
Consider the graphical representation of the water heating process described in handout 2.1

**SATURATION TEMPERATURE AND PRESSURE**

Saturation temperature $T_{\text{sat}}$:

Saturation pressure $P_{\text{sat}}$:

Effect of pressure on $T_{\text{sat}}$:
**T–v Diagram**

The effects of pressure on the phase change of a pure substance can be represented graphically on a $T–v$ diagram.

![T–v Diagram](image)

$P = 0.1\, \text{MPa}$

**P–v Diagram**

The effects of temperature on the phase change of a pure substance can be represented graphically on a $P–v$ diagram.

![P–v Diagram](image)
**P–T Diagram**
The P–T diagram is used to show all three phases of a pure substance in the pressure-temperature domain.

![P–T Diagram](image)

**Characteristics:**

- Substance that contracts on freezing
- Substance that expands on freezing

**P–v–T Diagram**
The phase changes and their alterations by pressure and temperature can be represented as a surface in a P–T–v diagram.

![P–v–T Diagram](image)