

Tlumiče pro velká zatížení

- Heavy-Duty Shock Absorber



CZ ÚVOD

Řada USS disponuje 2 komorami, z nichž jedna je naplněna hydraulickým olejem a druhá dusíkem. Hydraulické tlumiče pro velké zatížení byly vyvinuty, aby přeměňovaly energii na teplo a kontrolovaně systém utlumily při současné minimalizaci reakčních sil.

Standardní program zahrnuje více než 100 tlumičů s různými zdvihy a příjmy energie. Díky naší výrobě na nejmodernějších CNC strojích je základem našeho úspěchu flexibilní produkce modifikací a speciálních řešení.

	Zdvih	Energie/Zdvih	Max. reakční síla
	Stroke	Energy/Stroke	Max. Counterforce
	mm	Nm	N
USS 32	50 - 600	2.000 - 24.000	50.000
USS 40	50 - 1200	3.000 - 51.000	80.000
USS 50	50 - 1200	4.000 - 76.000	67.000 - 120.000
USS 75	50 - 1800	9.600 - 136.900	140.000 - 240.000
USS 100	50 - 1200	15.500 - 279.000	212.000 - 360.000
USSL 63	100 - 600	15.000 - 90.000	180.000
USSL 100	200 - 600	76.000 - 230.000	455.000

GB INTRODUCTION

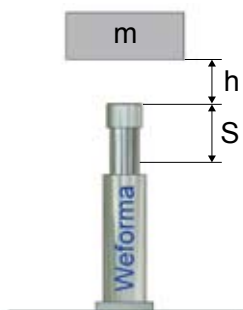
During the recent years production cranes and automated warehousing systems have increased in size and speed. The hydraulic heavy-duty shock absorber was developed to transform the impact into heat and to slow down the system in a controlled manner by minimizing the end forces.

A large range of more than 100 standard heavy-duty absorbers with different capacities and stroke lengths has been developed to meet the increasing demands of our customers. Due to our CNC - based production we have also established a good reputation for providing a quick and flexible response to modifications and specials.

Výpočet

▪ Selection

(1) VOLNÝ PÁD - FALLING MASS



Example

$m = 1000 \text{ kg}$
 $H = 1,5 \text{ m}$
 $S = 0,4 \text{ m}$
 $X = 1/h$
 $n = 1$

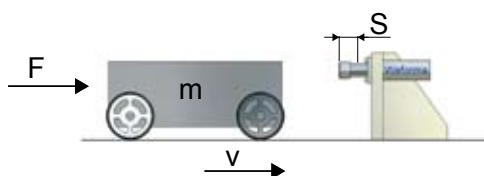
Formulae & Calculation

$W_k = m \cdot g \cdot H = 14.715 \text{ Nm}$
 $W_A = m \cdot g \cdot S = 3.924 \text{ Nm}$
 $W_{kg} = W_k + W_A = 18.639 \text{ Nm}$
 $W_{kg/h} = W_{kg} \cdot X = 18.639 \text{ Nm/h}$

Selection

USS-40-400-XXXX

(2) HMOTA PROTI PEVNÉMU DORAZU - - LOAD AGAINST SOLID STOP



Example

$m = 40.000 \text{ kg}$
 $v = 2,5 \text{ m/s}$
 $F = 6.000 \text{ N}$
 $S = 0,2 \text{ m}$
 $X = 5/h$
 $n = 2$

Formulae & Calculation

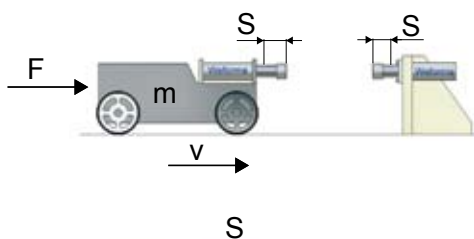
$W_k = \frac{m \cdot v^2}{2} = 125.000 \text{ Nm}$

with propelling force
 $W_A = F \cdot S = 1.200 \text{ Nm}$
 $W_{kg} = (W_k + W_A) : n = 63.100 \text{ Nm}$
 $W_{kg/h} = W_{kg} \cdot X = 315.500 \text{ Nm/h}$
 $v_e = v$

Selection

USSL-100-200-XXXX

(3) HMOTA PROTI PEVNÉMU DORAZU S TLUMIČI NÁRAZU - - LOAD AGAINST SOLID STOP WITH SHOCK ABSORBERS



Example

$m = 10.000 \text{ kg}$
 $v = 2,6 \text{ m/s}$
 $F = 4.000 \text{ N}$
 $X = 10/h$
 $S = 0,4 \text{ m}$

