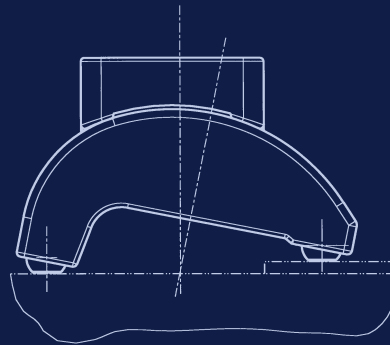
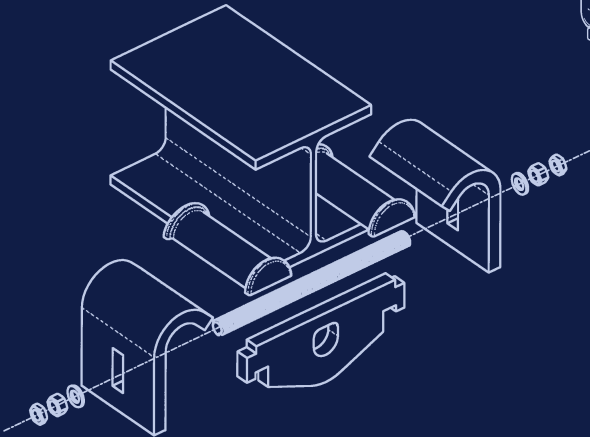
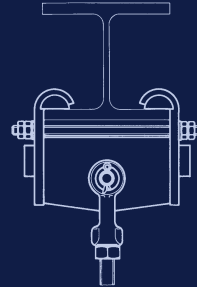
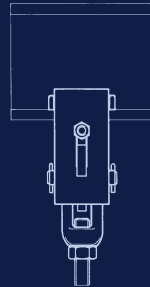
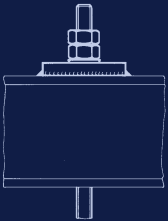
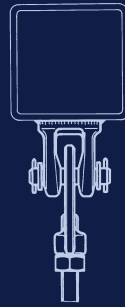
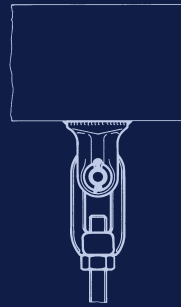
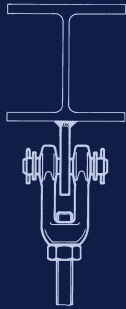
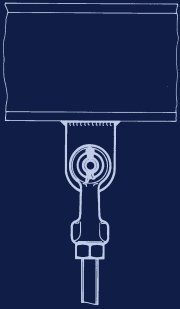


STRUCTURAL ATTACHMENT ELEMENTS

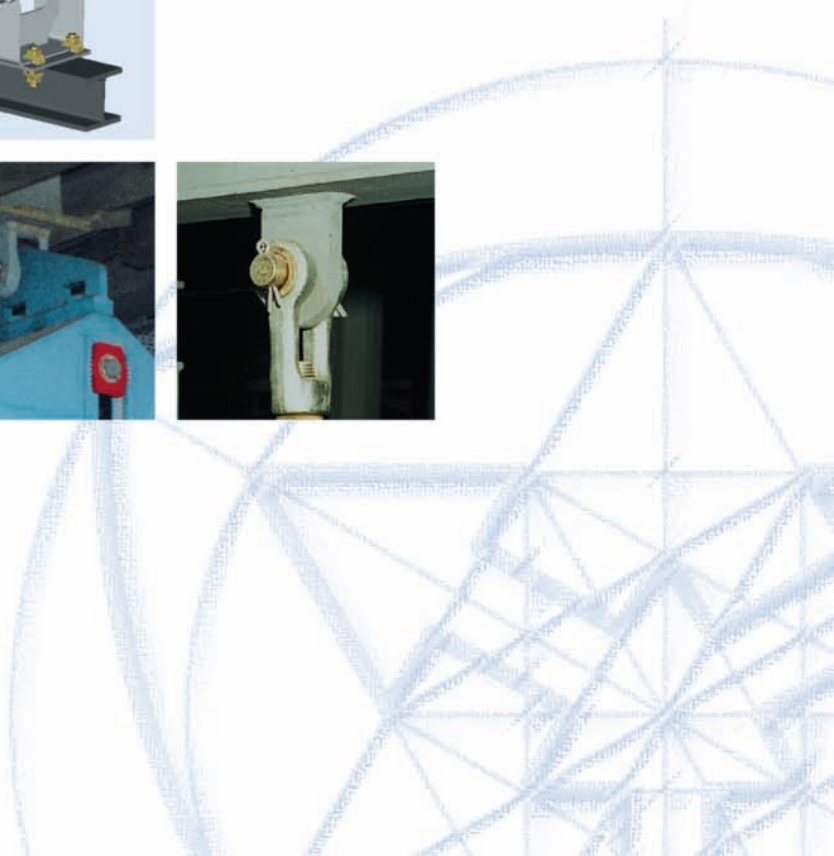
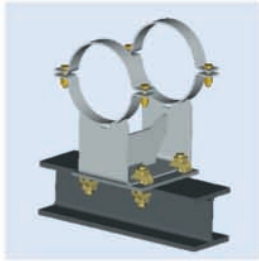
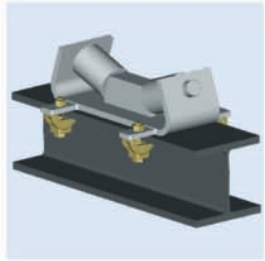
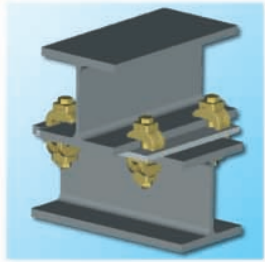
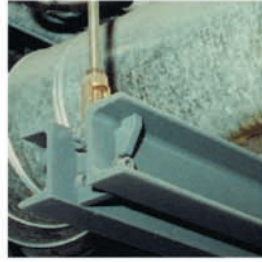
7



