CLAIMS

[Claim 1]

A gas exchange membrane made of a membrane not passing through dust particles but passing through gas molecules provided in at least a part of at least one of walls of a room provided inside with a life and/or activity space as a closed space in contact with the life and/or activity space,

the gas exchange membrane being used such that the surface of the membrane opposite to the life and/or activity space with respect to the membrane being in contact with the outside air,

the membrane having the area A set by scaling of {(V/A)/(D/L)} where V is the volume of the life and/or activity space, A is the area of the membrane, L is the thickness of the membrane and D is the diffusion constant of oxygen in the membrane,

the area A of the membrane being set so as to satisfy at least

$$A \geqq \frac{BL}{D(\eta_0 - \eta)} \qquad (16)$$

where B is the oxygen consumption rate inside the life and/or activity space, η_0 is the oxygen concentration in equilibrium state with the outside and η (η>0.18) is the target oxygen concentration inside the life and/or activity space.

[Claim 2]

A construction, comprising:

at least a room,

at least a part of at least one of walls of the room being made of a membrane not passing through dust particles but passing through gas molecules,

the room being provided inside with a life and/or activity space as a closed space,

the life and/or activity space being configured such that there is no movement of air as an air current between the inside and the outside of the life and/or activity space and outside air is introduced into the space opposite to the life and/or activity space with respect to the membrane from the outside space enclosing the room,

the room being configured such that a fan filter unit provided with a blow opening so as to supply gases inside the life and/or activity space is provided and all of gases flowing inside the life and/or activity space from the blow opening are finally fed back to an absorption opening of the fan filter unit,

the membrane having the area A set by scaling of {(V/A)/(D/L)} where V is the volume of the life and/or activity space, A is the area of the membrane, L is the thickness of the membrane and D is the diffusion constant of oxygen in the membrane,

the area A of the membrane being set so as to satisfy at least

$$A \geqq \frac{BL}{D(\frac{V_{O_2}}{V} - \eta)} \qquad (15)$$

where V is the volume of the life and/or activity space, B is the oxygen consumption rate inside the life and/or activity space, V_{O2} is the volume of oxygen in equilibrium state with the outside and without oxygen consumption inside the life and/or activity space and η ($\eta > 0.18$) is the target oxygen concentration inside the life and/or activity space.

[Claim 3]

A gas exchange device for exchanging gas constituent inside a closed space,

a membrane or membranes not passing through dust particles but passing through gas molecules being provided in a box provided with an outside air introduction opening, an inside air collection opening, an outside air after gas exchange exhaust opening and an inside air after gas exchange exhaust opening,

outside air introduced from the outside air introduction opening and gases inside the closed space collected from the inside air collection opening being subjected to exchange of gas constituent through the membrane,

the membrane having the area A set by scaling of {(V/A)/(D/L)} where V is the volume of the closed space, A is the area of the membrane, L is the thickness of the membrane and D is the diffusion constant of oxygen in the membrane,

the area A of the membrane being set so as to satisfy at least

$$A \geqq \frac{BL}{D(\frac{V_{O_2}}{V} - \eta)} \qquad (15)$$

where V is the volume of the closed space, B is the oxygen consumption rate inside the closed space, V_{O2} is the volume of oxygen in equilibrium state with the outside and without oxygen consumption inside the closed space and $\eta(\eta>0.18)$ is the target oxygen concentration inside the closed space.

[Claim 4]

A construction, comprising:

at least a room provided inside with a life and/or activity space as a closed space; and

at least a gas exchange device,

the gas exchange device being a gas exchange device,

a membrane or membranes not passing through dust particles but passing through gas molecules being provided

in a box provided with an outside air introduction opening, an inside air collection opening, an outside air after gas exchange exhaust opening and an inside air after gas exchange exhaust opening,

outside air introduced from the outside air introduction opening and gases inside the life and/or activity space collected from the inside air collection opening being subjected to exchange of gas constituent through the membrane,

the membrane having the area A set by scaling of {(V/A)/(D/L)} where V is the volume of the life and/or activity space, A is the area of the membrane, L is the thickness of the membrane and D is the diffusion constant of oxygen in the membrane,

the area A of the membrane being set so as to satisfy at least

$$A \geqq \frac{BL}{D(\frac{V_{O_2}}{V} - \eta)} \qquad (15)$$

where V is the volume of the life and/or activity space, B is the oxygen consumption rate inside the life and/or activity space, Vo_2 is the volume of oxygen in equilibrium state with the outside and without oxygen consumption inside the life and/or activity space and $\eta(\eta>0.18)$ is the target oxygen concentration inside the life and/or activity space.