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# PURPOSE

## The purpose of this standard is to establish the minimum requirements for implementing and managing effective ergonomics programs that maximize worker safety and well-being, and that contribute to the highest level of productivity and product quality.

# SCOPE

The provisions of this standard apply to all TI employees and supplemental contractors at Texas Instruments sites worldwide.

# reference documents

## TI Standard Policy and Procedure (SP&P) 04-04-01: "Environmental, Health and Safety"

## TI ESH Standard 02.01: “ESH Incident Notification and Reporting”

## TI ESH Standard 20.10: “ESH Roles and Responsibilities”

## TI ESHSM431: “Environmental Aspects and Impacts and Occupational Health & Safety Hazards and Risks, Rev A”

## ISO 45001:2018 Occupational health and safety management systems - Requirements with guidance for use.

## [Safety Incident Tracking System (SITS)](https://myportal.ti.com/portal/dt?provider=TIPassLoginSingleContainer&URI=http%3A%2F%2Fwwfprod.itg.ti.com%3A80%2Fsits%2F)

# Definitions

[TI ESH Standards Glossary of Definitions](https://sps01.itg.ti.com/sites/wwf/esh/standards/Knowledge_Bank/00.01.xlsx)

# Requirements

## Ergonomics risk surveys

### A competent person shall complete an ergonomics risk survey of work areas at least once every 36 months, or when changes occur. Note: see [Appendix A: Work Area Survey and Evaluation Guide](#Appendix_A) for guidance and see appendices B-E for sample checklists.

#### [Appendix B: Ergonomics Survey Checklist for Operations Tasks](#Appendix_B)

#### [Appendix C: Ergonomics Survey Checklist for Maintenance/Service Tasks](#Appendix_C)

#### [Appendix D: Ergonomics Survey Checklist for Computer Workstations](#Appendix_D)

#### [Appendix E: Ergonomics Survey Checklist for Laboratory Tasks](#Appendix_E)

### Sites shall have completed baseline surveys by June, 7th 2021. Existing surveys may be used as long as they represent the current state of work areas.

### Surveys shall be conducted for each of the categories listed below:

#### Tasks involved with manufacturing activity performed by manufacturing specialists, machine operators and support personnel (for example, incoming, diffusion, test, logistics, etc.).

#### Normal consumable replenishment tasks and common maintenance tasks for manufacturing and support equipment (for example: polish pad replacement, chamber cleaning, quartz tube removal for cleaning, water softener replenishment, etc.).

#### Tasks performed by full-time, dedicated personnel in permanently-staffed laboratories (for example: failure analysis labs, test labs, characterization labs, etc.).

5.1.3.4 Activities at product distribution centers (PDCs) at TI-owned sites.

### Surveys shall be documented to include the name of the work area, name of the assessor, and the date the assessment was performed.

#### If no significant changes to the work area have occurred within the past 36 months, then a new survey for that area is not needed. In this situation, the previous survey shall be noted as “no changes” with the date.

#### Existing ergonomics surveys conducted prior to (one year from approval of standard [Date to be inserted after approval of standard]) may be used as a baseline, as long are they are still valid.

#### If two or more modules, work areas, or job tasks are similar, then the same survey may be used.

#### Only those work areas or tasks that have been identified to have ergonomics-related hazards need to be further analyzed to determine the risk with the results documented. Note: see [Appendix F: Ergonomics Related Risk Assessment System](#Appendix_F) for a description of the risk scoring methodology.

## Job Assessments

### Sites shall establish and implement a process to assess and document common jobs identified during the risk survey process (examples include machine operator, wafer inspector, test area technician, material handler, facilities technician, etc.).

### Sites shall review and update job assessments at least every 3 years to determine if there have been any changes that could increase ergonomics-related risks.

### Any new, common jobs identified as part of the ergonomics risk survey should be assessed and documented.

### Job assessment documentation should include the following minimum information:

#### The name of the job being evaluated;

#### The date (s) and name (s) of the person(s) performing the assessment;

#### Number of hours worked per shift if standard hours are worked;

#### A list of job tasks performed;

#### Frequency of tasks performed; and

#### Descriptions and weights of commonly handled items if material handling tasks are performed.

### Note 1: The Job Assessment form located in Appendix G meets these requirements.

### Note 2: Job assessment documents are also useful when a worker is returning to work with medical restrictions so they may be created in the local language.

## Hazard Prevention and Control

### Manufacturing sites shall document and continuously update progress and completion of projects to mitigate identified VERY HIGH, HIGH and MEDIUM ergonomics-related risks identified during surveys and risk assessments as needed to reflect the current state.

