Introduction to
JARI’s Test and Research Facilities

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1. Introduction and conditions of using test and research facilities at JARI

2. Introduction to JARI’s main test and research facilities
   Exhaust gas and fuel efficiency tests/ noise tests/ hydrogen and fuel cell safety tests, fire tests/ collision tests/ impact and strength tests/ HMI tests/ new issues/ test courses

3. Cases for which industry utilizes JARI’s test facilities

4. Cases for which overseas organizations utilize JARI’s test facilities

5. Future direction of the utilizations of JARI’s test facilities
1. Introduction and conditions of using JARI’s test and research facilities

Projects as a third party organization

Municipal governments  Production industries  Academic organizations  JARI’s leading research

Test & research for automobile-related policies and standardization

Introduction of facilities  Acquire the know-how

After completion of a project

Projects of individual companies using JARI’s resources

Utilization of JARI’s test facilities and evaluation testing know-how

1) Contracted tests and research projects  2) Rental facilities  3) Technical guidance

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2. Introduction to JARI’s main test and research facilities

Chronology of the introduction of the main evaluation test equipment

1960s  A test course was built as a joint-use facility to help the Japanese industry catch up to Europe and North America.

1970s  Installation of a collision test site for conducting ESV research.
       Installation of a wind tunnel, tire test facility and large anechoic room for enhancing vehicle controllability.
       Installation of CYD, engine dynamos.

1980s  Installation of a HERP research facility for quickly investigating the effects of exhaust gases on human health.

1990s  Introduction of a driving simulator to study driver traits, and a large CYD for improving air environments.

2000s  New driving simulator for Human Machine Interface research.
       New collision test site and test course.

2010s  Introduction of HYSEF, and facilities for evaluating fuel cells.
       (HYSEF: Hydrogen and fuel cell vehicle Safety Evaluation Facility)

2020s  Planned purchase of equipment for evaluating robot safety.
       Introduction of other types of equipment/facilities will be considered.
Exhaust gas and fuel efficiency tests
Chassis dynamometer for light duty vehicles

For 4WD vehicles (for dynamo 200 km/h, vehicle speed wind 160 km/h)
Temperature environments from -10 to 35°C. (2WD, uses RL-SHED)

- Full tunnel system for diesel vehicles.
- Diluted-air refinery for gasoline vehicles.
- Possible to measure regulated components, and unregulated components such as number of particles.

Chassis dynamometer for 4WD light duty vehicles
Chassis dynamometer for heavy duty vehicles

Compatible with temperature environments from -30 to 40°C.

- Full tunnel system for diesel vehicles (with diluted-air refinery).
- Possible to measure regulated components, and unregulated components such as number of particles.
- Possible to take time series measurements of gas before and after catalytic conversion, etc., at multiple sampling points.

Appendix B specifications
Chassis dynamometer for motorcycles

Compatible up to 150 km/h (dynamo, vehicle speed wind)

- Possible to measure regulated components, and unregulated components such as number of particles
- Possible to evaluate particulates by full tunnel connection
Engine dynamometers

FREC (450 kW), FREC (370 kW), DCDY (370,150 kW): For transient driving
ECDY (370,300kW): For normal driving

• Full tunnel system for diesels (with diluted-air refinery)
• PM measurements in branch-dilution (micro) tunnel (before and after DPF)
• Possible to measure regulated components, and unregulated components such as number of particles
• Possible to take time series measurements of gas before and after catalytic conversion, etc., at multiple sampling points

Appendix C specifications

Engine dynamometer  Full-diluted tunnel  Diluted-air refinery
Equipment for testing vehicle vaporized gas

RL-SHED: Measures vaporized gas while vehicle is running.
DBL-SHED: Measures vaporized gas while vehicle is parked.