PRODUCT
GROUP



LISEGA



STRUCTURAL ATTACHMENTS, TRAPEZES

7

CONTENTS

PAGE

Structural attachments, trapezes _____	7.1
Weld-on clevis type 73 _____	7.2
Weld-on eye plate type 75 _____	7.2
Weld-on plate with spherical washer type 74 _____	7.3
Beam clamp type 78 _____	7.4
Trapeze type 79 _____	7.4
Beam adapter type 76 _____	7.7

0

1

2

3

4

5

6

PRODUCT
GROUP **7**

8

9

STRUCTURAL ATTACHMENTS, TRAPEZES PRODUCT GROUP 7

The attachment of pipe supports to the load bearing structure is produced by means of special components to be welded or clamped. The safety of the connections depends on their adaptation to the prevailing situation and their particular suitability in each case.

Product Group 7

As well as trapezes, the components of Product Group 7 include attachment elements connecting directly to the structure, such as trapezes.

The permissible loads correspond with the load table for statically determined components on page 0.5 of the **Technical Specification**.

For weld-on clevis type 73 and weld-on eye plate type 75, the minimum weld thicknesses must be considered. These are designed in such a way that the maximum weld stresses do not exceed 75N/mm^2 during normal operating conditions.

The stress analysis is based on a load applied conically at under 6° angulation.

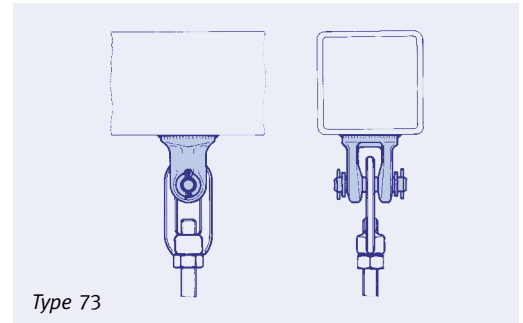
The weld-on clevis type 73 is particularly suited for attachment to hollow sections.

The beam clamp type 78 is designed for unwelded on site attachment. The beam width is to be specified when ordering.

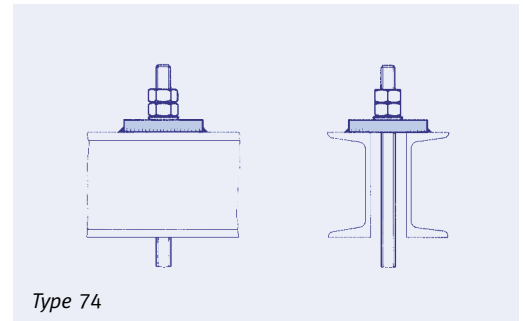
Trapeze types 79 are suitable for use with clamp base type 49 and can be used as rigid hangers or in conjunction with variable and constant hangers.

For protection against corrosion, the components are coated with a weldable primer ($30\mu\text{m}$) or electrogalvanized and then yellow chromated (zinc thickness $15\mu\text{m}$). The trapeze sections are coated to the LISEGA standard.

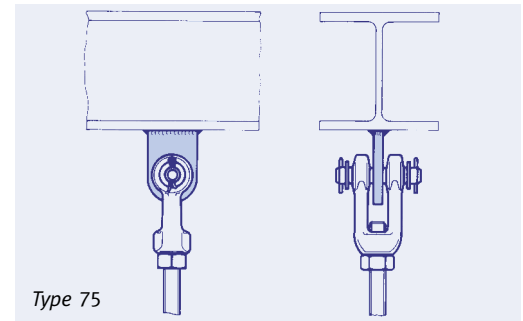
Material certification can be supplied for all components on request.