### The following priorities shall be followed for prevention, elimination, and mitigation of ergonomics-related hazards:

#### Elimination (such as changes in the design phase, outsourcing a process, and automation);

#### Substitution (such as switching to lighter components and replacing a telephone handset with a headset);

#### Engineering Controls (such as machine modifications, mechanical lifting devices, and workstation changes);

#### Administrative Controls (such as job rotation, job enlargement [task variation], rest break schedules, instruction on proper lifting technique, return-to-work processes and adequate staffing);

#### Personal Protective Equipment (PPE) (such as impact protective gloves, kneepads, and appropriate footwear). Note: back belts, wrist splints, and other joint immobilization devices are not considered PPE.

## Injury/incident investigation

## 5.4.1 Sites should follow TI ESH Standard 02.01: ESH Incident Notification and Reporting requirements for the reporting and documentation of ergonomics-related injuries. Worker Involvement

### Sites shall have a system for workers to request ergonomics-related assistance and a protocol for response.

### Sites shall ensure workers are:

#### Provided with access to information about their site and/or region’s ergonomics program;

#### Informed of their roles and responsibilities in this program, including:

##### Prompt and accurate reporting of signs and symptoms of Musculoskeletal Disorders using the site’s reporting system and direct communication with the supervisor to allow for early intervention;

##### Reporting of ergonomics-related concerns or recommendations by using the site’s reporting system, contacting the site ESH team or other means.

## Training

### Workers shall receive general ergonomics awareness training at least once every 3 years. Training content, at a minimum, shall include:

#### General principles of ergonomics;

#### Information about risk factors for Musculoskeletal Disorders;

#### Information about the signs and symptoms of Musculoskeletal Disorders;

#### Information about the importance of reporting symptoms early; and

#### Instructions on how to report symptoms, concerns, and recommendations.

### Competent persons responsible for carrying out the various components outlined in this standard shall receive training from Worldwide ESH that provides them with the necessary skills and information to perform the tasks required of their roles.

#### The Competent Person shall be trained and capable of the following:

##### Investigating root cause of WMSDs and discomfort complaints;

##### Identifying ergonomics-related hazards in the workplace;

##### Conducting job task analyses and data collection;

##### Quantifying risk using appropriate ergonomic evaluation tool(s) for hazards found in the work area. Examples of evaluation tools include:

##### Quantitative task evaluation tools such as lifting equations, psychophysical data, etc.;

##### Semi-quantitative task evaluation tools such as Rapid Upper Limb Assessment (RULA), Strain Index methodology, etc.; and

##### Work area and workstation checklists, including the TI computer workstation checklist, SEMI (Semiconductor Equipment and Materials International) Supplier Ergonomic Success Criteria (SESC) checklist, etc.

##### Documenting and communicating findings; and

##### Making recommendations for solutions to eliminate or reduce ergonomics-related risk factors in the workplace.

#### This training shall be completed by these individuals prior to assignment.

# STANDARD Approval

This standard has been approved by Zane Broadhead, TI Vice President

# Revision history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Rev#** | **Date** | **Nature of Revision** | **Author/Editor** | **Approver** |
| A | 01/10/2003 | Periodic review; minor wording changes | Paul Schwab | Brenda Harrison |
| B | 07/10/2006 | Periodic review; minor wording changes | Paul Schwab | Brenda Harrison |
| C | 06/18/2014 | Updated Standard as follows:  1. Eliminated the need for each site to have a separate written program.  2. Additional requirements for ergonomic assessments including risk-ranking of identified ergonomics-related hazards.  3. Changes to “Medical Management” requirements.  4. Requirement for periodic refresher training for employees.  5. Training requirements for “Competent Person” added to standard.  6. Need for Program Evaluation eliminated. | Paul Schwab | David Thomas |
| D | 6/17/2020 | Modified Standard as follows:   1. Added a requirement for an ergonomics-related risk survey to be completed for each work area at manufacturing sites and permanently-staffed laboratories with an appendix describing the process. 2. Added a requirement for a job assessment for each manufacturing operations job, common consumable replenishment task, and general maintenance task. 3. Added a requirement for a project progress and completion tracking system for projects intended to mitigate identified risks. 4. Added ergonomics related risk survey tools as appendices. 5. Added a risk rating methodology appendix. 6. Added a job assessment form as an appendix. | Paul Schwab | ELC |

