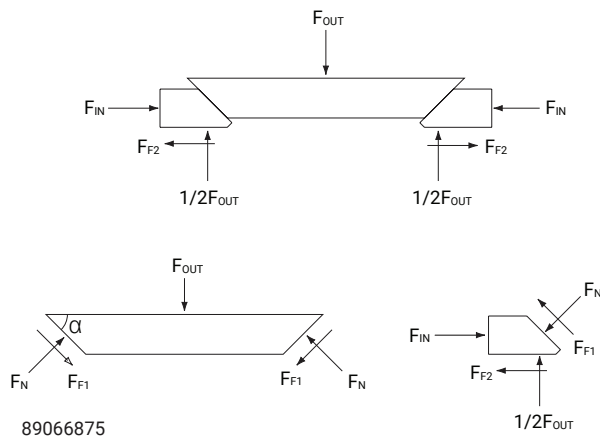


Card-Lok Theory

CONNECT AND PROTECT

Basic theory, knowledge of pertinent forces and understanding of product functionality enables an engineer to select the proper components. The discussion below illustrates the advantage of five or more piece Card-Lok.



$$F_{out} = (N-1)F_{in} \left[\frac{1 - \mu_1 \tan(\alpha)}{\tan(\alpha) + \mu_1 + \mu_2(1 - \mu_1 \tan(\alpha))} \right]$$

Where N = Number of wedge segments

α = angle of interface

μ_1 = friction coefficient of 45 wedge face

μ_2 = friction coefficient of wedge surface in contact with cold wall

If $\mu_1 = \mu_2 = \mu$ and $\alpha = 45^\circ$ then

$$F_{out} = (N-1)F_{in} \left[\frac{1 - \mu}{1 + 2\mu - \mu^2} \right]$$

μ	Three-piece F_{OUT}	Five-piece F_{OUT}	Seven-piece F_{OUT}
0	$2.00 \cdot F_{in}$	$4.00 \cdot F_{in}$	$6.00 \cdot F_{in}$
.05	$1.73 \cdot F_{in}$	$3.40 \cdot F_{in}$	$5.19 \cdot F_{in}$
.10	$1.51 \cdot F_{in}$	$3.03 \cdot F_{in}$	$4.54 \cdot F_{in}$
.15	$1.33 \cdot F_{in}$	$2.66 \cdot F_{in}$	$3.99 \cdot F_{in}$
.20	$1.18 \cdot F_{in}$	$2.35 \cdot F_{in}$	$3.53 \cdot F_{in}$
.25	$1.04 \cdot F_{in}$	$2.09 \cdot F_{in}$	$3.13 \cdot F_{in}$
.30	$.93 \cdot F_{in}$	$1.85 \cdot F_{in}$	$2.78 \cdot F_{in}$
.40	$.73 \cdot F_{in}$	$1.46 \cdot F_{in}$	$2.20 \cdot F_{in}$

$$F_{in} = \frac{T}{kd} \text{ where } k \approx .25 \text{ (friction coef. of screw)}$$

d = diameter of screw and T = Torque