

Damping Technology

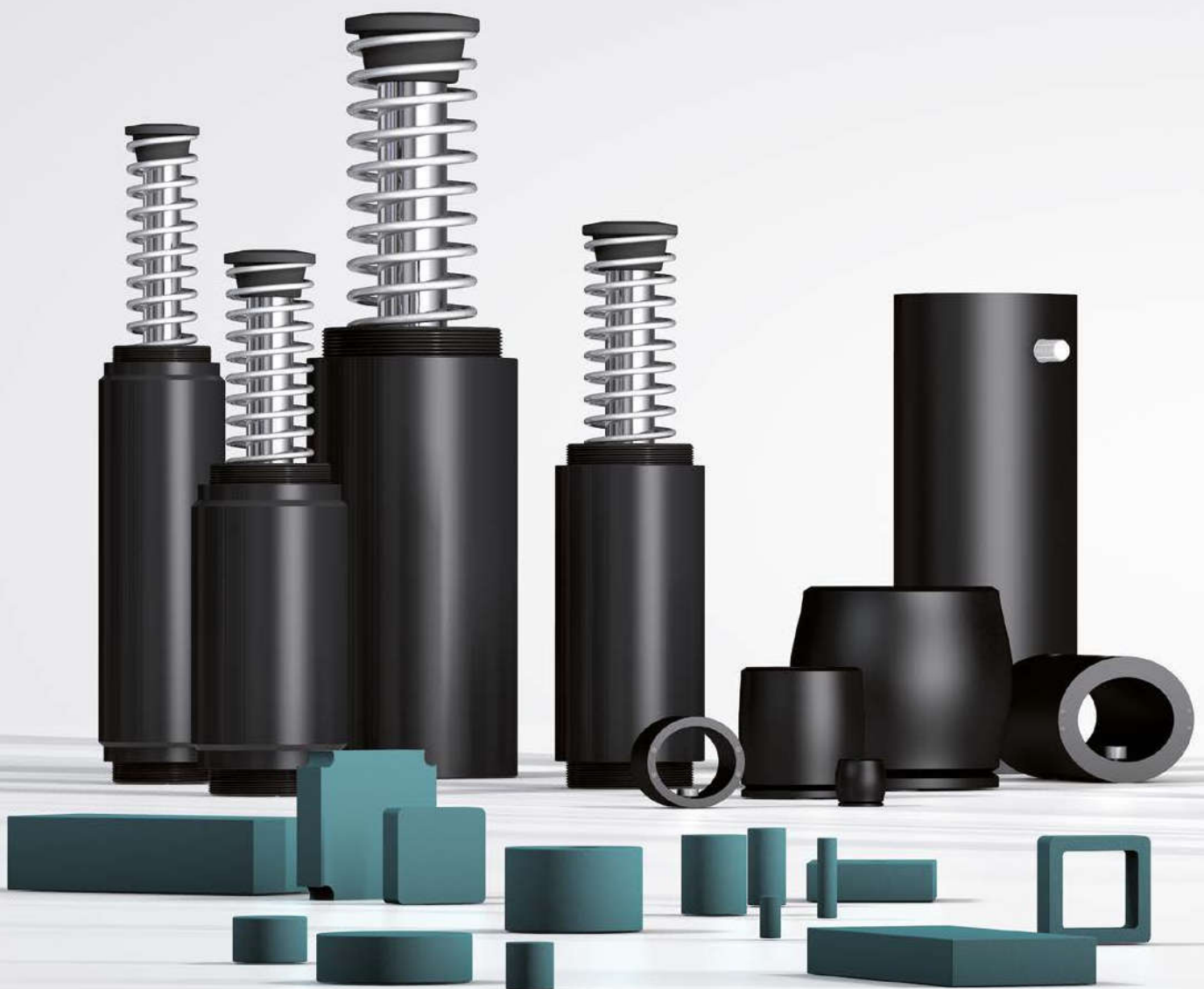
ACE: Your partner for industrial shock absorbers,
gas springs and vibration control

Main Catalogue 2017



Automation Control

**Miniature Shock Absorbers, Industrial Shock Absorbers
Heavy Industrial Shock Absorbers, Pallet Stoppers
Profile Dampers, Damping Pads**