**Appendix A: Work Area Survey and Evaluation Guide**

A simple walk-through procedure can be used to survey a work area to identify ergonomic-related risks. During the walk-through, the Competent Person looks for potential ergonomics hazards in the work area observes workers performing job tasks, and asks workers and supervisors to help identify concerns. The Competent Person should also check injury records to identify concerns. If a potential hazard is identified during the walkthrough, an evaluation is performed to determine the risk of injury (see Figure A-1).

|  |
| --- |
| **Figure A-1:** Work Area Walk-Through Example |
| **Identified potential hazard:** Cart seem hard to push  **Identified potential hazard:**  Shelf height looks to be too high for the weight of the magazine  **Identified potential hazard:** Awkward posture at microscope inspection station  **Walking path for survey**  Identified potential hazards are highlighted in red color. |

Ergonomics survey checklists are provided in Appendices B, C, and D to help the Competent Person review work area and job tasks to determine if in-depth ergonomics assessments are needed. The “Observations and worker comments” column provides visual markers, which should be adequate for most assessments. The “Quantifiers” column provides additional data to help the evaluator if there are any uncertainties.

**Figure A-2:** Task Analysis Summary Documentation Example

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Site** | **Floor** | **Area** | **Identified Concern** | **Severity** | **Frequency** | **Control** | **Loss History** | **Risk** |
| 01/20/00  No changes | Z-Fab | 2 | Plasma | Material handling: WIP shelf too high | 4  (NIOSH Equation Lifting Index = 1.7) | 3  (Top shelf is used < once per week) | 5  No controls provided | 3 Recordable injury | High  4×3×5+3 = 63 |
| 01/20/00  New finding | Z-Fab | 2 | Plasma | Awkward working posture: Microscope | 3  (RULA Score = 4) | 5  (Inspector spends most of the shift at the workstation) | 4 (Inspector can take rest breaks as needed) | No documented injuries | High  3×5×4+3 = 63 |
| 05/15/00  New finding | Z-Fab | 2 | Plasma | Pushing: 17 kg (37 lbf) initial push force required | 2  (>90% of females capable) | 3  (several times per week) | 5  No controls provided | No documented injuries | Low  2×3×5+0 = 30 |

**Appendix B: Ergonomics Survey Checklist for Manufacturing and PDC Operations Tasks**

|  |  |
| --- | --- |
| Site: | Module/work area: |
| Evaluator: | Date: |

Note: Any items with “yes” answers shall list any provided controls or be assessed in detail using the appropriate risk assessment tool.

| **Risk** | **Observations and worker comments** | **Quantifiers (optional)** | **Yes** | **No** | **Workstation, equipment or job task w/ observation** |
| --- | --- | --- | --- | --- | --- |
| Material handling | * Workers struggling * Noticeable grimacing or grunts * Awkward lifting postures * Worker complaints * Poor hand-object coupling | >8.2 kg (18 lb.) between knee and shoulder (46-127 cm [18-50 in.])  >5 kg (11 lb.) above shoulder height (127 cm [50 in.])  >6 kg (13 lb.) below knee height (46 cm [18 in.]) |  |  |  |
| Carrying items | * Workers struggling * Noticeable grimacing or grunts * Worker complaints | One hand  >5.5 kg (12.1 lb.) >30.5 m (100 ft.)  Two hands  >12 kg (26.4 lb.) >8.5 m (18 ft.) |  |  |  |
| Gripping/squeezing | * White knuckles * Noticeable exertion * Worker complaints | Grip >4.6 kgf (10 lbf)  Finger pinch >0.9 kgf (2 lbf) |  |  |  |
| Push forces (carts, etc.) | * Workers struggling * Noticeable grimacing * Worker complaints | >11.4 kgf (25 lbf) initial  >6.8 kgf (15 lbf) sustained |  |  |  |
| Awkward computer monitor use (>5-min.) | Workers must tilt head upward to look at monitor | Neck extension >15°  Top of monitor >1475 mm (58 in.) |  |  |  |
| Awkward computer keyboard/mouse use (>5-min.) | Using keyboard/mouse in an awkward posture | >20° degrees wrist flexion/ extension  Standing Height  >107 cm (42 in.)  <91 cm (36 in.)  Seated Height  Height adjustable chair provided |  |  |  |
| Awkward static working postures (>5 min.) | Neck: Twist/bend | >20° flexion, side-side / 15° extension |  |  |  |
| Shoulder: Overhead work | >20° flexion / extension |  |  |  |
| Extended reach | >20° flexion / extension |  |  |  |
| Elbow/forearm: Twist | >20° flexion / extension |  |  |  |
| Hand/wrist: Bend/twist/pinch | >20° flexion / extension |  |  |  |
| Trunk: Twist/bend | >20° flexion / extension |  |  |  |
| Knee: Squat/kneel | Full squat or kneel >5 min.   |  |  | | --- | --- | |  |  | | Squat | Kneel | |  |  |  |
| Prolonged standing (>5 min.) | Standing in one position without having an opportunity to walk or stand | n/a |  |  |  |
| Awkward reaches | Excessive reach | >48 cm (19 in.) from the leading edge of the machine of workstation |  |  |  |
| Climbing steps | Steps look to be too high  >3 steps w/o handrail  Uneven step heights | Step height >25 cm (10 in.)  Step =height variance >1.3 cm (0.5 in.) |  |  |  |
| Low light levels | Work area looks dark | <30 FC (300 lux) for visually intensive tasks |  |  |  |
| Other risk factors | (list observations) | n/a |  |  |  |

