

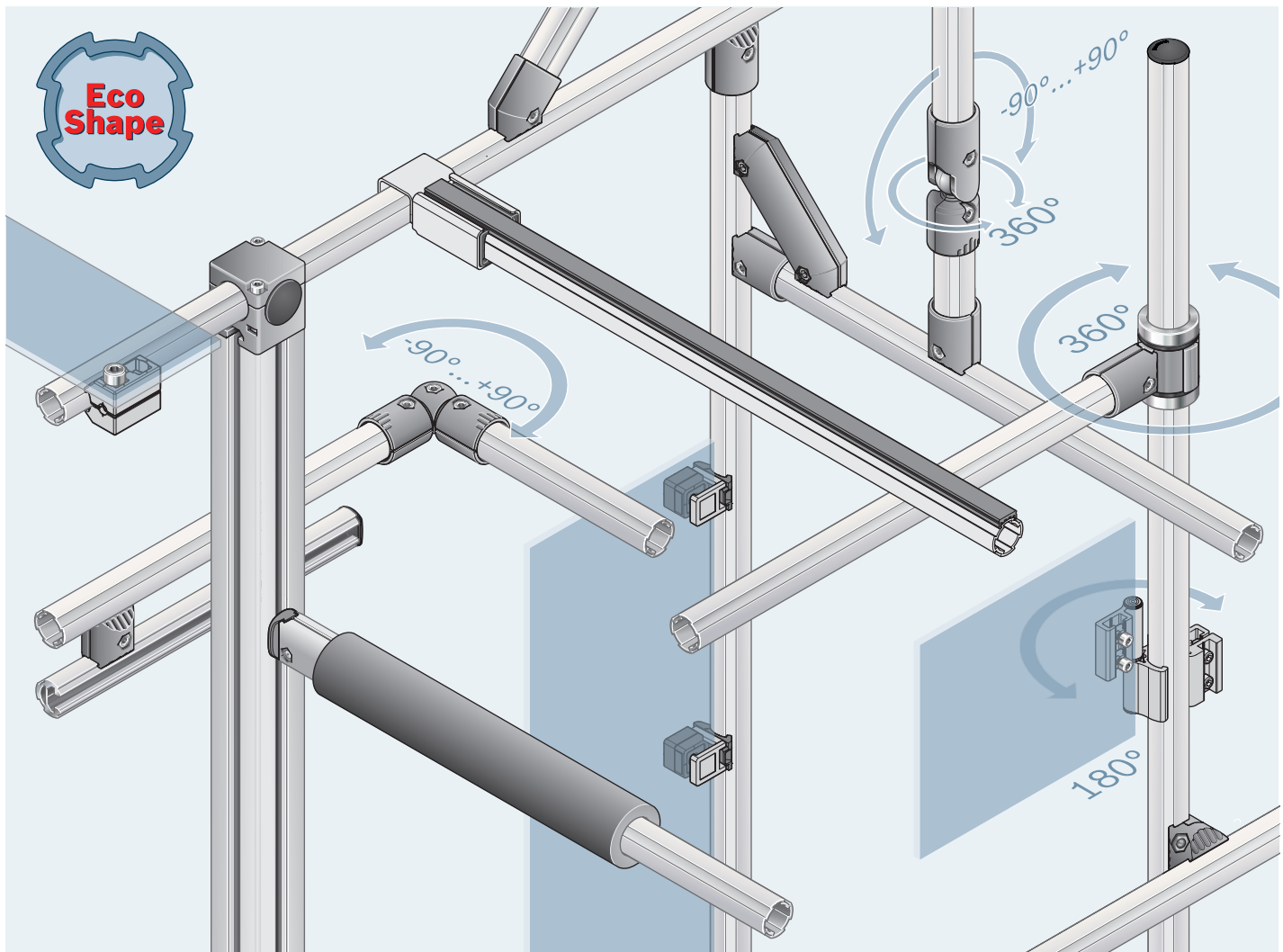
EcoShape The Next Dimension in Tubular Framing Systems

3.0



EcoShape: Easy³ – Versatile, simple, efficient

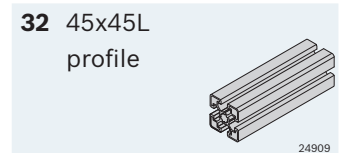
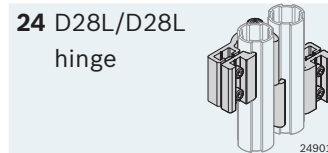
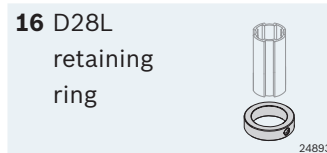
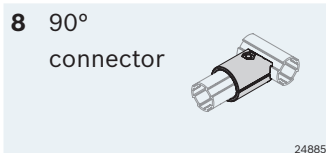
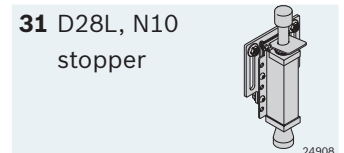
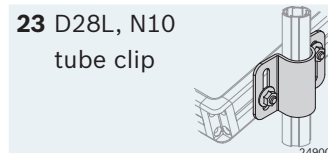
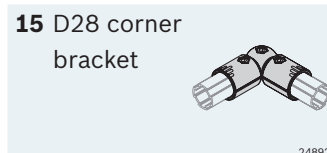
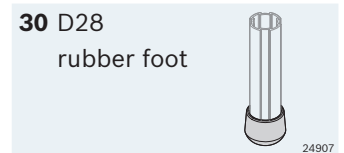
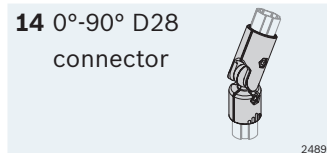
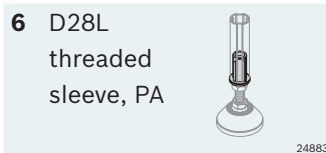
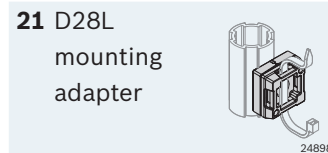
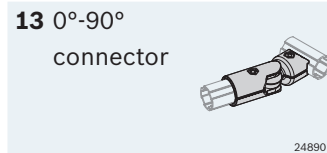
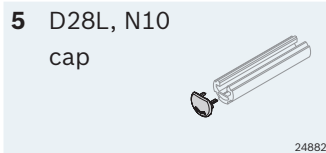
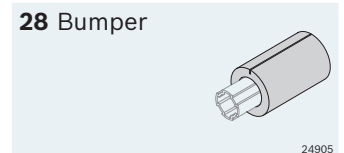
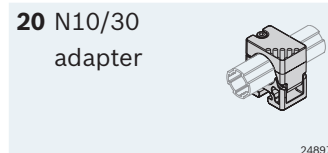
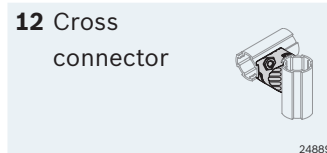
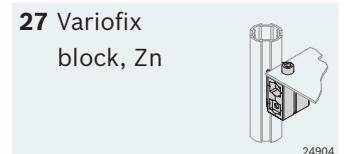
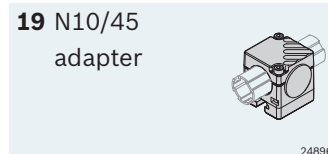
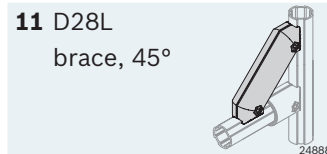
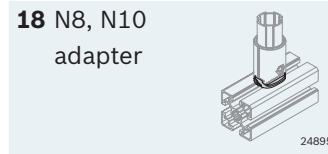
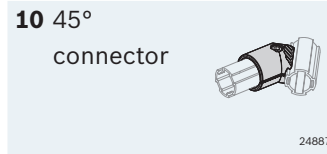
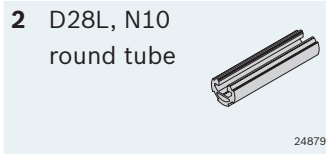
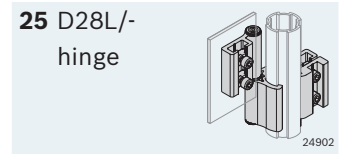
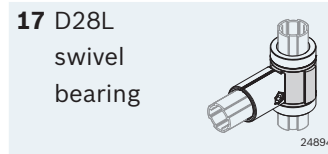
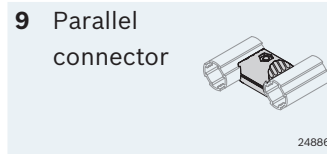
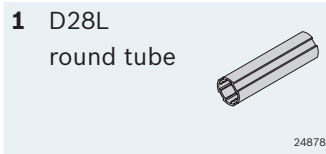
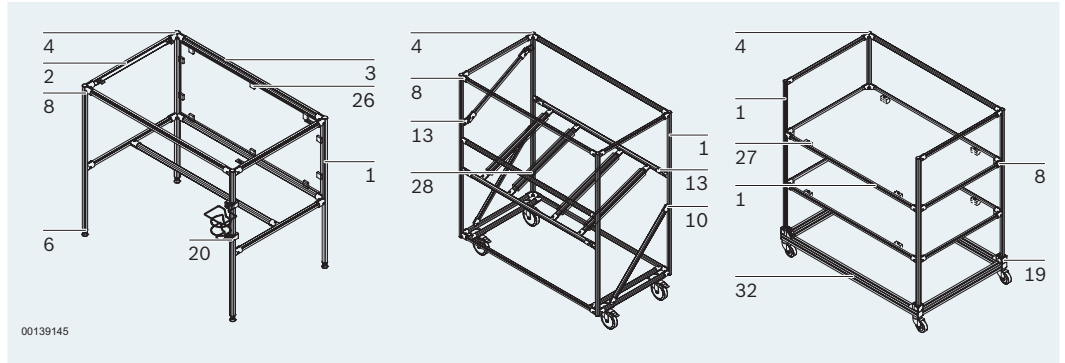
With EcoShape, you can build custom structures that require very few components. Planning is easy, too, thanks to the new MTpro planning software and the ability to make virtually any connection with a few standard parts.



