

Messung des Luftwiderstands
Luftwiderstand

Situation

Gerätebau 20

Chem

Ue

Formel sheet

$v = 0.5$

$m = 5.5$

$\eta = 98$

$f = m \cdot \eta$

$v = \frac{1}{2} \rho v^2 C_{w1} + (v \cdot \rho \cdot v) \cdot C_{w2} + (v \cdot \rho \cdot v) \cdot C_{w3} + (v \cdot \rho \cdot v) \cdot C_{w4} + (v \cdot \rho \cdot v) \cdot C_{w5} + (v \cdot \rho \cdot v) \cdot C_{w6} + (v \cdot \rho \cdot v) \cdot C_{w7} + (v \cdot \rho \cdot v) \cdot C_{w8} + (v \cdot \rho \cdot v) \cdot C_{w9} + (v \cdot \rho \cdot v) \cdot C_{w10}$

$\rho = 1.225 \text{ kg/m}^3$

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beachte

end

end

haben = haben (wie v. ei)

Output

iter	v	S _z
0	0.5	0
1	0.5105	99.204
2	0.5112	16.736
3	0.5117	2.874
4	0.5119	0.4092
5	0.5120	0.06147
6	0.5120	0.008222
7	0.5120	0.001241
8	0.5120	0.0001817
9	0.5120	1.1422e-05
10	0.5120	4.0812e-06
11	0.5120	9.7462e-07

12	304.07	$1.28882 \cdot 10^{-8}$
13	304.07	$1.89042 \cdot 10^{-9}$
14	304.07	$2.77272 \cdot 10^{-10}$
15	304.07	$4.06292 \cdot 10^{-11}$
16	304.07	$5.96352 \cdot 10^{-12}$

Converting out $160 = 7$, $V = 304.07$

Power

$$P_A = \frac{0.3V^2}{500 + (10V)^3} - 0.02V$$

$$\text{of } V = 304.07$$

$$\text{recall } P_D = 9.8 \times 3.5 = 34.30$$

$$\text{Substituting } V = 304.07$$

$$P_D = \frac{0.3 \times (304.07)^2}{500 + (10(304.07))^3} - 0.02(304.07)$$

$$P_D = 40.38195931 - 6.0814$$

$$P_D = 34.3$$