

Wiesen Test of Mechanical Aptitude

APTITUDE

WTMA

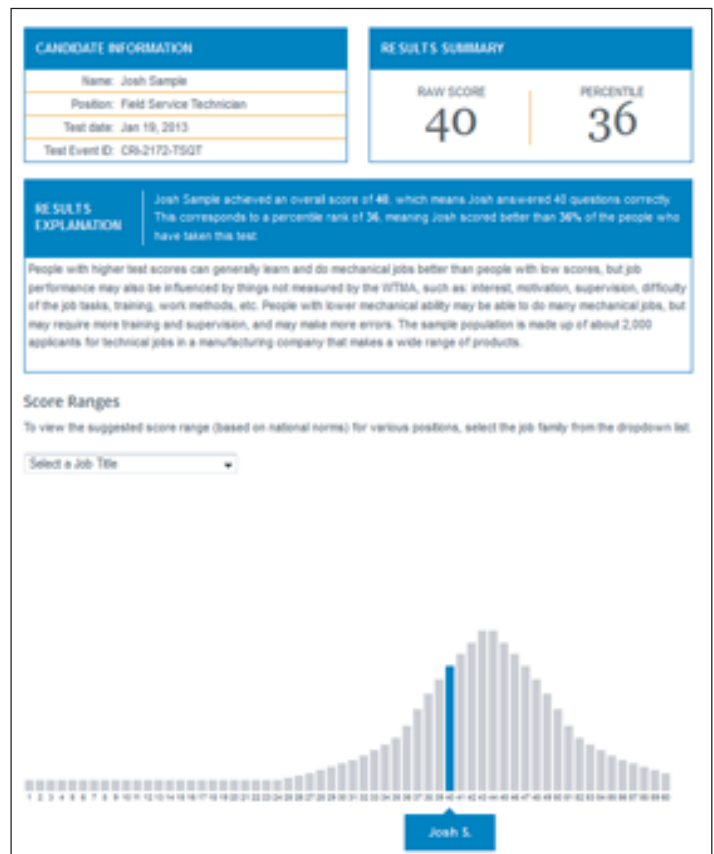
TEST DESCRIPTION

The WTMA **measures a subject's mechanical aptitude**, or ability to learn to use and maintain equipment and machinery. It is a 30-minute, 60-item test that can predict performance for occupations involving the operation, maintenance, and servicing of tools, equipment and machinery. Such occupations either require or are facilitated by mechanical aptitude. The WTMA was specifically developed to improve upon shortcomings of earlier mechanical aptitude tests. Reading level for the WTMA items is estimated to be at the sixth-grade level, and the WTMA is also available in a Spanish-language version. The WTMA's content is designed to minimize gender and racial/ethnic bias, and it has been shown to have **lower adverse impact than older mechanical aptitude tests**.



DETAILED SCORE REPORTS

Each individual is given a raw score and a percentile ranking. The raw score indicates how many questions (out of 60) the individual answered correctly, while the percentile ranking is a relative performance metric that indicates how the individual scored in relation to others who have taken the test. For example, a percentile ranking of 45 means that an individual scored better than 45% of the group on which the test was normed.



VALIDITY INFORMATION

Construct Validity: Various studies have shown that the WTMA correlates highly (.70 to .80) with the Bennett Mechanical Comprehension Test (BMCT), the DAT Mechanical Reasoning Test, and other measures of mechanical aptitude and comprehension.

Adverse Impact: Four different studies comparing the relative adverse impact of the WTMA and BMCT demonstrate that the WTMA has less adverse impact on women than does the BMCT; the average score difference between men and women across the four studies was 0.31 standard deviation units less for the WTMA than it was for the BMCT.

Criterion Related Validity: Research has shown that the WTMA has **predictive validity for jobs which require the operation, maintenance, or repair of machinery or mechanical equipment.** In a validity study of the WTMA involving 96 carpet manufacturing operators, the validity coefficient was .24 ($p < .05$), using supervisors' evaluations of productivity as the criterion. Productivity was evaluated using a 20-item performance rating instrument. The validity coefficient for the WTMA was higher than the validity of any of the other four cognitive aptitude tests used in the study.

STANDARDIZATION SAMPLE

Norms for the WTMA were established by administering the WTMA to a sample of 1,817 adults aged 18 and older working in industrial occupations. This sample included employees at a utility company, machine operators for a textile manufacturer, custodial workers of a public transportation organization, production workers at a diesel engine manufacturer, maintenance workers for a school district, electricians, and other industrial workers. Using this sample, it was determined that the WTMA has very high reliability (.97).

MEAN SCORES AND STANDARD DEVIATIONS FOR VARIOUS INDUSTRIAL SAMPLES

Type of Sample	N	M	SD
Applicants for Cleaner/Serviceperson at a public bus and rail transportation agency	161	39.5	6.62
Applicants for Repairperson at a public bus and rail transportation agency	27	42.6	7.25
Applicants for Communications/Signalperson at a public bus and transportation agency	40	41.3	8.10
Candidates for promotion to skilled trades apprentice (electrician, machine repair, etc.) from manufacturing jobs (assembly line or other production machine operation) at a diesel engine manufacturer	123	47.6	4.27
Incumbent tufting machine operators/maintainers in a carpet factory	102	36.3	7.88
Incumbents in technical/mechanical jobs in a public utility company	76	45.5	5.65
Incumbents in nontechnical/nonmechanical (clerical) jobs in a public utility company	93	44.0	5.91
Applicants for maintenance worker in a large school district	909	41.5	5.79
Applicants for production worker at a diesel engine manufacturer	258	44.2	5.69
Total industrial sample (including all of the above and some smaller samples)	1,817	41.8	6.42