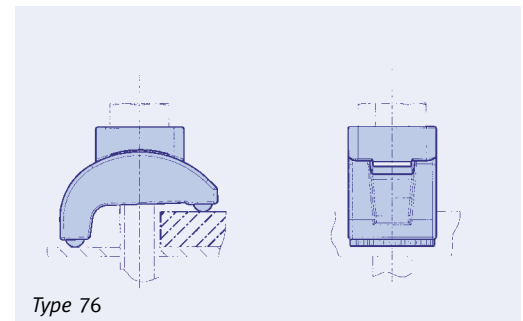
Type 73



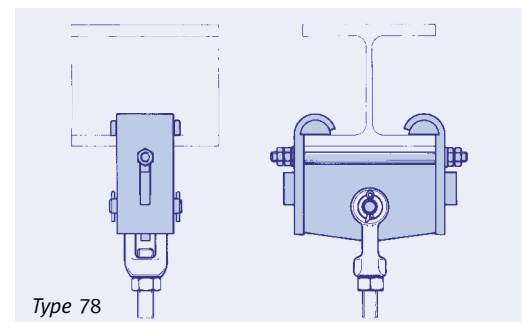
Type 74



Type 75



Type 76



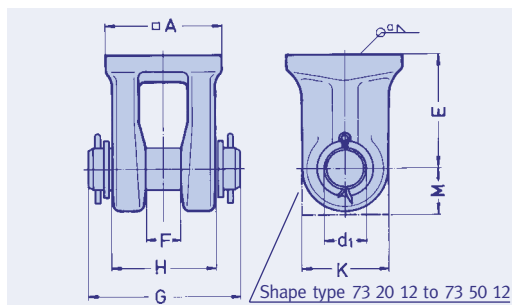
Type 78

Standardized connecting parts

WELD-ON CLEVIS TYPE 73

WELD-ON EYE PLATE TYPE 75

7



Weld-on clevis type 73 29 13 to 73 50 12

Material: S355J2G3
Drop forged
Pin: C35E + QT

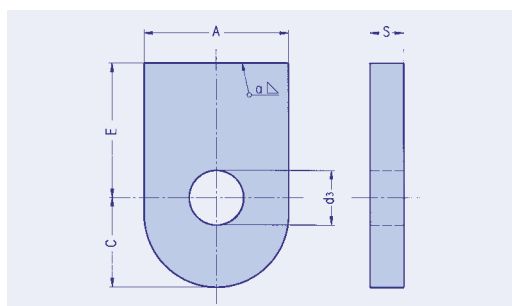
From load group 20:
Flame cut design

Type	□A	Ød ₁	E	F	G	H	K	M	min. ① Seam	Weight (kg)
73 29 13	40	12	35	12	60	34	24	–	3.0	0.3
73 39 13	50	16	40	17	70	44	32	–	3.0	0.4
73 49 13	65	20	50	20	90	57	46	–	3.0	1.1
73 59 13	75	24	60	22	105	68	53	–	3.0	2.1
73 69 12	95	33	90	27	125	80	64	–	3.5	3.8
73 79 12	120	40	110	32	140	93	80	–	4.0	6.8
73 89 12	120	45	120	37	165	110	90	–	5.5	9.2
73 99 12	120	50	130	42	185	120	100	–	7.5	11.1
73 10 12	150	60	140	50	210	150	120	–	8.5	18.5
73 20 12	170x175	70	150	60	245	165	170	75	9.0	37.0
73 30 12	170x175	70	150	60	245	165	170	75	10.5	37.0
73 40 12	150x190	80	170	56	230	150	150	90	12.5	38.0
73 50 12	180x220	90	195	64	240	165	180	110	13.5	58.0

① Weld thickness is calculated from the stress analysis and based on a permissible stress of 75N/mm² at normal load.

Order details:

Weld-on clevis type 73 .. 1.



Weld-on eye plate type 75 D1 19 to 75 50 12

Material: S235JRG2
From load group 6:
S355J2G3

Type	A	Ød ₃	E	C	S	min. ① Seam	Weight (kg)
75 D1 19	30	10.5	40	18	6	3.0	0.10
75 21 12	35	12.5	45	22	8	4.0	0.13
75 31 12	45	16.5	50	28	10	4.5	0.24
75 41 12	60	20.5	55	37	12	6.0	0.45
75 51 12	65	24.5	60	40	15	7.0	0.65
75 61 12	80	34	70	50	20	8.5	1.25
75 71 12	100	41	80	65	25	9.5	2.35
75 81 12	120	46	90	75	30	10.5	3.9
75 91 12	130	51	100	80	30	13.5	4.6
75 10 12	150	61	110	90	40	15.5	7.7
75 20 12	170	71	120	100	45	18.0	10.6
75 30 12	180	71	130	110	45	20.5	12.6
75 40 12	220	81	140	120	50	18.5	18.5
75 50 12	250	91	150	135	60	20.0	27.5

① Weld thickness is calculated from the stress analysis and based on a permissible stress of 75N/mm² at normal load.

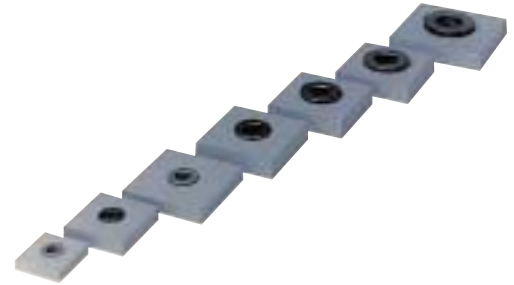
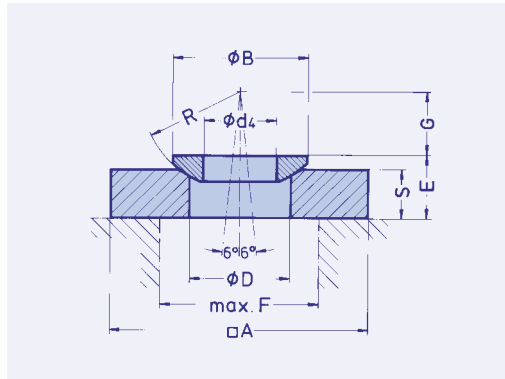
Order details:

Weld-on eye plate
type 75 .. 1.

