	200	1050	1650	127	160	5-7
4. 66 12	90	70	51								46	50	215	1050	1650	153	198	6-8
4. 66 13	135	100	80								51	55	200	1050	1650	180	255	6-9
4. 66 14	215	155	125								61	60	245	1050	1650	258	335	7-10
4. 66 15	256	190	150								61	70	235	1050	1650	263	370	8-10
4. 66 21			63	45							41	65	220	1250	1900	196	269	4-7
4. 66 22			110	80							51	65	245	1250	1900	291	390	6-9
4. 66 23		190	160	120							51	70	260	1250	1900	356	488	7-9
4. 66 24		240	200	150							61	80	270	1300	1900	415	585	8-10
4. 66 31				60	47	25					41	65	225	1250	2050	229	335	4-7
4. 66 32				90	69	40					46	65	245	1250	2050	303	433	5-8
4. 66 33				155	125	92	55				46	90	290	1250	2050	363	532	5-8
4. 66 34				225	185	137	80				51	90	305	1250	2050	471	675	6-9
4. 66 35				340	280	200	120				61	100	315	1350	2050	632	895	7-10
4. 66 36				420	350	260	150				71	110	355	1350	2050	748	1055	8-30
4. 66 41							45	34	25		41	65	235	1250	2050	245	366	4-7
4. 66 42							72	54	40		46	65	285	1250	2050	335	495	5-8
4. 66 43							99	75	55		46	90	295	1250	2050	405	590	5-8
4. 66 44							146	110	80		51	90	315	1250	2050	515	775	6-9
4. 66 45							218	164	120		61	100	350	1350	2050	705	1020	7-10
4. 66 46							272	205	150		71	110	360	1350	2050	835	1210	8-30

① Weights for type 46 - for type 48 approx. 23% less.

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 66 13	74	65	48								480	400	300	570	150	85
49 66 14	120	92	67								530	400	330	585	200	100
49 66 25			74	66	57						630	450	370	620	300	112
49 66 35				127	120	115	89	52			630	450	380	650	300	134
49 66 45								96	72	52	630	450	380	650	300	137

SELECTION TABLE OD 711.2

Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

4

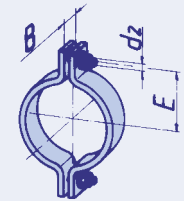
Pipe clamps, clamp bases, OD 711.2 (ND 700), types 42, 44, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 71 19	15	11	8.1								M30	430	90	30	5-6

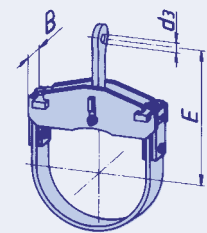
Type	permissible load (kN)										d3	E	B	kg	load group			
	100	250	350	450	500	510	530	560	580	600°C								
44 71 14	43	36	30								41	630	105	57	4-7			
44 71 15	95	75	60								51	630	120	71	6-9			
44 71 16	124	88	72								61	630	130	81	7-10			
44 71 17	150	120	88								71	630	165	98	8-30			
44 71 18	177	145	115								71	630	195	121	8-30			
44 71 19	307	225	180								71	650	225	186	9-30			
44 71 25				26	24						41	720	120	50	5-7			
44 71 26				43	40						51	720	135	62	6-9			
44 71 27				65	60						61	720	145	88	7-10			
44 71 28				95	80						71	720	160	99	8-30			
44 71 29				131	120						71	720	195	140	8-30			
44 71 35						40	35	25			46	740	160	70	5-8			
44 71 36							72	62	40		51	740	190	107	6-9			
44 71 37								105	85	60	61	740	205	154	7-10			
44 71 38					165	155	125	80			71	740	215	195	8-30			
44 71 39					225	195	170	107			71	740	255	253	9-30			
44 71 45									42	31	23	46	740	170	95	5-8		
44 71 46									89	66	47	51	740	215	179	6-9		
44 71 47										127	94	68	61	740	255	239	7-10	
44 71 48										239	156	115	86	71	740	245	256	8-30

Type	permissible load (kN)										d3	E _K	E _R	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4. 71 11	74	57	42								41	45	195	1100	1700	155	198	5-7
4. 71 12	118	90	70								46	55	240	1100	1700	185	250	6-8
4. 71 13	180	133	105								51	60	225	1100	1700	235	339	7-9
4. 71 14	236	175	142								51	80	230	1100	1700	277	385	7-9
4. 71 15	275	200	160								61	90	215	1100	1700	299	420	8-10
4. 71 21				70	50						46	70	220	1250	2000	232	315	5-8
4. 71 22				110	80						51	70	240	1250	2000	315	428	6-9
4. 71 23				195	170	125					51	70	250	1350	2000	404	570	7-9
4. 71 24				240	195	156					61	90	280	1350	2000	491	650	8-10
4. 71 31						60	46	27			41	70	235	1300	2100	257	367	4-7
4. 71 32						90	69	40			46	70	250	1300	2100	336	465	5-8
4. 71 33						175	140	105	63		51	100	285	1300	2100	450	645	6-9
4. 71 34						225	185	137	80		51	100	305	1400	2100	536	725	6-9
4. 71 35						340	280	200	120		61	100	335	1400	2100	689	960	7-10
4. 71 36						440	365	270	156		71	130	345	1450	2100	856	1160	8-30
4. 71 41							49	37	27		41	70	240	1300	2100	286	411	4-7
4. 71 42							72	54	40		46	70	290	1300	2100	364	530	5-8
4. 71 43							115	86	63		51	100	305	1300	2100	497	725	6-9
4. 71 44							145	109	80		51	100	315	1400	2100	582	825	6-9
4. 71 45							217	163	120		61	100	355	1400	2100	766	1090	7-10
4. 71 46							283	213	156		71	130	370	1450	2100	944	1325	8-30

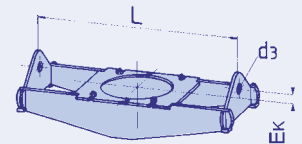
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 71 13	85	67	49								506	400	320	570	150	90
49 71 14	130	100	72								556	400	350	585	200	107
49 71 25			92	82	65						656	450	390	635	300	130
49 71 35				150	142	135	99	58			656	450	410	650	300	145
49 71 45								108	81	58	656	450	410	650	300	148



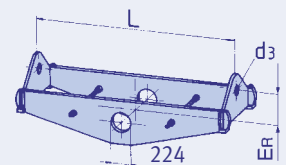
Heat resistant materials
see page 4.3



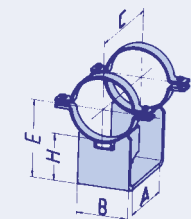
② Type 46



② Type 48



① Weights for type 46 - for
type 48 approx. 26% less.

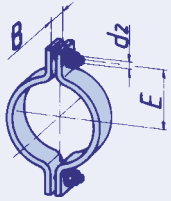


SELECTION TABLE OD 762

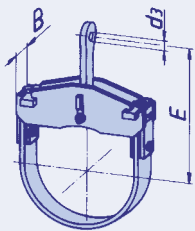
Temperatures up to
650°C from page 4.46

Twice the specified load is possible
by use of type 77 (see page 4.55)

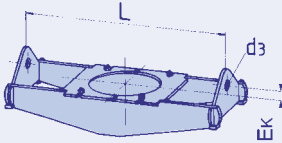
Pipe clamps, clamp bases, OD 762 (ND 750), types 42, 44, 46, 48, 49



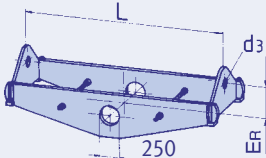
Heat resistant materials
see page 4.3



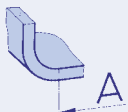
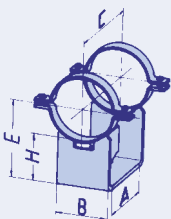
② Type 46



② Type 48



① Weights for type 46 - for
type 48 approx. 24% less.



Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 76 19	14	10	7.7								M30	455	90	31	5-6

Type	permissible load (kN)										d3	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
44 76 14	54	42	33								41	670	135	70	4-7	
44 76 15	83	67	53								51	670	120	72	6-9	
44 76 16	115	88	72								61	670	130	85	7-10	
44 76 17	150	115	88								71	670	165	104	8-30	
44 76 18	195	155	120								71	670	195	130	8-30	
44 76 19	307	225	180								71	690	210	186	9-30	
44 76 25				43	40						51	760	135	65	6-9	
44 76 26				64	60						61	760	145	91	7-10	
44 76 27				95	80						71	760	160	112	8-30	
44 76 28				120	100						71	760	195	148	8-30	
44 76 29			220	185	165						71	760	215	201	9-30	
44 76 35						40	39	26			46	770	170	84	5-8	
44 76 36						72	64	40			51	770	190	122	6-9	
44 76 37						105	95	60			61	770	205	162	7-10	
44 76 38						160	135	90			71	770	225	217	8-30	
44 76 39					235	218	180	119			71	770	255	293	9-30	
44 76 45								50	38	27	46	770	195	131	5-8	
44 76 46								90	66	47	51	770	215	187	6-9	
44 76 47								127	93	68	61	770	255	249	7-10	
44 76 48								230	158	116	86	71	770	255	281	8-30
44 76 49								335	215	159	119	71	770	275	372	9-30

Type	permissible load (kN)										L		kg ^①		load group			
	100	250	350	450	500	510	530	560	580	600°C	d3	Ek	Er	min.		max.	min.	max.
4.②7611	74	57	42								41	45	215	1150	1750	170	223	5-7
4. 76 12	120	91	69								46	55	215	1150	1750	218	280	6-8
4. 76 13	183	135	105								51	65	245	1150	1750	262	353	7-9
4. 76 14	245	180	140								51	80	260	1150	1750	308	442	7-9
4. 76 15	310	230	185								61	90	255	1150	1750	350	480	8-10
4. 76 21			70	50							46	70	250	1400	2200	269	380	5-8
4. 76 22			110	80							51	70	250	1400	2200	372	490	6-9
4. 76 23			200	180	130						51	80	300	1500	2200	486	680	7-9
4. 76 24			280	235	180						61	90	300	1500	2200	587	780	8-10
4. 76 31					69	51	30				41	80	260	1500	2300	326	453	4-7
4. 76 32					90	69	40				46	80	270	1500	2300	396	535	5-8
4. 76 33					140	100	60				51	100	310	1500	2300	516	705	6-9
4. 76 34					225	185	137	80			51	100	330	1500	2300	601	820	6-9
4. 76 35					340	280	200	120			61	110	360	1500	2300	800	1095	7-10
4. 76 36					510	400	290	180			71	140	400	1600	2300	1082	1440	8-30
4. 76 41							54	41	30		41	80	275	1500	2300	362	500	4-7
4. 76 42							72	54	40		46	80	285	1500	2300	430	610	5-8
4. 76 43							109	82	60		51	100	335	1500	2300	575	805	6-9
4. 76 44							145	109	80		51	100	340	1500	2300	673	945	6-9
4. 76 45							219	163	120		61	110	365	1500	2300	887	1240	7-10
4. 76 46							326	246	180		71	140	430	1600	2300	1198	1625	8-30

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 76 13	95	85	62								531	400	340	590	150	104
49 76 14	147	110	80								581	400	370	585	200	113
49 76 25			104	94	76						681	450	400	635	300	135
49 76 35				171	162	155	120	70			681	450	420	650	300	152
49 76 45								128	96	70	681	450	420	650	300	158

SELECTION TABLE

OD 812.8

Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

4

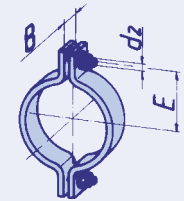
Pipe clamps, clamp bases, OD 812.8 (ND 800), types 42, 44, 46, 48, 49

Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 81 19	14	10	7.4								M30	480	90	33	5-6

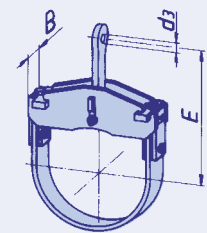
Type	permissible load (kN)										d3	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
44 81 14	54	42	34								41	700	135	75	4-7	
44 81 15	90	70	57								51	700	120	77	6-9	
44 81 16	122	88	71								61	700	130	91	7-10	
44 81 17	153	115	88								71	700	165	111	8-30	
44 81 18	205	165	125								71	700	205	150	8-30	
44 81 19	307	225	180								71	720	210	200	9-30	
44 81 25				43	40						51	790	135	71	6-9	
44 81 26				65	60						61	790	145	98	7-10	
44 81 27				90	80						71	790	170	117	8-30	
44 81 28				125	105						71	790	195	150	8-30	
44 81 29		220	190	170							71	790	215	215	9-30	
44 81 35						70	62	40			51	810	190	120	6-9	
44 81 36						105	85	60			61	810	205	172	7-10	
44 81 37						150	125	85			71	810	225	227	8-30	
44 81 38						160	150	100			71	810	220	257	8-30	
44 81 39					220	218	180	118			71	810	255	310	9-30	
44 81 45								85	64	45	51	810	215	195	6-9	
44 81 46								126	92	68	61	810	255	259	7-10	
44 81 47								221	157	115	86	71	810	255	296	8-30
44 81 48								332	217	161	119	71	810	285	410	9-30

Type	permissible load (kN)										d3	E _k	E _r	L		kg ^①		load group
	100	250	350	450	500	510	530	560	580	600°C				min.	max.	min.	max.	
4. 81 11	90	69	55								46	45	215	1200	1800	205	250	5-8
4. 81 12	135	100	80								51	60	240	1200	1800	245	330	6-9
4. 81 13	212	155	123								61	70	255	1200	1800	315	423	7-10
4. 81 14	276	205	163								61	90	245	1200	1800	380	520	8-10
4. 81 15	330	245	195								71	100	265	1200	1800	418	575	9-30
4. 81 21			70	50							46	80	250	1500	2300	297	420	5-8
4. 81 22			110	80							51	80	250	1500	2300	404	535	6-9
4. 81 23		220	180	140							61	90	320	1600	2300	590	770	7-10
4. 81 24		310	260	200							71	100	320	1600	2300	763	975	8-30
4. 81 31					80	59	34				46	90	280	1600	2400	398	525	5-8
4. 81 32					100	80	46				46	90	300	1600	2400	468	640	5-8
4. 81 33					140	100	60				51	100	330	1600	2400	565	760	6-9
4. 81 34					220	185	137	80			51	110	350	1600	2400	669	910	6-9
4. 81 35					340	280	200	120			61	120	370	1600	2400	877	1175	7-10
4. 81 36					560	400	340	200			71	150	415	1600	2400	1230	1680	8-30
4. 81 41						60	45	34	46	90	295	1600	2400	436	600	5-8		
4. 81 42						82	62	46	46	90	300	1600	2400	526	715	5-8		
4. 81 43						108	81	60	51	100	340	1600	2400	635	875	6-9		
4. 81 44						146	108	80	51	110	350	1600	2400	750	1025	6-9		
4. 81 45						219	163	120	61	120	370	1600	2400	983	1345	7-10		
4. 81 46						365	272	200	71	150	465	1600	2400	1360	1890	8-30		

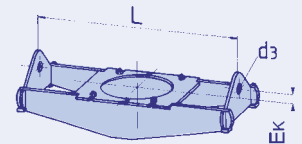
Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 81 13	105	85	63								556	400	360	590	150	109
49 81 14	150	117	86								606	400	400	585	200	119
49 81 25			118	108	86						706	450	425	635	300	143
49 81 35				188	178	170	131	82			706	450	425	650	300	157
49 81 45								151	113	82	706	450	425	650	300	168



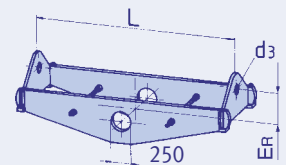
Heat resistant materials see page 4.3



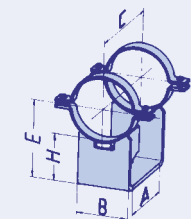
② Type 46



② Type 48



① Weights for type 46 - for type 48 approx. 26% less.