- Possible to measure regulated HCs, and unregulated components of hydrocarbons

RL-SHED test equipment (with CYD for light duty vehicles)

DBL-SHED test equipment
Basic diesel combustion test and research facilities

- Single-cylinder engines: 1 L engine displacement, common rail injectors, superchargers
- Visible single-cylinder engines: 1 L engine displacement, accumulator injectors
- Spray observation chamber: can be used for non-combustion and combustion
- Lasers (YAG, He-Ne), high-speed video
- Combustion simulation: KIVA III + CHEMKIN
Noise tests
Road surface based on ISO standards for noise

Types and features of tests

- Measurements taken with testing methods of various countries (2- and 4-wheeled vehicles)
- Organization for confirming performance of aftermarket mufflers
- Involved with developing methods to harmonize domestic and international test methods, numerous test results

STC (with confidence) at SHIROSATO

Simulated test fields at TSUKUBA

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Hydrogen and fuel cell safety tests, fire tests
Hy-SEF (Hydrogen and Fuel Cell Vehicle Safety Evaluation Facility)

High-pressure hydrogen test facility
Liquefied hydrogen test facility
Hydraulic test facility
Explosion resistant fire test facilities

Explosion resistant fire test facility
Fuel cell test facility
Environment-responsive exhaust gas treatment facility

New Energy and Industrial Technology Development Organization
(Extra-governmental organization of the Ministry of Economy, Trade and Industry)
Explosion resistant fire test facilities

Fire exposure tests for hydrogen tanks and fuel cells, vehicle fire tests
Safe 70 MPa filling pressure, 260 L capacity fuel tank structure that will not rupture (designed to withstand 50 kg TNT gunpowder)

Shape: 18 m inner diameter, 16 m high
Wall structure: Reinforced concrete (1.2 m thick)
Inner wall: sheet metal finish
Noise reduction: -80 dB
Hydraulic test facilities

Tests on compressed hydrogen tanks for cars, etc., pressure cycles of high-pressure tanks (durability evaluation), rupture (pressure resistance) tests, etc.
Environment cycle test using hydraulic test facilities

Pressurizer
Maximum pressure used: 120 MPa
Tank size: 20 - 260 L

Large thermostatic chamber
(-40°C to 150°C, 60% to 98%RH)
Gas test pit

Hydrogen filling and release tests, gas permeability tests, etc.

Gas test pits: 2 units
(3 m × 6 m × 3 m)

Gas permeability test chamber

Tank size: up to 260 L
Temperature control range: from -40 to 85°C

Explosion resistant chamber

Tank size: up to 130 L
Temperature control range: from -40 to 50°C
Collision tests
Collision test site

**Maximum traction speed:** 150 km/h (up to 2.8 ton test vehicle weight)  
80 km/h (up to 25 ton test vehicle weight)  

**Test scenarios:** front-end collision, side collision, collision with pedestrian, collision with motorcycle, collision with road structure, collision with other car

- **Front-end collision area**
- **Dummy calibration room**
- **Car to Car collision area**
- **Side collision area**
- **Fixed barriers for large vehicles**
- **Multi-purpose tests area**

Track width: 12 m
Examples of collision tests

- Car-to-car (head-on collision)
- Moving barrier-to-car (side collision)
- Car-to-pedestrian
- Car-to-motorcycle
- Front-end collision (no belts in rear seats)
- Car-to-bicycle
- Offset front-end collision
Impact and strength tests
HYGE sled test equipment

Specifications

(1) Cylinders  Inner: ca. 300 mm (12 inch); Length: 7,314 mm
(2) Sleds  Width: 1,219 mm; Length: 3,657 mm; Mass: 996 kgf
(3) Rails  Length: 36 m
(4) Lighting equipment  Lamps: 28 × 2kw metal halide lamps (both sides)
Illuminated area: 1.7 m × 7.0 m (11.9m²);
Average illuminance: 54,000 lx

HYGE sled test equipment
**Injection system collision test equipment**

- Head impactor tests
- Leg impactor tests

Free flight and guidance systems

**Main specifications**

- Acceleration system: Pneumatic acceleration cylinders
- Impactor mass: 2.5 - 20 kg
- Collision speed: 10 - 50 km/h

Example: Pedestrian protection evaluation test (head)
Drop weight test equipment

Energy absorbed by specimen materials is measured when a weight (spindle) is freely dropped on them.

Specifically, this involves axial compression features of the front side member, bending properties of side sills, shearing of bolts, etc. Basic properties of each member can be obtained by these tests.

Main specifications
• Effective dropping height: 7 m  
  (Max 60 km/h using acceleration equipment)
• Maximum load: 100 tons
• Weight mass: 50 - 2000 kg  
  (4000 kg under some conditions)
Compression test equipment on a plate (CTP)

- Quasi-static evaluation of the compression properties of large parts (bumpers, white body, etc.)
- Can also be used for strength tests for anchor bolts, etc.