- ▶ The connectors can be combined with the EcoShape D28L and D28L, N10 round tubes, as well as the D28 round tube ("Manual Production Systems 5.0" catalog, 3 842 538 280 (2013-11),  105).
- ▶ Integrated poka yoke system for easy and secure connector installation
- ▶ Twist locks for secure joints
- ▶ Positive interlocking connections

31 components – endless possibilities

Consistent simplicity and efficiency are key features of the EcoShape system: just a few components are all you need to create everything from simple transport shuttles to entire assembly lines.



The 31 standard components are designed in accordance with the poka yoke principle, making them quick to assemble and prohibiting any faulty connections. The assembly line can be improved and expanded at any time in line with the kaizen philosophy.

The system allows you to quickly and economically plan and build flow racks, material shuttles, workstations and any other frame systems to meet your specific needs, using the small number of standard components.

- ▶ Two aluminum tubular profiles give your construction the required stability.
- ▶ With just eight connectors you create any imaginable connection between two EcoShape profiles – parallel, perpendicular, or at any desired angle.
- ▶ All of the connectors establish a positive interlocking connection (radial) between the profiles for a secure fit.
- ▶ The connection elements allow for a length tolerance (of 2 mm per connector), greatly facilitating cut-to-size and assembly work.
- ▶ Variofix blocks let you securely attach surface elements quickly and inexpensively.
- ▶ EcoShape can be combined with the components from the MPS Manual Production Systems and MGE Basic Mechanic Elements product ranges. You can use this versatility to expand system functionality, for example in the area of ergonomics.
- ▶ The ability to combine all components with one another gives you great flexibility with just a few components.
- ▶ The tubes and connectors will neither rust nor wear, making them ideal for long-term use and for reuse in new systems.
- ▶ For even greater stability you can combine EcoShape with the modular aluminum framing system.

ESD conductivity

All EcoShape systems are ESD-conductive and suitable for use in ESD-sensitive areas. All parts with the ESD symbol in the catalog are suitable for building ESD-conductive systems. ESD conductivity is guaranteed in accordance with the standard DIN EN 61340-5-1. No further ESD elements are required – with EcoShape you have everything in a single package.

Ergonomics

The combination of lean production and ergonomics results in an unbeatable strategy to help you achieve short production runs and reduced costs. EcoShape unites low investment expenditure with high flexibility and quality, including in the area of ergonomics. The ergonomic accessories found in the MPS program can also be used with all EcoShape workstations and flow rack systems.



For the design and planning of EcoShape tubular framing systems we recommend MTpro!
More information can be found on page 21.



◀ Aluminum is environmentally friendly and up to 99% recyclable. Aluminum profiles are reusable.



1

$A = 1,80\text{ cm}^2$

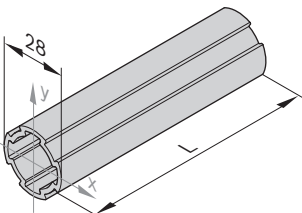
$I_x = 1,33\text{ cm}^4$

$I_y = 1,33\text{ cm}^4$

$W_x = 0,95\text{ cm}^3$

$W_y = 0,95\text{ cm}^3$

$m = 0,48\text{ kg/m}$



00134985

2

$A = 2,63\text{ cm}^2$

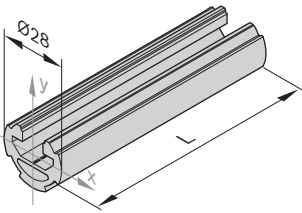
$I_x = 1,17\text{ cm}^4$

$I_y = 1,97\text{ cm}^4$

$W_x = 0,84\text{ cm}^3$

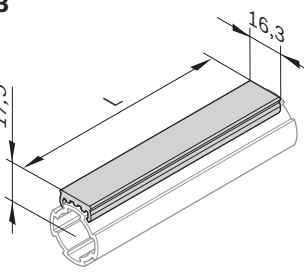
$W_y = 1,41\text{ cm}^3$

$m = 0,71\text{ kg/m}$



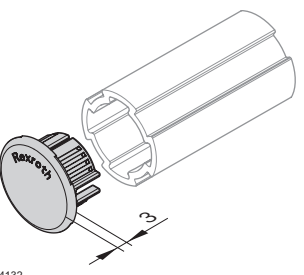
00134986

3



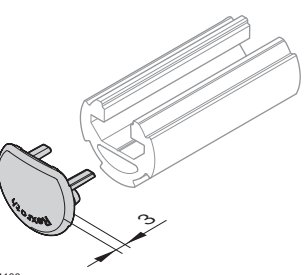
00134987

4



24132

5



24133

- ▶ Round tube D28L with 4 interfaces for attaching EcoShape connectors

D28L round tube	L (mm)	No.
1 pc 	50 ... 5600	3 842 996 191/L
 50 pcs 	5600	3 842 541 211

Material: Aluminum, anodized

- ▶ D28L, N10 round tube with 10 mm slot for mounting accessories from the modular aluminum framing system
- ▶ 3 interfaces for attaching EcoShape connectors

D28L, N10 round tube	L (mm)	No.
1 pc 	50 ... 5600	3 842 996 192/L
 20 pcs 	5600	3 842 541 213

Material: Aluminum, anodized

- ▶ Slide rail for creating a simple conveyor track or manual slide section by clipping slide rail onto a D28L or D28L, N10 round tube

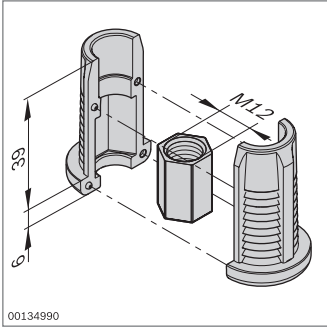
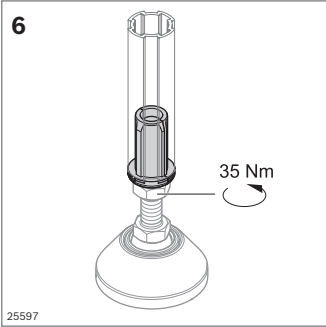
Slide rail	L (mm)	ESD		No.
	2000		10	3 842 541 196
	2000		10	3 842 548 117

