IME 222, Fall 2023

HOMEWORK 2: Dimensioning and Tolerance for Oldham Coupling

Submission instructions:

- Develop a 3D model for Flange, Circular disc, Shaft, and Key (4-part design)
- Open a drafting model and put only the **necessary** projection views. Use third angle projection.
- Save your ". CATDrawing" models as "***HW2 _Fall2023_Your WSU ID***".
- All 3D part designs should be compressed into a single file for submission.
- Save the drafting model and export all the sheets as '.pdf' files using ISO A3 sheets.
- Upload **ONLY THREE** files (One ".PDF", one zipped ". CATPart" AND One ". CATDrawing" extension) to Blackboard.
- For submission, **use WSU lab computers**.
- **Don't upload pictures or Word documents to Blackboard.**
- Late submissions will be graded as mentioned in the syllabus.
- Please follow these instructions

Oldham Coupling

It is used to connect two parallel shafts whose axes are at a small distance apart. Two flanges, each having a rectangular slot, are keyed, one on each shaft. The two flanges are positioned such that, the slot in one is at right angle to the slot in the other.

To make the coupling, a circular disc with two rectangular projections on either side and at right angle to each other, is placed between the two flanges. During motion, the central disc, while turning, slides in the slots of the flanges. Power transmission takes place between the shafts, because of the positive connection between the flanges and the central disc.

1. Generate only the **necessary primary views** with an appropriate **dimensioning and tolerances**. These exercises are designed to fit on ISO A3 metric size paper (*Use any sheet size with appropriate scaling of the drawing*). Use a title block or title strip as assigned by your instructor. (Use 3rd angle projection system).

   The basic hole diameter (D) of the flange is 30 mm. Specify the hole diameter and shaft diameter tolerances for the hole and shaft, H7/f7 (normal running fit). The nominal length of the shaft is 60 mm. Refer to the table below for the tolerance deviations for each component.

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Procedures and deliverables

1. Find the missing values on the table based on the above given fit descriptions.
2. Develop 3D part model for each part.
3. Open drafting & generate the necessary views. Use ISO A3 sheet, 3rd angle projection, include the symbol.
    - **Flange:** Front & Right-side views (Scale 1:1)
    - **Circular disc:** Front, Right-side and Top views (Scale 1:1)
    - **Shaft:** Front, Left-side views (Scale 3:1)
    - **Key:** Front, Right-side views (Scale 6:1)
4. Setup the part name, dimension expression ("mm"), institute, scale, drawing number, sheet number, projection symbol, set your dimension texts font to Times New Roman, and size 5 ….
5. Print all the sheets (4 sheets) on ISO A3 sheet size to save as a ".pdf" file.
6. Compressed all part models (4 parts) as a single file.
7. Submit
    - *A ".pdf" extension file which consists of four sheets.
    - A "CATDrawing" extension file which consists of four sheets/drawings.
    - A compressed (zipped) Folder ".zip" extension file which consists of four-part designs.

Note that: 3D part models/designs are modeled based on the basic or nominal diameters.

- *W- width*
  D- depth
  L- length, H- height

Part #	Part Name	Feature	Upper deviation (mm)	Lower deviation (mm)	
1	Flange Ø30 mm	Slot W, D	0.010	-0.010	It should be designed with a maximum total thickness from the hub surface to the back surface, with a deviation of ±0.050 mm.
		Hole diameter	?	?	
		Hole depth	0.015	-0.015	
		Keyway L, W, D	0.001	-0.001	
		All other features	0.025	-0.025	
2	Circular Disc	Diameter	0.050	-0.050	It should be designed with a total max. thickness from rib to rib, with a deviation of ±0.015 mm.
		Rib (Pad) width	0.015	-0.015	
		Basic thickness	0.015	-0.015	
3	Shaft Ø ? L 60mm	Diameter	?	?	
		L	0.100	-0.100	
		Keyway L (30mm), W, D	0.001	-0.001	
4	Key	W, H (10X10mm)	0.001	-0.001	
		L (30mm)	0.001	-0.001	

Use 3-digit precision tolerance.

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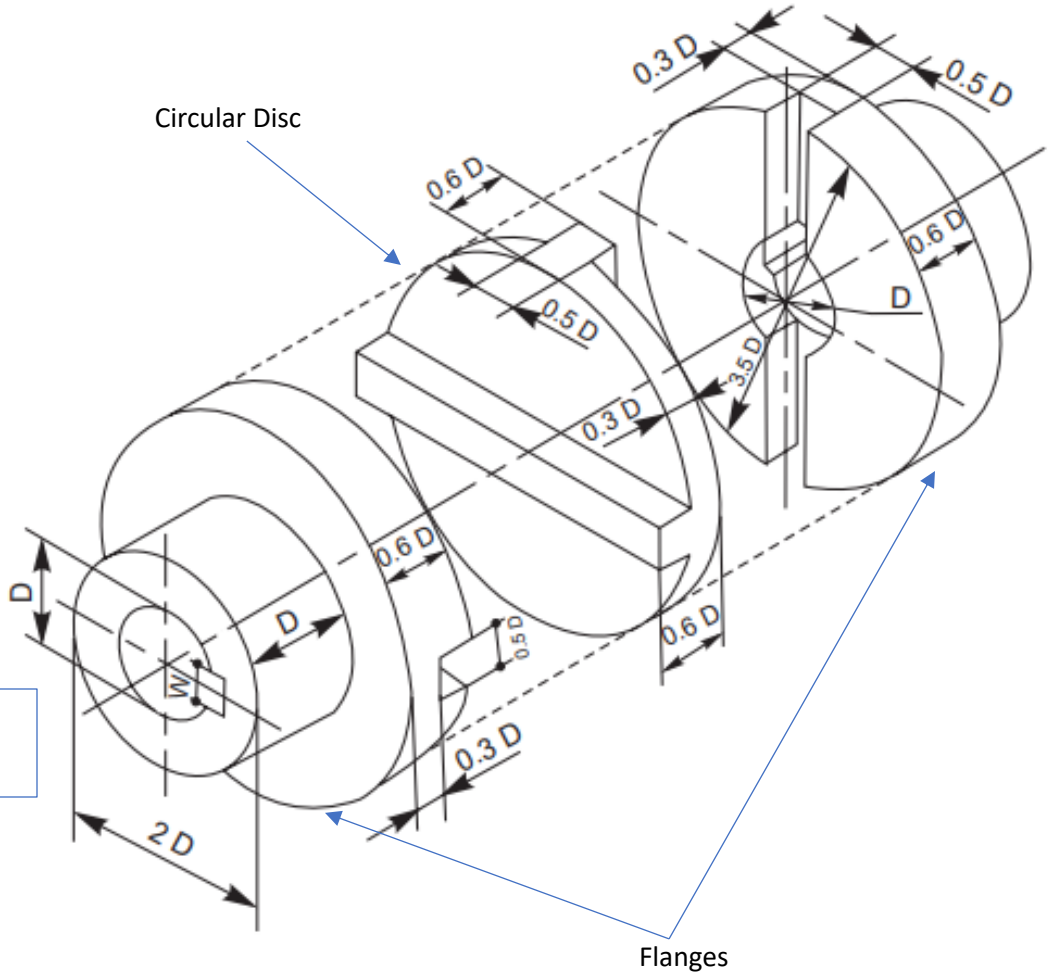

The depth of the hole is given as D+0.3D