12/03/2013 Tue

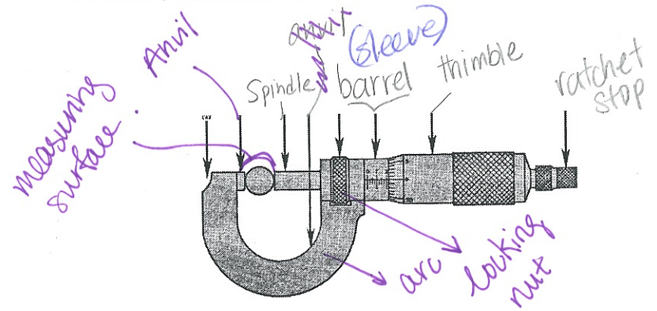
0.276"

To a machinist:
two hundred seventy six thousands

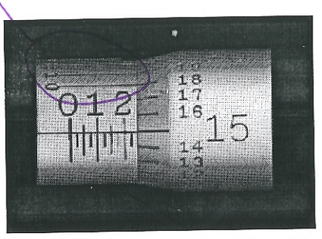
...ometer.

ME317 DFM
Day 2 Self Quiz

1. Label the barrel, thimble and ratchet stop in the correct locations on the figure.

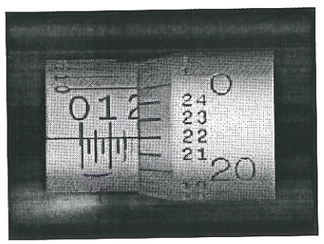


2. Write down the dimension that is indicated by each figure. The units are inches.



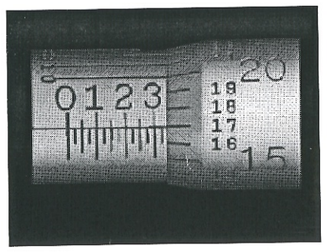
0.200"
0.025"
0.015"
0.0000"
0.2400 in

0.200"
0.025"
0.015"
0.240 in



0.100"
0.075"
0.022"
0.0000"
0.1970

0.100"
0.075"
0.022"
0.197"



0.300"
0.025"
0.017"
0.342"

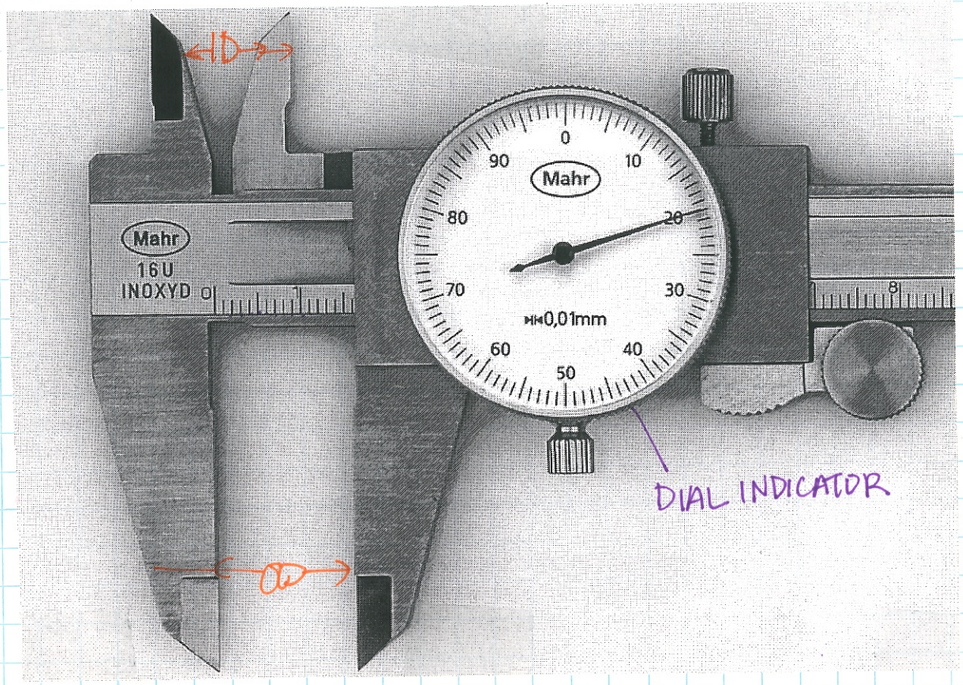
0.300"
0.025"
0.017"
0.342"

