Thermodynamique

Fluides en thermodynamique

Richard Mollier, 1863 - 1935

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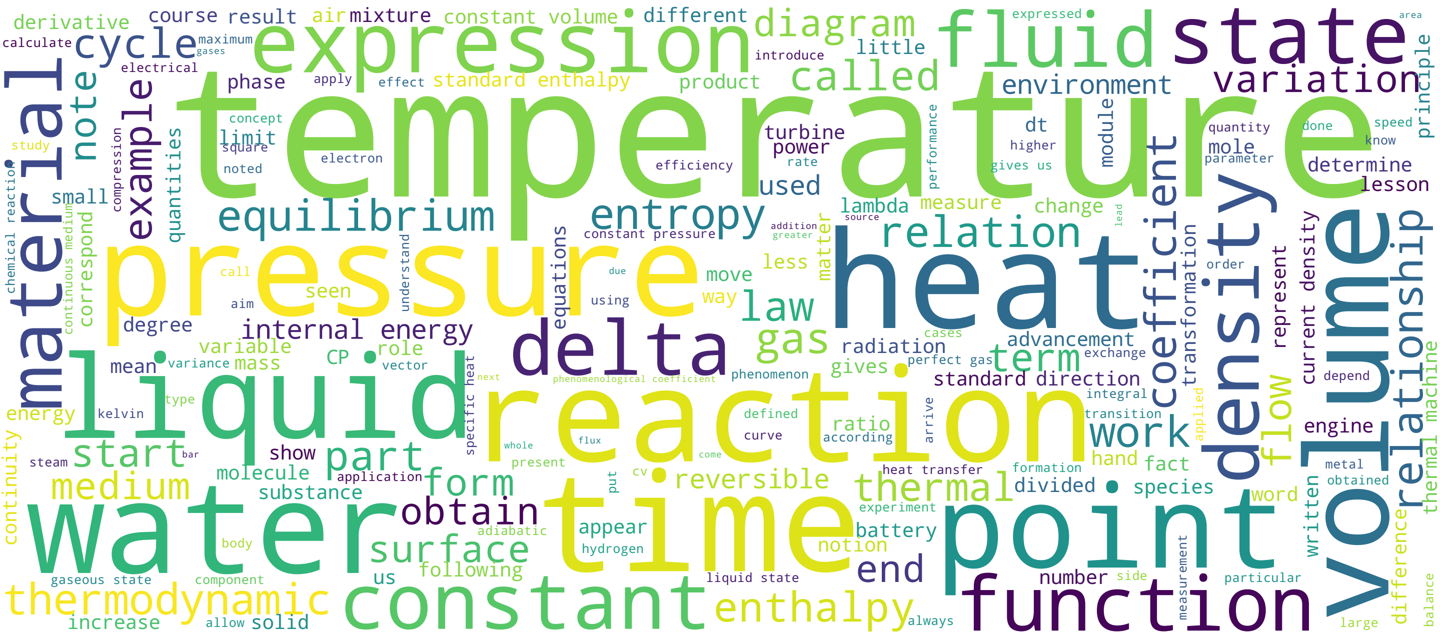


Video

EPFL

Hello to all. It is a great pleasure to contribute to the coordinated thermodynamics course by the Swiss Federal Institute of Technology in Lausanne and dedicated to fluids. It's the first time we've met. My name is André Tala, I am a teacher-researcher at the École National Polytechnic School of Yaoundé, Cameroon. Right away, let's move on to the presentation of the lesson as a whole as a summary. We will first make a reminder on the states of matter. To familiarize ourselves with the basic vocabulary. Then, in a word, we will see the role that a fluid can play in applied thermodynamics. We will then unroll the content of the lesson which will be the subject of our exchanges the next days.