**Appendix C: Ergonomics Survey Checklist for Maintenance/Service Tasks**

|  |  |
| --- | --- |
| Site: | Module/work area: |
| Evaluator: | Date: |

Note: Any items with “yes” answers shall list any provided controls or be assessed in detail using the appropriate risk assessment tool.

| **Risk** | **Observations and worker comments** | **Quantifiers (optional)** | **Yes** | **No** | **Workstation, equipment or job task w/ observation** |
| --- | --- | --- | --- | --- | --- |
| Material handling | * Workers struggling * Noticeable grimacing or grunts * Awkward lifting postures * Worker complaints | >8.2 kg (18 lb.) between knee and shoulder (46-127 cm [18-50 in.])  >5 kg (11 lb.) above shoulder height (127 cm [50 in.])  >6 kg (13 lb.) below knee height (46 cm [18 in.]) |  |  |  |
| Carrying items | * Workers struggling * Noticeable grimacing or grunts * Worker complaints | One hand  >5.5 kg (12.1 lb.) >30.5 m (100 ft.)  Two hands  >12 kg (26.4 lb.) >8.5 m (18 ft.) |  |  |  |
| Gripping/squeezing | * White knuckles * Noticeable exertion * Worker complaints | Grip >4.6 kg (10 lbf)  Finger pinch >0.9 kg (2 lbf) |  |  |  |
| Push forces (carts, etc.) | * Workers struggling * Noticeable grimacing * Worker complaints | >11.4 kg (25 lbf) initial  >6.8 kg (15 lbf) sustained |  |  |  |
| Awkward computer monitor use (>5-min.) | Workers must tilt head upward to look at monitor | Neck extension >15°  Top of monitor >1475 mm (58 in.) |  |  |  |
| Awkward computer keyboard/mouse use (>5-min.) | Using keyboard/mouse in an awkward posture | >20° degrees wrist flexion/ extension  Standing Height  >107 cm (42 in.)  <91 cm (36 in.)  Seated Height  Height adjustable chair provided |  |  |  |
| Awkward static working postures (>5 min.) | Neck: Twist/bend | >20° flexion, side-side / 15° extension |  |  |  |
| Shoulder: Overhead work | >20° flexion / extension |  |  |  |
| Extended reach | >20° flexion / extension |  |  |  |
| Elbow/forearm: Twist | >20° flexion / extension |  |  |  |
| Hand/wrist: Bend/twist/pinch | >20° flexion / extension |  |  |  |
| Trunk: Twist/bend | >20° flexion / extension |  |  |  |
| Knee: Squat/kneel | Full squat or kneel >5 min.   |  |  | | --- | --- | |  |  | | Squat | Kneel | |  |  |  |
| Prolonged standing (>5 min.) | Standing in one position without having an opportunity to walk or stand | n/a |  |  |  |
| Awkward reaches | Excessive reach | >48 cm (19 in.) from the leading edge of the machine of workstation |  |  |  |
| Climbing steps | Steps look to be too high  >3 steps w/o handrail | Step height >25 cm (10 in.) |  |  |  |
| Low light levels | Work area looks dark | <30 FC (300 lux) for visually intensive tasks |  |  |  |
| Other risk factors | (list observations) | n/a |  |  |  |