Formulae & Calculation

$W_k = \frac{m \cdot v^2}{2} : 2 = 16.900 \text{ Nm}$

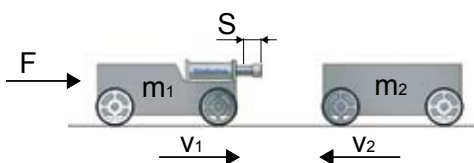
with propelling force
 $W_A = F \cdot S = 1.600 \text{ Nm}$
 $W_{kg} = W_k + W_A = 18.500 \text{ Nm}$

 $W_{kg/h} = W_{kg} \cdot X = 185.000 \text{ Nm/h}$
 $v_e = v / 2 = 1,3 \text{ m/s}$

Selection

USS-40-400-XXXX

(4) HMOTA PROTI HMOTĚ S TLUMIČEM NÁRAZU - LOAD AGAINST LOAD WITH ONE SHOCK ABSORBER



Example

$m1 = 5.000 \text{ kg}$
 $v1 = 1,6 \text{ m/s}$
 $m2 = 6.000 \text{ kg}$
 $v2 = 2,0 \text{ m/s}$
 $X = 6/h$
 $S = 0,5 \text{ m}$

Formulae & Calculation

$W_k = \frac{(m1 \cdot m2) \cdot (v1 + v2)^2}{2 (m1 + m2)} = 17.672 \text{ Nm}$

with propelling force
 $W_A = F \cdot S$
 $W_{kg} = W_k + W_A$

 $W_{kg/h} = W_{kg} \cdot X = 106.032 \text{ Nm/h}$
 $v_e = v1 + v2 = 3,6 \text{ m/s}$

Selection

USS-32-500-XXXX

HMOTA PROTI HMOTĚ S TLUMIČI NÁRAZU -

(5)

LOAD AGAINST LOAD WITH SHOCK ABSORBERS

Example

$m_1 = 15.000 \text{ kg}$
 $v_1 = 1,9 \text{ m/s}$
 $m_2 = 16.000 \text{ kg}$
 $v_2 = 1,8 \text{ m/s}$
 $X = 12/\text{h}$
 $S = 0,4 \text{ m}$

Formulae & Calculation

$$W_k = \frac{(m_1 \cdot m_2) \cdot (v_1 + v_2)^2}{4(m_1 + m_2)} = 26.490 \text{ Nm}$$

with propelling force

$$W_A = F \cdot S$$

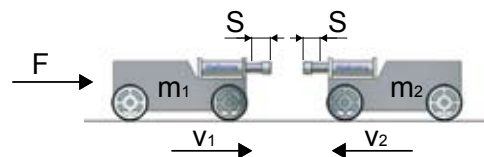
$$W_{kg} = W_k + W_A$$

$$W_{kg/h} = W_{kg} \cdot X = 317.880 \text{ Nm/h}$$

$$v_e = (v_1 + v_2) / 2 = 1,85 \text{ m/s}$$

Selection

USS-50-400-XXXX



HMOTA NA NAKLONĚNÉ ROVINĚ - - LOAD ON INCLINE

(6)

Example

$m = 21.000 \text{ kg}$
 $H = 0,5 \text{ m}$
 $\alpha = 22^\circ$
 $S = 0,6$
 $X = 1/\text{h}$

Formulae & Calculation

$$W_k = m \cdot g \cdot H = 103.005 \text{ Nm}$$

$$W_A = m \cdot g \cdot \sin \alpha \cdot S = 46.303 \text{ Nm}$$

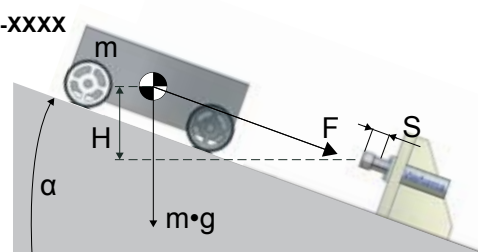
$$W_{kg} = W_k + W_A = 149.308 \text{ Nm}$$

$$W_{kg/h} = W_{kg} \cdot X = 149.308 \text{ Nm/h}$$

$$v = v_e = \sqrt{2 \cdot g \cdot H}$$

Selection

USSL-100-600-XXXX



VZORCE • • FORMULAE

REAKČNÍ SÍLA

COUNTERFORCE

$$F_G = \frac{W_{kg} \cdot 1,2^*}{S}$$

BRZDNÝ ČAS

DECELERATION TIME

$$t = \frac{2 \cdot S}{v_e} \cdot 1,2^*$$

ZPOMALENÍ

DECELERATION RATE

$$a = \frac{v^2}{2 \cdot S} \cdot 1,2^*$$

ZDVIH

STROKE

$$S = \frac{v^2}{2 \cdot a} \cdot 1,2^*$$

*Platí pouze při optimálním nastavení. Dbát na bezpečnost! -

*Calculation for optimum setting. Allow a safety margin!