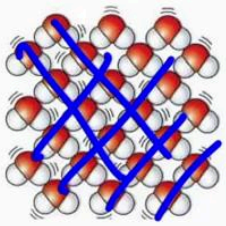
Notes

Summary

0m 04s

États de la matière

Matériau à faible température (arrangement régulier des molécules)



Solide

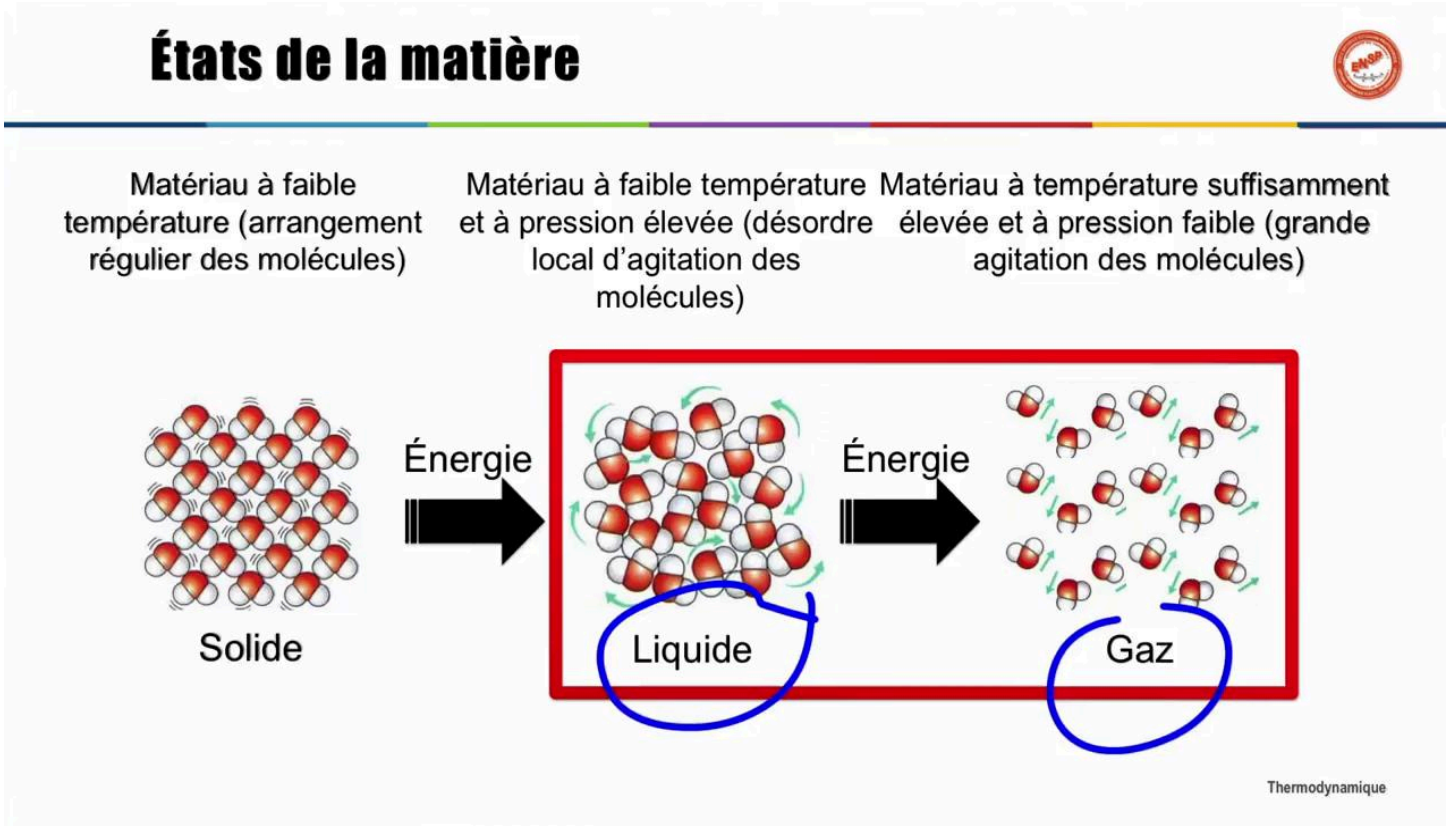
Thermodynamique

Let's start with a reminder about the states of matter. For any simple body, it is urgent to consider three states of matter. The first state is the solid state which corresponds to a material, to temperatures. On a molecular scale, we will have a regular arrangement of molecules or atoms.