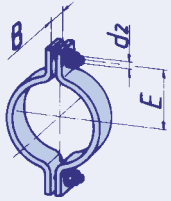
SELECTION TABLE

OD 914.4

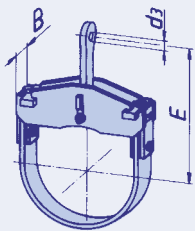
Temperatures up to 650°C from page 4.46

Twice the specified load is possible by use of type 77 (see page 4.55)

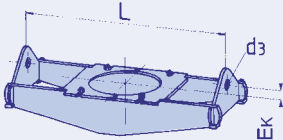
Pipe clamps, clamp bases, OD 914.4 (ND 900), types 42, 44, 46, 48, 49



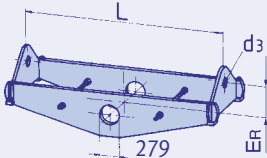
Heat resistant materials see page 4.3



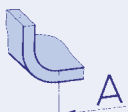
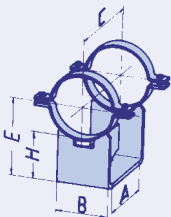
② Type 46



② Type 48



① Weights for type 46 - for type 48 approx. 28% less.



Type	permissible load (kN)										d2	E	B	kg	load group
	100	250	350	450	500	510	530	560	580	600°C					
42 91 19	14	10	7.7								M30	530	100	40	5-6

Type	permissible load (kN)										d3	E	B	kg	load group	
	100	250	350	450	500	510	530	560	580	600°C						
44 91 14	51	40	33								41	760	135	82	4-7	
44 91 15	88	69	56								51	760	120	88	6-9	
44 91 16	153	115	88								61	760	165	122	7-10	
44 91 17	205	170	125								71	760	205	166	8-30	
44 91 18	254	205	165								71	760	210	209	8-30	
44 91 19	307	225	180								71	785	210	220	9-30	
44 91 25				65	60						51	840	145	106	7-9	
44 91 26				90	80						71	840	170	130	8-30	
44 91 27				125	105						71	840	195	165	8-30	
44 91 28				140	130						71	840	215	220	9-30	
44 91 29			220	190	170						71	840	215	235	9-30	
44 91 35						100	90	60			61	870	205	190	7-10	
44 91 36						150	130	80			71	870	225	245	8-30	
44 91 37				195	185	160	103				71	870	220	285	9-30	
44 91 38				240	220	183	119				71	870	255	336	9-30	
44 91 46								127	94	68	61	870	255	290	7-10	
44 91 47								222	158	115	86	71	870	255	327	8-30
44 91 48								332	218	161	119	71	870	285	439	9-30

Type	permissible load (kN)										L				kg ^①		load group	
	100	250	350	450	500	510	530	560	580	600°C	d3	Ek	ER	min.	max.	min.		max.
4. 91 11	96	71	57								46	50	255	1300	1900	245	305	5-8
4. 91 12	135	100	80								51	60	240	1300	1900	295	365	6-9
4. 91 13	215	155	125								61	70	240	1300	1900	380	490	7-10
4. 91 14	280	205	165								61	90	265	1300	1900	448	600	8-10
4. 91 15	335	245	195								71	100	295	1300	1900	500	670	9-30
4. 91 21			80	60							46	80	250	1600	2400	385	500	5-8
4. 91 22			115	85							51	90	270	1600	2400	490	635	6-9
4. 91 23			210	180	140						61	100	300	1600	2400	670	855	7-10
4. 91 24			290	250	200						71	100	325	1600	2400	868	1115	8-30
4. 91 25			360	300	240						71	110	345	1600	2400	936	1265	9-30
4. 91 31					90	69	40				46	100	300	1700	2500	503	650	5-8
4. 91 32					140	100	60				46	110	330	1700	2500	640	835	5-8
4. 91 33					185	137	80				51	110	350	1700	2500	775	1030	6-9
4. 91 34					400	330	235	140			61	130	385	1700	2500	1120	1470	7-10
4. 91 35					580	480	340	200			71	130	455	1800	2500	1452	1870	8-30
4. 91 36					680	550	400	240			71	160	440	1800	2500	1611	2065	9-30
4. 91 41							72	54	40		46	100	300	1700	2500	551	740	5-8
4. 91 42							109	82	60		46	110	345	1700	2500	697	945	5-8
4. 91 43							146	110	80		51	110	370	1700	2500	855	1160	6-9
4. 91 44							255	192	140		61	130	445	1700	2500	1225	1665	7-10
4. 91 45							364	272	200		71	130	445	1800	2500	1592	2105	8-30
4. 91 46							438	325	240		71	160	490	1800	2500	1789	2410	9-30

Type	permissible load (kN)										E	A	B	C	H	kg
	100	250	350	450	500	510	530	560	580	600°C						
49 91 13	130	102	75								607	450	360	650	150	127
49 91 14	235	163	132								657	450	420	660	200	148
49 91 25			148	130	120						757	500	450	710	300	177
49 91 35				250	238	227	176	110			757	500	480	710	300	195
49 91 45								210	156	110	757	500	480	710	300	210

SELECTION TABLE

OD 33.7 - 88.9, TEMPERATURE 610-650°C

4

Pipe clamps, OD 33.7 (ND 25), type 43

Type	permissible load (kN)				650°C	d1	E	B	kg	load group
	610	620	630	640						
43 03 59	3.2	2.8	2.3	2.1	1.8	12	235	50	1.4	C-2

Pipe clamps, OD 42.4 (ND 32), type 43

Type	permissible load (kN)				650°C	d1	E	B	kg	load group
	610	620	630	640						
43 04 59	3.2	2.8	2.3	2.1	1.8	12	240	50	1.4	C-2

Pipe clamps, OD 48.3 (ND 40), type 43

Type	permissible load (kN)				650°C	d1	E	B	kg	load group
	610	620	630	640						
43 05 59	3.2	2.8	2.3	2.1	1.8	12	240	50	1.4	C-2

Pipe clamps, OD 60.3 (ND 50), type 43

Type	permissible load (kN)				650°C	d1	E	B	kg	load group
	610	620	630	640						
43 06 59	4.1	3.5	2.9	2.6	2.3	12	250	55	2.4	C-4

Pipe clamps, OD 73 (ND 65), types 43, 48

Type	permissible load (kN)				650°C	d1	E	B	kg	load group
	610	620	630	640						
43 07 59	4.1	3.5	2.9	2.6	2.3	12	255	60	2.5	C-4

Type	permissible load (kN)				650°C	d3	dN	E _R	L		kg		load group
	610	620	630	640					min.	max.	min.	max.	
48 07 51	7	6	5	4	4	21	36	70	350	750	6	13	C-4
48 07 52	10	9	8	6	6	21	36	70	350	750	7	15	C-4
48 07 53	17	15	13	11	10	25	36	100	350	750	9	21	3-5

Pipe clamps, OD 76.1 (ND 65), types 43, 48

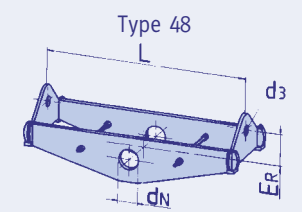
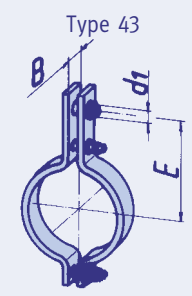
Type	permissible load (kN)				650°C	d1	E	B	kg	load group
	610	620	630	640						
43 08 59	4.1	3.5	2.9	2.6	2.3	12	255	60	2.5	C-4

Type	permissible load (kN)				650°C	d3	dN	E _R	L		kg		load group
	610	620	630	640					min.	max.	min.	max.	
48 08 51	7	6	5	4	4	21	36	70	350	750	6	13	C-4
48 08 52	10	9	8	6	6	21	36	70	350	750	7	15	C-4
48 08 53	17	15	13	11	10	25	36	100	350	750	9	21	3-5