Main specifications
- Compression load: Max 50 tons (load cell: 10 tons × 4)
- Movable amount: 0 - 999 mm
- Load acceleration: 5 - 500 mm/min

Plate area: 800 × 1900 mm
Plate height: 110 - 700 mm
HMI tests and research
Driving simulator (DS)

All-direction field of view

Dangerous scenarios are tested safely in the DS.
Simulated test fields

Accidents between vehicles turning right and those traveling straight

Pedestrian rushing accidents

Rear-end collisions

Crossing collisions

Lap section: ca. 1.8 km
Total length: ca. 4.5 km

Accidents with pedestrian during right turns

Reproduces 70% of accident situations in Japan
Actual car tests can be conducted for various hypothetical traffic situations
New projects
Test car with a monitor screen (for reproducing dangerous scenarios)

- Three **LCDs** and three **video cameras** are mounted on the hood.
- The scenes in front of vehicles are given composite displays of virtual objects (CG vehicles/pedestrians)
- Running tests with real cars can enable reproduction of highly realistic dangerous scenarios.
Composite examples of virtual objects (pedestrians, other vehicles, walls) made with CG

Pedestrian, other vehicles, walls are CG (computer graphics)
Pre-crash sled test equipment

60% of drivers who cause accidents take evasive actions (maneuvers).
⇒ Pre-crash sled test equipment is developed that can reproduce braking action just before a collision.

- Brakes: Deceleration can be freely set to a maximum of 1G
- Collisions: With a target deceleration corridor of ECE-16 or 44, collisions can be made at up to 55 km/h.
Appearance of pre-crash sled test equipment

- Base stage: 1800 × 3500 mm
- Weight of vehicle: 2 tons (total weight: 2.5 tons)

- Using guide rollers beneath the vehicle, the forward movement stability and pitching of the vehicle after separation can be controlled.
- Braking deceleration and timing are controlled using dual-system braking equipment (rail brakes, tire brakes).

Reproduces impact deceleration by having the vehicle collide with impact mitigating devices (pipes).
Safety evaluation of life-supporting robots

Creating and proposing methods for testing life-supporting robots
Establishing testing and certification organizations

In the future
- Projects for evaluating robot safety
- Use of various devices for various evaluation tests

Anechoic chamber
Vibration testing device

Advanced Industrial Science Technology Research Institute
(Extra-governmental organization of the Ministry of Economy, Trade and Industry)
SHIROSATO Test Center

- **Circling test site**
  - Turning radius 80 m
- **Low friction (μ) road**
  - Total length 1,410 m
- **High-speed loop road**
  - Total length 5,500 m
- **All-purpose test road**
  - Total length 1,500 m
- **Multi-application test/NV test/Driving noise test road**
  - Total length 1,500 m
- **Bad road test site**
  - Gravel road, one lap 620 m
- **Service road**
  - Total length 5,694 m
- **Control building area**

Total area: 302ha

Appendix D specifications

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3. Cases for which industry utilizes JARI’s test facilities

**Automobile manufactures**

- Only JARI has the facility
- Company’s facilities are insufficient
- As a 3rd party organization (certification test data)
- FS before the formulation of regulations

(Examples)

- Hysef, etc.
- Collision test site
- ANCAP
- Use of World SID dummies

**Parts and electrical equipment makers**

- Without investing in equipment
- No experience in conducting tests

(CYD and sled tests
- Fuel cell safety tests

**Venture companies and parallel importers**

- To register a small-number of vehicles (model certification)

(Braking and noise tests
- Belt anchor tests

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4. Cases for which overseas organizations utilize JARI’s test facilities

Consulting

- Support and training for construction of collision test sites
- Visiting test courses (many visitors)

Provision of information

- EV data provision
- FC data provision

Contracted projects

- Muffler tests
- Effects of engine oil on exhaust gas
- Benchmark exhaust gas tests
- ANCAP collision experiments
- Leg collision tests

Overseas manufactures and research organizations, especially Asian research institutes, can benefit from the advanced knowledge and extensive experience of JARI
5. Future direction for the utilization of JARI’s test and research facilities

Projects as a third party organization

Test & research for automobile-related policies and standardization

- Introduction of facilities
- Acquire the know-how

After completion of a project

Projects of individual companies

Utilization of JARI’s test facilities and evaluation testing know-how

1) Contracted test and research projects
2) Rental facilities
3) Technical guidance
4) Certification-related projects
5) Joint research projects

For future activities

the same activities as before

expand
create

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Thank you for your attention.

