

Repetition/Duration Guidelines

Repetition

Table 1: High risk repetition rates by body part (Kilbom, A., 1994)

Body Part	Repetition Rate (reps/hour)	Repetition Rate (reps/min)	Risk Value
Shoulder	>150	>2.5	High
Upper arm/elbow	>600	>10	High
Forearm/wrist	>600	>10	High
Finger	>12,000	>200	High

Table 2: List of repetition rates, number of motions or exertions by body part and motion (ANSI Z-365 checklist as cited in The Advanced Ergonomics Manual (Selan, J., 1994))

Body Part	Motion	Repetition Rate, Motions or Exertions (number/hour)	Repetition Rate, Motions or Exertions (number/min)	Relative Stress Level
Shoulder	Flexion*	<90	<1.5	Nominal
		90-150	1.5-2.5	Moderate
		>150	>2.5	High
	Abduction*	<90	<1.5	Nominal
		90-150	1.5-2.5	Moderate
		>150	>2.5	High
Wrist	Flexion/Extension* Ulnar/Radial Deviation*	<900	<15	Nominal
		900-1800	15-30	Moderate
		>1800	>30	High
Hand Interface	Direct pressure on median nerve	Infrequent	Infrequent	Moderate
		Frequent	Frequent	High
	Grasp	<900	<15	Nominal
		900-1800	15-30	Moderate
Fingers	Key strokes	<15,000	<250	Nominal
		15,000-18,000	250-300	Moderate
		>18,000	>300	High
	Single finger trigger action	<1000	<16.7	Nominal
		1000-2000	16.7-33.3	Moderate
		>2000	>33.3	High
Neck	Flexion/Extension* Rotation*	<120	<2	Nominal
		120-180	2-3	Moderate
		>180	>3	High

* Please refer to the 'Non-neutral Posture Guidelines' for thresholds of non-neutral posture angles.

Note: Shaded areas are conversions of the values cited in the referenced material.

Duration

A job cycle of less than 30 seconds or more than 50% of the cycle time spent performing the same fundamental cycle (Silverstein, 1985).