Pipe clamps, OD 88.9 (ND 80), types 43, 48

Type	permissible load (kN)				650°C	d1	E	B	kg	load group
	610	620	630	640						
43 09 59	4.1	3.5	2.9	2.6	2.3	12	260	70	2.7	C-4

Type	permissible load (kN)				650°C	d3	dN	E _R	L		kg		load group
	610	620	630	640					min.	max.	min.	max.	
48 09 51	7	6	5	4	4	21	36	75	350	850	6	16	C-4
48 09 52	10	9	7	6	6	21	36	85	350	850	7	19	C-4
48 09 53	17	15	13	11	10	25	36	100	350	850	9	26	3-5



SELECTION TABLE

OD 108 - 159, TEMPERATURE 610 - 650°C

Pipe clamps, OD 108 (ND 100), types 43, 48

Type	permissible load (kN)					d1	E	B	kg	load group
	610	620	630	640	650°C					
43 10 59	8.9	7.7	6.3	5.7	5.0	16	270	70	5.1	1-4

Type	permissible load (kN)					d3	dn	Er	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 10 51	10	9	8	6	6	21	51	85	350	950	8	24	C-4
48 10 52	13	12	10	9	8	25	51	95	350	950	10	28	3-5
48 10 53	27	23	21	17	15	34	51	140	350	950	14	42	3-6

Pipe clamps, OD 114.3 (ND 100), types 43, 48

Type	permissible load (kN)					d1	E	B	kg	load group
	610	620	630	640	650°C					
43 11 59	8.9	7.7	6.3	5.7	5.0	16	275	70	5.2	1-4

Type	permissible load (kN)					d3	dn	Er	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 11 51	10	9	8	6	6	21	51	85	350	950	8	24	C-4
48 11 52	13	12	10	9	8	25	51	95	350	950	10	28	3-5
48 11 53	27	23	21	17	15	34	51	140	350	950	14	42	3-6

Pipe clamps, OD 133 (ND 125), type 43, 48

Type	permissible load (kN)					d1	E	B	kg	load group
	610	620	630	640	650°C					
43 13 59	10	8.7	7.1	6.5	5.6	16	290	80	8.1	1-4

Type	permissible load (kN)					d3	dn	Er	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 13 51	12	10	9	8	7	21	51	95	400	1000	10	27	C-4
48 13 52	17	15	13	11	10	25	51	110	400	1000	12	34	3-5
48 13 53	29	26	22	19	17	34	51	150	400	1000	17	49	4-6

Pipe clamps, OD 139.7 (ND 125), type 43, 48

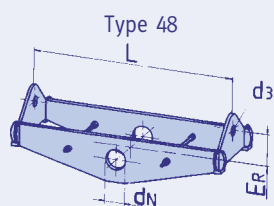
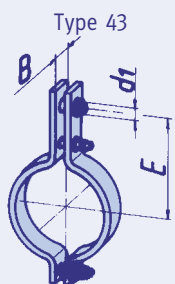
Type	permissible load (kN)					d1	E	B	kg	load group
	610	620	630	640	650°C					
43 14 59	10	8.7	7.1	6.5	5.6	16	295	80	8.2	1-4

Type	permissible load (kN)					d3	dn	Er	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 14 51	12	10	9	8	7	21	51	95	400	1000	10	28	C-4
48 14 52	17	15	13	11	10	25	51	110	400	1000	13	35	3-5
48 14 53	29	26	22	19	17	34	51	150	400	1000	18	49	4-6

Pipe clamps, OD 159 (ND 150), type 43, 48

Type	permissible load (kN)					d1	E	B	kg	load group
	610	620	630	640	650°C					
43 16 59	10	8.7	7.1	6.5	5.6	16	315	80	8.8	1-4

Type	permissible load (kN)					d3	dn	Er	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 16 51	12	10	9	8	7	21	63	100	450	1050	12	31	C-4
48 16 52	19	16	15	12	11	25	63	125	450	1050	16	41	3-5
48 16 53	36	30	27	23	20	34	63	150	450	1050	23	60	4-6



SELECTION TABLE

OD 168.3 - 244.5, TEMPERATURE 610-650°C

4

Pipe clamps, OD 168.3 (ND 150), Type 43, 48

Type	permissible load (kN)					650°C	d1	E	B	kg	load group
	610	620	630	640	650						
43 17 59	10	8.7	7.1	6.5	5.6	16	320	80	9.1	1-4	

Type	permissible load (kN)					650°C	d3	dn	Er	L		kg		load group
	610	620	630	640	650					min.	max.	min.	max.	
48 17 51	12	10	9	8	7	21	63	100	450	1050	12	31	C-4	
48 17 52	19	16	15	12	11	25	63	125	450	1050	16	42	3-5	
48 17 53	36	30	27	23	20	34	63	150	450	1050	23	60	4-6	

Pipe clamps, OD 193.7 (ND 175), Type 43, 48

Type	permissible load (kN)					650°C	d1	E	B	kg	load group
	610	620	630	640	650						
43 19 59	17	14	12	11	9	20	355	100	16	3-6	

Type	permissible load (kN)					650°C	d3	dn	Er	L		kg		load group
	610	620	630	640	650					min.	max.	min.	max.	
48 19 51	10	9	8	6	6	21	63	110	550	1150	16	33	C-4	
48 19 52	17	15	13	11	10	25	63	125	550	1150	21	46	3-5	
48 19 53	25	21	19	16	14	25	63	150	550	1150	25	56	3-5	
48 19 54	44	38	34	28	25	41	63	160	550	1150	38	82	4-7	

Pipe clamps, OD 219.1 (ND 200), Type 44, 48

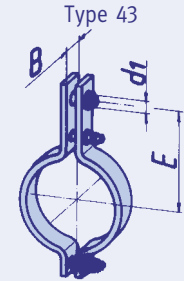
Type	permissible load (kN)					650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640	650							
44 22 51	8	7	6	5	5	21	430	115	280	21	C-4	
44 22 52	19	17	14	12	11	34	460	105	280	36	4-6	
44 22 53	30	26	22	19	17	46	485	165	280	56	5-8	

Type	permissible load (kN)					650°C	d3	dn	Er	L		kg		load group
	610	620	630	640	650					min.	max.	min.	max.	
48 22 51	10	9	8	7	6	21	79	130	550	1350	18	51	C-4	
48 22 52	23	20	17	15	13	25	79	150	550	1350	26	71	3-5	
48 22 53	31	27	24	20	18	41	79	170	550	1350	32	86	4-7	
48 22 54	54	46	41	35	31	46	79	200	550	1350	48	123	5-8	

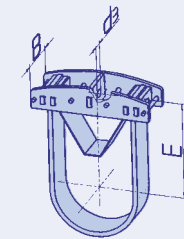
Pipe clamps, OD 244.5 (ND 225), Type 44, 48

Type	permissible load (kN)					650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640	650							
44 24 51	8	7	6	5	5	21	440	120	280	23	C-4	
44 24 52	19	17	14	12	11	34	475	105	280	37	4-6	
44 24 53	30	26	22	19	17	46	500	170	280	59	5-8	

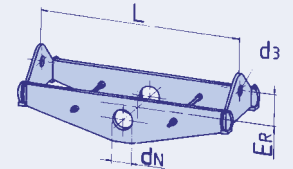
Type	permissible load (kN)					650°C	d3	dn	Er	L		kg		load group
	610	620	630	640	650					min.	max.	min.	max.	
48 24 51	12	11	9	8	7	25	79	110	550	1350	20	56	3-5	
48 24 52	25	21	19	16	14	25	79	150	550	1350	28	75	3-5	
48 24 53	36	31	28	24	20	41	79	160	550	1350	37	95	4-7	
48 24 54	60	53	45	40	34	46	79	180	550	1350	50	130	5-8	