Notes

Summary

0m 55s



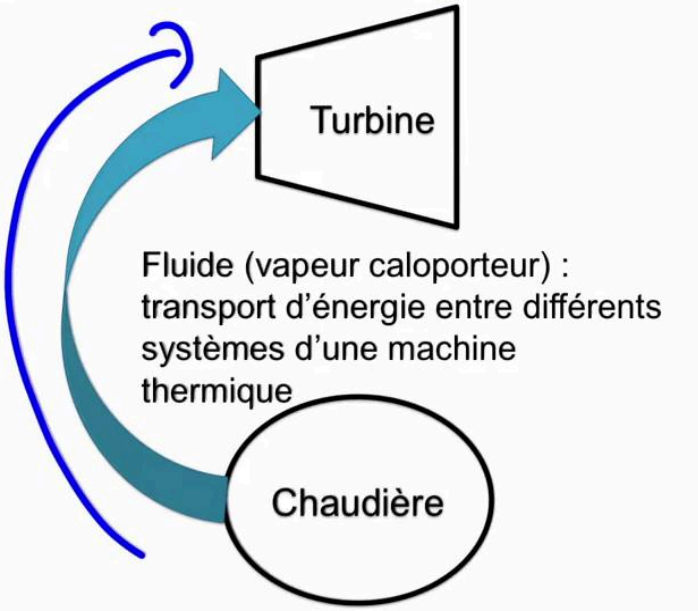
We then have the liquid state which corresponds to a material with low high temperature or at the molecular level. We will start to have a local disorder of agitation of the molecules or atoms. The third state, which is in the gaseous state, corresponds to a material at temperature high enough and appreciating low or molecular scale. There will be a great agitation of the molecules or atoms. Note that we can go from the from solid to liquid or from liquid to liquid. Gaseous, step by step heat energy to initial states of these three hygienic phases of matter. We will limit ourselves in the framework of this let us leave to the fluids, namely the liquid and the gas.

Notes

Summary

1m 21s

Rôle des fluides en thermodynamique



Exemple du moteur à vapeur

- Dans la chaudière, apport de chaleur à l'eau qui passe de l'état liquide à l'état vapeur
- Dans la turbine, détente de la vapeur et génération d'un travail mécanique

