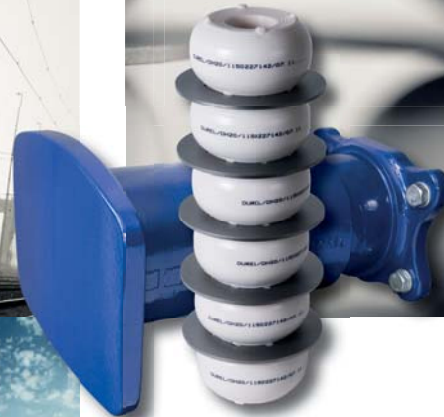


DUREL BUFFER SPRINGS – OPTIMUM ENERGY ABSORPTION

KL/DH20/1150227142/07. 11.



DUREL BUFFER SPRINGS – FOR A WIDE VARIETY OF INDUSTRIES

**UNBEATABLE ENERGY
ABSORPTION AND RELIABILITY
UNDER EXTREME CONDITIONS**

Buffers with DUREL polymer springs provide maximum protection against rolling stock damages and ensure ideal dynamic behavior. Installed in side or central buffers, DUREL buffer springs offer enhanced protection and dynamic behavior thanks to their progressive spring characteristics. The unique damping ability of DUREL polymer springs lessen the impact energy by over 50 percent, increasing both traveling comfort and the safety of freight cars, locomotives, coaches and special rail cars – an increasingly important aspect with regard to the safe transport of hazardous goods. DUREL buffer springs are also used in crash buffers.

DUREL high-performance springs are made of thermoplastic polymers. Their consistent quality ensures the safest and most reliable buffer operation. Notably, due to their reliability especially under difficult conditions, DUREL springs have been certified in many countries and are now in use worldwide.



YOUR POLYMER SPRING EXPERTS

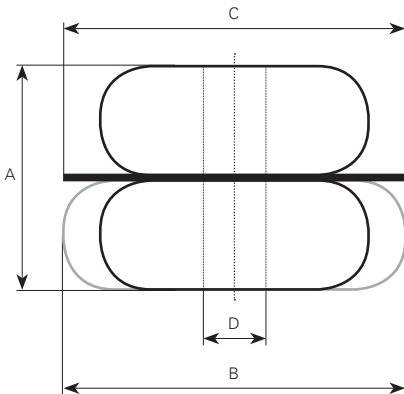
TECHNICAL SPECIFICATIONS

- Suitable for all types of buffer casings
- Superior energy absorption, vibration and noise damping for increased safety and traveling comfort
- Compliant with relevant EN and UIC standards
- For use at ambient temperatures between -76°F and 122°F (-60°C and $+50^{\circ}\text{C}$)

SPRING COMPOSITION

Individual spring assemblies consist of polymer pads and intermediate discs, respectively, shown in the corresponding product pictures.

- A** Installed height
- B** Pad diameter at full stroke
- C** Diameter of intermediate disc
- D** Diameter of guiding rod



- Springs must be protected from continued sun exposure (UV-resistant springs available upon request).
- Product specifications valid at the time of printing.
- The contents of this brochure and technical data are subject to change.
- The data shown in the relevant property charts apply.



DUREL DP30K

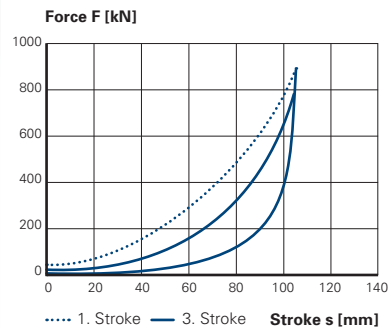
Buffer spring (compact spring) Category A

- For use in freight cars, locomotives and special rail cars
- EBA* Certification No. 05B09A; UIC 526-1 and EN 15551 compliant

- Energy absorption: > 22 kJ
- Damping: > 53 %
- Pre-tension force: > 20 kN
- Max. end force: < 880 kN
- Stroke: $> 105 -5$ mm
- Weight: 6.5 kg