Type 44



Type 48



SELECTION TABLE

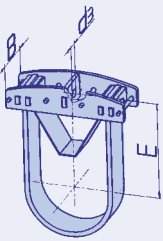
OD 267 - 323.9, TEMPERATURE 610-650°C

Pipe clamps, OD 267 (ND 250), Type 44, 48

Type	permissible load (kN)					d3	E	max B	max ISO	kg	load group
	610	620	630	640	650°C						
44 26 51	8	7	6	5	5	21	455	125	280	24	C-4
44 26 52	19	17	14	12	11	34	485	110	280	40	4-6
44 26 53	31	27	23	20	18	46	505	180	280	63	5-8

Type	permissible load (kN)					d3	dn	ER	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 26 51	14	12	11	9	8	25	92	120	600	1400	24	64	3-5
48 26 52	26	22	20	17	15	25	92	150	600	1400	32	84	3-5
48 26 53	37	32	29	24	21	41	92	160	600	1400	43	105	4-7
48 26 54	65	56	50	42	36	46	92	195	600	1400	59	146	5-8

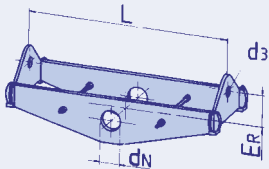
Type 44



Pipe clamps, OD 273 (ND 250), Type 44, 48

Type	permissible load (kN)					d3	E	max B	max ISO	kg	load group
	610	620	630	640	650°C						
44 27 51	8	7	6	5	5	21	455	125	280	24	C-4
44 27 52	19	17	14	12	11	34	485	110	280	40	4-6
44 27 53	31	27	23	20	18	46	505	180	280	64	5-8

Type 48



Type	permissible load (kN)					d3	dn	ER	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 27 51	14	12	11	9	8	25	92	120	600	1400	24	64	3-5
48 27 52	26	22	20	17	15	25	92	150	600	1400	33	84	3-5
48 27 53	37	32	29	24	21	41	92	160	600	1400	43	105	4-7
48 27 54	65	56	50	42	36	46	92	195	600	1400	60	147	5-8

Pipe clamps, OD 323.9 (ND 300), Type 44, 48

Type	permissible load (kN)					d3	E	max B	max ISO	kg	load group
	610	620	630	640	650°C						
44 32 51	17	15	13	11	10	25	500	100	290	39	3-5
44 32 52	30	26	22	19	17	34	510	175	290	63	4-6
44 32 53	51	44	38	33	29	46	530	145	290	87	5-8

Type	permissible load (kN)					d3	dn	ER	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 32 51	21	18	16	14	12	25	118	150	700	1400	37	84	3-5
48 32 52	39	33	30	25	22	41	118	180	700	1400	55	115	4-7
48 32 53	53	45	40	34	30	46	118	180	700	1400	65	139	5-8
48 32 54	68	58	52	44	39	46	118	210	700	1400	74	161	5-8
48 32 55	90	77	69	58	51	51	118	250	800	1400	99	200	6-9

SELECTION TABLE

OD 355.6 - 406.4, TEMPERATURE 610-650°C

4

Pipe clamps, OD 355.6 (ND 350), Type 44, 48

Type	permissible load (kN)					650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640	640							
44 36 51	17	15	13	11	10	25	520	105	290	43	3-5	
44 36 52	30	26	22	19	17	34	525	180	290	67	4-6	
44 36 53	51	44	38	33	29	46	545	145	290	91	5-8	

Type	permissible load (kN)					650°C	d3	dN	Er	L		kg		load group
	610	620	630	640	640					min.	max.	min.	max.	
48 36 51	18	15	13	11	10	25	118	140	700	1500	36	87	3-5	
48 36 52	25	21	19	16	14	34	118	160	700	1500	49	102	4-6	
48 36 53	42	36	32	27	24	41	118	180	800	1500	66	133	4-7	
48 36 54	71	62	54	47	40	46	118	220	800	1500	89	183	5-8	
48 36 55	105	91	81	68	59	51	118	240	800	1500	114	235	6-9	

Pipe clamps, OD 368 (ND 350), Type 44, 48

Type	permissible load (kN)					650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640	640							
44 37 51	17	15	13	11	10	25	530	110	290	45	3-5	
44 37 52	31	27	23	20	18	34	535	190	290	72	4-6	
44 37 53	51	44	38	33	29	46	550	150	290	94	5-8	

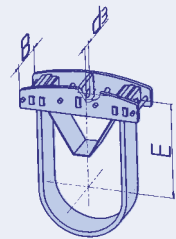
Type	permissible load (kN)					650°C	d3	dN	Er	L		kg		load group
	610	620	630	640	640					min.	max.	min.	max.	
48 37 51	18	15	13	11	10	25	118	140	750	1500	38	88	3-5	
48 37 52	25	21	19	16	14	34	118	160	750	1500	52	103	4-6	
48 37 53	42	36	32	27	24	41	118	180	750	1500	63	133	4-7	
48 37 54	71	62	54	47	40	46	118	220	750	1500	86	184	5-8	
48 37 55	105	91	81	68	59	51	118	240	850	1500	120	236	6-9	

Pipe clamps, OD 406.4 (ND 400), Type 44, 48

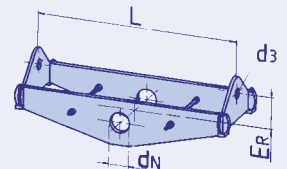
Type	permissible load (kN)					650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640	640							
44 41 51	17	15	13	11	10	25	560	110	300	48	3-5	
44 41 52	40	35	30	26	23	46	580	136	300	88	5-8	
44 41 53	67	58	50	44	38	51	580	200	300	134	6-9	

Type	permissible load (kN)					650°C	d3	dN	Er	L		kg		load group
	610	620	630	640	640					min.	max.	min.	max.	
48 41 51	21	18	16	14	12	25	144	160	800	1600	56	109	3-5	
48 41 52	36	32	27	24	20	41	144	180	800	1600	70	141	4-7	
48 41 53	49	42	37	32	28	46	144	200	800	1600	85	172	5-8	
48 41 54	72	63	55	47	40	46	144	240	800	1600	102	214	5-8	
48 41 55	124	109	94	82	69	51	144	230	900	1600	158	303	6-9	

Type 44



Type 48



SELECTION TABLE

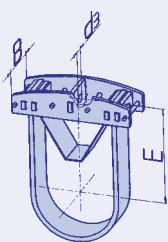
OD 419 - 508, TEMPERATURE 610-650°C

Pipe clamps, OD 419 (ND 400), Type 44, 48

Type	permissible load (kN)					d3	E	max B	max ISO	kg	load group
	610	620	630	640	650°C						
44 42 51	17	15	13	11	10	25	565	115	300	50	3-5
44 42 52	42	37	31	27	24	46	585	136	300	92	5-8
44 42 53	69	60	51	45	39	51	585	210	300	140	6-9

Type	permissible load (kN)					d3	dN	ER	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 42 51	21	18	16	14	12	25	144	160	800	1600	57	109	3-5
48 42 52	36	32	27	24	20	41	144	180	800	1600	70	142	4-7
48 42 53	49	42	37	32	28	46	144	200	800	1600	86	173	5-8
48 42 54	72	63	55	47	40	46	144	240	900	1600	111	214	5-8
48 42 55	124	109	94	82	69	51	144	230	900	1600	160	305	6-9

Type 44

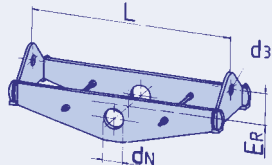


Pipe clamps, OD 457.2 (ND 450), Type 44, 48

Type	permissible load (kN)					d3	E	max B	max ISO	kg	load group
	610	620	630	640	650°C						
44 46 51	17	15	13	11	10	25	590	120	300	55	3-5
44 46 52	31	27	23	20	18	46	600	136	300	81	5-8
44 46 53	62	54	46	40	35	51	605	195	300	140	6-9
44 46 54	100	86	73	65	56	51	620	315	300	203	6-9

