

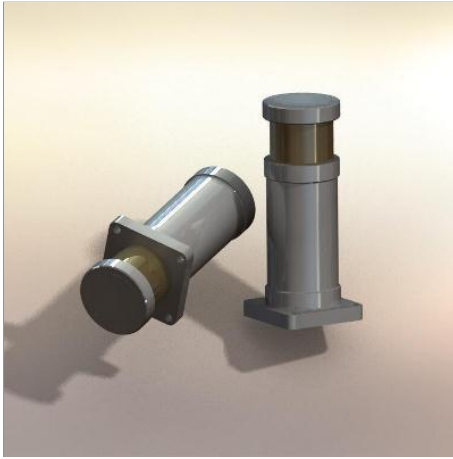


Dyna Shock System SAS

VISCOELASTIC DEVICES WITH HYDROSTATIC COMPRESSION OF ELASTOMER

VISCOELASTIC SHOCK ABSORBERS / AUTOMATIC STROKE RETURN

BA5 range from 25 to 150 kJ



Technology

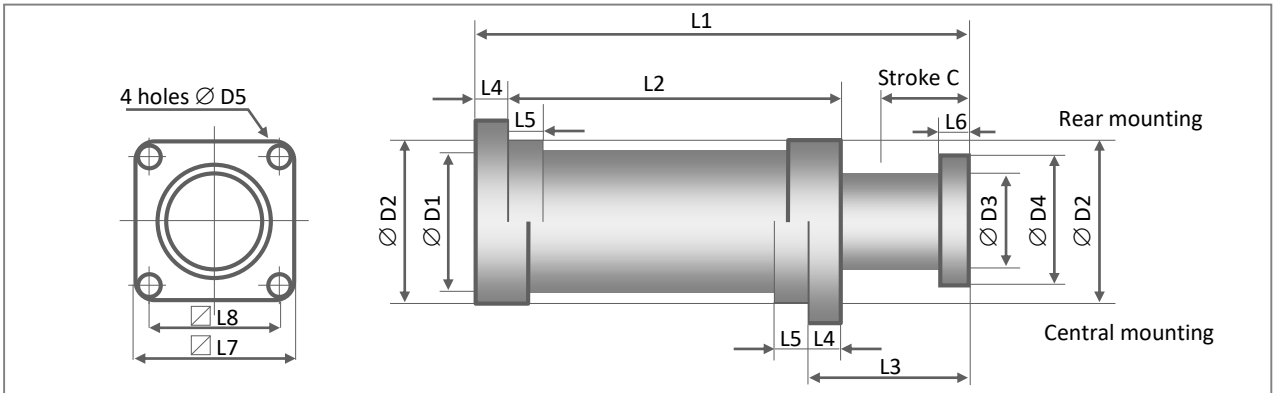
The shock absorbers are designed on the principal of compression of hydrostatic viscoelastic fluids. The viscosity and the compressibility of our fluids allow in a same device to obtain both functions the one of a shock absorber and the one of a spring, without the need of any additional rearming mechanism (gas or mechanical spring). The two functions can be used separately or in combination, in the same product.

Advantages

- Simple design – High reliability
- High damping coefficient
- Low sensitivity to temperature variances
- Security by integrated static preload
- Simple integration

Applications

Protection against shocks in Industry, Material Handling, Rolling Mill, Railway, Defence, Waterways, Paper industry, ...



DIMENSIONAL CHARACTERISTICS

	L1 mm	L2 mm	L3 mm	L4 mm	L5 mm	L6 mm	L7 mm	L8 mm	D1 mm	D2 mm	D3 mm	D4 mm	D5 mm	Mass kg
BA5A-105	415	275	140	20	30	15	135	105	/	116	87	120	14	25
BA5B-130	500	325	175	30	30	15	155	125	139	142	117	140	15	40
BA5C	520	315	205	30	36	35	175	140	160	160	132	158	18	45
BA5D	585	350	235	35	40	40	215	170	180	180	153	185	22	73
BA5E	670	405	265	40	45	45	250	195	215	215	182	220	26	117