**Appendix D: Ergonomics Survey Checklist for Computer Workstations**

Note: Any items with “yes” answers shall list any provided controls or be assessed in detail using the appropriate risk assessment tool. This assessment only applies to dedicated computer workstations used for ≥ 4 hours per day.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Risk** | **Observations and worker comments** | **Quantifiers (optional)** | **Yes** | **No** | **Workstation, equipment or job task with finding with observation** |
| Static posture | Using a computer without breaks for extended periods | Using mouse/keyboard >2 hours without a rest break |  |  |  |
| Awkward computer monitor use  (>5-min.) | Workers must tilt head upward to look at monitor | Neck extension >15°  Top of monitor >1475 mm (58 in.) |  |  |  |
| Awkward computer keyboard/mouse use (>5-min.) | Using keyboard/mouse in an awkward posture | >20° degrees wrist flexion/ extension  Height >107 cm (42 in.)  Height <91 cm (36 in.) |  |  |  |
| Awkward static working postures  (>5 min.) | Neck: Twist/bend | >20° down/10° up |  |  |  |
| Shoulder: Overhead work | >20° flexion/ extension |  |  |  |
| Extended reach | >20° flexion/ extension |  |  |  |
| Elbow/forearm: Twist | >20° flexion/ extension |  |  |  |
| Hand/wrist: Bend/twist/pinch | >20° flexion/ extension |  |  |  |
| Trunk: Twist/bend | >20° flexion/ extension |  |  |  |
| Chair does not fit the user | Backrest not utilized because seat pan is too deep.  User’s weight exceeds the chair’s capacity. | User’s weight exceeds the chair’s capacity. |  |  |  |
| Blood circulation, back pain | Subject’s feet are not supported when the chair is adjusted so the wrists are straight and shoulders relaxed. | Subject’s feet are not on the floor or a footrest. |  |  |  |
| Eye fatigue | Excessive glare on display from window or other light source | Background light source >1,000% of display brightness. |  |  |  |

**Appendix E: Ergonomics Survey Checklist for Laboratory Tasks**

|  |  |
| --- | --- |
| Site: | Lab: |
| Evaluator: | Date: |

Note: Any items with “yes” answers shall list any provided controls or be assessed in detail using the appropriate risk assessment tool.

| **Risk** | **Observations and worker comments** | **Quantifiers (optional)** | **Yes** | **No** | **Workstation, equipment or job task w/ observation** |
| --- | --- | --- | --- | --- | --- |
| Material handling | * Workers struggling * Noticeable grimacing or grunts * Awkward lifting postures * Worker complaints * Poor hand-object coupling | >8.2 kg (18 lb.) between knee and shoulder (46-127 cm [18-50 in.])  >5 kg (11 lb.) above shoulder height (127 cm [50 in.])  >6 kg (13 lb.) below knee height (46 cm [18 in.]) |  |  |  |
| Carrying items | * Workers struggling * Noticeable grimacing or grunts * Worker complaints | One hand  >5.5 kg (12.1 lb.) >30.5 m (100 ft.)  Two hands  >12 kg (26.4 lb.) >8.5 m (18 ft.) |  |  |  |
| Gripping/squeezing | * White knuckles * Noticeable exertion * Worker complaints | Grip >4.6 kg (10 lbf)  Finger pinch >0.9 kg (2 lbf) |  |  |  |
| Push forces (carts, etc.) | * Workers struggling * Noticeable grimacing * Worker complaints | >11.4 kg (25 lbf) initial  >6.8 kg (15 lbf) sustained |  |  |  |
| Awkward computer monitor use (>5-min.) | Workers must tilt head upward to look at monitor | Neck extension >15°  Top of monitor >1475 mm (58 in.) |  |  |  |
| Awkward computer keyboard/mouse use (>5-min.) | Using keyboard/mouse in an awkward posture | >20° degrees wrist flexion/ extension  Standing Height  >107 cm (42 in.)  <91 cm (36 in.) |  |  |  |
| Awkward static working postures (>5 min.) | Neck: Twist/bend | >20° flexion, side-side / 15° extension |  |  |  |
| Shoulder: Overhead work | >20° flexion / extension |  |  |  |
| Extended reach | >20° flexion / extension |  |  |  |
| Elbow/forearm: Twist | >20° flexion / extension |  |  |  |
| Hand/wrist: Bend/twist/pinch | >20° flexion / extension |  |  |  |
| Trunk: Twist/bend | >20° flexion / extension |  |  |  |
| Knee: Squat/kneel | Full squat or kneel >5 min.   |  |  | | --- | --- | |  |  | | Squat | Kneel | |  |  |  |
| Prolonged standing (>5 min.) | Standing in one position without having an opportunity to walk or stand | n/a |  |  |  |
| Awkward reaches | Excessive reach | >48 cm (19 in.) from the leading edge of the machine of workstation |  |  |  |
| Climbing steps | Steps look to be too high  >3 steps w/o handrail  Uneven step heights | Step height >25 cm (10 in.)  Step =height variance >1.3 cm (0.5 in.) |  |  |  |
| Low light levels | Work area looks dark | <30 FC (300 lux) for visually intensive tasks |  |  |  |
| Other risk factors | (list observations) | n/a |  |  |  |