Type	permissible load (kN)					d3	dN	ER	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 46 51	36	31	27	23	20	41	144	170	900	1700	82	156	4-7
48 46 52	41	35	31	26	23	46	144	190	900	1700	92	174	5-8
48 46 53	70	61	53	46	40	46	144	230	900	1700	119	237	5-8
48 46 54	143	126	109	95	80	51	144	255	1000	1700	199	365	6-9
48 46 55	160	140	123	106	90	61	144	275	1000	1700	215	393	7-10

Type 48



Pipe clamps, OD 508 (ND 500), Type 44, 48

Type	permissible load (kN)					d3	E	max B	max ISO	kg	load group
	610	620	630	640	650°C						
44 51 51	17	15	13	11	10	25	615	120	300	59	3-5
44 51 52	35	30	26	23	20	46	630	136	300	95	5-8
44 51 53	70	61	52	46	40	51	635	230	300	168	6-9
44 51 54	106	92	79	69	60	61	650	210	300	226	7-10

Type	permissible load (kN)					d3	dN	ER	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 51 51	36	31	27	23	20	41	173	185	1000	1800	98	178	4-7
48 51 52	41	36	31	27	23	46	173	200	1000	1800	110	197	5-8
48 51 53	71	61	54	46	40	46	173	235	1000	1800	140	272	5-8
48 51 54	143	122	109	92	80	51	173	275	1050	1800	228	412	6-9
48 51 55	177	156	135	118	100	61	173	310	1050	1800	257	469	7-10

SELECTION TABLE

OD 558.8 - 660.4, TEMPERATURE 610-650°C

4

Pipe clamps, OD 558.8 (ND 550), Type 44, 48

Type	permissible load (kN)				650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640							
44 56 51	35	30	26	23	20	46	655	136	300	104	5-8
44 56 52	70	61	52	46	40	51	665	240	300	184	6-9
44 56 53	106	92	79	69	60	61	675	215	300	242	7-10
44 56 54	141	123	105	93	80	61	690	290	300	305	7-10

Type	permissible load (kN)				650°C	d3	dN	Er	L		kg		load group
	610	620	630	640					min.	max.	min.	max.	
48 56 51	39	34	30	26	22	41	173	200	1100	1900	115	203	4-7
48 56 52	54	47	41	36	30	46	173	235	1100	1900	141	250	5-8
48 56 53	71	63	54	47	40	46	173	240	1100	1900	159	296	5-8
48 56 54	140	121	107	91	80	51	173	280	1100	1900	246	444	6-9
48 56 55	215	186	164	140	120	61	173	355	1200	1900	337	578	7-10

Pipe clamps, OD 609.6 (ND 600), Type 44, 48

Type	permissible load (kN)				650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640							
44 61 51	35	30	26	23	20	46	695	136	310	117	5-8
44 61 52	70	61	52	46	40	51	705	255	310	206	6-9
44 61 53	106	92	79	69	60	61	715	225	310	266	7-10
44 61 54	159	139	118	104	90	71	740	230	310	350	8-30

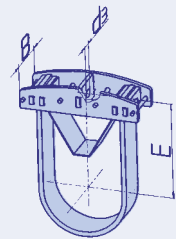
Type	permissible load (kN)				650°C	d3	dN	Er	L		kg		load group
	610	620	630	640					min.	max.	min.	max.	
48 61 51	39	34	30	26	22	41	199	220	1200	2000	136	231	4-7
48 61 52	73	62	56	47	40	46	199	225	1200	2000	193	334	5-8
48 61 53	93	81	71	61	53	46	199	280	1200	2000	219	379	5-8
48 61 54	140	123	107	93	78	51	199	295	1300	2000	299	491	6-9
48 61 55	213	183	161	138	120	61	199	355	1300	2000	382	631	7-10
48 61 56	264	233	202	176	150	71	199	350	1300	2000	452	735	8-30

Pipe clamps, OD 660.4 (ND 650), Type 44, 48

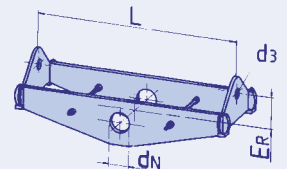
Type	permissible load (kN)				650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640							
44 66 51	35	30	26	23	20	46	720	136	310	124	5-8
44 66 52	70	61	52	46	40	51	730	260	310	220	6-9
44 66 53	106	92	79	69	60	61	745	230	310	285	7-10
44 66 54	159	139	118	104	90	71	770	235	310	374	8-30

Type	permissible load (kN)				650°C	d3	dN	Er	L		kg		load group
	610	620	630	640					min.	max.	min.	max.	
48 66 51	45	39	34	29	25	41	224	230	1250	2050	161	298	4-7
48 66 52	72	62	55	47	40	46	224	230	1250	2050	217	362	5-8
48 66 53	99	85	75	64	55	46	224	280	1250	2050	248	419	5-8
48 66 54	143	126	109	95	80	51	224	310	1250	2050	319	534	6-9
48 66 55	217	187	166	141	120	61	224	330	1350	2050	420	679	7-10
48 66 56	267	235	204	177	150	71	224	350	1350	2050	493	790	8-30

Type 44



Type 48



SELECTION TABLE

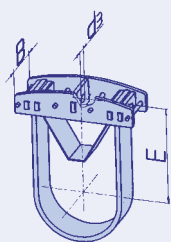
OD 711.2 - 812.8, TEMPERATURE 610-650°C

Pipe clamps, OD 711.2 (ND 700), Type 44, 48

Type	permissible load (kN)					650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640	650							
44 71 51	44	38	32	29	25	46	740	165	310	155	5-8	
44 71 52	70	61	52	46	40	51	760	270	310	238	6-9	
44 71 53	106	92	79	69	60	61	770	240	310	308	7-10	
44 71 54	141	123	105	93	80	61	785	215	310	345	7-10	
44 71 55	186	162	138	121	105	71	795	285	310	469	8-30	

Type	permissible load (kN)					650°C	d3	dN	E _R	L		kg		load group
	610	620	630	640	650					min.	max.	min.	max.	
48 71 51	49	43	37	32	27	41	224	230	1300	2100	176	318	4-7	
48 71 52	72	61	54	46	40	46	224	230	1300	2100	229	376	5-8	
48 71 53	111	95	85	72	63	51	224	280	1300	2100	299	489	6-9	
48 71 54	140	120	106	91	80	51	224	310	1400	2100	350	554	6-9	
48 71 55	217	189	166	142	120	61	224	335	1400	2100	444	710	7-10	
48 71 56	279	246	213	185	156	71	224	355	1450	2100	544	844	8-30	

Type 44

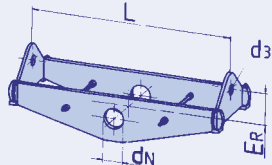


Pipe clamps, OD 762 (ND 750), Type 44, 48

Type	permissible load (kN)					650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640	650							
44 76 51	44	38	32	29	25	46	770	175	310	170	5-8	
44 76 52	70	61	52	46	40	51	790	280	310	258	6-9	
44 76 53	106	92	79	69	60	61	800	245	310	328	7-10	
44 76 54	159	139	118	104	90	71	815	250	310	445	8-30	
44 76 55	211	184	156	138	119	71	820	330	310	585	9-30	

Type	permissible load (kN)					650°C	d3	dN	E _R	L		kg		load group
	610	620	630	640	650					min.	max.	min.	max.	
48 76 51	54	46	41	35	30	41	250	260	1500	2300	251	385	4-7	
48 76 52	72	63	55	47	40	46	250	260	1500	2300	283	440	5-8	
48 76 53	106	91	81	69	60	51	250	310	1500	2300	360	560	6-9	
48 76 54	142	122	108	92	80	51	250	340	1500	2300	411	654	6-9	
48 76 55	215	189	164	143	120	61	250	330	1500	2300	508	814	7-10	
48 76 56	320	283	245	213	180	71	250	410	1600	2300	697	1068	8-30	

