

# Drying Revision 2020

## Revision prompts (Quiz)

These questions are to assist in revision for your exam and are intended for use in conjunction with the lecture notes and tutorial material available to you through your lectures and the 280.371 stream site

## Examination preparation (notes and comment)

### Course Material

280371 Drying All\_Course notes\_2020

**Lectures** Based on “Course notes” with additions and clarifications

**Tutorials** Worked examples with slides and charts from “Course notes”

**Recorded Zoom Lectures**

# Revision prompts (Quiz)

These questions are to assist in revision for your exam and are intended for use in conjunction with the lecture notes and tutorial material available to you through your lectures and the 280.371 stream site

1. Why is drying an important operation?
2. Give examples of the use of drying in 4 different industries.
3. Name 4 types of dryer.
4. Draw a schematic **drying curve** (moisture content versus time) for a material that exhibits constant rate drying, capillary controlled drying and diffusion controlled drying.

Label the axes and give the units

Identify the constant rate and falling rate regions.

Label the capillary and diffusion controlled parts of the curve.

5. Draw a schematic **drying rate curve** (drying rate versus moisture content) for a material that exhibits constant rate drying, capillary controlled drying and diffusion controlled drying; the material has a residual moisture content,  $X^*$ .

Label the axes and give the units

Identify the constant rate and falling rate regions.

Label the capillary and diffusion controlled parts of the curve

Identify the residual moisture content on the curve you have drawn.

6. Given the equations for drying time,  $t_D$ :

Can you correctly identify the equations for:

Constant rate drying

Capillary controlled drying

Diffusion controlled drying

7. What is a Gurney-Lurie Chart used for?

What shapes can be readily analysed using Gurney-Lurie charts?

Define Fourier number

On a Gurney-Lurie Chart, what do the symbols,  $x$ ,  $m$ ,  $n$ , stand for?

Can you recognise the equation relating mass diffusivity to temperature? What are the units of mass diffusivity.

What is the physical significance of Mass transfer Biot number

8. What is a psychrometric chart and what is it used for?

Can you:

Plot a point given the humidity and dry bulb temperature ( $H$ ,  $\theta_{DB}$ )

Draw the wet bulb line through the point

Draw the constant enthalpy line through the point

Read off the enthalpy of the air

Read off the wet bulb temperature

9. Can you draw a schematic of a dryer showing:

Wet solids in; dry solids out; air out; recycle air; make-up air in; air entering dryer.

10. Can you make a solids balance on a dryer?

11. Can you make a water balance on a whole dryer system?

12. Can you make a water balance on the recycle loop of a dryer with recycle?

13. Can you make an enthalpy balance on a dryer?

14. Can you calculate dryer efficiency?

## **Examinations** (these notes apply to most exams, not only drying)

### **Exam 2020**

See also general exam information in the PDF file on this Stream site, near the top, in the section EXAM INFORMATION at:

Exam 2020 280371\_Doing the Exam on line\_Updated 23 June

## Exams general

Read the instructions given to you, and follow them carefully.

Write in blue or black ink

Read all questions (read a question before you begin to answer it)

Look at units and make any necessary conversions

Show all calculations (working); explain what you are doing.

Draw visible lines on the charts you use; or if using a chart in WORD or POWER POINT, and using lines from the *Shapes* menu (found in *Insert* on the tool bar), make sure the lines are visible and do not move after you have set them; (you can make a pdf file of your completed chart).

# Show and explain your calculations.

**Course Material** (Course notes (slides), lecture slides, tutorials with worked examples)

Be familiar with your course materials.

Be familiar with the symbols used in your course, and their units.

It is advisable to do all your calculations in SI units; (for example, this means converting kilograms per hour to kilograms per second, before you do your calculations, not after. One reason for doing this is that it reduces opportunities to make mistakes).

Be careful when rearranging equations.

Be careful when you copy numbers from one line to another; and make sure that you use the numbers you are given in the statement of the problem.

Know how to use your Steam Tables.