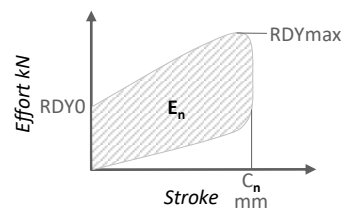
- **Impact speed:** BA5 series shock absorbers are designed for impact velocities up to 4 m/s. Higher velocities require custom modification.
- **Outside protection:** painting – Reservoir: Zn6CFe

MECHANICAL CHARACTERISTICS *

	En kJ	Stroke mm	RDY0 kN	RDYmax kN
BA5A-105	25	105	167	310
BA5B-130	50	130	280	500
BA5C	75	140	400	700
BA5D	100	160	470	820
BA5E	150	180	640	1100

* Based on following data:

- Impact speed: 2 m/s
- Operating temperature: -20°C to +40°C



Symbols:

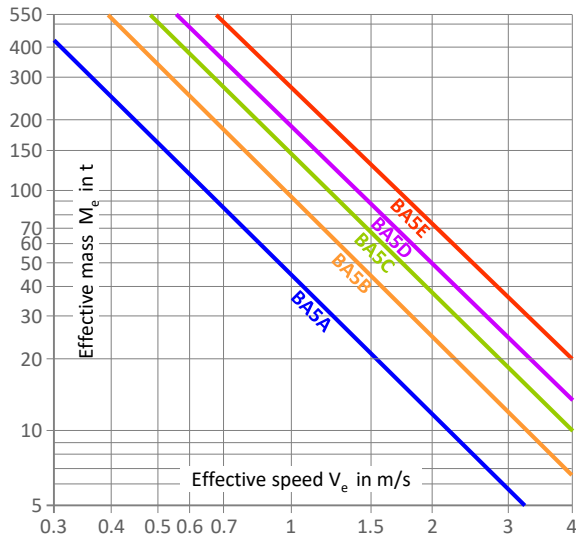
- E_n = nominal energy capacity
- C_n = maximum stroke
- RDY = dynamic reaction



SELECTION OF A STANDARD SHOCK ABSORBER

BA5 range

1 SELECTION CHART



2 EFFECTIVE ENERGY CALCULATION

$$E_e = \frac{1}{2} M_e V_e^2$$

3 ALLOWABLE IMPACT FREQUENCY

$$F < 15 \times \frac{E_n}{E_e} \text{ impacts/hour}$$

4 EFFECTIVE STROKE CALCULATION

$$C_e = C_n \left(\sqrt{\frac{E_e}{E_n(0.03V_e + 0.24)}} + 1.36 - 1.17 \right)$$

5 EFFECTIVE REACTION Rdy_e CALCULATION

$$Rdy_e = \left[\left(\frac{Rdy_{max} - Rdy_0}{C_n} \right) \times C_e + Rdy_0 \right] (0.1V_e + 0.8)$$

6 APPLICATION EXAMPLE

Given data:

Shock to absorb with 2 shock absorbers in series

- Effective mass = 300 t
- Effective speed = 1.2 m/s ⇒ 0.6 m/s / device
- Impact frequency = 15 impacts/hour
- Maximum allowable structural load = 1000 kN

① Selection chart gives BA5E.

The mechanical characteristics are:

- E_n = 150 kJ
- C_n = 180 mm
- Rdy_{max} = 1100 kN
- Rdy₀ = 640 kN

② The energy to dissipate per shock is 108 kJ.

③ The allowable impact frequency F is $15 \times 150 / 108$

④ The effective stroke C_e will be 156 mm.

$$180 \left(\sqrt{\frac{108}{150(0.03 \times 0.6 + 0.24)}} + 1.36 - 1.17 \right)$$

⑤ The effective dynamic reaction Rdy_e will be 893 kN.

$$\left[(1100 - 640) \times \frac{156}{180} + 640 \right] (0.1 \times 0.6 + 0.8)$$

Rdy_e < 1000 kN (resistance of the structure)

**All performance characteristics can be modified.
Please advise us of your specific requirements.**



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