Heat Stress Screening Evaluation

ACGIH® Threshold Limit Value® (TLV®) for Heat Stress and Strain (2006) provides a screening evaluation step that considers environmental conditions reflected in the wet bulb globe temperature (WBGT) index, the work demands (metabolic rate) category and the clothing requirements. The effective WBGT is the sum of the measured WBGT and the clothing adjustment factor.

The screening evaluation assumes that there is a typical work activity for the heat stress exposure and allows for a recovery period. The first step is to identify the work and recovery locations and the work activity. The Screening Heat Stress Data form is completed.

Determine the clothing worn during the work and recovery periods. Two blank locations for clothing ensembles and clothing adjustment factors (CAF) are provided on the form for user specific ensembles. Enter the CAF for the clothing ensemble in each location.

Select the metabolic rate category that best describes the work demands during the work period. Circle the category.

Enter the amount of time spent working and resting. The total should not exceed two hours; and a one hour limit is preferable. Calculate the %-work from the work time divided by total time times 100%.

Enter environmental data for the work and rest locations, and compute the WBGT for each (if not read directly from a meter). The effective WBGT for work and rest is the measured WBGT for each location plus the clothing adjustment factor. Compute the time-weighted average (TWA) of the effective WBGTs.

The level of heat stress is found from the screening criteria table (page 3) by locating the WBGT entry that represents the work category and the %-work.

Screening Heat Stress Data

Work Description

Clothing Enter Clothing Adjustment Factor for Work and for Rest. Space provided for two other ensembles.	*Ensemble*	*°F*	*°C*	Clothing Adjustment Factor (CAF) °F / °C
	Work Clothes / Cloth Coveralls	0	0	
	Double Layer Cloth	5	3	
	SMS Polypropylene Coveralls	1	0.5	
	Polyolefin Coveralls	2	1	
	Limited-Use Vapor-Barrier Coverall	20	11	
				Work
				Rest

Work Demands Choose a characteristic category and circle a category. Values based on average person.	Category	Rate [W]	Category Associated with Task (circle one)
	Rest / Sedentary	115	
	Light Sustainable with ease for 8 h	180	Light
	Moderate Sustainable for 8 h w/ nominal breaks	300	Moderate
	Heavy Breaks required at least every hour	415	Heavy
	Very Heavy Frequent breaks required	520	Very Heavy

Work Time (WT)	[min]	Total Time (TT) [min]		% Work (100% WT/TT) %
Rest Time (RT)	[min]			

Thermal Environment Enter individual values or WBGT for work and rest locations. Eff-WBGT is WBGT plus CAF. Circle units. °F / °C		Work	Rest	WBGT °F / °C	TWA-Eff-WBGT
	T_{db}				
	T_{nwb}			Work	Eff-WBGT-Work
	T_g			Rest	Eff-WBGT-Rest

Screening Criteria: Action Limit and TLV® by % of Work and Metabolic Rate Category

Action Limit

°C-WBGT				
%Work	Light	Moderate	Heavy	Very Heavy
75 to 100	28.1	25.0	--	--
50 to 75	28.7	26.0	24.2	--
25 to 50	29.3	27.2	25.7	24.6
0 to 25	30.0	28.8	27.8	27.0
°F-WBGT				
%Work	Light	Moderate	Heavy	Very Heavy
75 to 100	82.6	77.0	--	--
50 to 75	83.6	78.8	75.6	--
25 to 50	84.8	81.0	78.3	76.3
0 to 25	86.1	83.8	82.0	80.6

TLV®

°C-WBGT				
%Work	Light	Moderate	Heavy	Very Heavy
75 to 100	30.8	28.2	--	--
50 to 75	31.2	29.0	27.6	--
25 to 50	31.8	30.1	28.8	27.9
0 to 25	32.3	31.3	30.5	29.8
°F-WBGT				
%Work	Light	Moderate	Heavy	Very Heavy
75 to 100	87.4	82.8	--	--
50 to 75	88.2	84.3	81.7	--
25 to 50	89.2	86.1	83.9	82.3
0 to 25	90.2	88.4	86.9	85.7

Note: In the TLV® Booklet, these values are rounded to the nearest 0.5 °C-WBGT and rounding to 1 °F-WBGT is appropriate.