Material: PVC, gray
ESD: PVC (conductive), black

- ▶ Cap for D28L and D28L, N10 round tube

Cap	ESD		No.
4 D28L		20	3 842 548 129
5 D28L, N10		20	3 842 548 130

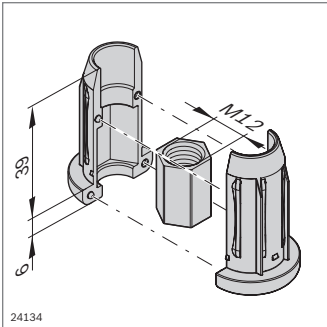
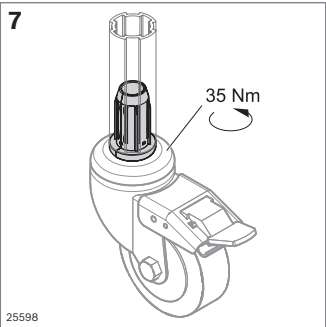
Material: PA66 (conductive), black



► Threaded sleeve for integrating a leveling foot or caster.
Further information (📄 19)

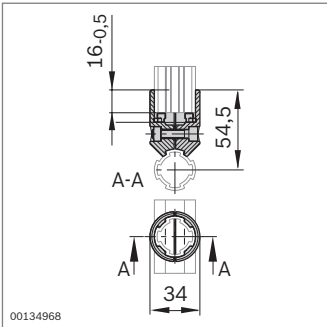
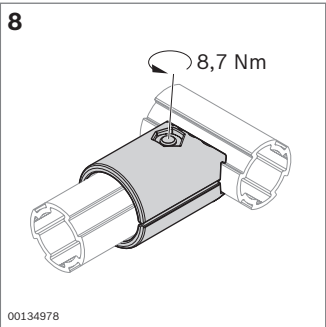
D28L threaded sleeve, PA	ESD	No.
	20	3 842 541 185

Material: PA66 (conductive), black
Hexagon nut: aluminum



D28L threaded sleeve, Zn	ESD	No.
	20	3 842 548 119

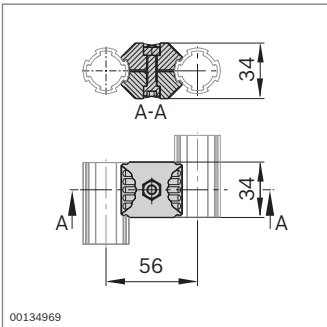
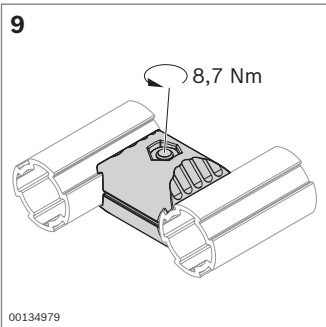
Material: Diecast zinc
Hexagon nut: aluminum



90° connector	ESD	No.	FS
	20	3 842 541 173	FS1

Material: Diecast zinc
Scope of delivery: Incl. fastening material (FS)

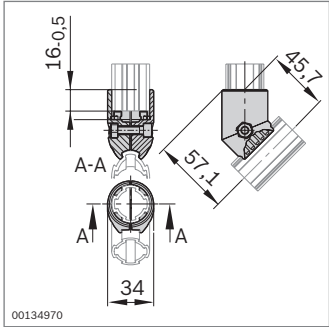
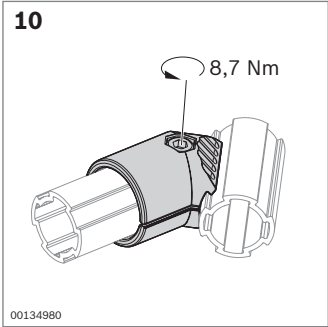
FS1
ISO 4762 M6x25
ISO 4032 M6



Parallel connector	ESD	No.	FS
	20	3 842 541 183	FS1

Material: Diecast zinc
Scope of delivery: Incl. fastening material (FS)

FS1
ISO 4762 M6x25
ISO 4032 M6



45° connector	ESD	No.	FS
	20	3 842 541 175	FS1

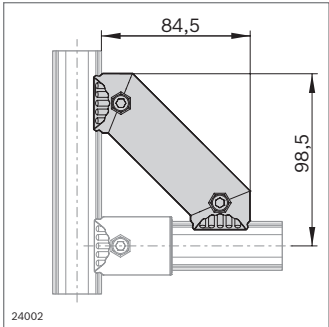
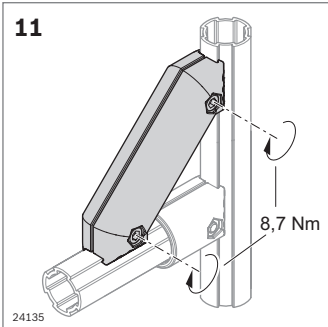
Material: Diecast zinc

Scope of delivery: Incl. fastening material (FS)

FS1

ISO 4762
M6x25

ISO 4032
M6



D28L brace, 45°	ESD	No.	FS
	20	3 842 548 118	2xFS1

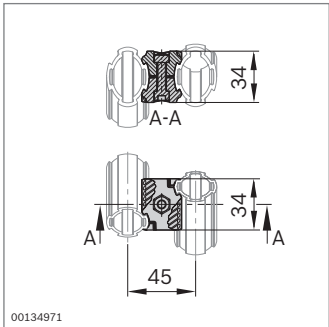
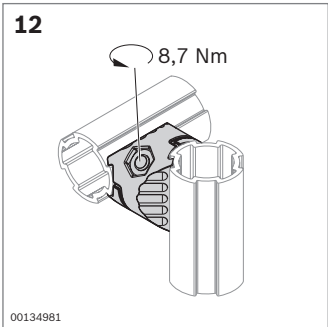
Material: Diecast zinc

Scope of delivery: Incl. fastening material (FS)

FS1

ISO 4762
M6x25

ISO 4032
M6



Cross connector	ESD	No.	FS
	20	3 842 541 181	FS1

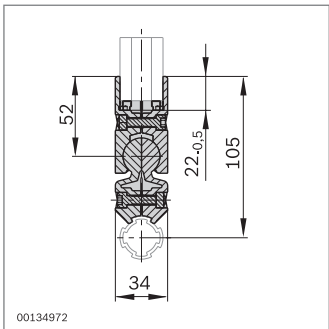
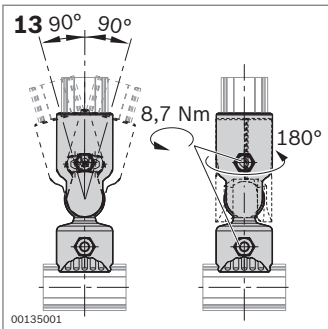
Material: Diecast zinc

Scope of delivery: Incl. fastening material (FS)

FS1

ISO 4762
M6x25

ISO 4032
M6



0°-90° connector	ESD	No.	FS
	20	3 842 541 178	2xFS1

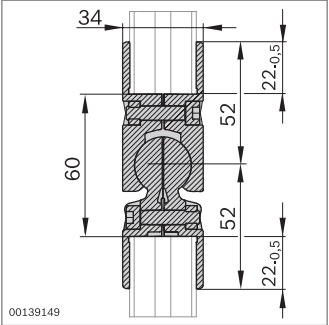
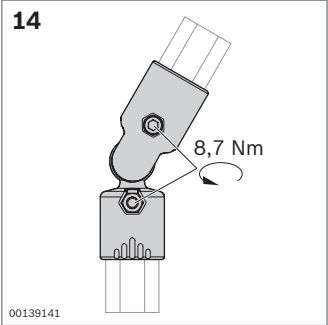
Material: Diecast zinc

Scope of delivery: Incl. fastening material (FS)

FS1

ISO 4762
M6x25

ISO 4032
M6

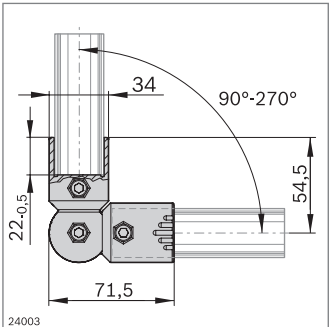
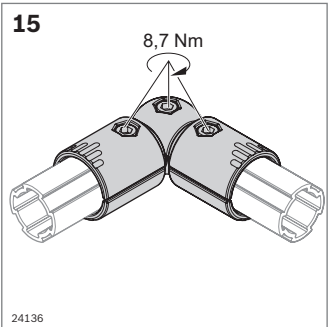