If you have any comments and questions, please feel free to contact me: Tamotsu NAKATANI.
Mail to: ntamotsu@jari.or.jp
Tel: +81-29-856-1112
## Appendix A

### Specification of chassis dynamometer for light duty vehicles, etc.

<table>
<thead>
<tr>
<th>Chassis Dynamometer</th>
<th>Type A</th>
<th>Type B</th>
<th>Type C</th>
<th>Type D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Light-duty vehicle - Passenger car (@MEIDEN)</td>
<td>2WD_CHDY (Normal temperature type)</td>
<td>2WD_CHDY (Normal temperature type)</td>
<td>Motor cycle -37kW-DCDY (Normal temperature type)</td>
</tr>
<tr>
<td></td>
<td>2WD_CHDY-VT_SHED (Environmental type)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Light-duty vehicle - Passenger car (@MEIDEN)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2WD_CHDY-VT_SHED (Environmental type)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air-conditioner</td>
<td>Temperature 25°C±5°C</td>
<td>Temperature 25°C±5°C</td>
<td>Temperature -10°C~40°C</td>
<td>Temperature 25°C±5°C</td>
</tr>
<tr>
<td>Driving Wheels</td>
<td>4WD</td>
<td>2WD</td>
<td>2WD</td>
<td>-</td>
</tr>
<tr>
<td>Total vehicle weight</td>
<td>800~3500kg</td>
<td>454~5443kg</td>
<td>500~3000kg</td>
<td>100~550kg</td>
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<tr>
<td>wheelbase</td>
<td>2100-4100mm</td>
<td>2032-3302mm</td>
<td>2032-3302mm</td>
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<tr>
<td>tread</td>
<td>770-2370mm</td>
<td>800-2170mm</td>
<td>900-2160mm</td>
<td>-</td>
</tr>
<tr>
<td>Absorption Power</td>
<td>220kW -FCDY</td>
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<td>--</td>
<td>95kW -DCDY</td>
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<tr>
<td>Motoring Power</td>
<td>200kW -FCDY</td>
<td>--</td>
<td>--</td>
<td>70kW -DCDY</td>
</tr>
<tr>
<td>Max vehicle speed</td>
<td>200km/h</td>
<td>200km/h</td>
<td>160km/h</td>
<td>150km/h</td>
</tr>
<tr>
<td>Rollers</td>
<td>φ1219.2,smooth iron-made</td>
<td>--</td>
<td>--</td>
<td>φ530.5,smooth iron-made</td>
</tr>
<tr>
<td>Max cooling fan speed</td>
<td>160km/h</td>
<td>120km/h</td>
<td>120km/h</td>
<td>150km/h</td>
</tr>
<tr>
<td>CVS System</td>
<td>CVS-7400T (@HORIBA)</td>
<td>CVS-9400S (@HORIBA)</td>
<td>CVS-7200S (@HORIBA)</td>
<td>CVS-9400S (@HORIBA)</td>
</tr>
<tr>
<td>CVS volume rate</td>
<td>5 , 10 , 15 , 20 , 25 , 30 m³/min</td>
<td>4.5 , 9 , 12 m³/min</td>
<td>4.5 , 9 , 12 , 15 , 18 m³/min</td>
<td>3 , 4.5 , 6 , 9 m³/min</td>
</tr>
<tr>
<td>Model</td>
<td>CVS-7400T (@HORIBA)</td>
<td>CVS-9400S (@HORIBA)</td>
<td>CVS-7200S (@HORIBA)</td>
<td>CVS-9400S (@HORIBA)</td>
</tr>
<tr>
<td>Analyzer type</td>
<td>MEXA-7100D (for direct) MEXA-72000D (for dilute, bag) (@HORIBA)</td>
<td>MEXA-9100D (for STD dilute, bag) MEXA-9200D (for LEV dilute, bag) (@HORIBA)</td>
<td>MEXA-7200LE (for dilute, bag) (@HORIBA)</td>
<td>MEXA-9400D (for direct, dilute, bag) (@HORIBA)</td>
</tr>
</tbody>
</table>