A 272 ± 2 mm	C 165 mm
B 165 ± 2 mm	D $25 -1$ mm

Static properties



DUREL DP30

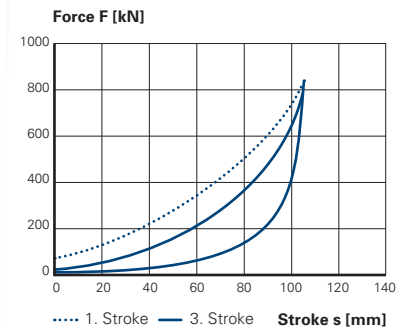
Buffer spring Category A+/40 kJ (dynamic)

- For use in freight cars, locomotives and special rail cars
- EBA* Certification No. 01J07A; UIC 526-1 and EN 15551 compliant

- Energy absorption: > 24 kJ
- Damping: > 55 %
- Pre-tension force: > 10 kN
- Max. end force: < 840 kN
- Stroke: $> 105 -5$ mm
- Weight: 7.7 kg

A 301 ± 2 mm	C 165 mm
B 165 ± 2 mm	D $25 -1$ mm

Static properties



*German Federal Railway Authority



DUREL DP50K

**Buffer spring (compact spring)
Category B**

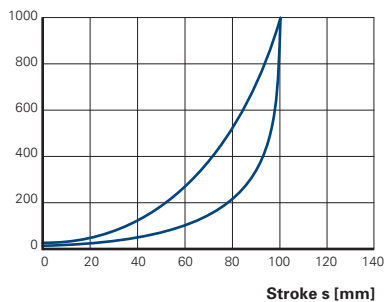
- For use in freight cars, locomotives and special rail cars
- UIC 526-1 and EN 15551

- Energy absorption: > 34 kJ
- Damping: > 53 %
- Pre-tension force: > 20 kN
- Max. end force: < 1,200 kN
- Stroke: > 105 -5 mm
- Weight: 9.4 kg

A 277 ±2 mm **C** 185 mm
B 185 ±2 mm **D** 25 -1 mm

Static properties

Force F [kN]



DUREL DR20

Coach buffer spring

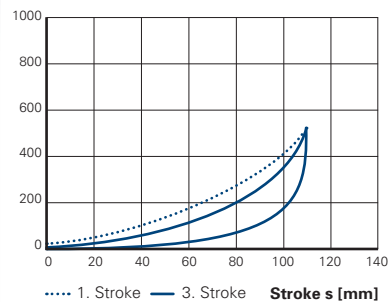
- For use in coaches and special rail cars
- EBA* Certification No. 02K26A; UIC 528 and EN 15551 compliant

- Energy absorption: > 18 kJ
- Damping: > 50 %
- Pre-tension force: > 10 kN
- Max. end force: < 700 kN
- Stroke: > 110 -5 mm
- Weight: 6.8 kg

A 310 ±2 mm **C** 165 mm
B 165 ±2 mm **D** 45 -1 mm

Static properties

Force F [kN]



DUREL DR35K

**Buffer spring (compact spring)
for coaches, locomotives and
special rail cars**

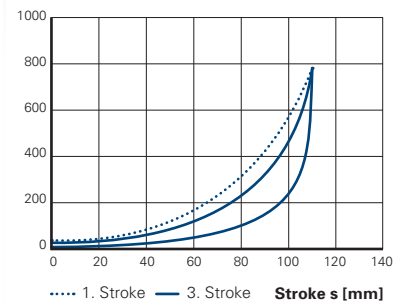
- For use in coaches, locomotives and special rail cars
- UIC 528 and EN 15551

- Energy absorption: > 23 kJ
- Damping: > 53 %
- Pre-tension force: > 10 kN
- Max. end force: < 800 kN
- Stroke: > 110 -5 mm
- Weight: 7.5 kg

A 280 ±2 mm **C** 165 mm
B 165 ±2 mm **D** 25 -1 mm

Static properties

Force F [kN]





DUREL DH20

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Combination spring for hydraulic combination shock absorbers Category C

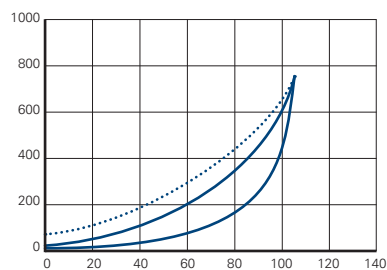
- For use in freight cars, locomotives and special rail cars
- Certified by EBA* for use with EP70D hydraulic combination shock absorbers, UIC 526-1 and EN 15551 compliant