SPHERICAL WASHER WITH WELD-ON PLATE TYPE 74

Spherical washer with weld-on plate type 74 D1 19 to 74 50 13

Material:
spherical washer:
9SMnPb28K
from load group 5: C 15
weld on plate: S235JRG2
for S ≥ 20: S355J2G3



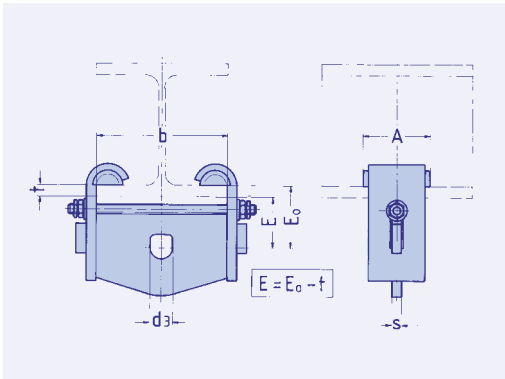
Type	for rod	□A	ØB	ØD	Ød4	E	max. F	G	R	S	Weight (kg)
74 D1 19	M10	60	21	15	10.5	12	35	10	15	10	0.3
74 21 13	M12	70	24	18	13	17	40	11	17	15	0.6
74 31 13	M16	70	30	25	17	17	45	15	22	15	0.6
74 32 13	M16	95	30	25	17	22	45	15	22	20	1.4
74 33 13	M16	130	30	25	17	22	45	15	22	20	2.7
74 41 13	M20	70	36	30	21	18	50	18	27	15	0.6
74 42 13	M20	95	36	30	21	23	50	18	27	20	1.4
74 43 13	M20	130	36	30	21	23	50	18	27	20	2.7
74 51 13	M24	95	44	35	25	24	55	21	32	20	1.4
74 52 13	M24	130	44	35	25	24	55	21	32	20	2.7
74 61 13	M30	130	56	45	31	35	60	27	41	30	4.0
74 62 13	M30	170	56	45	31	35	60	27	41	30	6.8
74 71 13	M36	130	68	50	37	37	70	32	50	30	4.0
74 72 13	M36	170	68	50	37	37	70	32	50	30	6.8
74 81 13	M42	130	78	59	43	39	90	37	58	30	4.0
74 82 13	M42	170	78	59	43	39	90	37	58	30	6.8
74 91 13	M48	130	92	66	50	46	120	41	67	35	4.5
74 92 13	M48	170	92	66	50	41	120	41	67	30	6.8
74 10 13	M56x4	225	103	76	58	47	140	50	79	35	13.9
74 20 13	M64x4	250	120	89	66	54	150	59	93	40	19.6
74 30 13	M68x4	250	128	95	70	61	160	64	100	45	22.0
74 40 13	M72x4	300	136	98	75	61	160	70	107	45	31.8
74 50 13	M80x4	350	152	110	83	64	180	78	120	45	43.3

Order details:

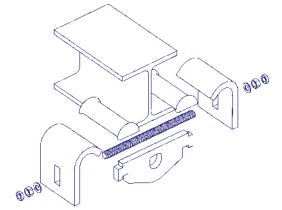
Spher. washer with weld-on plate type 74

BEAM CLAMP TYPE 78

7



**Beam clamp
type 78 21 11 to 78 71 11**



Type	d ₃	A	E ₀ up to beam dim. b=										s	t _{max} ①	Weight (kg)
			46	82	100	125	140	180	220	260	300				
78 21 11	17	80	55	55	65	65	65	75	85	-	-	8	15	0.8 - 1.6	
78 31 11	21	80	-	70	70	70	80	90	100	110	10	20	2.0 - 3.6		
78 41 11	25	125	-	-	-	85	90	90	100	105	115	15	25	6.7 - 8.9	
78 51 11	34	125	-	-	-	95	95	105	115	130	140	15	25	6.8 - 9.5	
78 61 11	41	180	-	-	-	-	-	100	100	110	110	20	30	17.7 - 19.8	
78 71 11 ①	51	180	-	-	-	-	-	115	115	125	130	20	30	18.2 - 20.8	

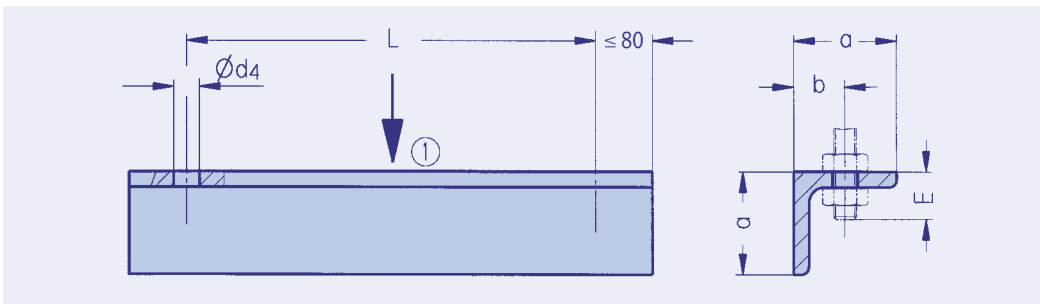
① Load groups 8 & 9 can be connected. Permissible load 100kN during normal operating condition.

② A larger t dimension can be accommodated by increasing E₀ accordingly. Indicate complete beam size when ordering.

Order details:

Beam clamp
type 78 .1 11 – beam size...

TRAPEZE TYPE 79



**Trapezes for small loads and
pipe diameters ≤ 80 mm
type 79 C2 37 to 79 42 37**

① The permissible center load is limited by the load group of the individual trapeze (3rd digit of type number).