12/03/2013 Tue

5

To read a dial Caliper:
1. Read last whole number on rule
2. Read smaller number
3. Read number on dial.
4. Sum

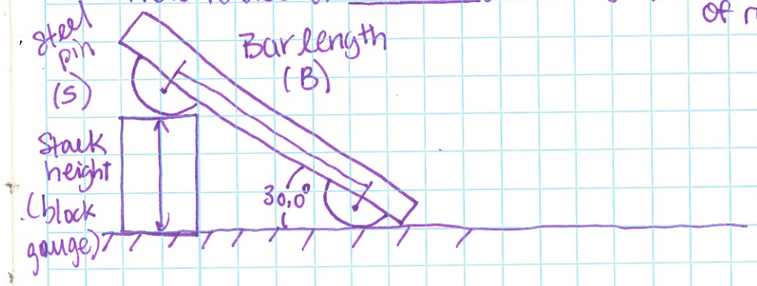
1.000
0.100
0.021
1.121



① Also:
gauge block
for reference and calibrating equipment.
② radii gauge
measure the radii of an object. Use light leakage
③ micro-finish comparator
larger number means rougher finish.

How to use a sine bar: — measure angle / set angle.

sin(∠) × distance between centers of rolls on the sine bar = height of the gauge block.



lecture notes:

manufacturing cost
- Indirect cost (overhead)
- Fixed cost (Does not vary)
  - Tooling
  - Set up
- Variable cost (Does vary)
  - Material
  - Labor

*My salary as an engineer is an indirect cost, and a ~~fixed cost~~. fixed cost.

12/15/13

PRE-CLASS PREPARATION – 7

Address these questions in your logbook. We'll discuss them during the next class.

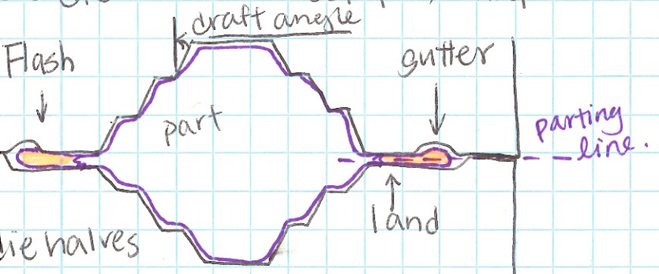
From the text and video...

1. In what form is the raw material for forging?
2. Can we make larger parts with forging than we could with extrusion or powder metals?
3. Which form of forging is typically used for complex shapes, open or closed die?
4. Draw the side view of an impression die for forging. Label the die halves, part, parting line, flash, land, and gutter.
5. What is a draft angle?
6. Make a sketch of the grain flow in a forging and a machined part. How is that helpful to the designer?
7. Make a list of the processes for making a bolt and nut like was shown in the video.

