

# Jack Task Analysis Toolkit

Analysis tools that help you design your workspaces for optimal human performance

## Benefits

- Advance your current human performance studies in Jack by putting a complete set of performance analysis tools to work for you
- Diminish quality issues related to human performance
- Identify potentially injurious situations and reduce risk of worker injury
- Improve efficiency of workstation layouts
- Help integrate ergonomic compliance into the design process
- Reduce worker compensation costs
- Avoid costly physical prototyping studies

## Summary

Designing work areas that enable workers to more safely and effectively perform industrial tasks can be a significant challenge. The Jack Task Analysis Toolkit enables you to evaluate human performance from an in-depth ergonomics perspective early in the product lifecycle, before designs are frozen and changes require costly rework. The toolkit allows you to evaluate tasks using the Jack and Jill human models, without ever putting real workers at risk.

The Jack Task Analysis Toolkit (TAT) provides analytical tools to help you design manufacturing workspaces for optimal human performance. TAT is an add-on module to Jack, Siemens PLM Software's widely-used human simulation and ergonomics analysis software.

Leading automotive, aerospace, medical device, heavy equipment, and consumer product manufacturers currently use Jack to evaluate human performance faster and at lower cost during the design process. The TAT add-on enhances workspace design by enabling you to analyze human factors issues that determine how your workers can better perform tasks.



## What is the Task Analysis Toolkit?

Manual work gives rise to numerous human performance concerns that need to be taken into account during an analysis, including working postures, part weight, and task frequency. The Task Analysis Toolkit enables you to perform ergonomic compliance checks directly within a 3D virtual environment. You can leverage TAT tools to quantitatively review manual tasks, such as lifting and carrying, and to assess strength capabilities, joint forces and postural demands.

The availability of comprehensive and sophisticated ergonomic analysis tools within the Jack environment enables engineers to test workplace design concepts for ergonomic risk factors early, without incurring the cost of building physical prototypes. Jack and Jill figures can interact directly with your product or facility data and their performance can be reviewed in order to detect potentially injurious situations.

# TECNOMATIX

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# Jack Task Analysis Toolkit

## Features

- TAT assessment tools are linked directly to the human figure, minimizing user inputs and standardizing assessment results between users
- TAT tools can be run interactively, enabling real-time results during animations and motion capture sessions
- TAT tools are based on recognized data sources endorsed by the ergonomics community
- Analysis reports are available for TAT tools, enhancing communication of results
- TAT includes simplified screening tools, as well as complex quantitative analysis options, facilitating easy use and interpretation

## Task Analysis Toolkit business value

Most of today's manufacturers consider human performance issues to be crucial to the workplaces, products, and processes they design. When workers build ergonomically sound products in a safer, more productive environment, companies achieve dramatic improvements in quality, cost control, time-to-market, and worker



morale. The Task Analysis Toolkit enables you to quantitatively determine how much workers can lift, lower, push, pull, twist and bend when performing their jobs. Its tools can help you identify nonproductive activities/tasks that elevate your risk of worker injury or compromise your product quality.

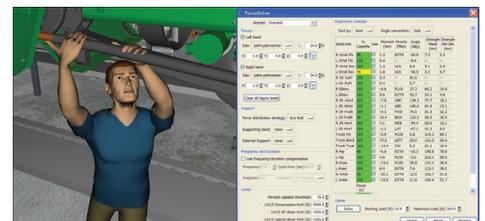
## Available TAT tools

Each tool in the Task Analysis Toolkit quantifies specific task demands and provides feedback on acceptable ergonomic thresholds for use during product and process design. The Task Analysis Toolkit provides the following analysis tools:

- *Fatigue analysis* helps you to assess whether a given job includes enough recovery time to avoid worker fatigue. This tool calculates the recovery time required for a job and compares it to the available rest time.
- *Lower back analysis* uses a complex biomechanical low back model to evaluate the spinal forces that act on the lower back under an unlimited number of posture and loading conditions.
- *Manual material handling* enables you to evaluate and design manual handling tasks that reduce the risk of low back pain, including lifting, lowering, pushing, pulling and carrying activities. This tool leverages the results of 20 years of research conducted by the Liberty Mutual Research Center.
- *Metabolic energy expenditure* predicts the energy demands of a given job based on worker characteristics and job elements.
- *National Institute for Occupational Safety and Health (NIOSH) lifting analysis* evaluates symmetrical and asymmetrical lifting tasks, while accounting for the frequency of the task.
- *Ovako working posture analysis (OWAS)* evaluates the relative discomfort of a

work posture based on the positions and load requirements of the back, arms and legs. OWAS helps determine the urgency of taking corrective measures.

- *Predetermined time standards* help predict the time required to perform a job by subdividing a task into a set of motions with assigned times from the Methods-Time Measurement (MTM-1) system.
- *Rapid upper limb assessment (RULA)* evaluates worker exposure to the risk of upper limb disorders. This tool accounts for posture, muscle use, the weight of loads, task duration and frequency.
- *Static strength prediction (SSP)* evaluates the percentage of a worker population that has the strength to perform a task based on posture, exertion requirements and anthropometry, including wrist strength calculations.
- *ForceSolver* offers a powerful alternative to the traditional method of conducting a static strength or low back assessment. In addition to considering posture, you can define task parameters, such as support forces and standing strategy, in order to predict the maximum acceptable force that a human can exert. Hand forces are an output rather than an input, making the ForceSolver ideal for executing what-if scenarios.



## Packaging and availability

The Task Analysis Toolkit is available as an add-on module for Jack software.

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