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# Appendix B

Specification of chassis dynamometer for heavy duty vehicles

<table>
<thead>
<tr>
<th>Chassis Dynamometer</th>
<th>Type A</th>
<th>Type B</th>
<th>Type C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory</td>
<td>Environmental type</td>
<td>Normal temperature type</td>
<td>Normal temperature type</td>
</tr>
<tr>
<td>Temperature -30°C~40°C</td>
<td>Temperature 25°C±5°C</td>
<td>Temperature 25°C±5°C</td>
<td></td>
</tr>
<tr>
<td>Air-conditioner</td>
<td>Motoring Power</td>
<td>Absorption Power</td>
<td>Rollers</td>
</tr>
<tr>
<td>Temperature 25°C±5°C(4°C&lt;) relative humidity 55%±2%</td>
<td>Temperature 25°C±5°C relative humidity 55%±2%</td>
<td>Temperature 25°C±5°C(4°C&lt;) relative humidity 55%±2%</td>
<td>Mechanical + electrical inertia compensation</td>
</tr>
<tr>
<td>Driving Wheels</td>
<td>Rear axle 1 or Rear axle 2 of truck or bus</td>
<td>Rear axle 1 or Rear axle 2 of truck or bus</td>
<td>Rear axle 1 or Rear axle 2 of truck or bus</td>
</tr>
<tr>
<td>Total vehicle weight</td>
<td>3500~25000kg</td>
<td>2000~25000kg</td>
<td>2000~25000kg</td>
</tr>
<tr>
<td>Rear axle 1 or Rear axle 2 of truck or bus</td>
<td>2000~25000kg</td>
<td>2000~25000kg</td>
<td>2000~25000kg</td>
</tr>
<tr>
<td>Absorption, Motor Power</td>
<td>370kW -FCDY</td>
<td>300kW -FCDY</td>
<td>300kW -DCDY</td>
</tr>
<tr>
<td>Max vehicle speed</td>
<td>150km/h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flywheel System</td>
<td>Rear axle 1 or Rear axle 2 of truck or bus</td>
<td>Rear axle 1 or Rear axle 2 of truck or bus</td>
<td>Rear axle 1 or Rear axle 2 of truck or bus</td>
</tr>
<tr>
<td>Primary tunnel</td>
<td>Diameter</td>
<td>457.2mm</td>
<td>605.6mm</td>
</tr>
<tr>
<td></td>
<td>Length</td>
<td>4622mm</td>
<td>6191.5mm</td>
</tr>
<tr>
<td>Secondary tunnel</td>
<td>Diameter</td>
<td>≥76.2mm</td>
<td>83.1mm</td>
</tr>
<tr>
<td></td>
<td>Length</td>
<td>≥1000mm</td>
<td>1076.5mm</td>
</tr>
<tr>
<td>CVS volume rate</td>
<td>30,40,50,60,70,80,90 m³/min</td>
<td></td>
<td>150,120,90,50 m³/min</td>
</tr>
<tr>
<td>Sample gas flow rate for PM</td>
<td>50~200L/min</td>
<td></td>
<td>75~150L/min</td>
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<tr>
<td>Clean air Sampling system</td>
<td>Flow rate</td>
<td>100 m³/min</td>
<td>180 m³/min</td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
<td>25±5°C</td>
<td>25±2°C</td>
</tr>
<tr>
<td></td>
<td>Humidity</td>
<td>50±8%RH</td>
<td>50±8%RH</td>
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<tr>
<td>Model</td>
<td>CVS-7400T DLS-7200 DLT-1890W (@HORIBA)</td>
<td></td>
<td>CVS-9400T DLS-150 DLT-24150W (@HORIBA)</td>
</tr>
<tr>
<td>Emissions Analyzers</td>
<td>Analyzer type</td>
<td>NOx: Chemiluminescence detector CO, CO2: Non-dispersive infrared detector THC: Heated flame ionization detector CH4: NonMethane Cutter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model</td>
<td>MEXA-7100D (for direct) MEXA-7100DEGR(for direct) MEXA-7200F(for dilute,bag) (@HORIBA)</td>
<td></td>
</tr>
</tbody>
</table>