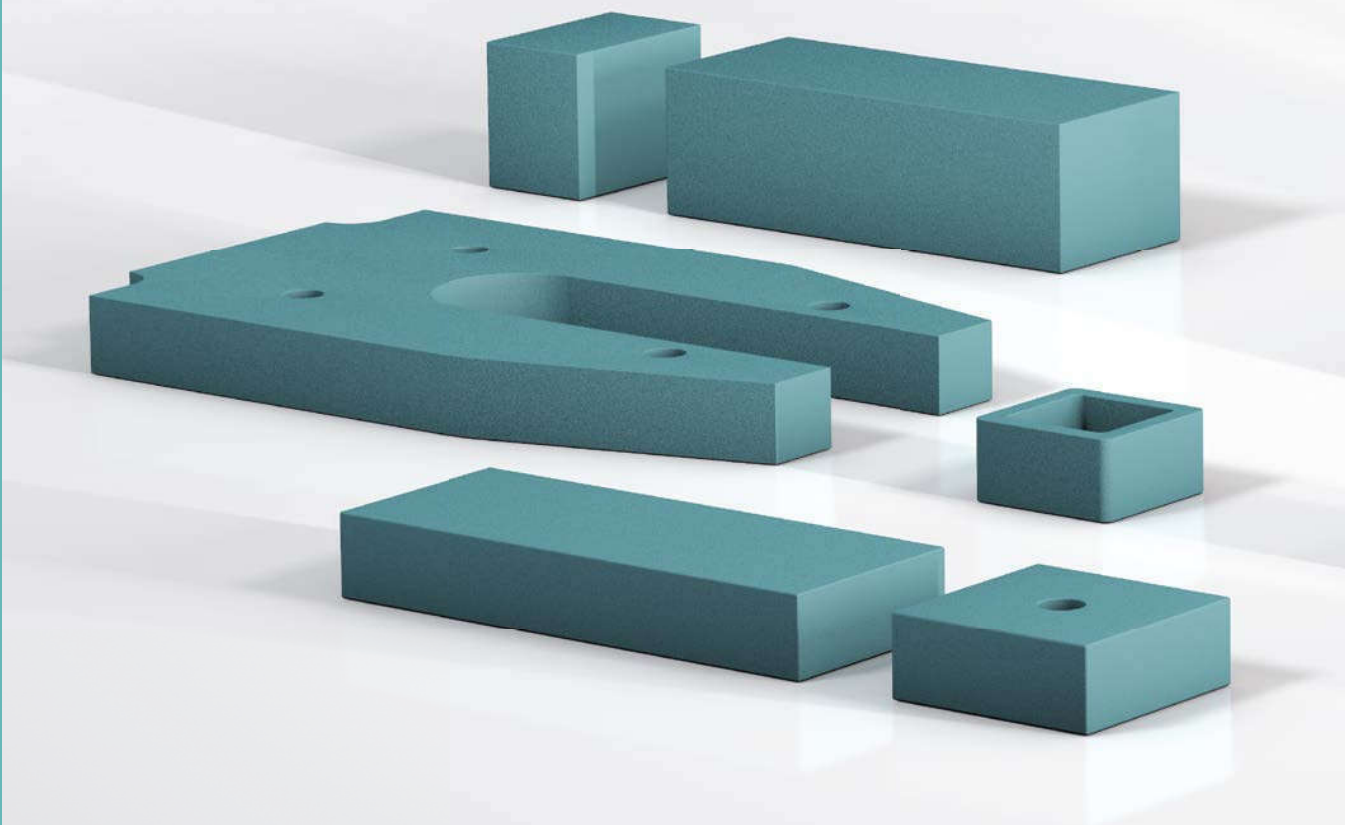


Damping Pads

Customised damping technology

With damping pads from the SLAB series, ACE provides solutions to effectively slow down impact loads over large and small surfaces. This means that these products are found in a wide range of damping technologies from ACE where oscillation begins or where damaging impacts in construction designs need to be slowed over a large surface.

The ACE SLAB pads, available to choose in any size, absorb static loads from 3 N/cm² to 30 N/cm² and can be either cut to size two-dimensionally according to each requirement or designed as a moulded part. It is simply adhered to assemble. The standard plate heights are between 12.5 mm and 25 mm. Many different coatings clear the way for numerous applications and not least because they can be used in a temperature range from -5 °C to +50 °C.



Individual Pad Cutting

SLAB pads pre-assembled for each project

Whether pads, cuts or drawing parts, stocked SLAB pads in combination with our freely programmable cutting machine ensure maximum flexibility with excellent delivery speed.

Fast, flexible and adapted to your conditions.

Ask for special solutions !!!

Can be integrated quickly and cost-effectively

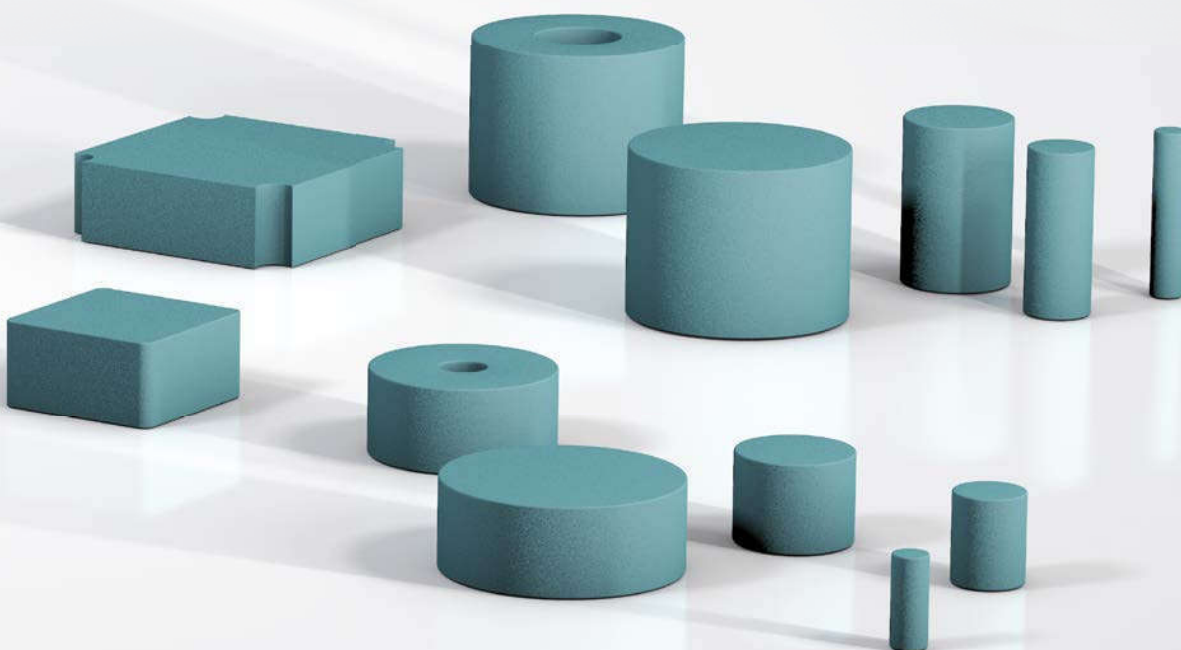
Immense inner damping

Pad thicknesses up to 80 mm on request

Can be assembled with CNC cutting machines

Patented formula

Environmentally-friendly H₂O-foamed



SLAB 030 to SLAB 300

Energy absorption in pad format

Confectioning and Combinable

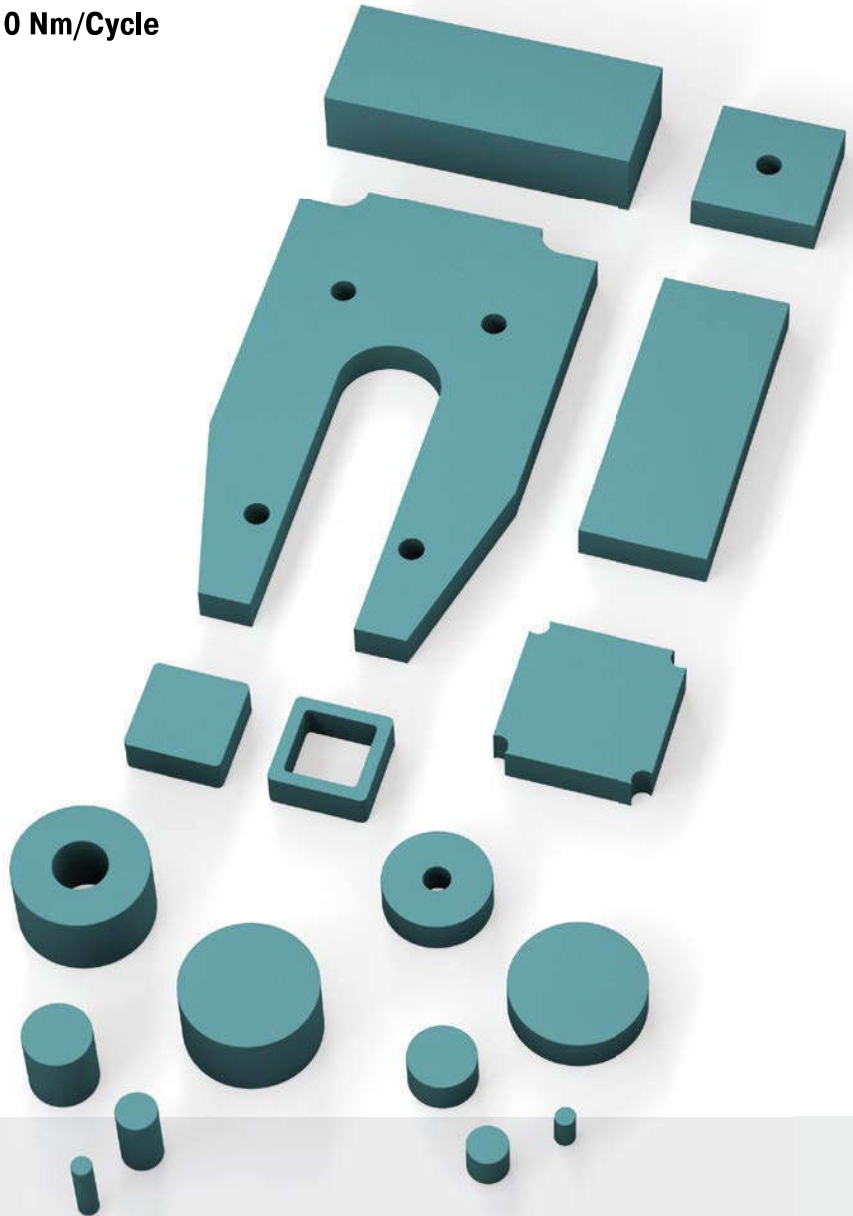
Energy capacity 3.1 Nm/Cycle to 210 Nm/Cycle