Type 48



Pipe clamps, OD 812.8 (ND 800), Type 44, 48

Type	permissible load (kN)					650°C	d3	E	max B	max ISO	kg	load group
	610	620	630	640	650							
44 81 51	70	61	52	46	40	51	825	295	320	282	6-9	
44 81 52	106	92	79	69	60	61	840	260	320	361	7-10	
44 81 53	150	131	111	98	85	71	850	245	320	459	8-30	
44 81 54	177	154	131	116	100	71	855	285	320	514	8-30	
44 81 55	211	184	156	138	119	71	855	340	320	623	9-30	

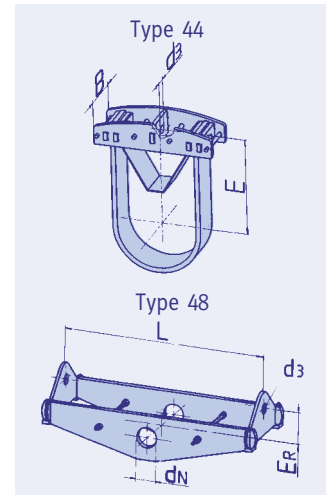
Type	permissible load (kN)					650°C	d3	dN	E _R	L		kg		load group
	610	620	630	640	650					min.	max.	min.	max.	
48 81 51	61	53	47	40	34	46	250	280	1600	2400	294	444	5-8	
48 81 52	82	72	63	54	46	46	250	300	1600	2400	326	502	5-8	
48 81 53	107	92	82	69	60	51	250	330	1600	2400	396	603	6-9	
48 81 54	143	123	109	93	80	51	250	350	1600	2400	452	704	6-9	
48 81 55	218	188	166	142	120	61	250	350	1600	2400	561	879	7-10	
48 81 56	361	313	276	236	200	71	250	450	1600	2400	783	1231	8-30	

SELECTION TABLE OD 914.4, TEMPERATURE 610-650°C

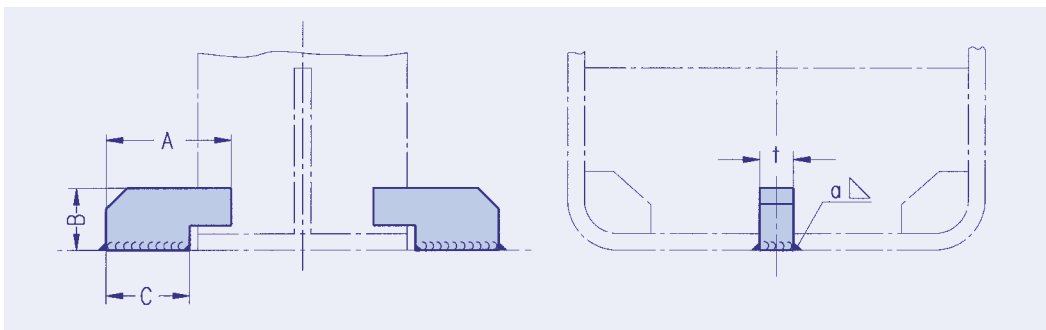
Pipe clamps, OD 914.4 (ND 900), Type 44, 48

Type	permissible load (kN)					d3	E	max B	max ISO	kg	load group
	610	620	630	640	650°C						
44 91 51	70	61	52	46	40	51	870	305	320	326	6-9
44 91 52	106	92	79	69	60	61	895	275	320	410	7-10
44 91 53	150	131	111	98	85	71	905	255	320	512	8-30
44 91 54	177	154	131	116	100	71	915	310	320	593	8-30
44 91 55	211	184	156	138	119	71	910	360	320	706	9-30

Type	permissible load (kN)					d3	dN	ER	L		kg		load group
	610	620	630	640	650°C				min.	max.	min.	max.	
48 91 51	71	63	54	47	40	46	279	300	1700	2500	351	523	5-8
48 91 52	108	92	82	70	60	46	279	330	1700	2500	412	630	5-8
48 91 53	143	122	108	92	80	51	279	350	1700	2500	506	786	6-9
48 91 54	251	221	192	167	140	61	279	385	1700	2500	678	1044	7-10
48 91 55	363	312	277	236	200	71	279	470	1800	2500	917	1346	8-30
48 91 56	429	378	328	285	240	71	279	450	1800	2500	1042	1501	9-30



LIFT-OFF RESTRAINT FOR CLAMP BASES TYPE 49



Type	for clamp bases	A	B	C	t	a	weight/pair (kg)
49 00 01	49 01 11 to 49 17 11	35	15	23	8	3	0.1
49 00 01	49 01 12 to 49 14 12	35	15	23	8	3	0.1
49 00 01	49 01 25 to 49 11 25	35	15	23	8	3	0.1
49 00 01	49 01 35 to 49 06 35	35	15	23	8	3	0.1
49 00 01	49 01 45 to 49 11 45	35	15	23	8	3	0.1
49 00 02	49 19 13 to 49 32 13	55	32	35	12	4	0.3
49 00 02	49 16 14 to 49 32 14	55	32	35	12	4	0.3
49 00 02	49 13 25 to 49 32 25	55	32	35	12	4	0.3
49 00 02	49 07 35 to 49 32 35	55	32	35	12	4	0.3
49 00 02	49 13 45 to 49 32 45	55	32	35	12	4	0.3
49 00 03	49 36 13 to 49 51 45	80	45	55	15	5	0.7
49 00 04	49 56 13 to 49 91 45	110	50	80	20	7	1.5

Lift-off restraint for clamp bases type 49

Type 49 00 01 to 49 00 04

The permissible occasional lift-off load of the clamp bases are 10% of the catalog load.

Order details:

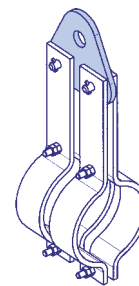
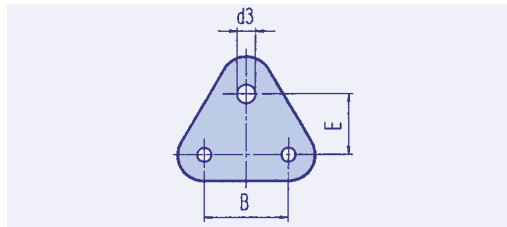
Lift-off restraint
Type 49 00 ..

CONNECTING PLATES TYPE 77

Connecting plates for coupling pipe clamps Type 43

Type 77 09 39 to 77 19 39

Twice the specified load is possible by coupling two pipe clamps with Type 77.



Type	for clamps	load group	d3	E	B	weight (kg)
77 09 39	43 01 19 up to 43 09 59	D-5	25	65	90	0.8
77 17 39	43 10 19 up to 43 17 59	3-6	34	70	90	1.2
77 19 39	43 19 19 up to 43 19 39, 43 19 59	4-7	46	90	90	2.3

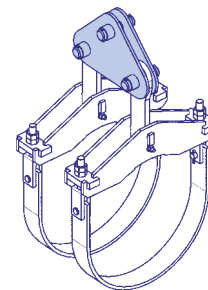
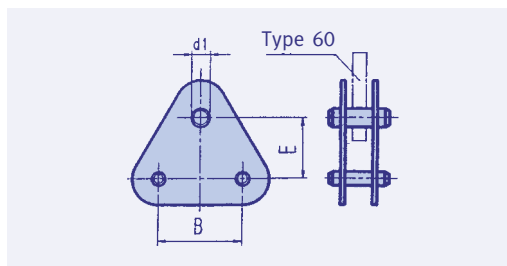
Order details:

Connecting plate
Type 77 .. 39

Connecting plates for coupling pipe clamps Type 44, up to 600°C

Type 77 22 .. to 77 91 ..

Type designation of connecting plates: the figures 44 of clamps to be coupled are to be replaced by 77



e.g. connecting plate for type 44 66 38 → 77 66 38.

① The load group for the upper connection (Type 60) is to be given when ordering

Type	load group ①	d1①		E	B _{max}	weight (kg)
		min	max			
77 22 .. up to 77 27 ..	5-10	33	60	135	180	10-23
77 32 .. up to 77 37 ..	5-30	33	70	140	225	11-32
77 41 .. up to 77 46 ..	6-30	40	70	140	275	16-52
77 51 .. up to 77 56 ..	7-50	45	90	200	300	30-75
77 61 .. up to 77 91 ..	7-50	45	90	190	325	31-82

Order details:

Connecting plate
Type 77, load group ...