0°-90° D28 connector	ESD	No.	FS
		20 3 842 543 480	2xFS1

Material: Diecast zinc
Scope of delivery: Incl. fastening material (FS)

FS1

	ISO 4762 M6x25
	ISO 4032 M6



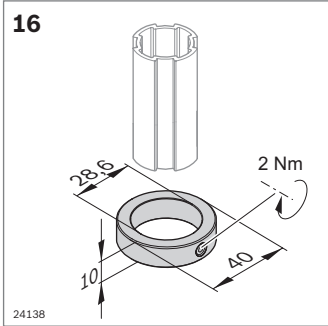
- D28 corner bracket for easy adjustment in 15° intervals
- Swivel range: 90°–270°

D28 corner bracket	ESD	No.	FS
		20 3 842 548 123	3xFS1

Material: Diecast zinc
Scope of delivery: Incl. fastening material (FS)

FS1

	ISO 4762 M6x25
	ISO 4032 M6

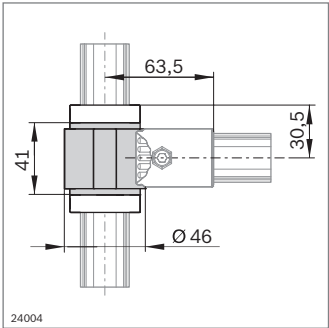
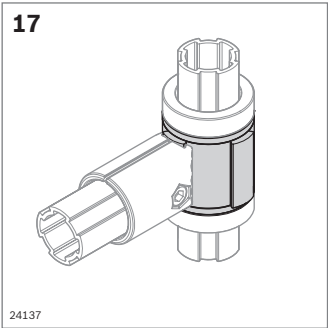


D28L retaining ring	ESD	No.	FS
		20 3 842 548 122	FS2

Material: Aluminum
Scope of delivery: Incl. fastening material (FS)

FS2

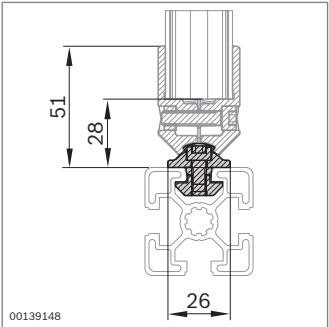
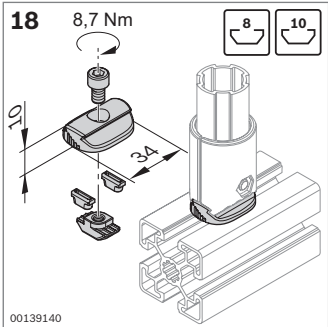
	ISO 4026 M6x6
--	------------------



- For axial displacement along the D28L or D28L, N10 round tube; end position defined via the retaining ring
- Realization of swivel applications

D28L swivel bearing	No.
	20 3 842 548 121

Material: Aluminum
Bushing: POM, black



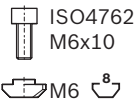
- N8, N10 adapter for connecting an MGE strut profile (8 mm, 10 mm slots)

N8, N10 adapter	ESD	No.	FS
		20	3 842 543 272 FS4, FS5

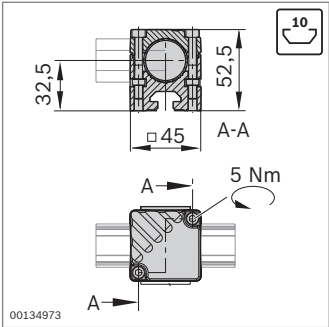
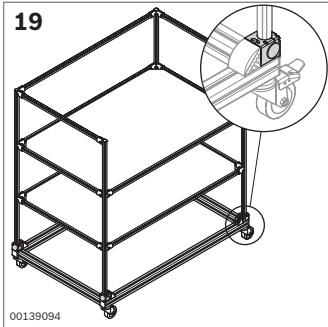
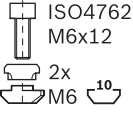
Material: Diecast zinc

Scope of delivery: Incl. fastening material (FS)

FS4



FS5



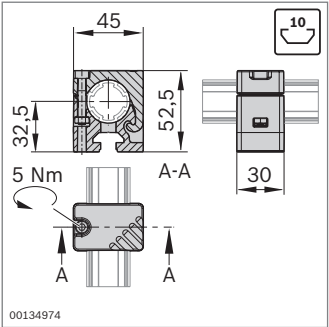
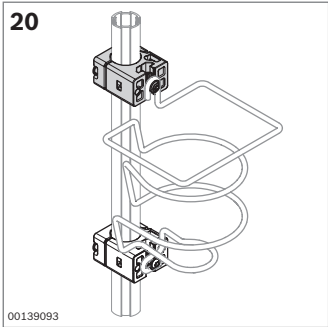
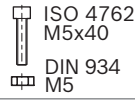
- N10/45 adapter for connecting D28L or D28L, N10 round tubes to profiles with a 10 mm slot

N10/45 adapter	ESD	No.	FS
		20	3 842 541 187 2xFS3

Material: Adapter: Diecast zinc
Cap: PE

Scope of delivery: incl. cap, fastening material (FS)

FS3



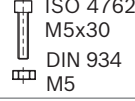
- N10/30 adapter for mounting light accessories such as a bottle holder to a D28L round tube

N10/30 adapter	ESD	No.	FS
		20	3 842 541 190 FS6

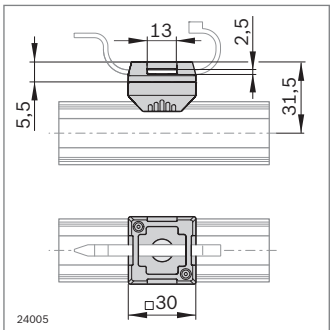
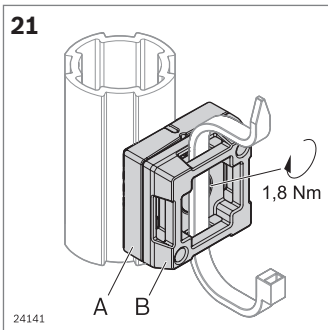
Material: Diecast zinc

Scope of delivery: Incl. fastening material (FS)

FS6



21

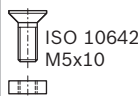


► For attaching cable fasteners

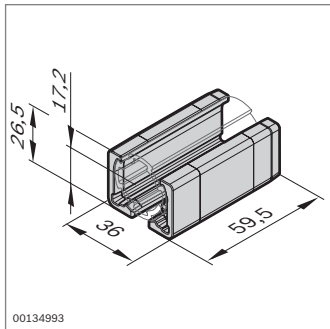
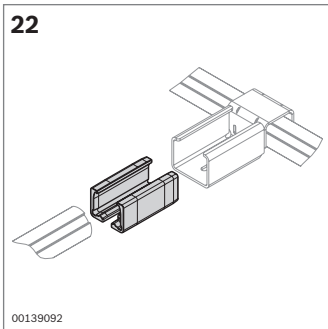
D28L mounting adapter	ESD	No.	FS
A + B	20	3 842 548 120	FS7

Material: PA66 (conductive), black
Scope of delivery: Incl. fastening material (FS)

FS7



22

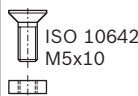


► For attaching containers using the container mount

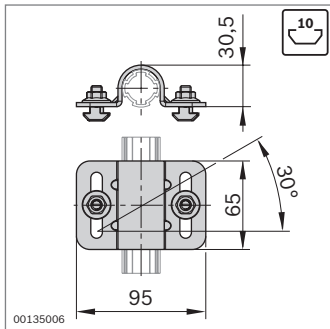
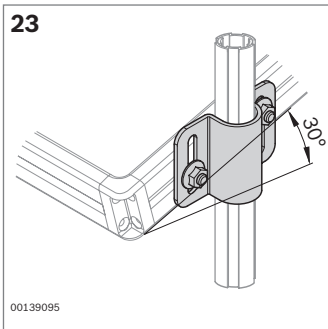
Container mount	ESD	No.	FS
C	10	3 842 544 797	FS7

Material: PA66 (conductive), black
Scope of delivery: Incl. fastening material (FS)