Stroke 6.5 mm to 12.5 mm

Tailor made damping material in pad format: SLAB damping pads are made of a viscoelastic PUR-material. They absorb impact loads extremely effectively and are also suitable for insulating or damping vibration.

The pad series SL-030 to SL-300 are quickly adapted to the relevant type of application. This is in part achieved through the configuration of the calculating tool or directly by the ACE specialist engineers. Furthermore, this is possible because the standard material can be cut exactly and quickly to any customer requirement with our new cutting system. It is also possible to obtain a sample to find an optimum solution.

The SLAB damping pads are proven impact or collision protection. They are used on luggage and transport belts, conveyor systems, pneumatic, electromechanical and hydraulic drives as well as on linear carriages.



Technical Data

Energy capacity: 3.1 Nm/Cycle to 210 Nm/Cycle

Standard density:

SL-030 = approx. 220 kg/m³

SL-100 = approx. 440 kg/m³

SL-300 = approx. 680 kg/m³

Standard colour: Green

Dimensions:

Widths: up to 1,500 mm

Lengths: up to 5,000 mm

Thicknesses: 12.5 mm and 25 mm

Environment: Resistant against ozone and UV radiation. Chemical resistancy on request.

Operating temperature range: -5 °C to +50 °C

Material: Profile body: Mixed cellular PUR-Elastomer (polyurethane)

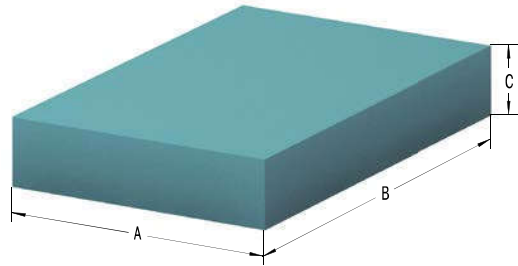
Application field: Linear slides, Handling modules, Luggage and transport belts, Impact panels, Pipeline insulation, Foundation mounting, Conveyor technology, Electronic systems and controls, Medical technology

Note: Possibilities for cutting: Water jet cutting, stamping, splitting, sawing and drilling

Safety instructions: Fire rating: B2, normally flammable, according to DIN 4102

On request: Special versions with further dimensions such as thicknesses, colours, shapes and drawing parts e.g. curves. Different wear layers.

SL-030-12

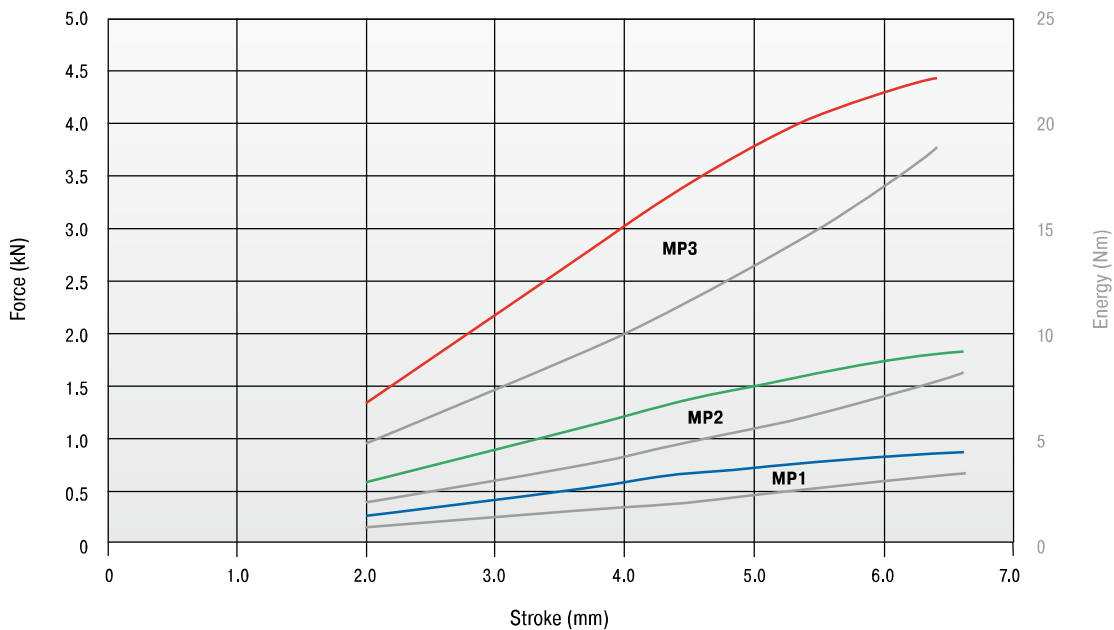


Characteristics

Type SL-030-12

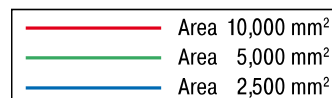
Force-Stroke Characteristic (dynamic)

Stroke Utilization 6.5 mm



Load data

Dynamic load, impact velocity: approx. 1 m/s



The chosen damping plate should be tested by the customer on the specific application.