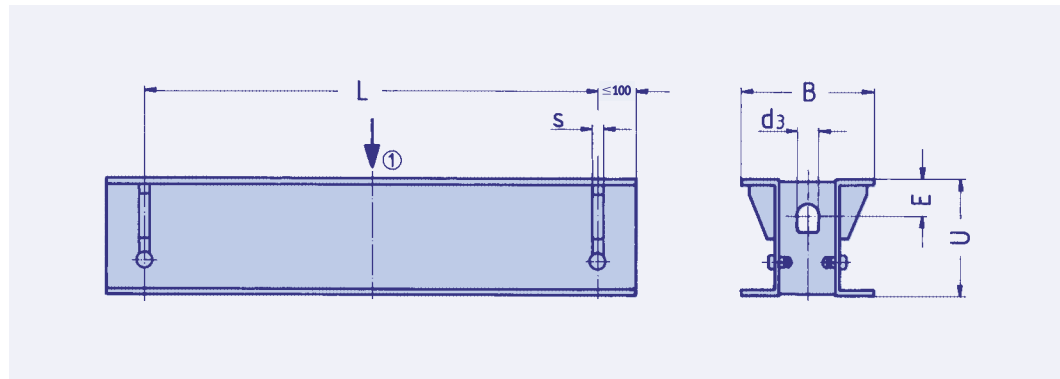
Type	L _{max}	E	a	b	d ₄	Weight (kg) for L=500mm +/- per 100mm	
79 C2 37	1000	25	40	22	11	1.7	0.3
79 D2 37	1000	25	60	25	11	2.6	0.46
79 12 37	600	25	60	25	11	2.6	0.46
79 12 37	1000	25	70	28	11	3.8	0.64
79 22 37	600	30	70	28	14	3.8	0.64
79 22 37	1100	30	80	32	14	6.0	1.0
79 32 37	600	30	80	32	14	6.0	1.0
79 32 37	1200	30	100	35	14	9.6	1.5
79 42 37	600	40	100	38	18	9.6	1.5
79 42 37	1200	40	130	42	18	15.6	2.4

Order details:

Trapeze
type 79 .2 37, L=...

TRAPEZE TYPE 79

Trapeze type 79 22 34 to 79 20 34



① The permissible center load is limited by the load group of the individual trapeze (3rd or 3rd and 4th digit of type number).

② The L max dimension can be extended to 2400mm by reducing the permissible load by 5% for every 100mm of extension.

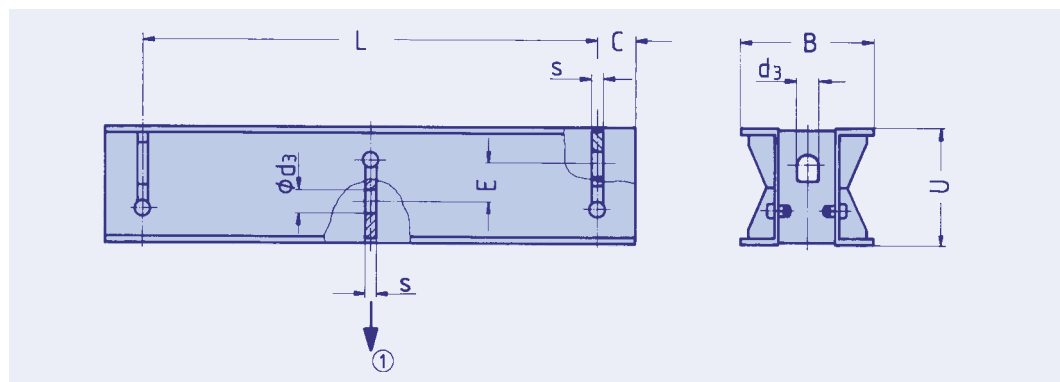
③ The trapeze is dimensionally compatible with other components in the LISEGA modular system within the load groups specified.

Type	Load- ^③ group	d ₃ ≥	s ≤	L max ^②	E	U	B	Weight (kg) 1000mm +per 100mm	
79 22 34	D - 4	21	10	1700	20	80	140	19	1.7
79 32 34	D - 4	21	10	1700	20	80	140	19	1.7
79 42 34	3 - 4	21	12	900 1800	20 40	80 120	140 190	19 31	1.7 2.7
79 52 34	4 - 5	25	18	1400 1800	40 40	120 140	190 200	31 38	2.7 3.2
79 62 34	5 - 6	34	20	1250 1800	40 55	140 180	200 230	38 54	3.2 4.4
79 72 34	6 - 7	41	25	1400 1800	60 65	180 200	230 250	54 65	4.4 5.1
79 82 34	6 - 8	46	25	1250 2400	70 80	200 260	250 310	65 102	5.1 7.6
79 92 34	7 - 9	51	30	1800 2400	85 90	260 300	310 350	102 129	7.6 9.2
79 10 34	8 - 10	61	30	2000	95	300	350	129	9.2
79 20 34	9 - 10	61	30	1800	95	300	350	129	9.2

Order details:

Trapeze
type 79 .2 34, L=...

Trapeze type 79 23 39 to 79 93 39



① The permissible center load is limited by the load group of the individual trapeze (3rd digit of type number).

② The L max dimension 1700mm & 1800mm of type 79 23 39 to 79 73 39 can be extended to 2400mm by reducing the permissible load by 5% for every 100mm of extension.

③ The trapeze is dimensionally compatible with other components in the LISEGA modular system within the load groups specified.