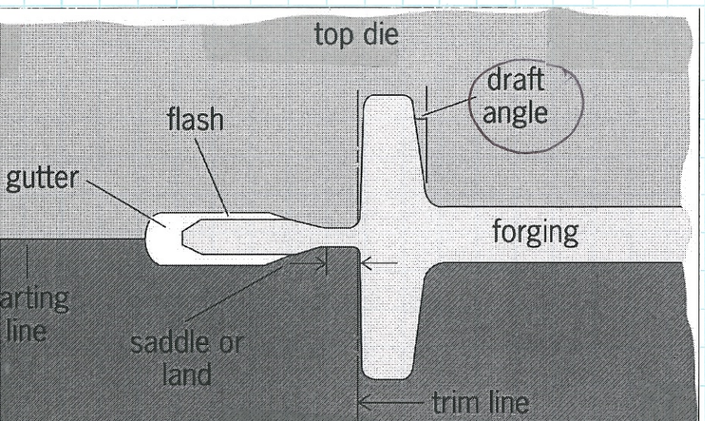
, Hot, red, kind of soft

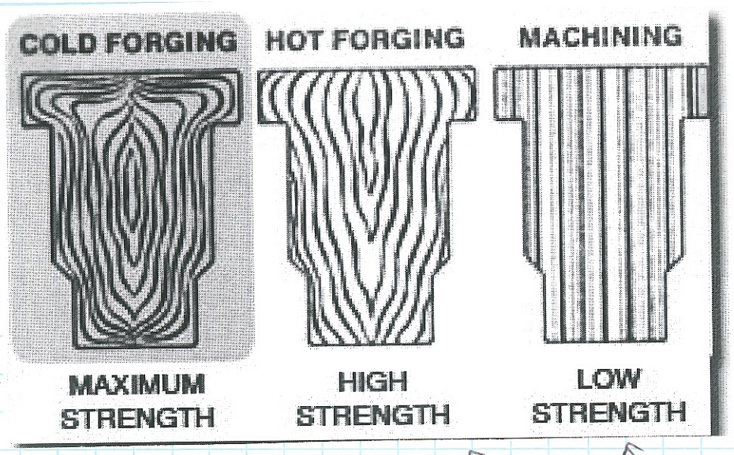
There is no limitation in the size of forging that can be made using open forging.

sed die is used for complex shape.



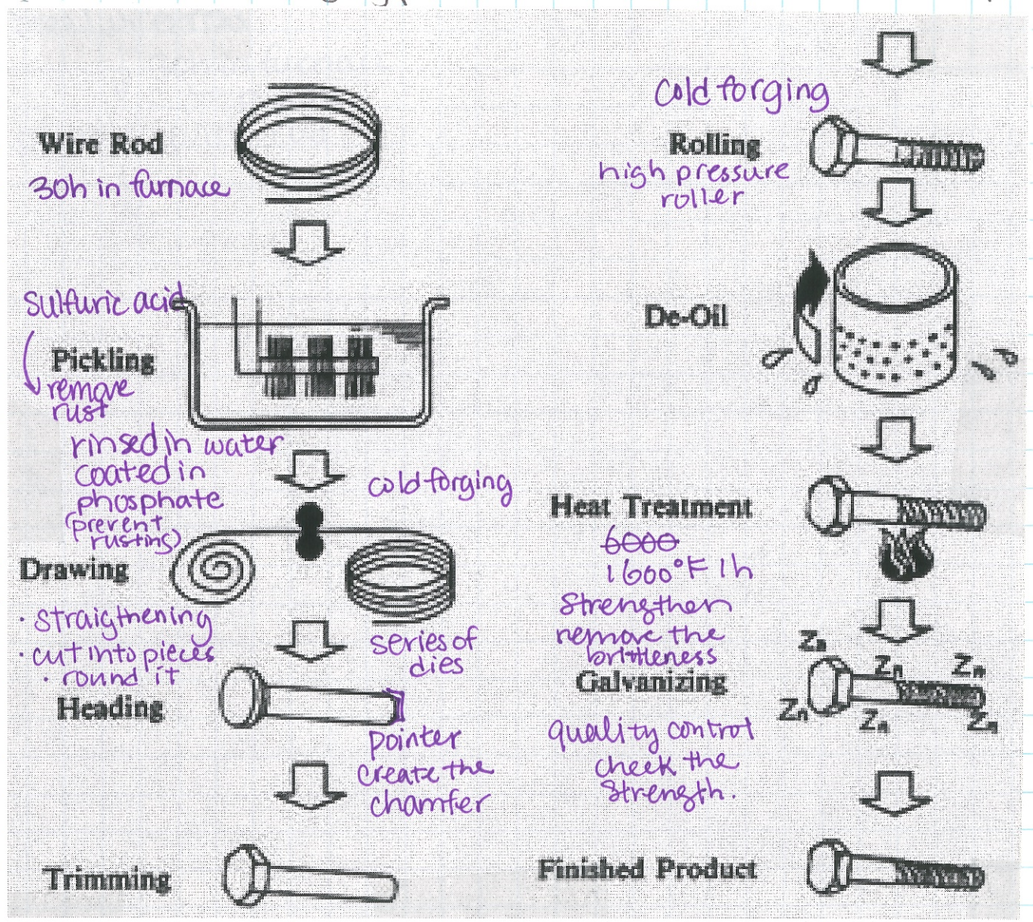
t angle is the angle between the slanted surface of the die and verticle line.