FS7



23



► XLean adapter for combination with XLean. The XLean adapter connects the D28L round tube to the XLean rail holder (17)

XLean adapter	ESD	No.
	20	3 842 541 296

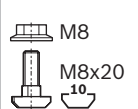
Material: PA66 (conductive), black

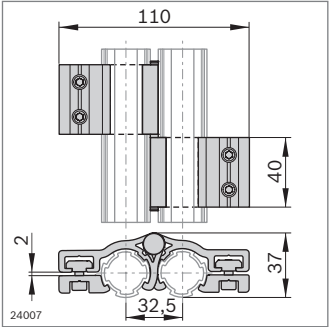
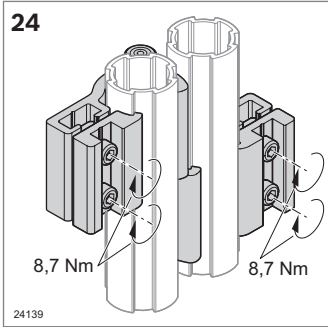
► D28L, N10 tube clip for fastening material shelves with a 10 mm slot to the D28L round tube; inclinations up to 30° possible

D28L, N10 tube clip	ESD	No.	FS
	20	3 842 541 193	2xFS8

Material: Steel, galvanized
Scope of delivery: Incl. fastening material (FS)

FS8



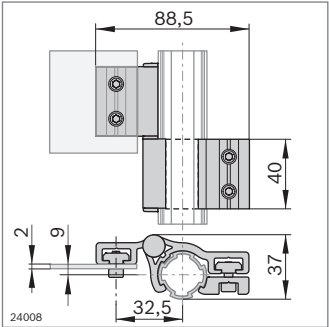
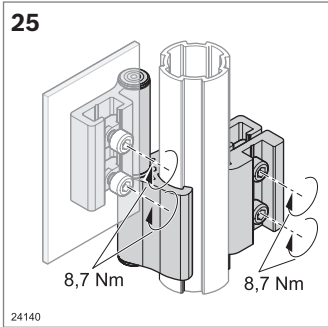
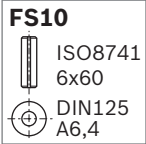
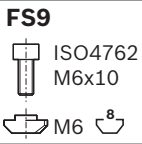


- Opening angle: 180°
- For D28L round tube assembly

D28L/D28L hinge	ESD	No.	FS
		2	3 842 548 126 4xFS9, FS10

Material: Aluminum

Scope of delivery: Incl. fastening material (FS)

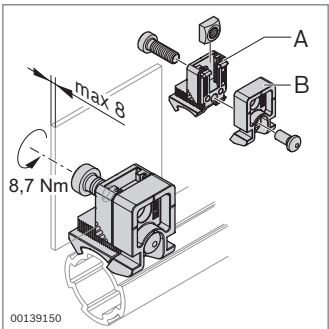
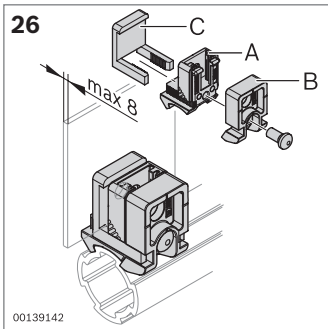
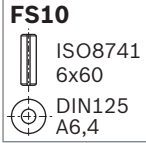
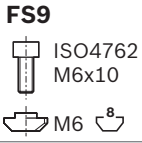


- Opening angle: 180°
- For surface element assembly

D28L/- hinge	ESD	No.	FS
		2	3 842 548 127 2xFS9, FS10

Material: Aluminum

Scope of delivery: Incl. fastening material (FS)

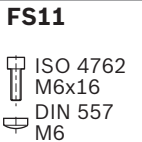


- Plastic Variofix block for fastening surface elements with a snap-in clip or screw
- Variofix remover for releasing the snap-in clip (🔧 MGE 13.0 p. 14-7)

Variofix block, PA	No.	FS
A + B	20	3 842 543 311 FS11, FS12

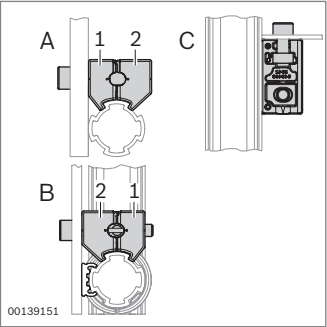
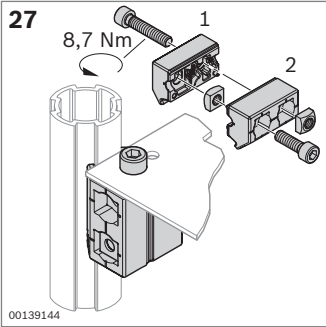
Material: PA66 (conductive), black

Scope of delivery: Incl. fastening material (FS)



Snap-in clip	No.
C	10 3 842 184 738

Material: PA6, transparent

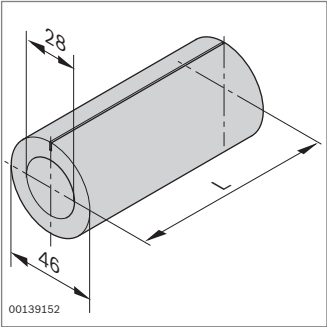
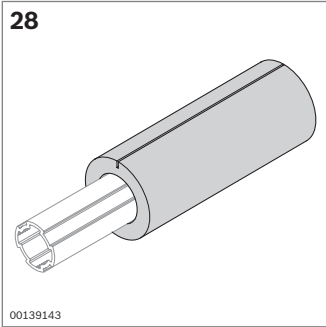
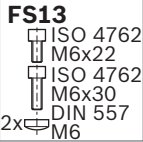


- Diecast zinc Variofix block for fastening surface elements
- Three arrangements possible (“A”, “B”, “C”)

Variofix block, Zn	ESD	No.	FS
		20	3 842 543 494 FS13

Material: Diecast zinc

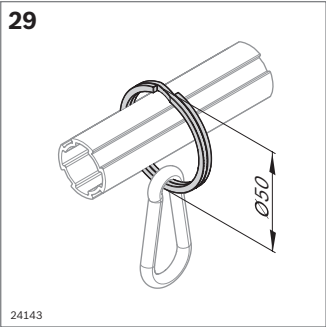
Scope of delivery Incl. fastening material (FS)



- Bumper for D28 and D28L round tube

Bumper	L (mm)	No.
	2000	10 3 842 544 637

Material: PE-LD, gray



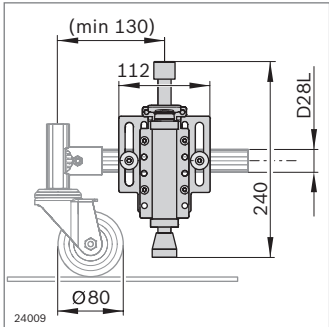
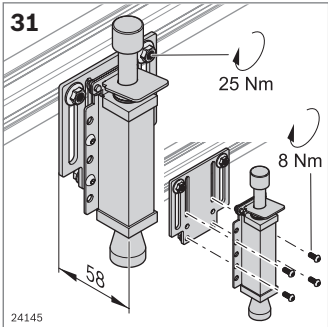
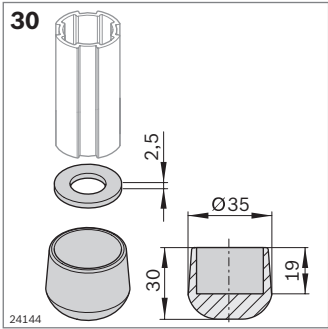
- For designing simple tool holders

D50 ring	No.
	20 3 842 548 131

Material: Steel, nickel-plated

Carabiner	No.
	1 0 842 901 309

Material: Steel, galvanized

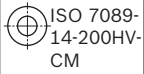


▶ Anti-slip flow rack and stand designs

D28 rubber foot	ESD	No.	FS
	20	3 842 548 128	FS14

Material: NR/SBR (conductive), black

FS14



- ▶ To ergonomically stop material shuttles at only one point
- ▶ Universal attachment options to the different round tubes and profile cross sections
- ▶ Stopper preload length: 34 mm