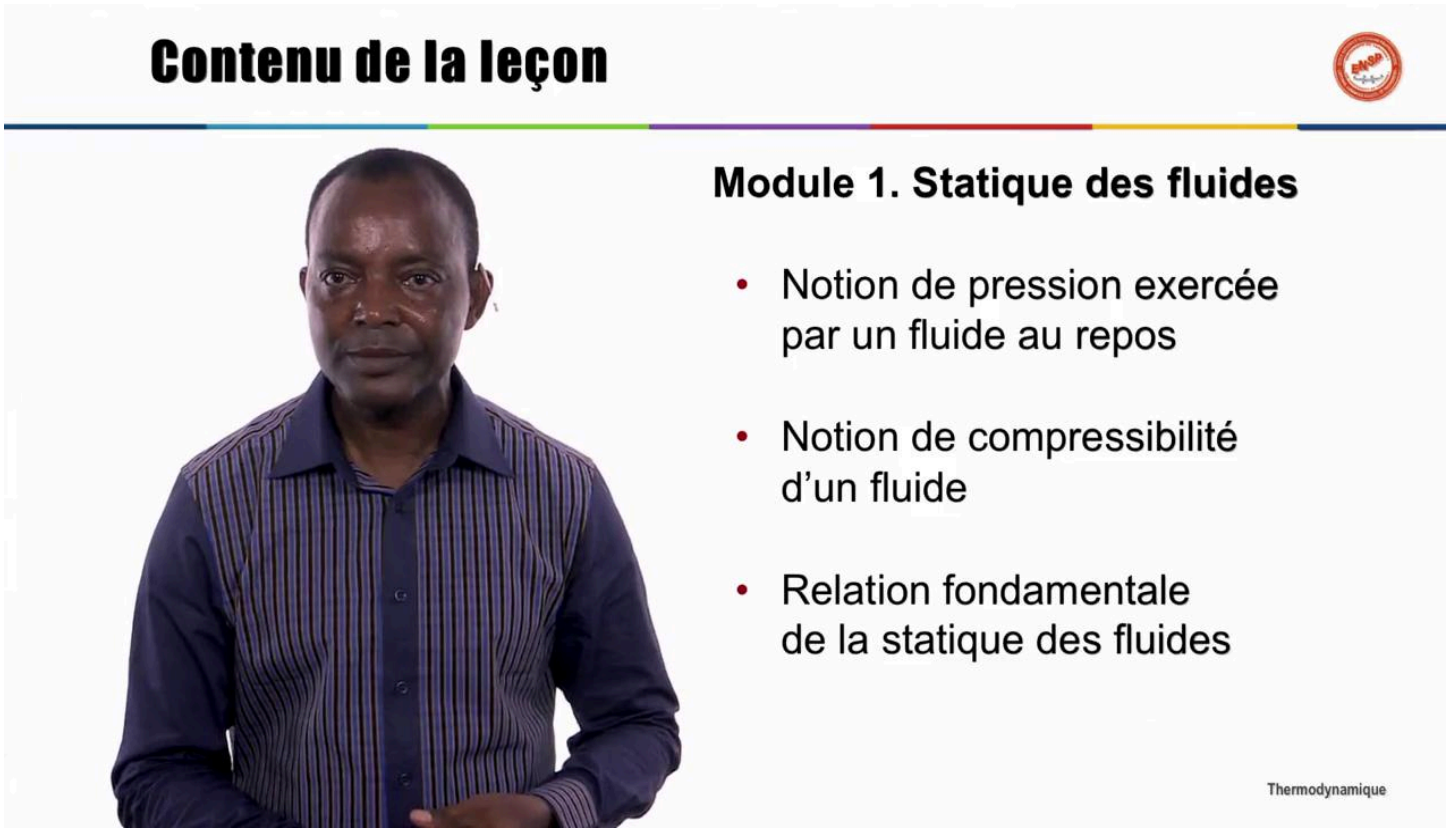
Thermodynamique

What role can the industry play in thermodynamics applied in a specific way? The Fed plays the role of energy transport between the different systems of a thermal machine to fix the idea. Consider a steam engine at the boiler level and to a heat step to the water which passes from the liquid state to the vapor state. The steam produced then expands in a turbine which generates a work mechanical provided outside, moving to the contents of the leaving to module one.

Notes

Summary

2m 20s



We will focus on fluid statics specifically. We will recall the notion of pressure exerted by a fluid at rest. Then we will say a word on the notion of compressibility of a fluid before to derive the fundamental relation of fluid statics to the modulus of.

Notes

Summary

2m 56s

Contenu de la leçon

Module 4. Diagrammes thermo-dynamiques h(s) et log p (h)

- Comprendre les principes physiques qui fondent les diagrammes utilisés pour le dimensionnement des machines thermiques