Ordering Example

ACE-SLAB _____
 Material Type _____
 Material Thickness 12.5 mm _____
 Customers Specific Dimension/Shape _____
 (D-Number is assigned by ACE)

SL-030-12-Dxxxx

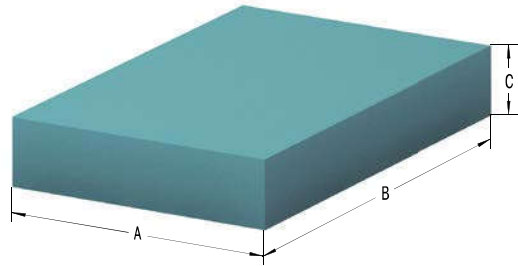
Performance and Dimensions

TYPES	¹ W ₃ max. Nm/cycle	¹ Stroke mm	A mm	B mm	C mm	Area mm ²	Standard density kg/m ³	Return Time s	Weight kg
SL-030-12-D-MP1	3.1	6.5	50.0	50.0	12.5	2,500	200	4	0.006
SL-030-12-D-MP2	8.0	6.5	70.7	70.7	12.5	5,000	200	4	0.013
SL-030-12-D-MP3	19.0	6.5	100.0	100.0	12.5	10,000	200	4	0.025

¹ Maximum energy absorption in terms of area graded pad sizes as a reference for the correct selection of material and pad size. The energy absorption depends on the individual impact surface and stroke utilization.

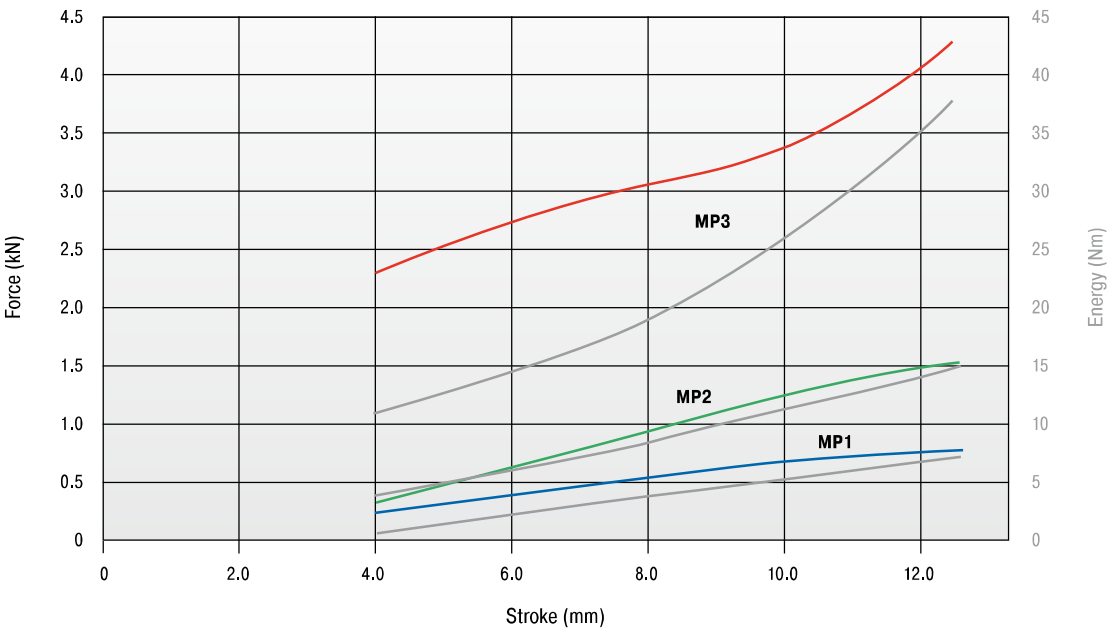
Confectioning and Combinable

SL-030-25

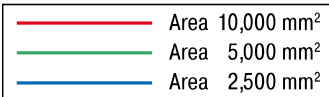


Characteristics

Type SL-030-25
Force-Stroke Characteristic (dynamic)
Stroke Utilization 12.5 mm



Load data
Dynamic load, impact velocity: approx. 1 m/s



The chosen damping plate should be tested by the customer on the specific application.

Ordering Example
ACE-SLAB _____
Material Type _____
Material Thickness 25 mm _____
Customers Specific Dimension/Shape _____
(D-Number is assigned by ACE)

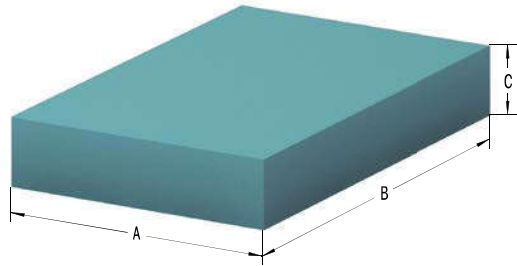
SL-030-25-Dxxxx

Performance and Dimensions

TYPES	¹ W ₃ max. Nm/cycle	¹ Stroke mm	A mm	B mm	C mm	Area mm ²	Standard density kg/m ³	Return Time s	Weight kg
SL-030-25-D-MP1	6.7	12.5	50.0	50.0	25.0	2,500	200	5	0.013
SL-030-25-D-MP2	15.0	12.5	70.7	70.7	25.0	5,000	200	5	0.025
SL-030-25-D-MP3	42.0	12.5	100.0	100.0	25.0	10,000	200	5	0.050

¹ Maximum energy absorption in terms of area graded pad sizes as a reference for the correct selection of material and pad size. The energy absorption depends on the individual impact surface and stroke utilization.

SL-100-12

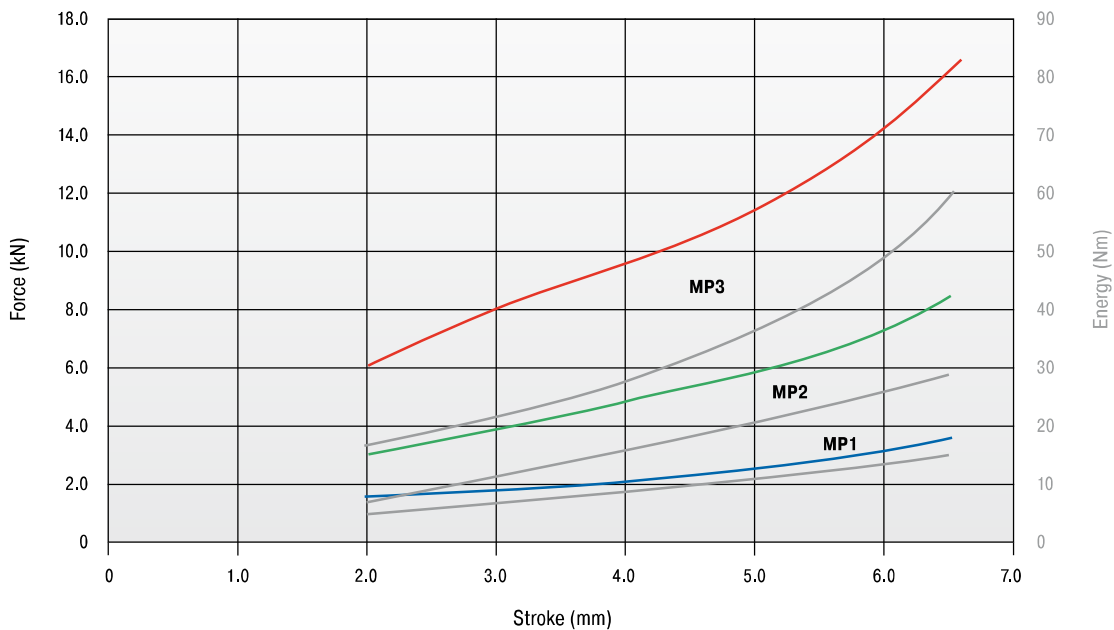


Characteristics

Type SL-100-12

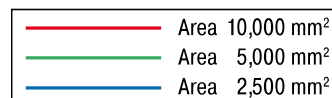
Force-Stroke Characteristic (dynamic)

Stroke Utilization 6.5 mm



Load data

Dynamic load, impact velocity: approx. 1 m/s



The chosen damping plate should be tested by the customer on the specific application.