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## Appendix C Specifications of engine test bench

<table>
<thead>
<tr>
<th>Engine Dynamometer</th>
<th>Test bench A (HERP building)</th>
<th>Test bench B (4No. building)</th>
<th>Test bench C (Diesel Center Building)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter Length</td>
<td>DC Dynamometer (@MEIDEN)</td>
<td>AC Dynamometer (@MEIDEN)</td>
<td>AC Dynamometer (@MEIDEN)</td>
</tr>
<tr>
<td>Absorption Power</td>
<td>370kW</td>
<td>370kW</td>
<td>450kW</td>
</tr>
<tr>
<td>Motoring Power</td>
<td>300kW</td>
<td>300kW</td>
<td>400kW</td>
</tr>
<tr>
<td>Torque</td>
<td>1961Nm</td>
<td>2000Nm</td>
<td>2100Nm</td>
</tr>
<tr>
<td>Max. speed</td>
<td>4000min^-1</td>
<td>5000min^-1</td>
<td>6000min^-1</td>
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<tr>
<td>Center height</td>
<td>750mm</td>
<td>750mm</td>
<td>750mm</td>
</tr>
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<table>
<thead>
<tr>
<th>Dilution Sampling System</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary tunnel Diameter</td>
<td>605.6mm</td>
<td>609.6mm</td>
<td>457.2mm</td>
</tr>
<tr>
<td>Length</td>
<td>6191.5mm</td>
<td>6521.5mm</td>
<td>4622mm</td>
</tr>
<tr>
<td>Secondary tunnel Diameter</td>
<td>83.1mm</td>
<td>83mm</td>
<td>83mm</td>
</tr>
<tr>
<td>Length</td>
<td>1076.5mm</td>
<td>1076.5mm</td>
<td>1076.5mm</td>
</tr>
<tr>
<td>CVS volume rate</td>
<td>20,40,60 m³/min</td>
<td>50,90,120,150 m³/min</td>
<td>10,20,30,40,50,60,70,80,90 m³/min with dilution air refinery (DAR)</td>
</tr>
<tr>
<td>Sample gas flow rate for PM</td>
<td>50~200L/min</td>
<td>75~150L/min</td>
<td>50~200L/min</td>
</tr>
<tr>
<td>Secondary dilution air flow rate</td>
<td>15~75L/min</td>
<td>75~150L/min</td>
<td>50~200L/min</td>
</tr>
<tr>
<td>Model</td>
<td>CVS-9300T DLS-200 DLT-2470W (@HORIBA)</td>
<td>CVS-9400T DLS-150 DLT-24150W (@HORIBA)</td>
<td>CVS-7400T DLS-7200 DLT-18900W DAR-5000 (@HORIBA)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emissions Analyzers</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>MEXA-9100DEGR(for direct) MEXA-9200F(for dilute,bag) (@HORIBA)</td>
<td>MEXA-9100DEGR(for direct) MEXA-7200D(for dilute,bag) (@HORIBA)</td>
<td>MEXA-7100DEGR(for direct) MEXA-7100D(for direct) MEXA-7200D(for dilute,bag) (@HORIBA)</td>
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</tbody>
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<thead>
<tr>
<th>Application of test cycles</th>
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<tr>
<td>Steady state test cycle : WHSC,ESC,NRSC,etc.</td>
<td>Transient test cycle : WHTC,ETC,NRTC,FTP,etc.</td>
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1st AAI Summit, 26-27 Nov. 2012, Tokyo
Appendix D  Features of the test course

- Ideal for large-scale tests
  (high-speed driving, wide turning area, long straight roads)

- High-quality standard road surfaces (flat, μ-values, ISO road, etc.)

- Road surface specs and course design with high degree of freedom and convenience
  (Simple, flat, and diversified road surfaces, equipment loan, having common area)

- Locational conditions with high confidentiality, partitioned independent test courses

- Locations, natural scenery, serenity suited for filming, etc.

- Fully-equipped test and repair facilities (weather, repair shop, apparatuses)

- Facilities that can be used for events
  (large meeting rooms, overnight lodging, cafeteria, plaza)

  ⇒ Consultations can be made for nighttime/long-term use
  ⇒ Course can be visited beforehand