APPENDIX "A"

APPENDIX "A"

COMPARISON OF ACCELERATION LEVELS OF HAND-HELD TOOLS FOR 1989[a] AND 2005[b]

Item	Type of Hand-Held Tool	Acceleration Levels (m/sec^2)	
		Year 1989	Year 2005
1	Chainsaws	59-75	6
2	Riveters	205-2,014	-
3	Pedestal Grinders	60-382	7-10
4	Jack-Leg Drills	121-362	-
5	Pavement Breakers	195	-
6	Chipping Hammers	29-2,014	18
7	Hand Grinders	20	4-8
8	Demolition Hammer Drills	-	8-25
9	Road Breakers	-	5-20
10	Hammer Drills	-	6-25

SOURCES: a Criteria for a Recommended Standard: Occupational Exposure to Hand-Arm Vibration; NIOSH, 1989

b Control the Risks from Hand-Arm Vibration; Health and Safety Executive, 2005

APPENDIX "B"

APPENDIX "B"

STAGES OF HAND-ARM VIBRATION SYNDROME[a]

Stage	Condition of Fingers	Work and Social Interference
00	No tingling, numbness, or blanching of fingers	No complaints
OT	Intermittent tingling	No interference with activities
ON	Intermittent numbness	No interference with activities
TN	Intermittent tingling and numbness	No interference with activities
01	Blanching of a fingertip with or without tingling and/or numbness	No interference with activities
02	Blanching of one or more fingers beyond tips usually during winter	Possible interference with nonwork activities; no interference at work
03	Extensive blanching of fingers during summer and winter	Definite interference at work, at home, and with social activities; restriction of hobbies
04	Extensive blanching of most fingers during summer and winter	Occupation usually changed because of severity of signs and symptoms

SOURCE: [a] Vibration Syndrome, Current Intelligence Bulletin 38, DHHS-NIOSH Publication No. 83-1983

APPENDIX "C"

Job	Date / /
Notes	Analyst(s)

The hand-arm vibration analysis on the following page is performed when one or two of the Caution Level job risk factors in the following checklist is present. This checklist is taken from the adapted WISHA checklist.

Moderate to High Hand-Arm Vibration			Check (✓) as applicable
Body Part	**Physical Risk Factor**	**Duration**	
Hands, wrists, and elbows	Using impact wrenches, carpet strippers, chain saws, percussive tools (jack hammers, scalers, riveting or chipping hammers) or other hand tools that typically have high vibration levels	More than 30 minutes total per day	Caution ❑
	Using grinders, sanders, jig saws or other hand tools that typically have moderate vibration levels	More than 2 hours total per day	Caution ❑
	WISHA HAV Analysis – Perform if any Caution condition exists. Actual exposure time is greater than the Hazard Level Exposure Time (See separate work sheet)		Hazard ❑

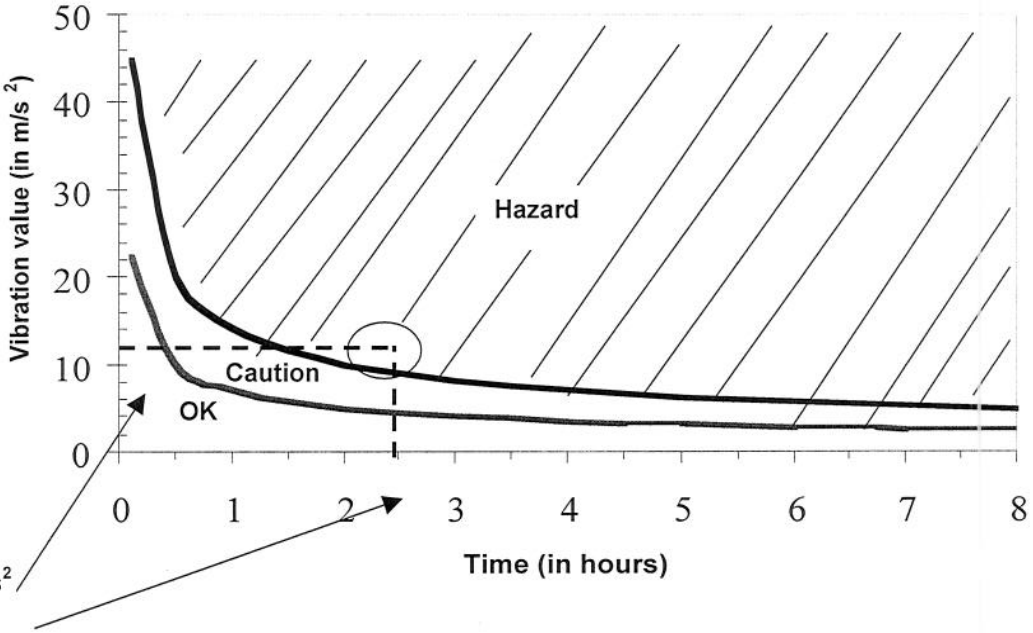
Use the instructions below to determine if a hand-arm vibration hazard exists.

Step 1. Find the vibration value for the tool. (Get it from the manufacturer, look it up at this web site: http://umetech.niwl.se/vibration/HAVHome.html, or you may measure the vibration yourself). The vibration value will be in units of meters per second squared (m/s^2). On the graph below find the point on the left side that is equal to the vibration value.

Step 2. Find out how many total hours per day the employee is using the tool and find that point on the bottom of the graph.

Step 3. Trace a line in from each of these two points until they cross.

Step 4. If that point lies in the crosshatched "Hazard" area above the upper curve, then the vibration hazard must be reduced below the hazard level or to the degree technologically and economically feasible. If the point lies between the two curves in the "Caution" area, then the job remains as a "Caution Zone Job." If it falls in the "OK" area below the bottom curve, then no further steps are required.



Example:
An impact wrench with a **vibration value of 12 m/s^2** is used for **2.5 hours** total per day. The exposure level is in the Hazard area. The vibration must be reduced below the hazard level or to the degree technologically and economically feasible.

Note: The caution limit curve (bottom) is based on an 8-hour energy-equivalent frequency- weighted acceleration value of 2.5 m/s^2. The hazard limit curve (top) is based on an 8-hour energy-equivalent frequency- weighted acceleration value of 5 m/s^2.

Adapted from State of Washington Department of Labor and Industries Ergonomics Rule
See http://www.lni.wa.gov/wisha/ergo/ergorule.htm
This version includes the hand-arm vibration section. See www.hsc.usf.edu/~tbernard/ergotools for electronic copy.