Ordering Example

ACE-SLAB _____
 Material Type _____
 Material Thickness 12.5 mm _____
 Customers Specific Dimension/Shape _____
 (D-Number is assigned by ACE)

SL-100-12-Dxxxx

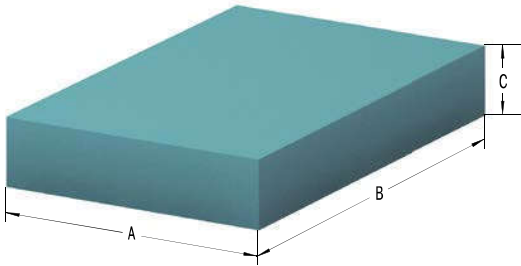
Performance and Dimensions

TYPES	¹ W ₃ max. Nm/cycle	¹ Stroke mm	A mm	B mm	C mm	Area mm ²	Standard density kg/m ³	Return Time s	Weight kg
SL-100-12-D-MP1	15.0	6.5	50.0	50.0	12.5	2,500	440	4	0.014
SL-100-12-D-MP2	30.0	6.5	70.7	70.7	12.5	5,000	440	4	0.028
SL-100-12-D-MP3	60.0	6.5	100.0	100.0	12.5	10,000	440	4	0.055

¹ Maximum energy absorption in terms of area graded pad sizes as a reference for the correct selection of material and pad size. The energy absorption depends on the individual impact surface and stroke utilization.

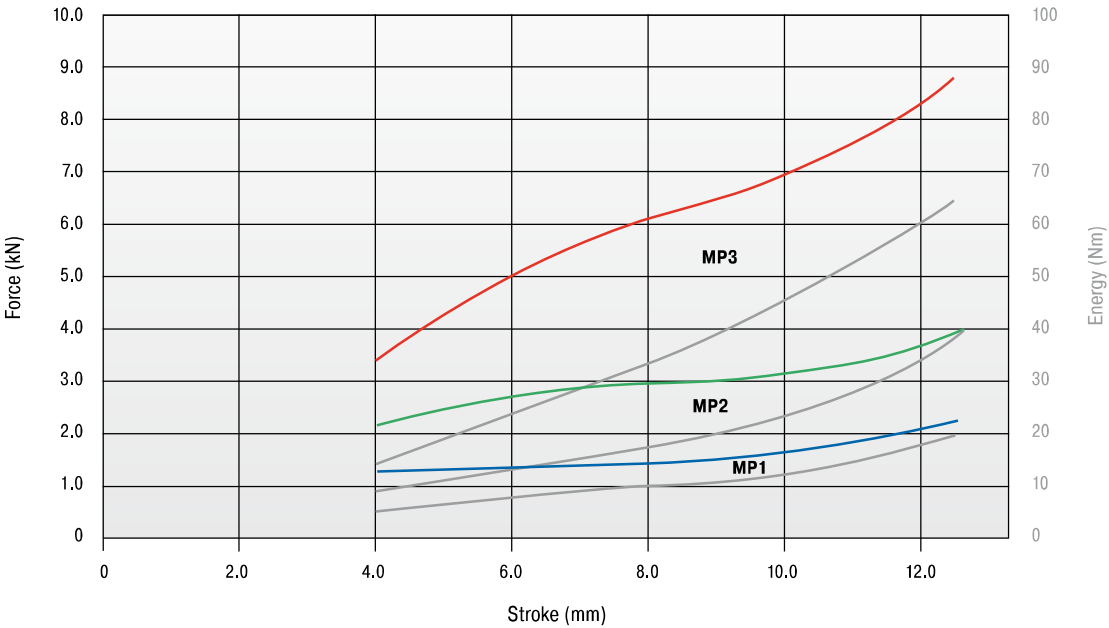
Confectioning and Combinable

SL-100-25

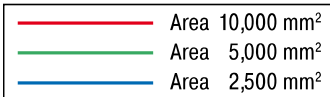


Characteristics

Type SL-100-25
Force-Stroke Characteristic (dynamic)
Stroke Utilization 12.5 mm



Load data
Dynamic load, impact velocity: approx. 1 m/s



The chosen damping plate should be tested by the customer on the specific application.

Ordering Example

ACE-SLAB _____
Material Type _____
Material Thickness 25 mm _____
Customers Specific Dimension/Shape _____
(D-Number is assigned by ACE)

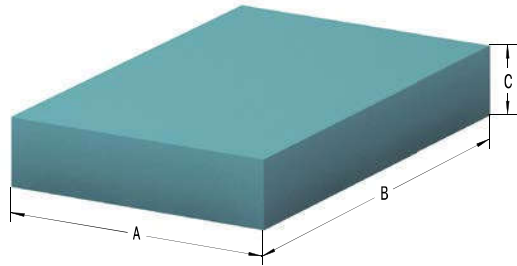
SL-100-25-Dxxxx

Performance and Dimensions

TYPES	¹ W ₃ max. Nm/cycle	¹ Stroke mm	A mm	B mm	C mm	Area mm ²	Standard density kg/m ³	Return Time s	Weight kg
SL-100-25-D-MP1	20.0	12.5	50.0	50.0	25.0	2,500	440	5	0.028
SL-100-25-D-MP2	40.0	12.5	70.7	70.7	25.0	5,000	440	5	0.055
SL-100-25-D-MP3	63.0	12.5	100.0	100.0	25.0	10,000	440	5	0.110

¹ Maximum energy absorption in terms of area graded pad sizes as a reference for the correct selection of material and pad size. The energy absorption depends on the individual impact surface and stroke utilization.