**Appendix F: Ergonomics Related Risk Assessment System**

Risk of an ergonomics related injury should be quantified based on probability and severity of injury using Table D1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table D1** | | | | | |
| PROBABILITY  (freq. x control) | **1**  **Insignificant** | **2**  **Minor** | **3**  **Moderate** | **4**  **Serious** | **5**  **Severe** |
| 25 | Low 25 | Medium  50 | High  75 | Very High  100 | Very High  125 |
| 20 | Very Low 20 | Low  40 | Medium  60 | High 80 | Very High  100 |
| 15 | Very Low 15 | Low 30 | Low 45 | Medium 60 | High 75 |
| 10 | Very Low 10 | Very Low 20 | Low 30 | Low 40 | Medium 50 |
| 5 | Very Low 5 | Very Low  10 | Very Low 15 | Very Low 20 | Low 25 |
| 1 | Very Low 1 | Very Low  2 | Very Low  3 | Very Low  4 | Very Low  5 |

Probability is calculated by multiplying frequency of the activity times the control. The scoring system for frequency is provided in Table D2 and the scoring system for control is provided in Table D3.

|  |  |
| --- | --- |
| **Table D2** | |
| **Score** | **Frequency** |
| 1 | Unlikely: Task will not happen except under emergency situations |
| 2 | Remote: Task is unlikely but possible to occur, i.e. annual or biannual |
| 3 | Possible: Task will occur at least once, i.e. weekly or monthly |
| 4 | Probable: Task will occur several times, i.e. daily |
| 5 | Frequent: Task is likely to occur frequently, i.e. continuous exposure to the hazard |

|  |  |  |
| --- | --- | --- |
|  | | |
| **Table D3** | |
| **Score** | **Control** |
| 0 | Hazard eliminated (examples include automation of task, outsourcing activity, process obsolescence, etc.). |
| 1 | Hazard recognized, adequate written procedures in place, appropriate controls in use, periodic review and inspection is occurring. |
| 2 | Hazard recognized, adequate procedures in place, employees trained on procedures, adequate controls in place. |
| 3 | Hazard recognized, written procedures, may lack some components, all required controls but not always used. |
| 4 | Hazard recognized, informal procedures in place and some controls in place, but not appropriate ones or not used. |
| 5 | Hazard not recognized, or recognized but ignored. |

Severity can be determined using Table D4 based on standard ergonomics related risk assessment tools. If more than one risk assessment tool is used to assess a job that involves several tasks (for example, a task that involves both lifting and pushing), the score for the task component with the greater risk should be used.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table D4** | | | | | |
| **Severity Score** | | | | | |
|  | 1 | **2** | **3** | **4** | **5** |
| Injury Example | Fatigue Mild discomfort | Back discomfort  Wrist discomfort  Shoulder tendonitis | Back strain/ pain  Wrist tendonitis/ pain  Shoulder tendonitis | Back strain Wrist tendonitis  Thoracic outlet syndrome | Herniated disc  Carpal tunnel syndrome  Thoracic outlet syndrome |
| Injury severity | None | None/  First Aid | First Aid/ Recordable | Recordable/ DART | DART/ Disabling Injury |
| **Assessment tool score** | | | | | |
| **NIOSH Lifting Equation** (Lifting Index) | ≤ 0.7 | 0.8 - 1.0 | 1.1 - 1.5 | 1.5 - 2.0 | > 2.0 |
| **MAC** (Manual Activity Charts) | 0 – 5.9 | 6.0 – 11.9 | 12.0 – 17.9 | 18.0 – 21.9 | ≥ 22 |
| **Psycho- physical data** (% capable) | 100% of female population | 90% of female population | 75% of female population | 50% of female population | <50% of female population |
| **RAPP** (Risk Assessment of Pushing and Pulling) | 0 - 5.9 | 6.0 - 11.9 | 12.0 - 17.9 | 18.0 - 21.9 | ≥ 22 |
| **RULA** (Rapid Upper Limb Assessment) | < 1 | 1 - 2 | 3 - 4 | 5 - 6 | ≥ 7 |
| **OWAS** (Ovako Work Assessment System) | No action category | Action category 1 | Action category 2 | Action category 3 | Action category 4 |
| **Revised Strain  Index** | < 3.0 | 3.0 - 6.4 | 6.5 - 10.0 | 10.1 - 13.4 | ≥ 13.5 |

DART: Days Away, Restricted or Transferred

Male psychophysical data may be used if a job can be restricted to males only.