- Energy absorption: > 22 kJ
- Damping: > 50 %
- Pre-tension force: > 20 kN
- Max. end force: < 750 kN
- Stroke: > 105 -5 mm
- Weight: 8 kg

A 337 ±2 mm **C** 165 mm
B 165 ±2 mm **D** 50 -1 mm

Static properties

Force F [kN]



..... 1. Stroke — 3. Stroke Stroke s [mm]



DUREL DH30

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Combination spring for hydraulic combination shock absorbers

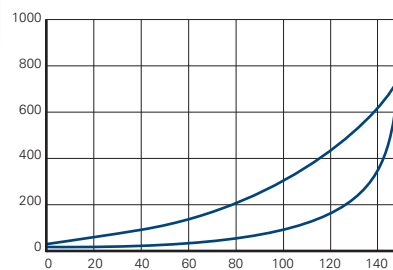
- For use in freight cars, locomotives and special rail cars
- Certified by EBA* for use with EP100D hydraulic combination shock absorbers, UIC 526-3 and EN 15551 compliant
- Spring for 150 mm stroke

- Energy absorption: > 30 kJ
- Damping: > 50 %
- Pre-tension force: > 15 kN
- Max. end force: < 1,000 kN
- Stroke: > 150 -5 mm
- Weight: 9.9 kg

A 337 ±2 mm **C** 189 mm
B 189 ±2 mm **D** 50 -1 mm

Static properties

Force F [kN]



..... 1. Stroke — 3. Stroke Stroke s [mm]



DUREL DP50L

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Buffer spring for refurbishment purposes

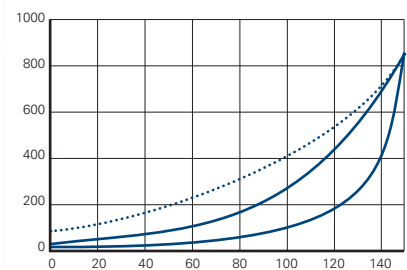
- For use in freight cars and special rail cars
- Spring for 150 mm stroke

- Energy absorption: > 36 kJ
- Damping: > 50 %
- Pre-tension force: > 15 kN
- Max. end force: < 950 kN
- Stroke: > 150 -5 mm
- Weight: 10.2 kg

A 412 ±2 mm **C** 165 mm
B 165 ±2 mm **D** 25 -1 mm

Static properties

Force F [kN]



..... 1. Stroke — 3. Stroke Stroke s [mm]



Innovative applications require individually-tailored solutions and professional service. Are you looking for design specifications that are not met by our standard offering? DUREL develops and manufactures custom springs – even in small quantities.

We offer solutions that are tailored to your needs. We design a variety of products according to customer specifications, significantly contributing to the success of their products. In doing so, we focus on the same high standards of quality that apply to volume production in terms of design, production and quality control.

Talk to us about your ideas and business goals. We would be happy to develop a custom design.

WE DEVELOP **CUSTOMIZED** SPRING SYSTEMS FOR A WIDE VARIETY OF INDUSTRIES





Would you like to learn more?

Our competent and dedicated team would be more than happy to address any questions or design specifications you may have with regard to individually-tailored solutions. We are looking forward to hearing from you.

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DUREL POLYMER SPRINGS – YOUR ADVANTAGE AT A GLANCE

- Under quasistatic conditions the *damping of over 50 % in the third stroke* even exceeds the relevant EN norms
- Unrivaled energy absorption despite reduced weight and compact volume
- Exceeds the performance of traditional metal, rubber and/or hydraulic-based springs in terms of reliability and durability
- Progressive spring curve
- Maintenance-free over the entire lifetime of the rail car and therefore the most affordable option
- Excellent creep resistance and flexural fatigue endurance
- No stick-slip effect or noise emissions
- Excellent resistance to chemicals, grease, oils, and solvents prevents material degradation and loss of material properties under typical operating conditions
- Broad operating temperature range from -76°F to 122°F (-60°C to $+50^{\circ}\text{C}$); the relatively constant stiffness ensures a consistent performance under any climate conditions.

DURABLE. RELIABLE. SAFE.



YOUR POLYMER SPRING EXPERTS