INSTALLATION INSTRUCTIONS

4

LISEGA pipe clamps and clamp bases are supplied ready for use complete with all bolting required. The standard surface treatment is outlined in **Technical Specifications**, page 0.11.

For safe operation and rational installation the following points should be observed.

If stored in the open, components should be protected from dirt and water.

Horizontal clamp type 42

This pipe clamp is used as a horizontal clamp with eye nut type 60. When tightening bolting it must be ensured that the halves are parallel to each other. Counter nuts are to be used.

Horizontal clamp type 43

With this horizontal clamp, connection is made via a separate connecting pin, with eye nut type 60. It has to be made sure that the pin is secured by the cotter pin provided. Otherwise, proceed as with type 42.

Horizontal clamp type 44, U-bolt/strap

These horizontal clamps consist of an upper part with connecting lug and, depending on load or temperature range, of a U-bolt with an inlay plate or strap as lower part. For installation, the preassembled lower part is taken off by loosening the fastening nuts or removing the connecting pins. The upper part is seated on top of the pipe and the lower part fitted by screwing the U-bolt on or pinning the flat steel strap on. After adjusting the clamp, the connections are tightened. The U-bolts are secured by counter nuts and the flat steel straps by tab washers for the hexagon nuts.

Pipe clamp type 44, over 600°C

These clamps consist of a yoke with connecting lug and restraint, as well as a flat steel strap for the lower part. To install, the restraint and strap are taken off by removing the outer threaded rods and connecting bolts.

The upper part is then fitted into the hanger. The restraint and strap are fitted again, bolted on, and the threaded rods mounted. All parts are to be checked for secure fit.

Riser clamp type 45

During installation, care must be taken to place the spacers between the clamp halves at the bolting. The bolting has to be tightened and secured by counter nuts.

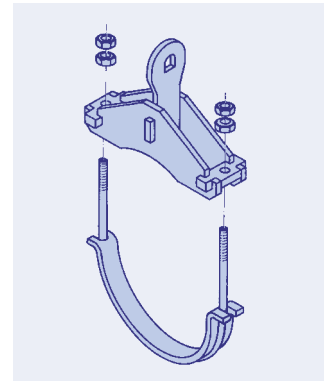
The clamp is mounted via the other supporting pins, which are secured by washers and cotter pins. The clamp is to be adjusted to the height indicated by tightening the supporting boltings so that it is form fitted for load actuation onto the shear lugs.

Riser clamp type 46

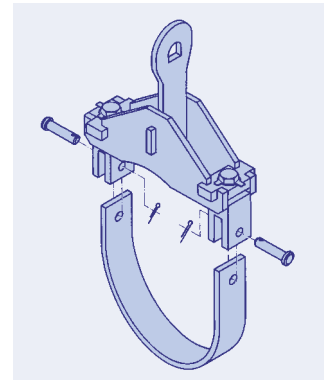
This clamp is supplied loose, sealed in plastic foil.

For installation we recommend hanging the front plates ① in the supports first. The parts to be tightened should be set at their lowest level. Afterwards both side plates ② can be inserted in the intake slot. With heavy clamps, the other side should be momentarily supported. Then the top plates ③ for the shear lugs can be fitted and bolted on by adjusting and tightening the preassembled securing plates ④.

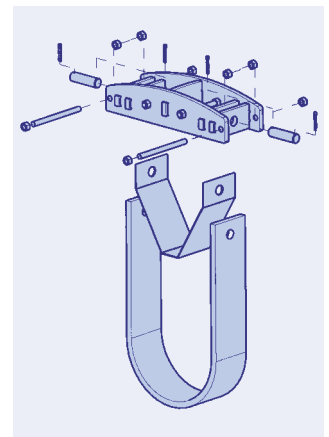
By tightening the hanging parts the clamp is to be adjusted to the height indicated and form fitted for load actuation onto the shear lugs.



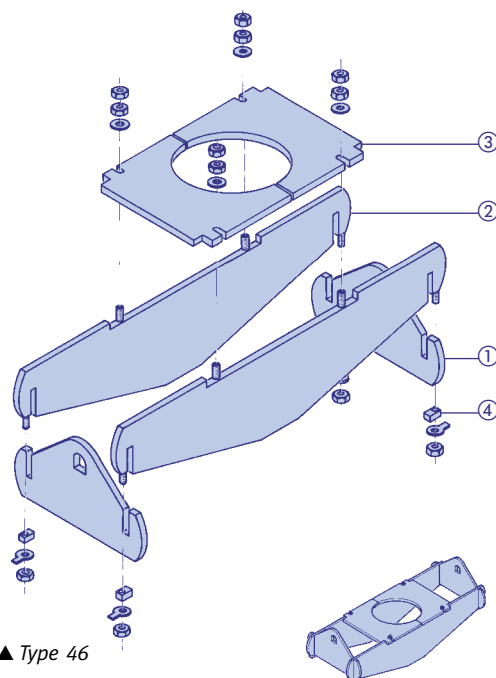
Type 44 with U-bolt



Type 44 with strap



Type 44 over 600°C



▲ Type 46



Type 49 .. .1 and 49 .. .2

Riser clamp type 48

This clamp is supplied loose, sealed in plastic foil.

First, one of the side plates ① should be prepared using threaded rods ②. For installation, both side plates are to be seated on the trunnions and connected by the rods, and the nuts only lightly tightened.

Clamp bases type 49

LISEGA clamp bases are sliding supports, connected to the pipe by clamping tension. During installation it is essential that the base plate lies flush and can glide unobstructed over the given stretches.

If required, the base plate may be welded to the supporting surface.

According to the particular field of application, different designs are used with regard to support height, pipe diameter, support load and operating temperature. The following points are hereby to be observed:

Type 49 .. .1 and 49 .. .2

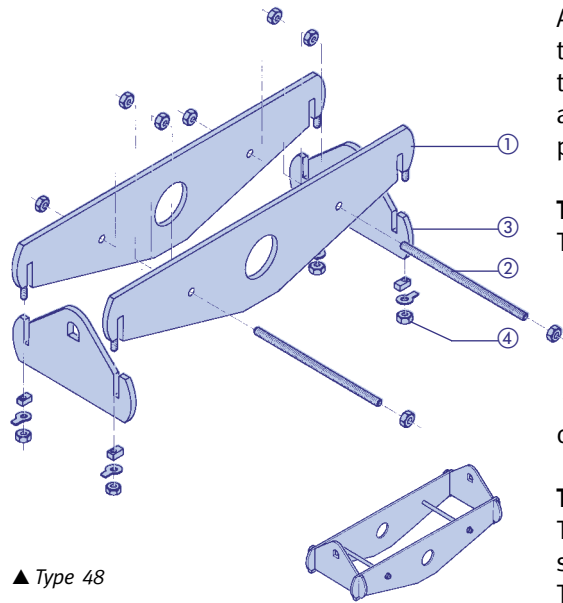
This clamp base consists of two halves to be fitted to each side of the pipes. The cornered ends form the base plate. In the lower part, both halves are firmly connected to each other by bolting. Through clamping tension, the upper bolting secures the clamp base against slipping.

Type 49 .. .3 and 49 .. .5

The foot of this clamp base forms a solid support into which the pipe can be fitted. The upper part, providing clamping tension, consists of half a clamp and is to be securely bolted.



Type 49 .. .3, 4



▲ Type 48



Type 49 .. .3, 4, 5

For heavy clamps, support with wooden blocks or ropes is required.

The front plates ③ are now fitted into the intake slots and connected to the hanging parts. Secure connection of the front and side plates is made by adjusting and tightening the preassembled securing plates ④. By tightening the supports the clamp is to be adjusted to the height indicated and form fitted for load actuation to the trunnions.