D28L, N10 stopper	No.	FS
	3 842 548 132	4xFS15, 2xFS16

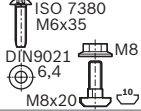
Material: Stopper: stainless steel, EPDM
 Attachment plate: aluminum

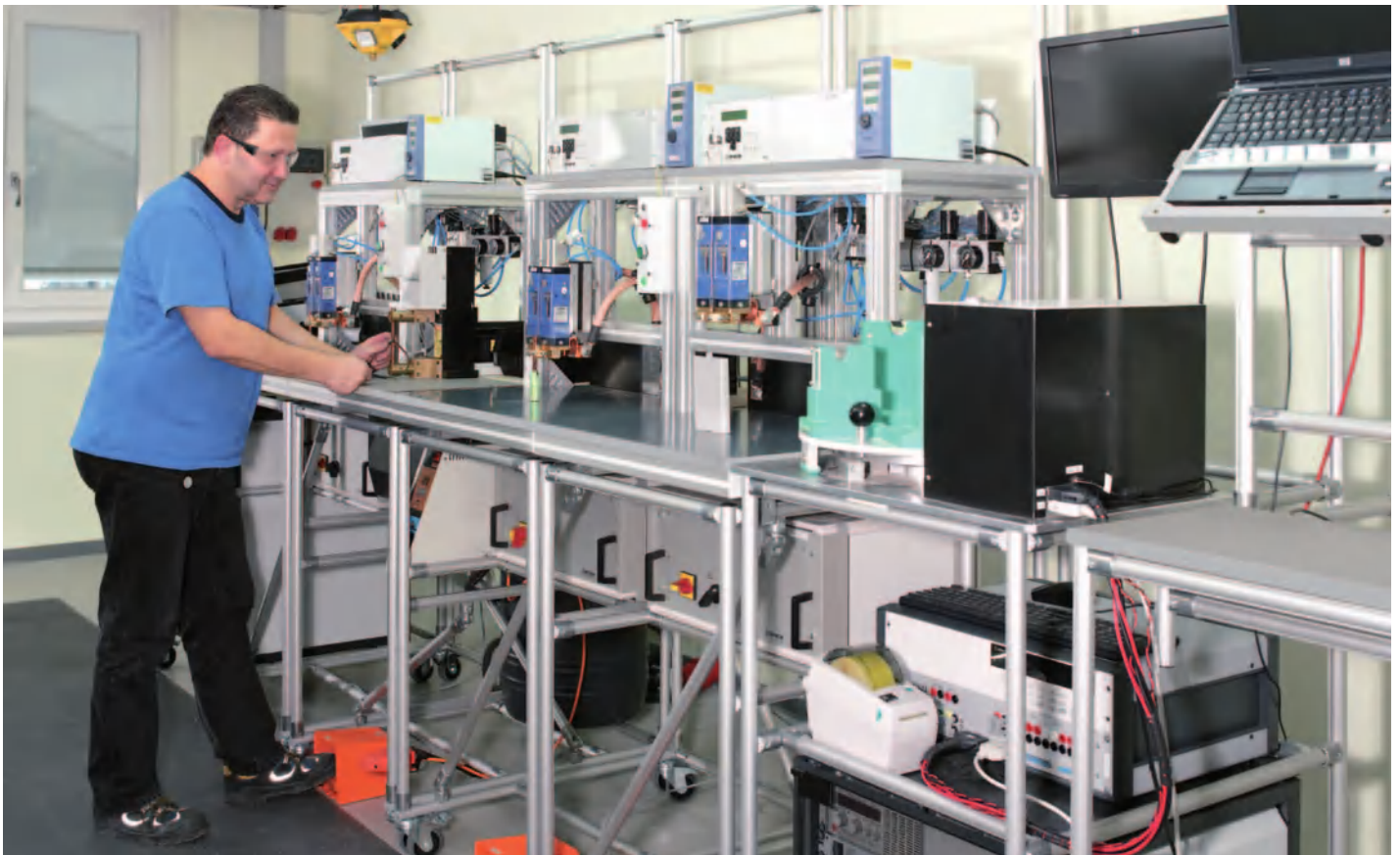
Scope of delivery: Incl. fastening material (FS)

FS15

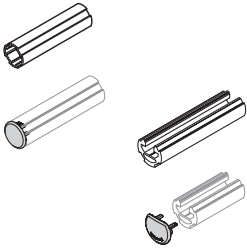
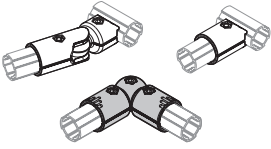
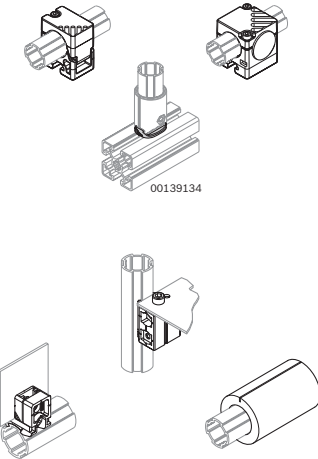


FS16

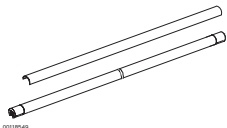
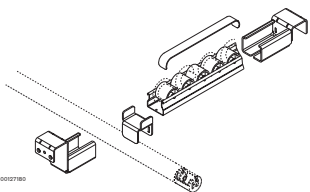
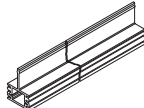
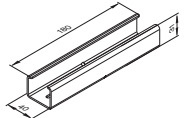
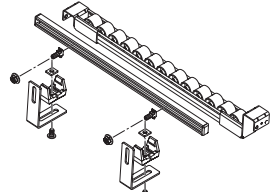


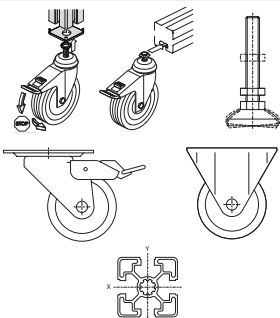


EcoShape modular product system

Tubular framing system		L (mm)	ESD	No.	Page
	D28L round tube	5600		3 842 541 211	6
	D28L round tube	50 ... 5600		3 842 996 191/...	6
	D28L, N10 round tube	5600		3 842 541 213	6
	D28L, N10 round tube	50 ... 5600		3 842 996 192/...	6
	Slide rail	2000		3 842 541 196	6
	Slide rail	2000		3 842 548 117	6
	D28L cap			3 842 548 129	6
	D28L, N10 cap			3 842 548 130	6
	D28L threaded sleeve, PA			3 842 541 185	7
	D28L threaded sleeve, Zn			3 842 548 119	7
	90° connector			3 842 541 173	7
	Parallel connector			3 842 541 183	7
	45° connector			3 842 541 175	8
	D28L brace, 45°			3 842 548 118	8
	Cross connector			3 842 541 181	8
	0°-90° connector			3 842 541 178	8
	0°-90° D28 connector			3 842 543 480	9
	D28 corner bracket			3 842 548 123	9
	D28L retaining ring			3 842 548 122	9
	D28L swivel bearing			3 842 548 121	9
	N8, N10 adapter			3 842 543 272	10
	N10/45 adapter			3 842 541 187	10
	N10/30 adapter			3 842 541 190	10
	D28L mounting adapter			3 842 548 120	11
	Container mount			3 842 544 797	11
	XLean adapter			3 842 541 296	11
	D28L, N10 tube clip			3 842 541 193	11
	D28L/D28L hinge			3 842 548 126	12
	D28L/- hinge			3 842 548 127	12
	Variofix block, PA			3 842 543 311	12
	Snap-in clip			3 842 184 738	12
	Variofix block, Zn			3 842 543 494	13
	Bumper for D28L round tube			3 842 544 637	13
	D50 ring			3 842 548 131	13
	Carabiner			0 842 901 309	13
	D28 rubber foot			3 842 548 128	14
	D28L, N10 stopper			3 842 548 132	14

Selected combination options with components from the MPS Manual Production Systems
and MGE Basic Mechanic Elements product ranges
www.boschrexroth.com/mediadirectory