Points are added for prior injuries or complaints as follows:

Ergonomics assessment request or complaint – 1

First Aid Cases – 2

OSHA Recordable – 3

DART case - 4

**Appendix G: Job Assessment Form**

**Job Assessment Form**



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Supervisor:** Please enter the information below for the employee’s current job. If this assessment is for a generic job, then enter the job name in the name field. If the provided selections in the drop-down menus are not adequate, then enter the information in the appropriate comment field. | | | | | |
| **Background Information** | | | | | |
| Evaluator name: |  | Phone (office and cell): |  | E-mail: |  |
| Supervisor/manager name |  | Phone (office and cell): |  | E-mail: |  |
| Date of assessment |  | | | | |

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| --- | --- | --- | --- |
| **Hours and Breaks (ONLY COMPLETE FOR NONEXEMPT EMPLOYEES)** | | | |
| Hours per day? |  | Meal break # per shift and duration: |  |
| Days per week? |  | Rest break # per shift and duration: |  |
| Overtime required? If yes, appx # hrs/wk |  |  | |

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| --- | --- | --- |
| **Control Over Work Pace** | | |
| Does the employee have control over the work pace (speed is not dictated by a machine or daily deadlines) | Click on correct response | Comments: |

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| --- |
| **Essential Job Functions** |
| **Supervisor:** Provide a brief description of each of the employee’s essential functions (the basic job duties that the employee must perform). Descriptions should focus on the critical tasks performed by the employee rather than on the physical requirements needed to accomplish those tasks (e.g., “transport wafer cassettes from area A to area B using a cart” rather than “push with 12 kg (26.4 lb.) of force”). You do not need to fill out weight, force or posture information or add pictures; an ESH team member will do this. Add lines as needed. Weights and forces can be added to the notes section as appropriate. This information can be found here: <http://online.corp.ti.com/ergonomics/Design_guidelines/Item_weights_and_measures.pdf>. |

| To be completed by the supervisor | | To be completed by ergonomics or ESH specialist | |
| --- | --- | --- | --- |
| Job task | Frequency (times/hr., times/shift) | Notes | Image (if available) |
| 1. |  |  |  |
| 2. |  |  |  |
| 3. |  |  |  |
| 4. |  |  |  |
| 5. |  |  |  |
| 6. |  |  |  |

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| --- | --- |
| **Equipment Operated or Maintained (Please List, if applicable)** | |
| 1. | 5. |
| 2. | 6. |
| 3. | 7. |
| 4. | 8. |

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| --- | --- |
| **Hand Tools, Carts, Devices Used (Please List, if applicable)** | |
| 1. | 5. |
| 2. | 6. |
| 3. | 7. |
| 4. | 8. |

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| **Physical Job Demands** | | |
| Use the criteria to the right to rate the physical requirements of each job activity in the section below. | **How often is activity performed?**  Daily = D  Weekly = W  Monthly = M  Quarterly = Q  Never = N | **Time spent performing activity (percent of workday)**  Rare (≤ 1%)  Limited (2% - 10%)  Occasional (11% - 30%)  Frequent (31% - 70%)  Constant (>70%) |

