



Status of Ductwork Airtightness in Japan and On-going Work at ISO on Ductwork Airtightness



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- I. Status of Ductwork Airtightness in Japan
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Status of Ductwork Airtightness in Japan Building Standard Law

- The Building Standard Law
 - is the **mandatory** and primary law concerning building codes
 - requires minimum standards concerning the site, construction, **equipment** and use of buildings

Reference: Introduction to the Building Standard Law, www.bcj.or.jp

- About airtightness related in ductworks
 - In an Order for Enforcement of the Standard, airtightness of **Fire dampers** is required

**No requirement on
airtightness of
ductworks**

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Status of Ductwork Airtightness in Japan Building Energy Efficiency Act

- Standards of the Act
 - Calculation of envelope performance and primary energy consumption amount targeting for newly built buildings is required
 - The calculation is executed in design term
 - It becomes full obligation in 2020

Reference: www.mlit.go.jp/common/001134876.pdf

- About airtightness related in ductworks

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Status of Ductwork Airtightness in Japan Official Program for Calculating Primary Energy (Building Energy Efficiency Act)

Program for calculating primary energy consumption in house Ver 2.3.1

Load Save Designed 84288 MJ/year Calc Output

Commons Envelope Heating Cooling Ventilation **HEX** DHW Solar Lighting PV Cogeneration

Type of Ventilation

Select type of ventilation

Balanced ventilation system with duct

Supply only or exhaust only ventilation system with duct

Wall-mounted balanced ventilation unit

Wall-mounted supply only or exhaust only ventilation unit

When ventilation system with duct is installed

Whether energy saving technique(s) is/are adopted or not, and its/these type(s)

Any energy saving technique is not adopted

Select the energy saving technique(s)

Evaluate energy saving effect by inputting the specific fan power

Specific fan power

0.30 W/(m³/h)

(the second decimal place)

Air change

Air change

0.5air change per hour

0.7air change per hour

0.0air change per hour

Reference: house.app.lowenergy.jp

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Status of Ductwork Airtightness in Japan Building Energy Efficiency Act

- Standards of the Act
 - Calculation of envelope performance and primary energy consumption amount targeting for newly built buildings is required
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- About airtightness related in ductworks

No requirement
even on
airtightness of
building

No requirement on
airtightness of
ductworks

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Status of Ductwork Airtightness in Japan Discussion : What makes the present situation

Design term

- **Building Standard Law & Building Energy Efficiency Act**
- by MLIT (Ministry of Land Infrastructure, Transport and Tourism)

Operation term

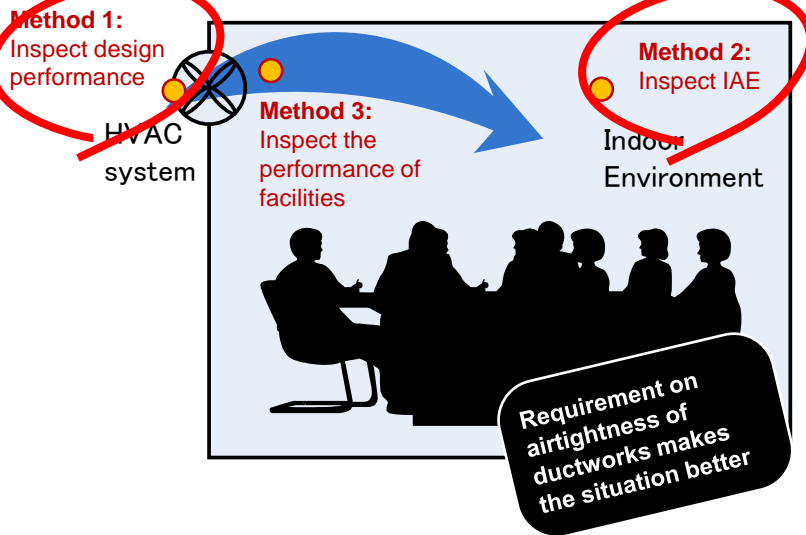
- **Act on Maintenance of Sanitation in Buildings**
- by MHLW (Ministry of Health Labour and Welfare)
 - Measurement of indoor air environment has to be executed every 2 months or more
 - Floor area of target building is greater or equal to 3,000m²



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Status of Ductwork Airtightness in Japan Discussion : Summary

- How to achieve energy conservation & good IEA



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On-going Works Works at ISO/TC163/SC1/WG10

1. Measurement of airtightness of building
 - 1) High-rise building > under discussion
 - 2) Large building > the proposal from USA

2. Air tightness of building elements and assemblies
 - 1) Ducts > under discussion
 - 2) Barrier assemblies > ISO14857-2014
 - 3) Partition, etc.

3. Evaluation of the measurement of airtightness
 - 1) Uncertainties > under discussion

4. Measurement of ventilation rate
 - 1) Multizone ventilation

TC163: Thermal performance and energy use in the built environment
SC1: Test and measurement methods
WG10: Air tightness of buildings

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On-going Works Ductwork Airtightness

Ductworks

- 1) Status
 - a) ASTM, CEN and northern European countries have related regulations with the brief description on measurement procedures

- 2) Importance
 - a) To indicate the leak position of the ventilation system
 - b) To improve the airtightness of the building

- 3) Tasks to be settled
 - a) Overviewing the status in terms of the codes and the regulations
 - b) Practical measuring system, procedures, etc. should be shown

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