Manual Production Systems 5.0 (3 842 538 280 (2013-11))		L (mm)	ESD No.	Page
	Lettering clip for tubular cross tie	2000	3 842 535 136	106
	Lettering clip for tubular cross tie	102	3 842 538 093	106
	D28 round tube	30 ... 6000	3 842 993 317/L	105
	D28 round tube	6070	3 842 535 118	105
	D28 roller section	100 ... 4500	3 842 993 321/L	91
	D28, ESD roller section	100 ... 4500	 3 842 993 431/L	91
	D28 roller section	4500	3 842 537 776	91
	D28, ESD roller section	4500	 3 842 537 778	91
	D28SK roller section	100 ... 4500	3 842 993 322/L	91
	D28SK, ESD roller section	100 ... 4500	 3 842 993 432/L	91
	D28SK roller section	4500	3 842 537 777	91
	D28SK, ESD roller section	4500	 3 842 537 779	91
	Brake		 3 842 532 871	92
	Rail holder with stop		 3 842 538 372	91
	Rail holder without stop		 3 842 537 687	91
	Mount		 3 842 537 657	92
	D28 tube clip		 3 842 535 364	100
	Polymer profile	30 ... 3000	3 842 993 615/L	102
	Polymer profile, ESD	30 ... 3000	 3 842 993 617/L	102
	Polymer profile	3000	3 842 538 108	102
	Polymer profile, ESD	3000	 3 842 538 107	102
	Rail holder with stop		 3 842 538 051	102
	Rail holder without stop		 3 842 538 050	102
	XLean transport guide mount		3 842 538 102	102
	M6, P60 - P 30 bracket set		 3 842 537 862	154
	Section link		 3 842 536 722	92
	Bridge		 3 842 536 724	92
	Flexible bridge		 3 842 537 911	92
	Adapter		 3 842 537 022	158
	Mounting bracket		 3 842 535 125	158
	Profile 15x22.5	30 ... 3000	3 842 992 473/L	158
	Profile 15x22.5	2000	3 842 513 576	158
	Cap		 3 842 537 594	158

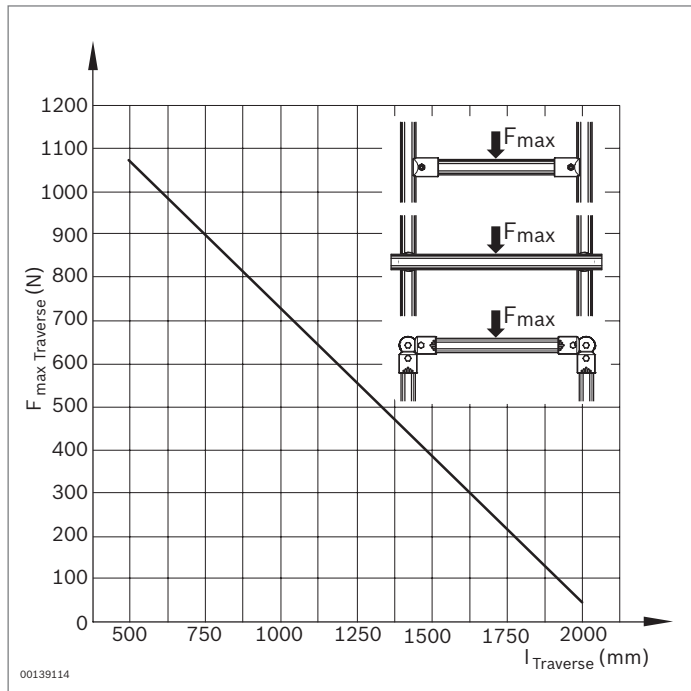
Basic Mechanic Elements 13.0 (3 842 540 391 (2013-02))		ESD No.	Page
	Caster wheel with lock	3 842 541 226	6-17
	Caster wheel	3 842 541 234	6-17
	Leveling foot	 3 842 529 025	6-4
	Leveling foot	 3 842 352 061	6-5
	Caster wheel with mounting flange and lock	3 842 259 790	6-21
	Trestle wheel with mounting flange	3 842 259 792	6-22
	45x45L profile	3 842 992 425/L	2-34

Technical data

The stated torque and load limit values were determined using a test model (dry).

D28L cross tie – Permissible point load, center

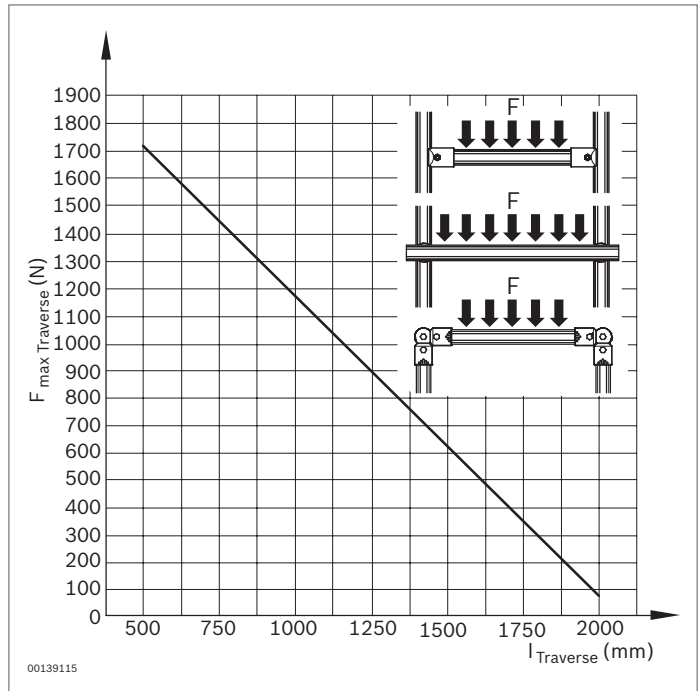
Connectors: 90° connector, cross connector, corner bracket



Safety factors and building specifications required by law and standard technical rules must be observed!

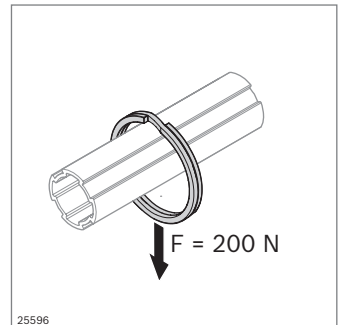
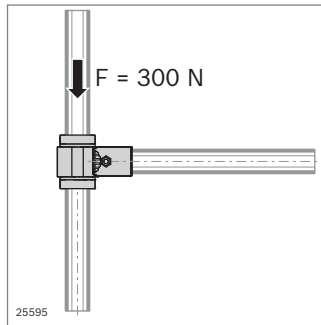
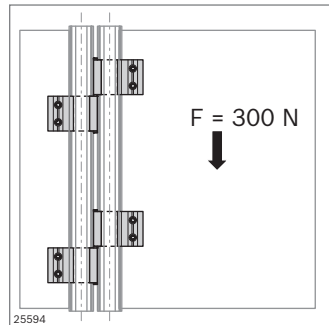
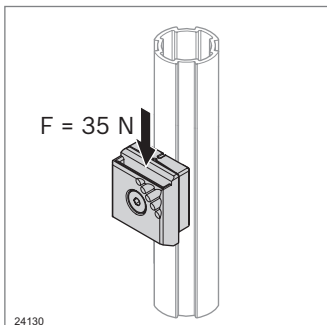
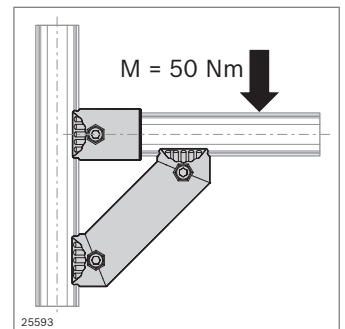
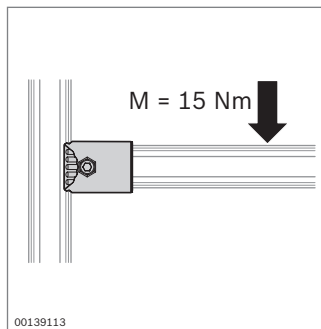
D28L cross tie – Permissible section load