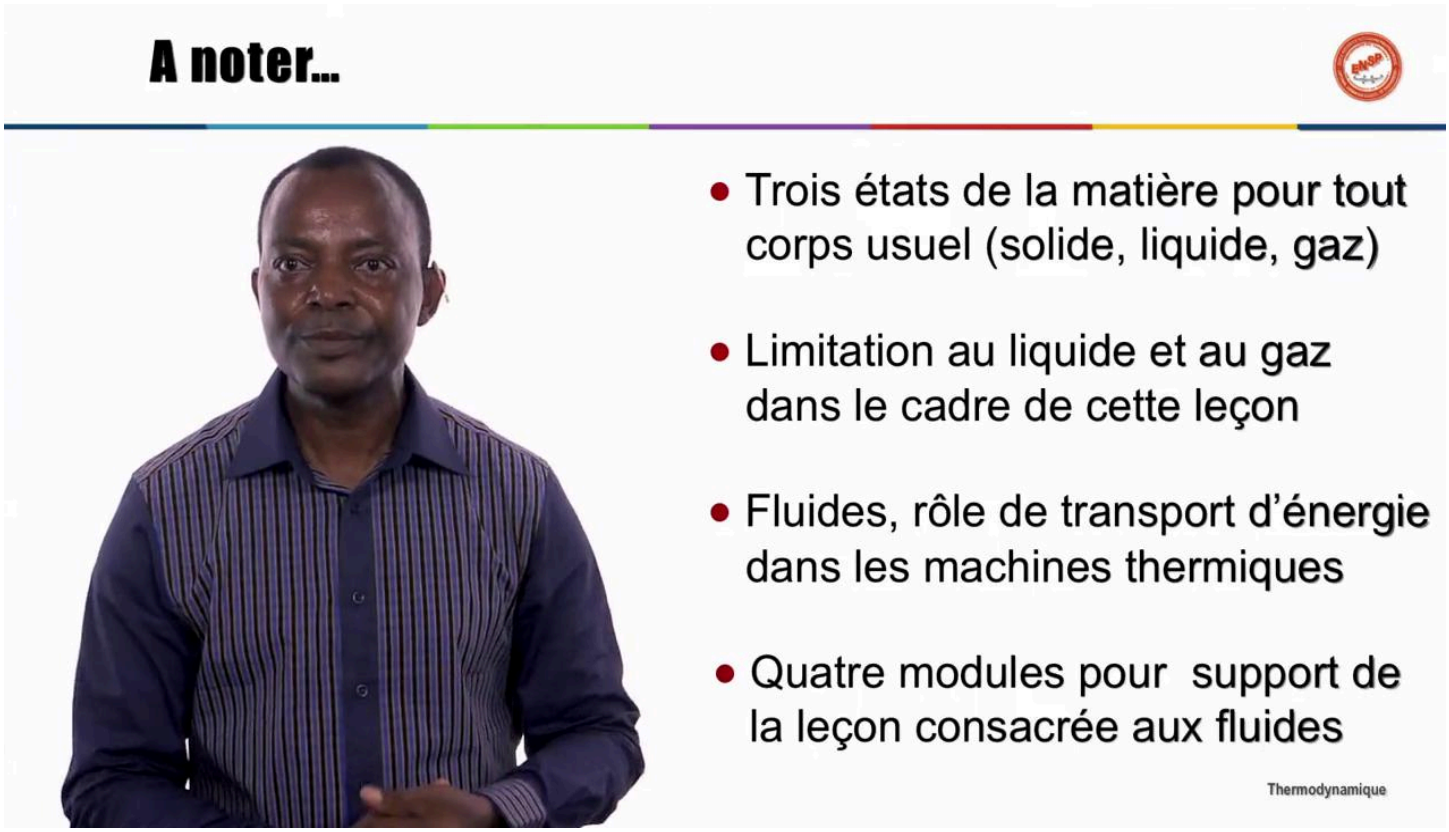
Thermodynamique

We will introduce the steam power plant. The aim is to briefly understand the principle of heat conversion into mechanical energy by means of a thermodynamic fluid. Module three will be devoted to the Clapeyron diagram of entropy diagram. The aim is to understand the physical principles behind these diagrams. Besides, very used in the bases of thermodynamics, the fourth and last module of this will be dedicated to Mollier diagrams and refrigeration diagrams. The aim is to understand the physical principles that underlie these diagrams and the time needed for the dimensioning of the thermal machines.

Notes

Summary

3m 16s



At the end of this introductory module, we will remember that every college has three states of matter, namely the solid state, the liquid state and the gaseous state. It is also that in the case of this license, a limit to liquids and gases. We will then note that the fluids play the role of energy transport in thermal machines. Finally, we presented the four modules that will constitute the support of this lesson dedicated to fluids. See you soon.

Notes

Summary

3m 57s