Type	Load- ^③ group	d ₃	L max ^②	E	U	B	C	s	Weight (kg) 1000mm +per 100mm	
79 23 39	D - 4	21	1700	40	80	140	40	10	19	1.7
79 33 39	D - 4	21	1700	40	80	140	40	10	19	1.7
79 43 39	3 - 5	25	1800	40	120	190	50	12	32	2.7
79 53 39	4 - 6	34	1800	60	140	200	60	18	40	3.2
79 63 39	5 - 7	41	1800	65	180	230	70	20	56	4.4
79 73 39	6 - 8	46	1800	65	200	250	80	25	68	5.1
79 83 39	6 - 9	51	2400	95	260	310	90	25	108	7.6
79 93 39	7 - 10	61	2400	120	300	350	100	30	138	9.2

Order details:

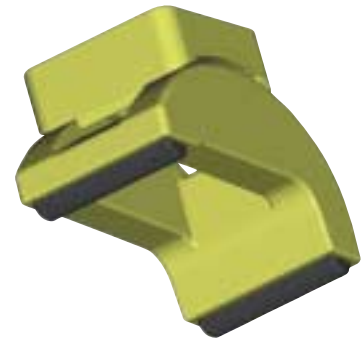
Trapeze
type 79 .3 39, L=...



BEAM ADAPTER TYPE 76



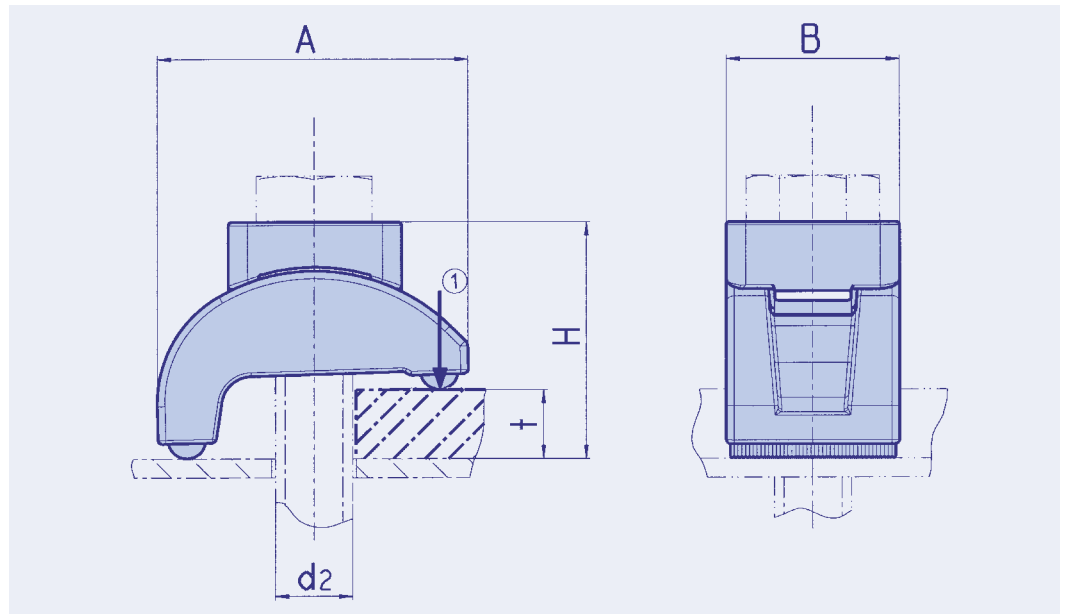
For alterations or extensions to pipe systems or structural steel in existing plants, clamp connections are often preferred to welding for the necessary attachment to the existing structure of pipe supports or additional steel. The use of this method is obligatory when welding is ruled out for safety reasons. The long-lasting security of this type of connection depends essentially on the condition of the contact surfaces and the preset forces applied. For a reliable connection, the specific design of the clamp elements used is decisive.



Offering the utmost reliability, LISEGA beam adapters type 76 serve as secure connections for this purpose.

These newly developed components enable the attachment of diverse components to existing steel without welding or drilling, while installation is simple and time-saving. LISEGA beam adapters adjust automatically on tightening to the thickness of the component to be clamped. If the given torque values are observed, the lasting security of the connection is guaranteed. Existing corrosion protection, e.g. hot-dip galvanizing or color coating, is not impaired.

Beam adapter
type 76 D2 11 to 76 42 11



Type	support load (kN)	Bolts 8.8		A	B	d2	H min	H max	t (clamp thickness)		Weight (kg)
		support load (kN)	torque value (Nm) max.						min	max	
76 D2 11	2.5	35	48	24	M10	31	37	3	15	0.1	
76 22 11	6.0	70	57	30	M12	38	45	4	17	0.2	
76 32 11	8.5	150	70	37	M16	44	54	6	20	0.3	
76 42 11	15.0	300	83	46	M20	55	65	6	25	0.6	

Order details:
Beam adapter
type 76 .. 11

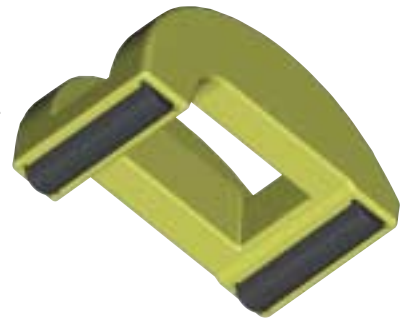
① The tabulated loads are normal operating loads (load condition H). For emergency (HZ) and faulted loads (HS) see table "Max. permissible loads" on page 0.5