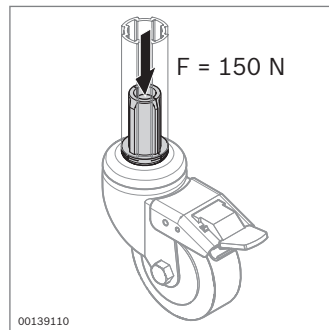
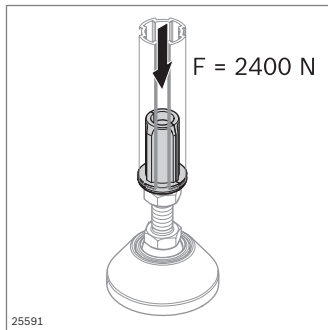
Connectors: 90° connector, cross connector, corner bracket



Connectors

Permissible load values for the connections

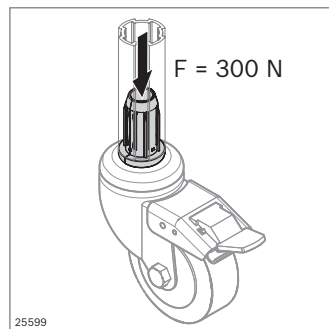
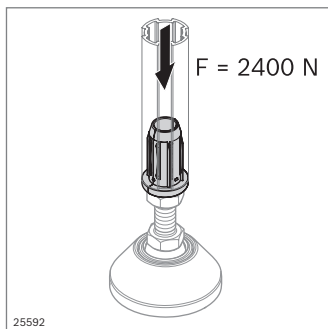




D28L threaded sleeve, PA

Permissible bearing load

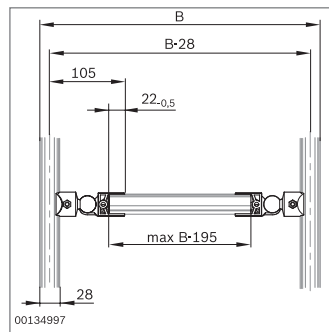
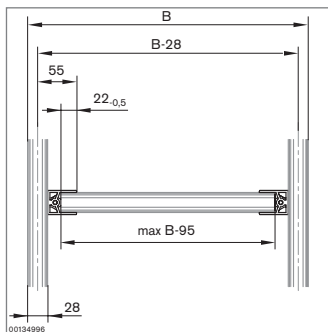
Material shuttle approved for 60 kg



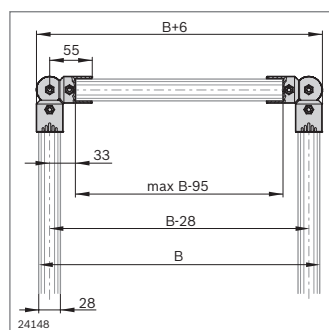
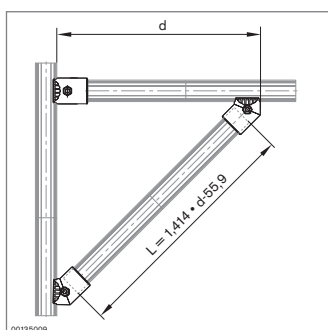
D28L threaded sleeve, Zn

Permissible bearing load

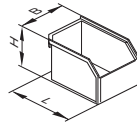
Material shuttle approved for 100 kg

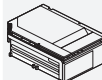
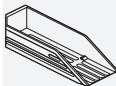


Length calculation



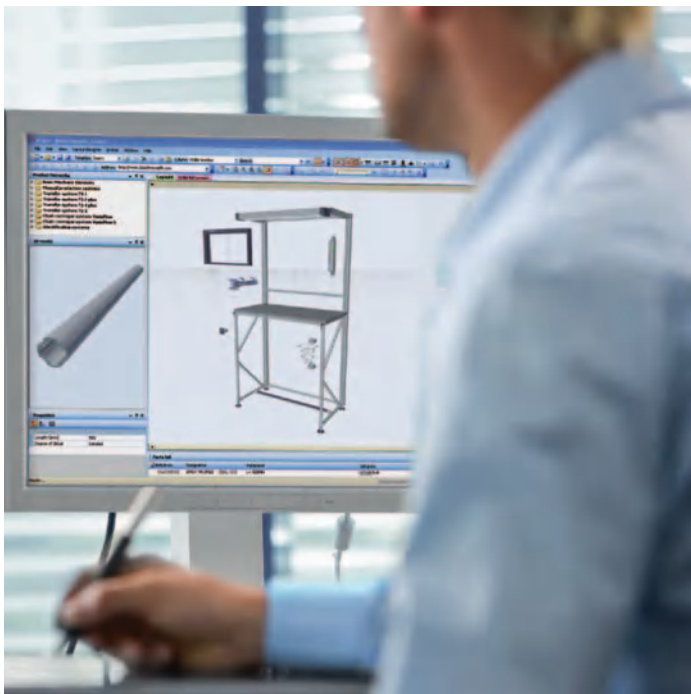
Grab containers



					Static load limit				
			W x H x L (mm)	(cm ³)	ESD	No.	D28L, N10 with container mount (kg)	Suspension profile (kg)	Mounting adapter with container mount and D28L round tube (kg)
Grab tray GB-Sxx		GB-S08	82 x 50 x 86	150		3 842 344 764	11	17	5
Grab container GB-xxxx						3 842 346 294	6	10	-
Grab ledge G-Zxx		GB-S12	123 x 50 x 86	240		3 842 344 765	11	19	5
Material: ABS						3 842 346 295	6	11	-
Surface resistivity:		GB-S17	173 x 50 x 86	360		3 842 344 766	11	21	5
10 ¹⁴ Ω/sq					3 842 346 296	6	12	-	
Specific volume resistance:		GB-0805	82 x 50 x 173	370		3 842 344 750	10	26	3
10 ¹⁴ Ω/cm						3 842 346 280	6	15	-
Min./max. ambient temperature:		GB-1205	123 x 50 x 173	600		3 842 344 751	10	26	3
-40°C/+70°C						3 842 346 281	6	15	-
Resistant to weak acidic and		GB-1210	123 x 100 x 173	1370		3 842 344 752	10	26	3
caustic materials, alcohols,						3 842 346 282	6	15	-
greases, oils, water		GB-1710	173 x 100 x 245	3050		3 842 344 753	13	30	2
						3 842 346 283	8	18	-
ESD version		GB-Z08	90 x 54 x 277	690		3 842 344 760	10	30	2
Material: ABS-CF						3 842 346 290	6	18	-
Surface resistivity:		GB-Z12	131 x 54 x 277	1050		3 842 344 761	6	23	2
10 ⁴ Ω/sq ... 10 ⁶ Ω/sq						3 842 346 291	3	13	-
Specific volume resistance:									
10 ⁴ Ω/cm ... 10 ⁶ Ω/cm									
Min./max. ambient temperature:									
-40°C/+70°C									
Resistant to weak acidic and									
caustic materials, alcohols,									
greases, oils, water									

You will find more information on grab containers and accessories in the Manual Production Systems 5.0 catalog (3 842 538 280 (2013-11))
www.boschrexroth.com/mediadirectory

MTpro planning software – fast, reliable planning



First plan, then order – it's that easy with MTpro planning software

MTpro is the high-performance, yet easy-to-use software from Rexroth that supports you in planning your assembly systems, without any prior knowledge of CAD. The user-friendly program guides you through a series of steps, from component selection to configuration and ordering of required parts.

MTpro features:

- ▶ Layout Designer for fast planning of complete frames and conveyor systems
- ▶ Simple planning via drag & drop
- ▶ No knowledge of CAD required
- ▶ Graphical user interface and multilingual content in 7 different languages (de, en, fr, es, it, jp, zh)
- ▶ ManModel function for ergonomic workstation planning
- ▶ User library to reuse your own modules
- ▶ Export of 3D models in all common CAD formats
- ▶ Automatic parts list generation with all accessories and small parts, including calculation of order lists
- ▶ Product information for Rexroth product lines
- ▶ MGE (Basic Mechanic Elements), MPS (Manual Production Systems), MIT (Material and Information Flow Technology)

With its “ManModels”, MTpro planning software can optimally adapt constructions for individual workers – with the perfect reach zone, the right distance to equipment, and the ideal angle of vision. The reach zone should be easily accessible from the working position and assist workers in avoiding unhealthy postures. It is divided into the working area directly within reach of the seated employee, the large reach zone, and the extended one-hand zone at the periphery.



Bosch Rexroth AG

Postfach 30 02 07
70442 Stuttgart, Germany
www.boschrexroth.com

You can find local contact information at:

www.boschrexroth.com/contact