



7th International Abilympics

Vocational Skills Contest

V4. CAD - Machinery

1. Task

Based on the drawing of a gear pump, create a detail drawing of the main body of part (1) and title block, thereby completing a technical drawing of the part.

2. Allocated time

4 hours 30 minutes

3. How to present the completed work

Contestants shall store their completed work (or uncompleted work if not finished) on the floppy disk and present it with a sheet of plotter paper on which the work is printed out. Note that the work shall conform to the specifications as noted in “Instructions for specifications” in 5 below.

4. Work instructions

- a. A drawing assigned as the task will be provided on the day of the contest.
- b. Contestants are not allowed to use tools, etc., other than those designated in 7 and 8 below.
- c. Contestants are not allowed to lend or borrow tools during the contest.
- d. Contestants shall notify the judge when they finish the task

<Note>

Contestants who need special assistive technology/device (hardware and software) shall notify the secretariat in advance. In principle, such contestants should bring it into the contest site during the orientation session and install/attach it in the presence of judges.

No special consideration will be given if there is any trouble with installed/attached technology/device

5. Instructions for specifications

- a. A technical drawing shall be created in conformity with the following ISO standards.

ISO 15:1998 Rolling bearings -- Radial bearings -- Boundary dimensions, general plan
ISO 68-1:1998 ISO general purpose screw threads -- Basic profile -- Part 1: Metric screw
ISO 128-20:1996 Technical drawings -- General principles of presentation -- Part 20: Basic conventions for lines
ISO 128-21:1997 Technical drawings -- General principles of presentation -- Part 21: Preparation of lines by CAD systems

ISO 128-22:1999	Technical drawings -- General principles of presentation -- Part 22: Basic conventions and applications for leader lines and reference lines
ISO 128-24:1999	Technical drawings -- General principles of presentation -- Part 24: Lines on mechanical engineering drawings
ISO 128-30:2001	Technical drawings -- General principles of presentation -- Part 30: Basic conventions for views
ISO 128-34:2001	Technical drawings -- General principles of presentation -- Part 34: Views on mechanical engineering drawings
ISO 128-40:2001	Technical drawings -- General principles of presentation -- Part 40: Basic conventions for cuts and sections
ISO 128-44:2001	Technical drawings -- General principles of presentation -- Part 44: Sections on mechanical engineering drawings
ISO 129-1:2004	Technical drawings -- Indication of dimensions and tolerances -- Part 1: General principles
ISO 286-1:1988	ISO system of limits and fits -- Part 1: Bases of tolerances, deviations and fits
ISO 406:1987	Technical drawings -- Tolerancing of linear and angular dimensions
ISO 1101:2004	Geometrical Product Specifications (GPS) -- Geometrical tolerancing -- Tolerances of form, orientation, location and run-out
ISO 1660:1987	Technical drawings -- Dimensioning and tolerancing of profiles
ISO 2203:1973	Technical drawings -- Conventional representation of gears
ISO 3098-0:1997	Technical product documentation -- Lettering -- Part 0: General requirements
ISO 4762:2004	Hexagon socket head cap screws
ISO 5455:1979	Technical drawings -- Scales
ISO 5456-1:1996	Technical drawings -- Projection methods -- Part 1: Synopsis
ISO 5456-2:1996	Technical drawings -- Projection methods -- Part 2: Orthographic representations
ISO 5457:1999	Technical product documentation -- Sizes and layout of drawing sheets
ISO 5459:1981	Technical drawings -- Geometrical tolerancing -- Datums and datum-systems for geometrical tolerances

ISO 5459:1981 Technical drawings -- Geometrical tolerancing -- Datums and datum-systems for geometrical tolerances
ISO 6410-1:1993 Technical drawings -- Screw threads and threaded parts -- Part 1: General conventions
ISO 6410-3:1993 Technical drawings -- Screw threads and threaded parts -- Part 3: Simplified representation
ISO 8015:1985 Technical drawings -- Fundamental tolerancing principle
ISO 8826-1:1989 Technical drawings -- Rolling bearings -- Part 1: General simplified representation
ISO 8826-2:1994 Technical drawings -- Rolling bearings -- Part 2: Detailed simplified representation
ISO 13567-1:1998 Technical product documentation -- Organization and naming of layers for CAD -- Part 1: Overview and principles