| **Activity  Category** | **Activity** | | **Check if applicable** (If applicable, answer the questions in the columns to the right) | **How often is the activity performed?**  (For “daily” responses, enter times per shift in the comments box) | **Time spent performing activity** | **Comments** |
| --- | --- | --- | --- | --- | --- | --- |
| Computer use | Keyboarding/using mouse | |  | Click on correct response | Click on correct response |  |
| Communication | Telephone use | |  | Click on correct response | Click on correct response |  |
| Visual | Microscope or magnifier use | |  | Click on correct response | Click on correct response |  |
| Unaided visual inspection | |  | Click on correct response | Click on correct response |  |
| Video inspection | |  | Click on correct response | Click on correct response |  |
|  | Differentiating colors | |  | Click on correct response | Click on correct response |  |
|  | Read data on monitor | |  | Click on correct response | Click on correct response |  |
| Posture/ movement | Standing | |  | Click on correct response | Click on correct response |  |
| Sitting | |  | Click on correct response | Click on correct response |  |
| Walking | |  | Click on correct response | Click on correct response |  |
| Kneeling |  |  | Click on correct response | Click on correct response |  |
| Stooping |  |  | Click on correct response | Click on correct response |  |
| Squatting |  |  | Click on correct response | Click on correct response |  |
| Crawling |  |  | Click on correct response | Click on correct response |  |
| Bending at the neck  (>20 deg.) | |  | Click on correct response | Click on correct response |  |
| Bending at the waist  (>20 deg.) | |  | Click on correct response | Click on correct response |  |
| Twisting at the waist  (>20 deg.) | |  | Click on correct response | Click on correct response |  |
| Reaching forward | |  | Click on correct response | Click on correct response |  |
| Reaching above shoulder  (for generic assessments, reaches 137 cm [>54 in.]) | |  | Click on correct response | Click on correct response |  |
| Reaching to the side | |  | Click on correct response | Click on correct response |  |
| Climbing | Climbing stairs | |  | Click on correct response | Click on correct response |  |
| Climbing onto step platform (25 cm [>10 in.]) | |  | Click on correct response | Click on correct response |  |
| Climbing ladders | |  | Click on correct response | Click on correct response |  |
| Balancing / working at heights | |  | Click on correct response | Click on correct response |  |
| Hand/foot use | Grasping/ holding/ objects and tools | |  | Click on correct response | Click on correct response |  |
| Squeezing objects and tools | |  | Click on correct response | Click on correct response |  |
| Pinching with fingers | |  | Click on correct response | Click on correct response |  |
| Twisting or bending of hand/wrist | |  | Click on correct response | Click on correct response |  |
| Writing with a pen or pencil | |  | Click on correct response | Click on correct response |  |
| Operation of foot controls | |  | Click on correct response | Click on correct response |  |
| Miscellaneous | Whole body or segmental vibration exposure (e.g., vibrating tools) | |  | Click on correct response | Click on correct response |  |
| Driving cars, forklifts or other powered equipment | |  | Click on correct response | Click on correct response |  |

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| **Weight related activities:**  **List activities that involve working with weighted objects (e.g. lifting, carrying, pushing, pulling) and provide information in each column as applicable** | | | | | |
| Weights for common items and forces for common activities at TI sites can be found here: <http://online.corp.ti.com/ergonomics/Design_guidelines/Item_weights_and_measures.pdf>. | | | | | |
| Activity | Body mechanics  (lift, push, pull, carry) | No. of times performed / shift | Time Spent Performing Activity | Object being lifted, pushed, pulled or carried | How much weight or force is involved with activity? |
|  | Click on correct response |  | Click on correct response |  |  |
|  | Click on correct response |  | Click on correct response |  |  |
|  | Click on correct response |  | Click on correct response |  |  |
|  | Click on correct response |  | Click on correct response |  |  |
|  | Click on correct response |  | Click on correct response |  |  |
|  | Click on correct response |  | Click on correct response |  |  |
|  | Comments | | | | |

|  | **Work Environment** (to be completed by supervisor) | | |  |
| --- | --- | --- | --- | --- |
| Environmental factors | Work with environmental factor required? | **How often is work with environmental factor required?**  (For “daily” responses, enter times per shift in the comments box) | **Time spent performing work with environmental factor** | **Comments** |
| Work in a yellow light or dark environment? (54-108 lux [5-10 FC]) | Click on correct response | Click on correct response | Click on correct response |  |
| Work outside: In high temperatures? (≥38° [≥100°F]) | Click on correct response | Click on correct response | Click on correct response |  |
| Work outside: In low temperatures? (≤0°C [≤32°F]) | Click on correct response | Click on correct response | Click on correct response |  |
| Work in noisy areas (85+dB)? | Click on correct response | Click on correct response | Click on correct response |  |
| Work in cramped or confined space? | Click on correct response | Click on correct response | Click on correct response |  |
| Work with lasers? (please list type/class of laser used on the Comments section): | Click on correct response | Click on correct response | Click on correct response |  |
| Work **with** chemicals? (please list all such chemicals in the comments field): | Click on correct response | Click on correct response | Click on correct response |  |
| Work **around** chemicals? (please list all such chemicals in the comments field): | Click on correct response | Click on correct response | Click on correct response |  |
| Wear/use Personal Protective Equipment (if so, **list all PPE** in the comments section) | Click on correct response | Click on correct response | Click on correct response |  |
| Work with high voltage equipment? (if so, list in comments field) | Click on correct response | Click on correct response | Click on correct response |  |
| Work in proximity to open flame? (if so, provide distance to open flame in comments field) | Click on correct response | Click on correct response | Click on correct response |  |

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| --- | --- | --- | --- |
| **Business Travel** (to be completed by supervisor) | | | |
| Business travel required? | Click on correct response | Frequency: | Destination(s): Click on correct response |
| Additional comments: | | | |

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| --- | --- |
| Form completed by: | |
| Supervisor: | Date: |
| Ergo or ESH specialist: | Date: |