SL-300-12

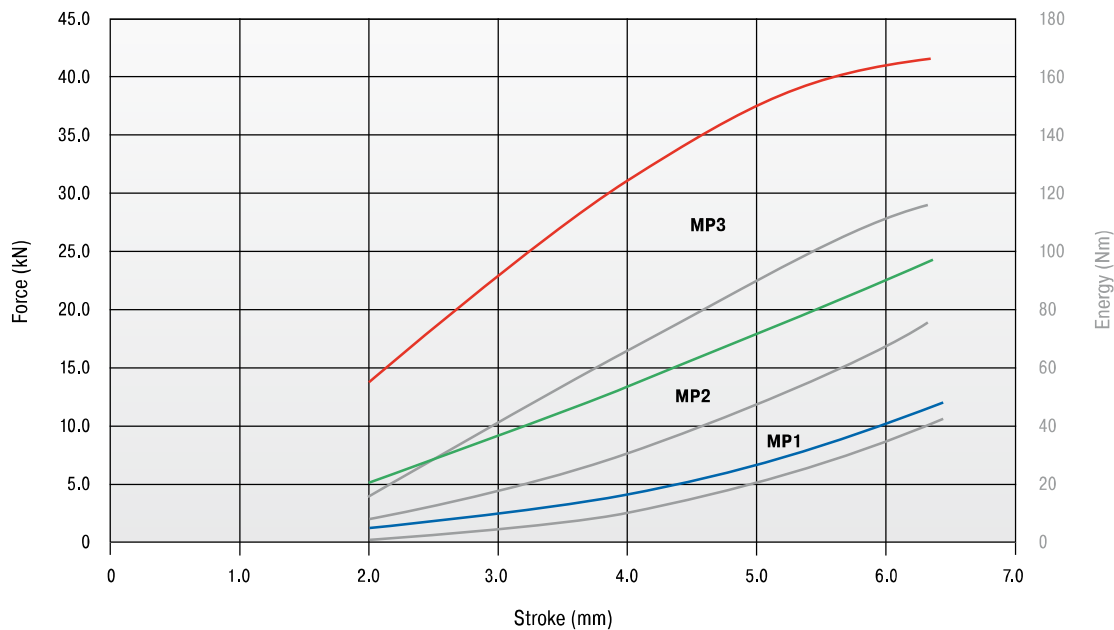


Characteristics

Type SL-300-12

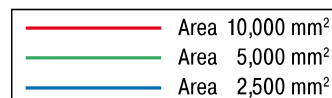
Force-Stroke Characteristic (dynamic)

Stroke Utilization 6.5 mm



Load data

Dynamic load, impact velocity: approx. 1 m/s



The chosen damping plate should be tested by the customer on the specific application.

Ordering Example

ACE-SLAB _____
 Material Type _____
 Material Thickness 12.5 mm _____
 Customers Specific Dimension/Shape _____
 (D-Number is assigned by ACE)

SL-300-12-Dxxxx

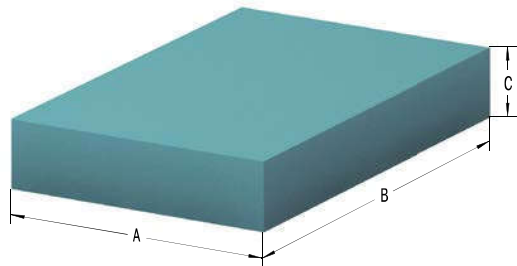
Performance and Dimensions

TYPES	¹ W ₃ max. Nm/cycle	¹ Stroke mm	A mm	B mm	C mm	Area mm ²	Standard density kg/m ³	Return Time s	Weight kg
SL-300-12-D-MP1	38,0	6,5	50,0	50,0	12,5	2,500	680	3	0,021
SL-300-12-D-MP2	65,0	6,5	70,7	70,7	12,5	5,000	680	3	0,043
SL-300-12-D-MP3	121,0	6,5	100,0	100,0	12,5	10,000	680	3	0,085

¹ Maximum energy absorption in terms of area graded pad sizes as a reference for the correct selection of material and pad size. The energy absorption depends on the individual impact surface and stroke utilization.

Confectioning and Combinable

SL-300-25

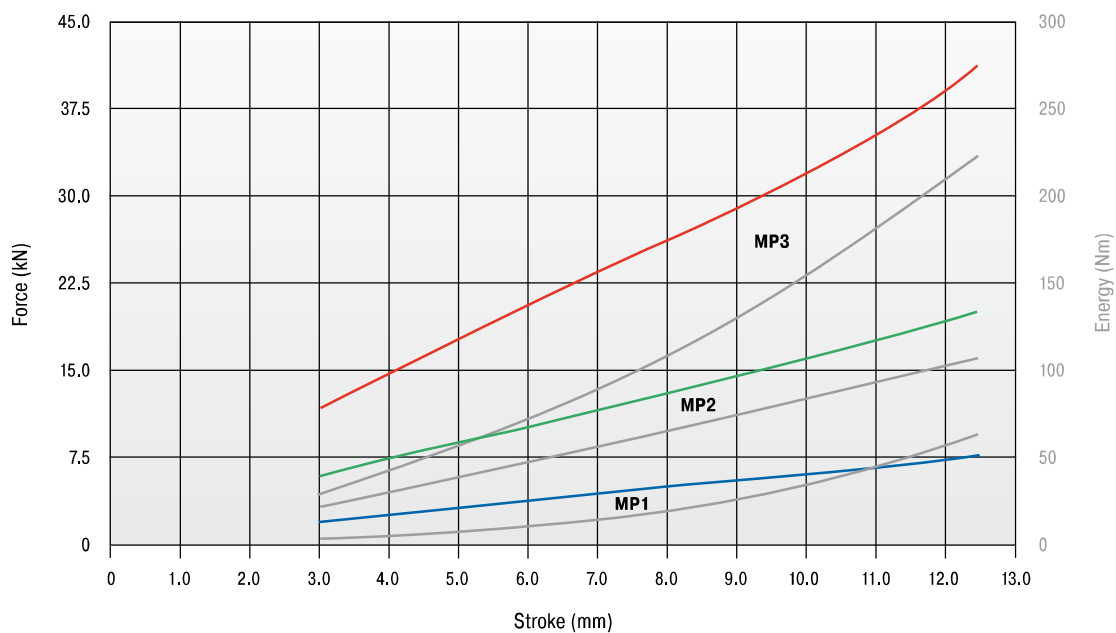


Characteristics

Type SL-300-25

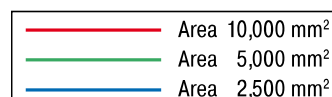
Force-Stroke Characteristic (dynamic)

Stroke Utilization 12.5 mm



Load data

Dynamic load, impact velocity: approx. 1 m/s



The chosen damping plate should be tested by the customer on the specific application.

Ordering Example

ACE-SLAB _____
 Material Type _____
 Material Thickness 25 mm _____
 Customers Specific Dimension/Shape _____
 (D-Number is assigned by ACE)

SL-300-25-Dxxxx

Performance and Dimensions

TYPES	¹ W ₃ max. Nm/cycle	¹ Stroke mm	A mm	B mm	C mm	Area mm ²	Standard density kg/m ³	Return Time s	Weight kg
SL-300-25-D-MP1	59,0	12,5	50,0	50,0	25,0	2,500	680	4	0,043
SL-300-25-D-MP2	101,0	12,5	70,7	70,7	25,0	5,000	680	4	0,085
SL-300-25-D-MP3	210,0	12,5	100,0	100,0	25,0	10,000	680	4	0,170

¹ Maximum energy absorption in terms of area graded pad sizes as a reference for the correct selection of material and pad size. The energy absorption depends on the individual impact surface and stroke utilization.

