

EPIC Lift Capacity Test Overview

Introduction

The EPIC Lift Capacity test is a gender-fair test of lift capacity at the Occasional and Frequent Department of Labor frequencies. Developed by an interdisciplinary team headed by Dr. Leonard Matheson to test people with medical impairments, it is the only lift capacity test awarded a U.S. Patent (#5,848,594).

The ELC Test determines the evaluatee's lift capacity and optimum physical demand characteristics level at which the evaluatee may work. Research by Dr. Matheson linked the United States Department of Labor standards for physical demand characteristics of work to the METS system, depicted in the table below:

Physical Demand Level	Occasional 0-33% of the workday	Frequent 34%-66% of the workday	Constant 67%-100% of the workday	Typical Energy Required
Sedentary	10 lbs	Negligible	Negligible	1.5 - 2.1 METS
Light	20 lbs	10 lbs and/or walk/stand/push/pull of arm /leg controls	Negligible and/or push/pull of arm/leg controls while seated	2.2 - 3.5 METS
Medium	20 to 50 lbs	10 to 25 lbs	10 lbs	3.6 - 6.3 METS
Heavy	50 to 100 lbs	25 to 50 lbs	10 to 20 lbs	6.4 - 7.5 METS
Very Heavy	Over 100 lbs	Over 50 lbs	Over 20 lbs	Over 7.5 METS

Test Configuration

The ELC is an isoinertial test of lift-lower capacity that uses progressive loads over three vertical ranges at two frequencies with masked free weights so that the evaluatee does not know the load. The evaluatee's maximum acceptable weight is recorded at each range.

ELC Subtest Order and Starting Loads

Subtest	Range	Frequency	Start Weight
1	Knuckle to shoulder	1x/cycle	10 lbs
2	Floor to knuckle	1x/cycle	10 lbs
3	Floor to shoulder	1x/cycle	70% of lesser of #1 or #2
4	Knuckle to shoulder	4x/cycle	40% of #1
5	Floor to knuckle	4x/cycle	40% of #2
6	Floor to shoulder	4x/cycle	40% of #3

Adjustable shelves mounted to the frame allow placement of shelves at shoulder and knuckle heights. The evaluatee's height determines the shelf height (in inches from the floor).

Weight Increments

The ELC begins at 10 pounds and progresses in 10-pound increments for both male and female evaluatees. The ELC uses masked weight canisters so that the evaluatee is unaware of the starting and incremental loads. The masked weights allow re-test confirmation of full effort.

Frequency

The ELC frequency begins at one lift per cycle for each of the three vertical ranges and proceeds to four lifts per cycle for each range if the evaluatee is capable.

Normative Data

The ELC references the U.S. Department of Labor Physical Demand Characteristics of Work (PDC) system and both MTM norms and healthy subject norms. The ELC normative data are based on test-retest trials of healthy normal males and females ranging in age from 18 years to 60 years. There are more than 4,500 reference subjects in the normative pool for the ELC, which is updated periodically. Norms are published for males and females of several age groups.

Safety

The ELC uses psychophysical criteria to identify maximum load levels. The High Risk Work Style Guidelines developed for the WSE are applied in simpler form on the ELC to enable evaluation of body mechanics.

A “Rating of Perceived Load” system was developed especially for the ELC and is covered by US Patent protection.

The ELC provides a “heart rate window” within which the test is conducted in order to minimize cardiovascular risk.

The ELC has peer-reviewed research studies that demonstrate their safe use in populations of persons with physical impairments.

Control and Support

The ELC is protected with both copyrights and a United States patent, restricting use to qualified evaluators.

The ELC is supported by Dr. Matheson and his colleagues who also sponsor a training and certification program, ongoing research and frequent peer-reviewed scientific publications. More than 1500 professionals in North America and around the world have been trained and certified on the ELC.

Report Format Example

Evaluation results are presented in two ways. The first is a narrative account involving qualifying statements that address aspects of high-risk work style, attitude factors, the evaluatee’s willingness to give best effort, and other key behavioral observations made by the evaluator. In addition, actual test results are listed and interpreted as percentile rankings. These results are compared with appropriate normative groups and matched against the Physical Demand Characteristics Chart and any job-target information that is available. *More sample report formats are provided in the ELC Examiner’s Manual.*

Mary Smith Report #1 Excerpt:

In order to evaluate Ms. Smith’s lift capacity in a manner that would be safe, reliable and valid, the ELC test was utilized. Pertinent results are presented in the table below.

Subtest	Range	Frequency	MAW	%tile	RAW	%tile
1	<i>Knuckle to Shoulder</i>	<i>1/cycle</i>	30	25	0.25	45
2	<i>Floor to Knuckle</i>	<i>1/cycle</i>	20	5	0.17	10
3	<i>Floor to Shoulder</i>	<i>1/cycle</i>	25	25	0.21	30
4	<i>Knuckle to Shoulder</i>	<i>4/cycle</i>	20	15	0.17	30
5	<i>Floor to Knuckle</i>	<i>4/cycle</i>	10	5	0.08	5
6	<i>Floor to Shoulder</i>	<i>4/cycle</i>	0	0	0	0

Ms. Smith’s body mechanics were unacceptable and required correction during Subtest #1. She responded to the correction and was allowed to continue. Her heart rate response to the tasks indicates that she put forth full effort.

Ms. Smith’s symptom responses to the tasks consisted of “achy” pain in the lumbar area without radiation. This occurred dependably during the subtests that involved spinal flexion and extension from a flexed posture and were tolerable to her. She fatigued considerably over the course of the test battery and was unable to safely complete all four repetitions of Subtest #6 at the beginning weight of 10 pounds.

Ms. Smith’s maximum acceptable weight is 25 pounds on an occasional basis over a full range of motion. She is too de-conditioned to safely and dependably lift-lower frequently at any load over her full range.

Ms. Smith appears to be able to benefit from a rehabilitation program. We recommend a four-week work-conditioning program to improve lift capacity with a retest at one week to confirm progress. If she is making significant progress, consideration should be given to attempting a return to work at ABC Manufacturing.