Hex. Bolt, Grade 8.8,
inclusive Hex. Nut, Grade 8

Bolt-Type	Dimensions	Weight/kg
76 D2 11 - 065	M10 x 65	0.06
76 D2 11 - 080	M10 x 80	0.07
76 D2 11 - 100	M10 x100	0.08
76 22 11 - 070	M12 x 70	0.09
76 22 11 - 090	M12 x 90	0.10
76 22 11 - 120	M12 x120	0.12
76 32 11 - 090	M16 x 90	0.19
76 32 11 - 120	M16 x120	0.23
76 32 11 - 150	M16 x150	0.27
76 42 11 - 120	M20 x120	0.39
76 42 11 - 150	M20 x150	0.45
76 42 11 - 180	M20 x180	0.51

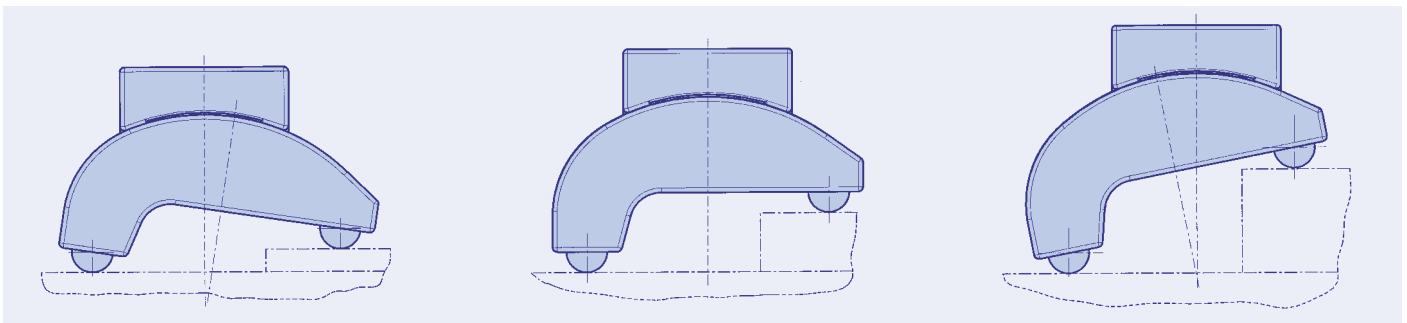
The unique feature of the LISEGA beam adapters is represented by the special contact elements. They adjust automatically due to their shape to any position and any existing sectional flange angles.

The hardened contact elements have a rounded grooved profile which presses into the contact surface on tightening. This provides a form-fit grip which offers mechanical security against shifting in any direction.

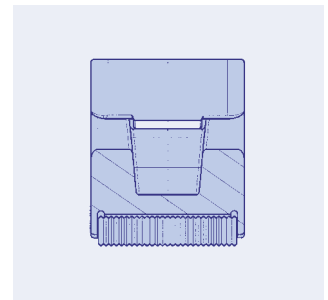
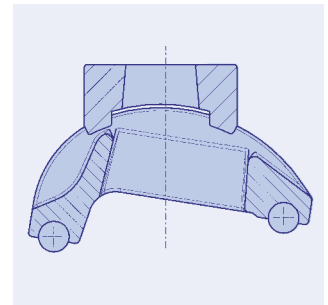


Cross connection:

The safe connection of beam sections to each other is simple effected with an inlay plate and eight LISEGA beam adapters. The load capacity of a cross connection is given in the table below.



Cross connection



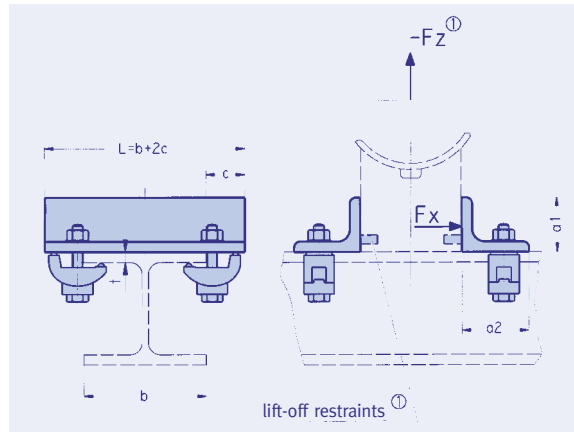
Cross connection with LISEGA beam adapters

Type	Loading capacity (kN) with 4 bolts 8.8	Thickness of intermed. plate
76 D2 11	10	10
76 22 11	24	12
76 32 11	34	15
76 42 11	60	18

Interconnection of sections can be made directly or by the use of a support plate. The load capacity of a cross connection can be taken from the table on the left.

GUIDE WITH BEAM ADAPTERS FOR CLAMP BASES TYPE 49 .. 3/4/5

**Guide with beam adapters
for clamp bases
type 76 00 11 up to
76 00 14**
Material:
Guide: S235JR G2



Order details:
Lateral guide
type 76 00 1.; b = ...

Order details:
Lateral guide with lift-off
restraint
type 76 00 2. - 49
(Clamp base type); b = ...