Bonding of Polyurethane (PUR) Elastomers

Cellular and compact parts of polyurethane (PUR) elastomers SLAB damping pads can be bonded according to the following recommendations. If treatment instructions are followed, the strengths of the bonded joint can be equivalent to the elastomer material itself.

1. General Information

To achieve the required bonding strength it is necessary to ensure the correct adhesive is chosen for each individual application.

Contact bonding material

Thin adhesive film, with little filling of the gaps. Correcting or moving of the areas covered with bonding material is no longer possible after the first contact is made (contact effect).

Once a bonding is separated, the bonding process must be renewed.

Please note that creases, ripples or blisters cannot be straightened once the contact is made.

Hardening bonding material

(As thin as possible) the film of glue fills the joint. The gluing can be done after the edges are brought together.

2. Preparation

The preparation of bonding surfaces is of significant importance for the bonding strength. The surfaces must be adapted to each other and available in plain, clean form.

Careful removal of

Adhesive remnants, oil, fat, separating agents, dirt, dust, scales, molding layers, protective coating, finish, paint, sweat etc.

Mechanical support

Stripping, brushing, scraping, grinding, sandblasting.

Chemical support

Degreasing (washing off with grease remover), etching, priming; pay attention to chemical resistancy on the following page!

In general, SLAB damping pads in sheet form can be bonded without pretreatment. Molded parts, with or without special skin, have to be cleaned from left-over separating agents, if necessary by grinding. When bonding with other materials like plastic, wood, metal or concrete, mechanical and/or chemical additives have to be used.

The adhesive has to be prepared according to the formula, observing the manufacturer's recommendations. The adhesive film is also to be carefully applied pursuant to these details. (Tools: brush, spatula, adhesive spreader, airless spray gun).

Contact bonding material

Apply the non-gap-filling adhesive film to both bonding surfaces – the thinner, the better. To close the pores of low density materials, two layers may be necessary.

Hardening bonding material

Apply evenly. Possible irregularities can be compensated by the film thickness.

3. Bonding

When using contact bonding material, the flash off time has to be kept in mind. Especially, with systems containing water instead of usual solvents, the adhesive film must be as dry as possible in order to pass the 'finger test' – no marks appear when touching the adhesive surface. When using hardening bonding material, the parts have to be joined immediately after applying the bonding material.

4. Pressing

Contact bonding material

Contact pressure up to 0.5 N/mm²

Hardening bonding material

Fix firmly

It is important to carefully follow the manufacturer's instructions with regard to processing temperature, hardening time and earliest possible loading.

5. Selection of Approved Bonding Materials

Because of the variety of materials that can be bonded together as well as numerous suitable bonding materials, we refer you to a worldwide leading producer of bonding and sealing materials.

Sika Deutschland GmbH
Kornwestheimer Straße 103-107
D-70439 Stuttgart
T +49 (0)711 - 8009-0
F +49 (0)711 - 8009-321
info@de.sika.com
<http://www.sika.de>

Chemical Resistance

Test (following DIN 53428)

Exposure time of the medium: 6 weeks at room temperature, but for concentrated acids and bases as well as solvents: 7 days at room temperature

Evaluation Criteria

Changing of tensile strength and elongation of break (dry samples), change in volume

Evaluation Standard

1 Excellent resistance	change in characteristics <10 %
2 Good resistance	change in characteristics between 10 % and 20 %
3 Conditional resistance	change in characteristics partly above 20 %
4 Not resistant	change in characteristics all above 20 %

All information is based on our current knowledge and experiences. We reserve the rights for changes towards product refinement.

Chemical Resistance

Water/Watery Solutions	SL-030 to SL-300
Water	1
Iron (III) chloride 10 %	1
Sodium carbonate	1
Sodium chlorate 10 %	1
Sodium chloride 10 %	1
Sodium nitrate 10 %	1
Tensides (div.)	1
Hydrogen peroxide 3 %	1
Laitance	1

Oils and Greases

ASTM Oil No. 1	1
ASTM Oil No. 3	1
Laitance	2
Hydraulic oils	depends on consistency/additives
Motor oil	1
Formwork oil	1
High performance grease	1-2
Railroad switch lubricant	1-2

Acids and Bases

Formic acid 5 %	3
Acetic acid 5 %	2
Phosphoric acid 5 %	1
Nitric acid 5 %	4
Hydrochloric acid 5 %	1
Sulphuric acid 5 %	1
Ammonia solution 5 %	1
Caustic potash solution 5 %	1
Caustic soda solution 5 %	1

Solvents	SL-030 to SL-300
Acetone	4
Diesel/Fuel oil	2
Carburetor fuel/Benzine	3
Glycerin	1
Glycols	1-2
Cleaning solvents/Hexane	1
Methanol	3
Aromatic hydrocarbons	4

Other Factors

Hydrolysis *	1
Ozone	1
UV radiation and weathering	1-2
Biological resistance	1

* 28 days, 70 °C, 95 % relative humidity

Sample Pads and Sample Sets

Sample Pads

Part Number	Dimensions and Type
SL-030-12-D-MP4	220 x 150 x 12.5 mm
SL-030-12-D-MP4-V+K	220 x 150 x 12.5 mm + layer for wear protection 2 mm, self-adhesive on one side
SL-030-25-D-MP4	220 x 150 x 25 mm
SL-100-12-D-MP4	220 x 150 x 12.5 mm
SL-100-12-D-MP4-V+K	220 x 150 x 12.5 mm + layer for wear protection 2 mm, self-adhesive on one side
SL-100-25-D-MP4	220 x 150 x 25 mm
SL-300-12-D-MP4	220 x 150 x 12.5 mm
SL-300-12-D-MP4-V+K	220 x 150 x 12.5 mm + layer for wear protection 2 mm, self-adhesive on one side
SL-300-25-D-MP4	220 x 150 x 25 mm
SL-030-12-D-MP5	1500 x 800 x 12 mm
SL-030-25-D-MP5	1500 x 800 x 25 mm
SL-100-12-D-MP5	1500 x 800 x 12 mm
SL-100-25-D-MP5	1500 x 800 x 25 mm
SL-300-12-D-MP5	1500 x 800 x 12 mm
SL-300-25-D-MP5	1500 x 800 x 25 mm

Sample Sets

Individually arranged sample sets are available on request!

