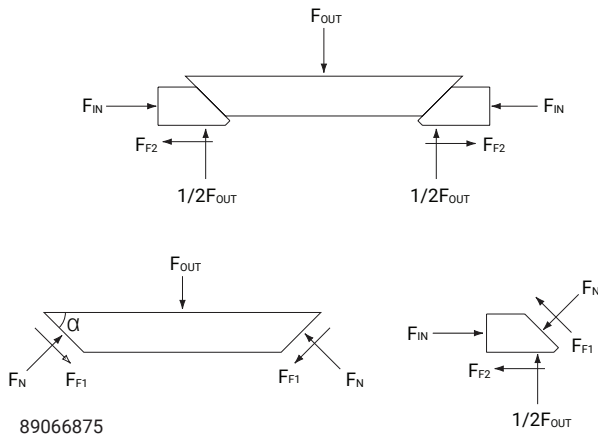


# Card-Lok Theory

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

$\alpha$  = angle of interface

$\mu_1$  = friction coefficient of 45 wedge face

$\mu_2$  = friction coefficient of wedge surface in contact with cold wall

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

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

$\mu$	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