Operations of Inspection Institute of Weights and Measures  
~ Verification and Inspection of Verification Standards

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Inspection Institute of Weights and Measures  
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Outline of the organization

Senior Director

Deputy Senior Director

Administration and Guidance Section

Verification Section

Inspection Section
For implementation of “Reliable measurement”

4 Primary measures for implementation

- Measures to supply accurate measuring instruments
- Measures to use the measuring instruments properly
- Measure to provide correct measurements
- Measure to disseminate correct understanding on measurement
Measures to supply accurate measuring instruments

- **Verification and inspection of verification standards**
  “Specified measuring instruments” in the Measurement Act is subject to inspection by local governments based on the applicable regulations.

- **JCSS***
  Supplies calibration service only for weights as an accredited calibration laboratory

*JCSS = Japan Calibration Service System*
Activities for other 3 measures

Periodic inspections

On-site spot inspections

Dissemination of information

Exhibition room
Operations of verification staffs

• Verification of fuel dispensers

• Verification of clinical thermometers and glass thermometers

• Verification of hydrometers

• Inspection of verification standards
Verification of fuel dispensers

- Check conformance to the approved type and the dispenser to be verified
- Verification of structure → Confirmation of marked items and performance, etc.
- Verification of instrument errors → At max. flowrate, min. flowrate → Tolerance ±0.5 %
- Consultation with manufacturers and report to the persons in charge at the site

Achievement in 2015: Approx. 1,200 sets
Verification of clinical thermometers

- Verification of structure
  → Mixed broken pieces, broken column of mercury, markings such as scales, etc.

- Verification of instrument errors
  → 36, 38, 40°C
  → Tolerance ± 0.1°C

- Proposal for improvement of quality control to the manufacturers.

Number of verifications in 2015:
Approx. 74,000 pieces

Mixed broken piece
Verification of instrument errors at 36°C

JIS T 4206
Verification of hydrometers

**Hydrometer**: Instrument to measure specific gravity of liquid from balance between buoyancy and gravity force

- **Verification of structure**
  - Flaws, marked items such as scales
- **Verification of instrument errors**
  - At max. scale, min. scale, intermediate
  - Tolerance depends on the scale interval

Number of verifications
In 2015:
Approx. 15,000 pieces

JIS B 7525-1
JIS B 7525-2
JIS B 7525-3
JIS B 7548
Operations of the group for weighing instruments and pressure gauges

Verification
- Aneroid type manometers
- Sphygmo-manometers
- Weighing instruments

Inspection
- Verification standard weights
Verification of pressure gauges

Pressure verification standards

For railroad vehicles

For high-pressure gases

After completion of checking the actual pressure gauges and drawings for type approval;

- **Verification of structure**
  → Confirmation of sealings and marked items
  → Leakage test, etc.

- **Verification of instrument errors**
  → Instrument errors at pressures of more than 4 points

- Pressure balance when a deadweight is set.
- Pressure indicated by the pressure gauge.

Comparison

Calculation of instrument error

Number of verifications of pressure gauges in 2015: Approx. 4,200 sets
This number is about one third of the total number covered by local government in Japan.

JIS B 7505-2
JIS E 4118
Verification of sphygmomanometers

Verification facility for sphygmomanometers

After completion of checking of drawings for type approval and actual meters;

• **Verification of structure**
  → Visual confirmation of marked items and indicating mechanism
  → Leakage test, etc.

• **Verification of instrument errors**
  → Instrument errors at the pressures more than 4 points

Number of verification in 2015:
Approx. 37,000 sets and rejections were approx. 2,600 sets

Examples of rejections
Verification of weighing instruments

After completion of checking of drawings for type approval and actual meters:

- **Verification of structure**
  - Confirmation of marked items, etc.
  - Specified performance
    (Tests of eccentricity, repeatability, etc.)

- **Verification of errors**
  - At min. measuring capacity ~ max. capacity (Max)

Number of verifications in 2015: Approx. 1,800 sets (± 60 larger weighing instruments included)
Inspection of verification standard weights

Number of inspection of verification standard weights in 2015: Approx. 1,700 pieces

Verification standard weights

Inspection based on the regulation for inspection of verification standards
- Confirmation of exterior appearance and marked items
- Inspection of instrument errors

Inspection of instrument errors:
Inspect with proper verification standard weights

Platform scale room: Inspection with a crane
- 50 kg or more
Closing remark

Tokyo Metropolitan Government will positively deal with the administrations in metrology in the future through inspection, verification and the 4 primary measures as the leader of local governments in Japan.

Thank you for your attention.