



DATE:

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Kestrel 5400 TWL Algorithm and Presets

Manufacturer: Nielsen-Kellerman Co.
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Product: Kestrel 5400
Model: Kestrel 5400 Heat Stress Tracker
Kestrel 5400 Heat Stress Tracker Pro

TWL (Thermal Work Limit) Algorithm:

Kestrel 5400 units measure and calculate TWL using the algorithm developed by Derrick John Brake in "The Deep Body Core Temperatures, Physical Fatigue and Fluid Status of Thermally Stressed Workers and the Development of Thermal Work Limit as an Index of Heat Stress".

TWL Preset Clothing Ensembles:

Ensemble	IClo	VPF
Men's business suit: Long sleeve shirt/tweed suit jacket & long, loose trousers	1.13	0.37
Short sleeve shirt/denim shorts	0.41	0.43
Work Clothes: Short sleeve shirt/long trousers (denim)	0.50	0.40
Work Clothes & Coveralls	0.96	0.39

IClo values are sourced from "A Comprehensive Database for Estimating Clothing Insulation," Institute for Environmental Research, Kansas State University; Elizabeth McCullough and Byron James.

VPF values are sourced from "Heat and moisture transfer through clothing," IBPSA 2009 - International Building Performance Simulation Association 2009; Conrad Voelker, Sabine Hoffman, Oliver Kornadt, Edward Arens and Hui Zhang.

The ensembles are specified in detail as:

Men's business suit: Long sleeve shirt/tweed suit jacket & long, loose trousers	Short sleeve shirt/denim shorts	Work Clothes: Short sleeve shirt/long trousers (denim)	Work Clothes & Coveralls
<ul style="list-style-type: none"> • Briefs • T-shirt • Broadcloth, long-sleeve, collar shirt • Tweed, single-breasted suit jacket • Tweed, straight, long loose trousers • Belt • Calf length dress socks • Hard-soled street shoes 	<ul style="list-style-type: none"> • Briefs • Double knit, short-sleeve sport shirt • Denim walking shorts • Belt • Calf length dress socks • Hard-soled street shoes 	<ul style="list-style-type: none"> • Briefs • Double knit, short-sleeve sport shirt • Denim, straight, long fitted trousers • Belt • Calf length dress socks • Hard-soled street shoes 	<ul style="list-style-type: none"> • Briefs • Broadcloth, long-sleeve, collar shirt • Denim, straight, long fitted trousers • Gabardine coveralls • Calf length dress socks • Hard-soled street shoes

Authorized By:

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