6. Grain flow in a forging part. Grain flow in a mechained part.

7.



taking samples to check the stand

Making the nuts: hot forging, cut wire to slugs, heat to 2200°F → malleable. Hydraulic

s these questions in your logbook. We'll discuss them during the next class.

ne text and video...

One stage of processing in PM is the "green state". Is the material in the green state strong or weak?

What is sintering?

Does the material change density during the sintering process?

Can screw threads be directly produced in powder metal parts without further manufacturing refinement?

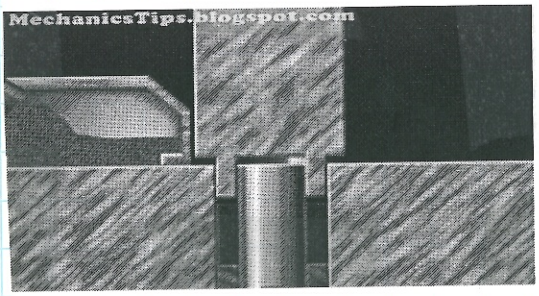
How might controlled porosity make plain bearings (bushings) better?

Common Method of consolidation:
1. mechanical pressing
2. injection molding
3. Isostatic pressing.

. In the green state, the powder particles are just lightly jointed together. The strength of he material is weak, only for handling purpose.

2. During sintering, parts are heated at a temperature below the melting point or range of the base metal, but not enough to metallegical bond the individual particles. Sintering further densify the parts, increasing strength.

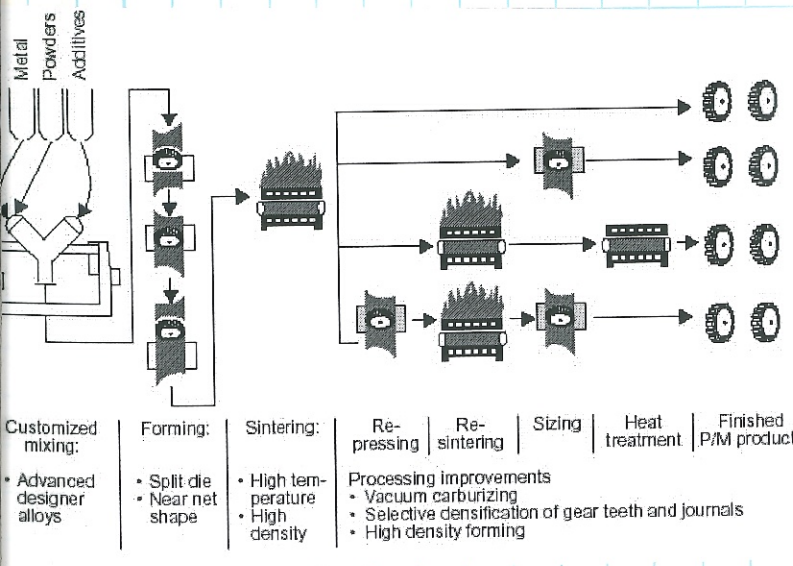
3. The material's density increases during sintering.

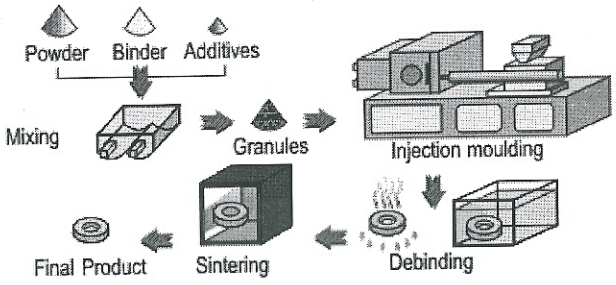


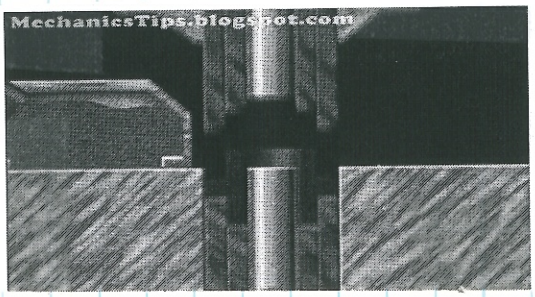
Class note 12/12/2013 Thursday.