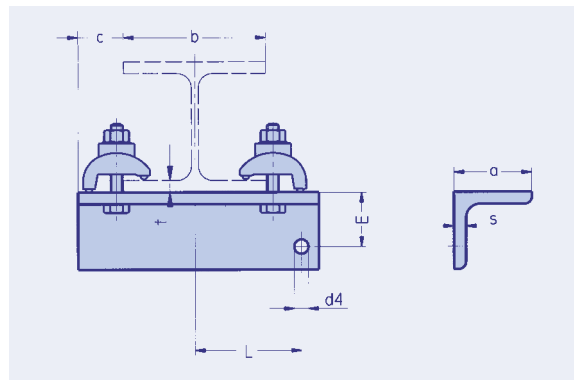
Type	type ① with lift-off restraint	torque value (Nm)	Fx (kN)	-Fz ① (kN)	a1	a2	bmin	c	tmax	weight (kg) for b=100 +per 100mm	
76 00 11	76 00 21	35	1.0	3.5	30	50	42	40	15	1.7	0.60
76 00 12	76 00 22	70	1.7	4.5	30	60	50	45	17	2.8	0.95
76 00 13	76 00 23	150	2.8	6.5	40	80	64	55	20	4.9	1.40
76 00 14	76 00 24	300	4.7	6.5	40	80	73	65	25	7.2	1.40

① The guides can be supplied if required with an additional lift-off restraint (width: 80mm) (when ordering, give details in addition to designation of clamp base type).

- Fz: the permissible short-term lift-off load is limited to 10% of the respective clamp base nominal load.

CANTILEVER WITH BEAM ADAPTERS TYPE 76 .. 16

**Cantilever with beam
adapters
type 76 C1 16 up to
76 21 16**
Material:
Cantilever: S235JR G2

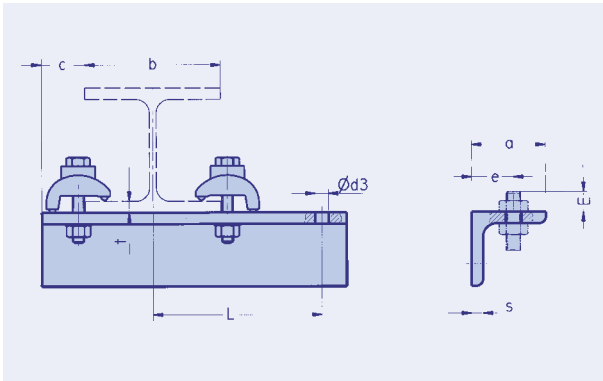


$$L_{min} = \text{Zero} \quad L_{max} = b/2 + c$$

Order details:
Cantilever with beam
adapters
type 76 .1 16;
b = ... L = ...

Type	torque value (Nm) max.	a x s	bmin	bmax	c	d4	E	tmax	Weight (kg) for b=100 L = 50	Weight (kg) +per 100mm
76 C1 16	35	40x6	42	300	40	11	25	15	0.9	0.35
76 D1 16	70	60x6	50	300	45	11	45	17	1.5	0.55
76 11 16	150	70x7	55	300	55	14	48	20	2.5	0.75
76 21 16	300	80x8	64	300	65	17	55	25	3.9	1.00

CANTILEVER WITH BEAM ADAPTER TYPE 76 .. 17



Cantilever with beam adapter
type 76 C1 17 up to
76 21 17
Material:
cantilever: S235JRG2

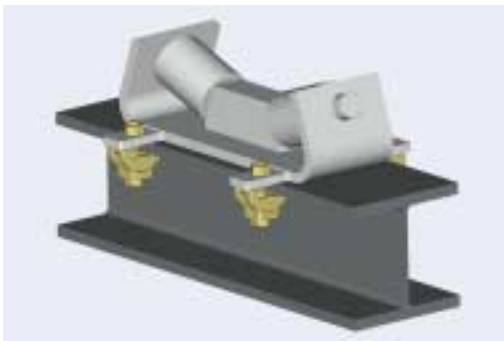
$$L > b/2 + c$$

Type	torque value (Nm) max.	a x s	b _{min}	c	d3	e	E	t _{max}	L _{max} up to beam dim. b=								Weight (kg)	
									82	100	125	140	180	220	260	300	for b=100 L=100	+per 100mm
76 C1 17	35	40x6	46	40	11	22	20	15	120	230	270	310	320	340	360	380	1.0	0.35
76 D1 17	70	60x6	55	45	11	25	20	17	105	170	200	250	280	340	360	380	1.8	0.55
76 11 17	150	70x7	64	55	14	28	25	20	110	140	170	200	230	290	350	380	2.8	0.75
76 21 17	300	80x8	73	65	14	30	25	25	145	160	190	235	265	290	310	330	4.4	1.00

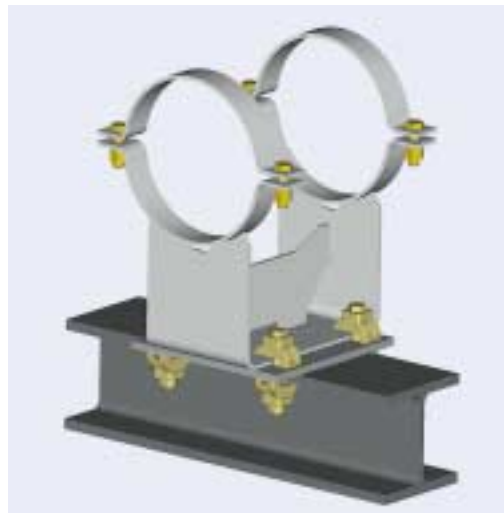
Order details:
Cantilever with beam adapter
type 76 .1 17;
b = ... L = ...

APPLICATION EXAMPLES

LISEGA beam adapters can be used in combination with all components suitable for seating or flanging on beams. Here are two further typical examples with LISEGA standard components:



Roller bearing with side plates fitted at works



Clamp base as fixed point