- b. The principal projection drawing in the detail drawing of the part (1) shall be a cross-sectional drawing along the line C - O - D - E - F as viewed in the direction pointed by arrow X in the assembly plan.
- c. The right side view of the part (1) shall have a cross-sectional drawing along the line A - A as viewed from arrow Y on its left side half, and a cross-sectional drawing along the line B - B as viewed from arrow Y on its right side half.
- d. The bottom view shall be created by drawing only the lower half, making it a symmetric figure.
- e. The completed work shall be installed in the floppy disk as a file and also be output on the plotter. A contour line shall be drawn in the drawing forming a 10mm margin from the edge of each of the four sides, and the technical drawing shall be completed within the frame of the contour line. The drawing may be output once during the process of completing the work.
- f. The drawing shall be laid out and output in the landscape format.
- g. Referring to the column in the lower right corner of the assigned drawing, a column showing each contestant's name and number, projection method adopted, and scale shall be drawn in the lower right corner of the drawing.
- h. Hatching or the like to show a cut edge of the cross-section surface will not be necessary.
- i. The length of radius and chamfer dimension shall be written in the figure and shall not be collectively designated using a note, etc.
- j. The instructions for surface roughness shall be written in the figure and shall not be collectively designated using mnemonic symbols, etc.
- k. The symbol placed before each dimensional value is a dimensional auxiliary symbol meaning the following:
 - φ : Length of diameter
 - R : Length of radius.
 - SR : Length of spherical radius.
 - C : Value by which chamfering based on an angle of 45 degrees should be done
- l. When entering a dimensional value, the size of each dimensional value shall be 3.5mm and the terminal symbol shall be an open arrow 2mm long.
- m. The figures shall be drawn while referring to the assigned drawing for the dimensional

values of each section.

6. Tools, materials, etc. to be provided on site

The following will be provided on site for presenting the work.

Item	Dimension and specification	Qty
Plotter paper	A3 size (297x420mm), 65g or similar	2
Floppy disk	3.5 inch HD, 1.44Mbyte	1
Writing utensils	Pencils, eraser, markers, etc.	

7. Items to be brought by each contestant

Item	Specification	Qty	Remarks
Ruler	Meter-based	As appropriate	
Protractor		As appropriate	
Adhesive tape		As appropriate	
Calculator		As appropriate	

(Note) Contestants who will bring their own tools including the items listed above are requested to prepare a list of tools and present it to the organizer for approval in advance. The organizer reserves the right not to allow the use of any tools that are considered to give the contestant an unfair advantage.

8. Equipment, tools, etc., to be prepared on site

Item	Specification	Qty	Remarks
Two-dimensional CAD System	AutoCAD	1	DOS/V enabled
			OS: WindowsXP
A1 static plotter	A2 and A3 size drawing paper can be used	1	One for all contestants on site
Side desk		1	Where equipment to be used can be placed on it
Chair		1	

9. Evaluation criteria

a. The completed work shall be evaluated regarding the following three items.

1) Drawings

The projection method, drawing method and skills will be evaluated respectively regarding the principal projection drawing, right side view and bottom view.

2) Dimensions

Dimension, dimensional tolerance, geometric tolerance, and surface profile will be evaluated respectively regarding the principal projection drawing, right side view, and bottom view.

3) Visual quality and arrangement of the drawing, contestant's working attitude, location of entry, and balance in the drawing will be evaluated.

b. Marks will be allotted to each item in the following manner and the order of ranking will be determined by the total marks scored.

Items to be evaluated	Maximum marks allotted
Drawings	50
Dimensions	40
Visual quality, etc.	10
Total marks	100