1. Powdered metal: iron, Cu, Ci Bronze. restriction: small size, lots of ~~tooling~~ tooling and up-front cost. Lots of production. low process cost, low scrap rate. expensive tooling. long set-up time

2. P/M Activity.







12 12/12/13 In-Class Notes ME317

Look at Strategy on Course Page

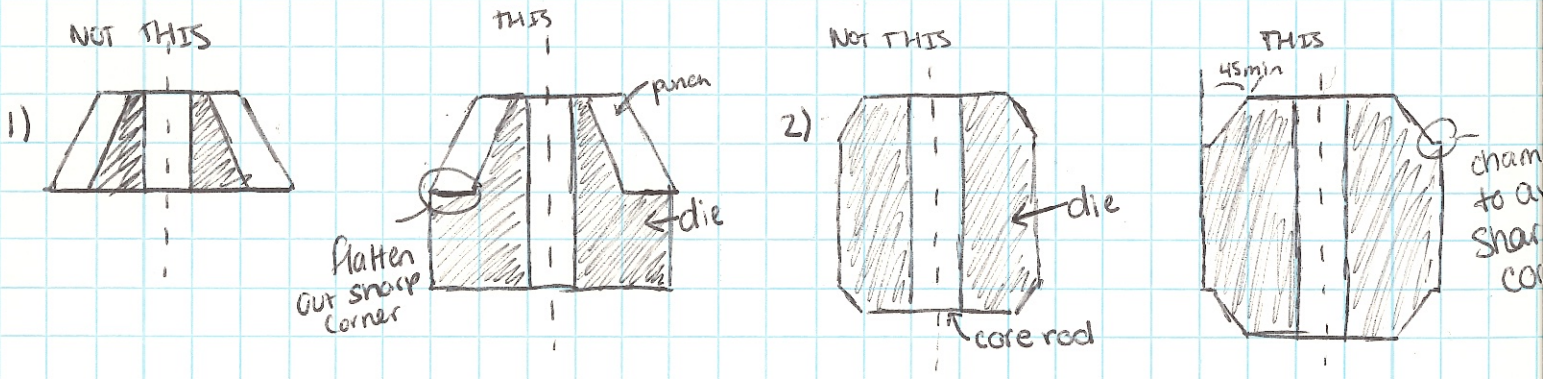
Powder Metal Parts
- pretty small parts
- used when making lots of parts
- high production rates / expensive tooling

Low cost production achieved from 100,000 parts/setup

* Feathered edge -

P/M Activity Instructions

1. Draw and label the punches and dies for the angular spur gears in Fig. 3.12.13 (do both the 'This' and 'Not this'). Highlight the problematic areas on the punch/die of the 'Not this' part.
2. Draw and label the punches and dies for the top component ('Not this' and 'This' versions) in Fig. 3.12.14. Highlight the problematic areas on the punch/die of the 'Not this' part.
3. Consider punch direction A (parallel to counter bored holes) in the Test Powder Metal Part drawing. Name the 3 most significant problems with producing this part with a powdered metal process.
4. Consider punch direction B (perpendicular to counter bored holes) in the Test Powder Metal Part drawing. Name the 3 most significant problems with producing this part with a powdered metal process.



MORE FOCUS ON CONCERNS
12 1/13/14

Great reflection!

- The greatest strength of my log book was the detailed videonotes and class notes. These helped tremendously in both preparing for and taking the exam. Instead of re watching all of the videos, I was able to read my notes to get a clear take away and summary. Additionally, the diagrams and printed guidelines helped in taking the test as well. They provided a good visual and insight into the processes that ~~a t~~ some problems on the exam talked about.

- I definitely need to space out my notes and include more diagrams. My writing was messy and the video summaries were in paragraph form, so it was hard to quickly find key information during the test because of the time pressure. This would also make this logbook more "user friendly", in that it would have ~~more~~ "considerable long-term value to others."
It would also be helpful to ~~add~~ title the PCP's not as PCP # but ~~does what~~ the topic that they are about.

I should do this too.

Austin, you have some great insights on improvements that you could make. You clearly put a lot of effort into your logbook, now we just need to refine your style.