Load Diagrams
Program 0180 Cellular Buffers
Cellular Buffers
Program 0180

Calculation and Selection of Impact Buffers made of Diepocell®

- Mass against mass

\[ W = \frac{1}{2}m \cdot v^2 \]

- Mass with drive against stop

\[ W = \frac{m_1 \cdot (v_1 + v_2)^2}{2(m_1 + m_2)} \]

- Mass in free fall (formula not applicable for lifts)

\[ W = m \cdot g \cdot h \]

This formula is not applicable for lifts.

- Crane-buffer calculation

\[ W_B = \frac{1}{2} m_B \cdot v_B^2 \]

\[ m_B = \frac{m_1 + m_2 (l_1 - l)}{L} \]

- pendulum movement of the load is not considered
- rotational energy from motor drive is to be considered
- reduced velocity in accordance with DIN 15018:
  - \( v = 100\% \) nominal velocity on trolleys
  - \( v = 85\% \) nominal velocity on cranes
  - \( v = 70\% \) nominal velocity on cranes with breaking devices

Formula for calculating deceleration

\[
\begin{align*}
\alpha_{av} &= \frac{v^2}{2t} \\
\alpha_{max} &= \frac{F}{m} \\
F_s &= \text{drive force (kN)} \\
F &= \text{final force (kN)} \\
f &= \text{buffer compression (m)} \\
m_c &= \text{crane mass w/o trolley (kg)} \\
m_m &= \text{mass (kg)} \\
m &= \text{mass at rail B (kg)} \\
ev &= \text{velocity of body 1/ body 2 (m/s)} \\
v &= \text{operating velocity (m/s)} \\
W_k &= \text{kinetic energy (J)} \\
W_{1/2} &= \text{work created by } F_0 (J) \\
W_{zul} &= \text{permitted energy input (J)}
\end{align*}
\]
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Exemplary Calculation and Selection of a Diepocell® Impact Buffer

Application: mass against a stop
Formula: $W = \frac{1}{2}m \cdot v^2$
Parameters: mass $m = 2490$ kg
velocity $V = 4$ m/s
Calculation: $W = \frac{1}{2} \times 2490 \text{ kg} \times (4,0 \text{ m/s})^2$
= 19920 Nm [J]
= 19,92 kNm [kJ]

80 x 40 Energy Absorption / Final Force
Cellular Buffers
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80 x 80 Energy Absorption / Final Force

80 x 120 Energy Absorption / Final Force
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100 x 100 Energy Absorption / Final Force

100 x 150 Energy Absorption / Final Force
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160 x 80 Energy Absorption / Final Force

160 x 160 Energy Absorption / Final Force
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160 x 240 Energy Absorption / Final Force

![Graph 160 x 240 Energy Absorption / Final Force]

200 x 200 Energy Absorption / Final Force

![Graph 200 x 200 Energy Absorption / Final Force]
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200 x 300 Energy Absorption / Final Force

250 x 250 Energy Absorption / Final Force
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250 x 375 Energy Absorption / Final Force

315 x 315 Energy Absorption / Final Force
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315 x 475 Energy Absorption / Final Force

400 x 400 Energy Absorption / Final Force
Conductix-Wampfler has just one critical mission: To provide you with energy and data transmission systems that will keep your operations up and running 24/7/365.

To contact your nearest sales office, please refer to: www.conductix.contact