3 densities, Dimensions: 50 x 50 mm, 70.7 x 70.7 mm and 100 x 100 mm. Thickness: 12.5 and 25 mm

Set "Sizes"

comprising 1 model, 1 type of thickness, 3 sizes = 3 sample pads

Part Number	Content	Dimensions
SL-SET-1.1	SL-030-12-MP1 to MP3	50 x 50 mm / 70.7 x 70.7 mm / 100 x 100 mm
SL-SET-1.2	SL-030-25-MP1 to MP3	50 x 50 mm / 70.7 x 70.7 mm / 100 x 100 mm
SL-SET-1.3	SL-100-12-MP1 to MP3	50 x 50 mm / 70.7 x 70.7 mm / 100 x 100 mm
SL-SET-1.4	SL-100-25-MP1 to MP3	50 x 50 mm / 70.7 x 70.7 mm / 100 x 100 mm
SL-SET-1.5	SL-300-12-MP1 to MP3	50 x 50 mm / 70.7 x 70.7 mm / 100 x 100 mm
SL-SET-1.6	SL-300-25-MP1 to MP3	50 x 50 mm / 70.7 x 70.7 mm / 100 x 100 mm

Set "Types"

comprising 3 models, 1 type of thickness, 1 size = 3 sample plates

Part Number	Content	Dimensions
SL-SET-2.1	SL-030-12-D-MP1, SL-100-12-D-MP1, SL-300-12-D-MP1	50 x 50 mm
SL-SET-2.2	SL-030-25-D-MP1, SL-100-25-D-MP1, SL-300-25-D-MP1	50 x 50 mm
SL-SET-2.3	SL-030-12-D-MP2, SL-100-12-D-MP2, SL-300-12-D-MP2	70.7 x 70.7 mm
SL-SET-2.4	SL-030-25-D-MP2, SL-100-25-D-MP2, SL-300-25-D-MP2	70.7 x 70.7 mm
SL-SET-2.5	SL-030-12-D-MP3, SL-100-12-D-MP3, SL-300-12-D-MP3	100 x 100 mm
SL-SET-2.6	SL-030-25-D-MP3, SL-100-25-D-MP3, SL-300-25-D-MP3	100 x 100 mm

Application Examples

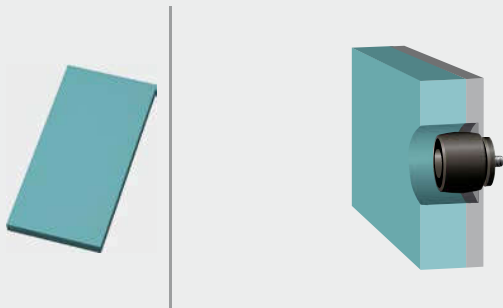
SL-030, TA

Damping combination SLAB and TUBUS

SLAB-TUBUS-Combination ensures fast luggage transport. Airports endeavour to shorten air passengers' waiting times as much as possible. This aim is met with a solution especially developed for luggage transport systems and has solved previous damping issue. Transport carriers with a weight of up to 120 kg can now be moved at the desired conveyor belt speeds. A SLAB-combination of the material SL-030-12(25)-Dxxxx together with two TA40-16 type TUBUS profile dampers are used here.



Fast luggage transport for airport customers



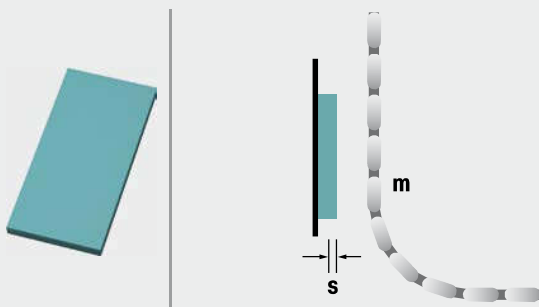
SL-030

Noise reduction

ACE-SLAB damping pads protect man and machine. At the beginning of the construction phase of a modern processing centre at the end position, a 25 kg cable channel collided with force against the housing and produced a deafening noise and mechanical strain on the energy chain. A reliable solution for compliance with the operational parameters was realized with the SL-030-25-Dxxxx type ACE-SLAB damping pads even before the milling machine was finished.



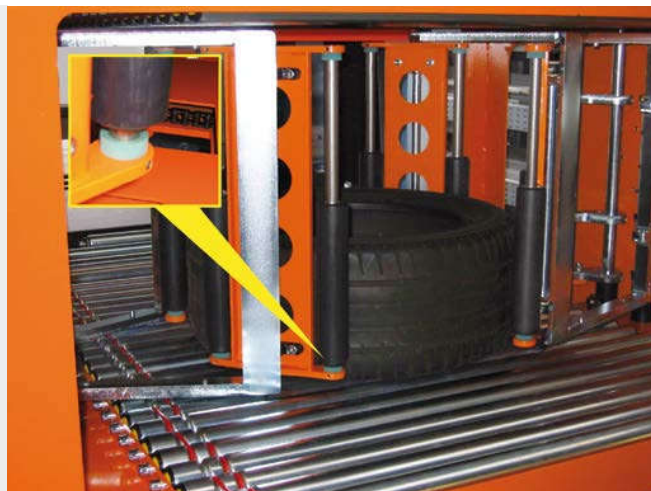
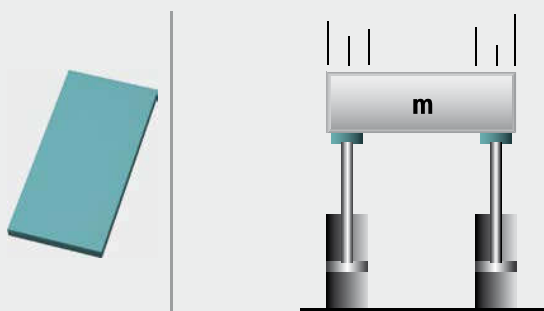
Low-noise energy chain



SL-030

Impact reduction in ring form

ACE-SLAB damping pads make tyre transport safer. Developed for absorbing the impact of forces, the ACE-SLAB damping pads SL-030-121-Dxxxx applied in this tyre testing system are ideal for protecting the sliding parts of the machine during quality tests. The individual customisation of the ring form of the centre arm and simple integration into the equipment also support the decision for applying these innovative absorber elements.

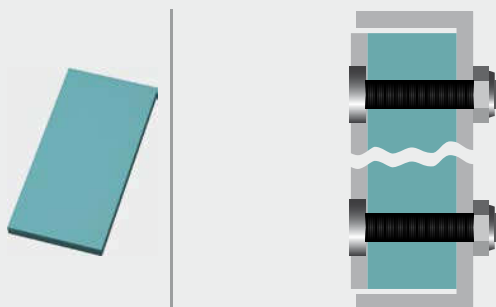


Perfectly fitted machine protection
SDS Systemtechnik GmbH, 75365 Calw, Germany

SL-030

Impact protection for large areas

ACE-SLAB damping pads offer impact protection for wooden battens. To protect wooden battens with differing weights and impact speeds of approx. 2 m/s, the SLAB-material SL-030-12-Dxxxx was screwed across the whole surface between two steel sheets in this application. This creates an even damping effect over the whole impact area, which protects the impact surfaces of the battens from an excessive impact load. The minimisation of recoil as well as reduction of noise are further positive side effects of this construction.



Impact protection for wooden battens