



~Advanced Test System and Test Bench Engineering Professional~

Tokyo Plant Co., Ltd.



Solution Hydrogen engine test

Update 2026.08.14

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» Demand for Hydrogen-Engine Test Benches

In recent years, as the global shift toward carbon neutrality accelerates, automotive and engine manufacturers around the world have been transitioning from conventional internal-combustion engines to electrified powertrains, as well as engines powered by hydrogen, synthetic fuels, and blended fuels.

Amid these rapid changes in the external environment, the demand for hydrogen and hydrogen-blended-fuel engine testing has been increasing, and we are receiving inquiries from many customers both in Japan and overseas.

To meet these growing needs, we continue to advance various initiatives on a daily basis. Leveraging our accumulated expertise, we are able to propose test benches optimized for hydrogen-engine testing.

» Supported Applications

- ✓Automotive Engines
- ✓Motorcycle Engines
- ✓Marine Engines
- ✓Construction-Equipment Engines
- ✓Agricultural Engines
- ✓Generator Engines
- ✓Other Industrial Engines

» Track Record

- ✓Automotive Manufacturers
- ✓Engine Manufacturers
- ✓Universities
(participating in Ministry of the Environment projects)



» Hydrogen Engine Test Bench



» Scope of the project

- ✓Automation system MORPHEE
- ✓Hydraulic dynamometer
- ✓Combustion analysis system
- ✓Fuel flow meter
- ✓Gas analyzer
- ✓Dumper, shaft
- ✓Cooling tower
- ✓Oil-Water Separator tank
- ✓Silencer system
- ✓Intake and Exhaust System
- etc

» Project structure

Design
company

Construction
Company

Hydrogen gas
Supply company

Tokyo Plant
(Test system)

Auxiliary equipment
company

We will participate in your project from the planning phase onward.

We provide seamless support throughout every stage — from creating requirement specifications and design documents, to product design, manufacturing, commissioning, and delivery. Rest assured, we also provide prompt and reliable after-sales service following delivery.

Planning



Please let us know your requirements, specifications, and requests. We can provide a variety of proposals based on your budget and testing needs.

We will also align with the customer's project goals to ensure successful achievement. A non-disclosure agreement will be concluded if necessary.

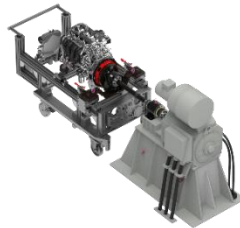
Contract



After the product manufacturing specifications, service requirements, definitions, and project amount are finalized, the contracting process will begin.

We will work closely with the customer to ensure that the project is executed in accordance with the agreed schedule.

Design, production



We will proceed with product manufacturing under strict delivery and safety control, ensuring compliance with the customer's defined requirements, functionality, and quality standards.

Also, conducting Pre-commissioning at our test bench.

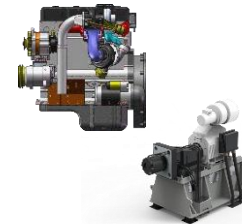
Delivery Civil work



After packing, we deliver the products with the utmost care to ensure that they remain secure and intact during transportation.

We also carry out civil engineering work such as installation, piping, and wiring as requested by the customer.

Commissioning Acceptance



System configuration is carried out, followed by reproducible testing and final adjustments at the customer's test bench.

After service

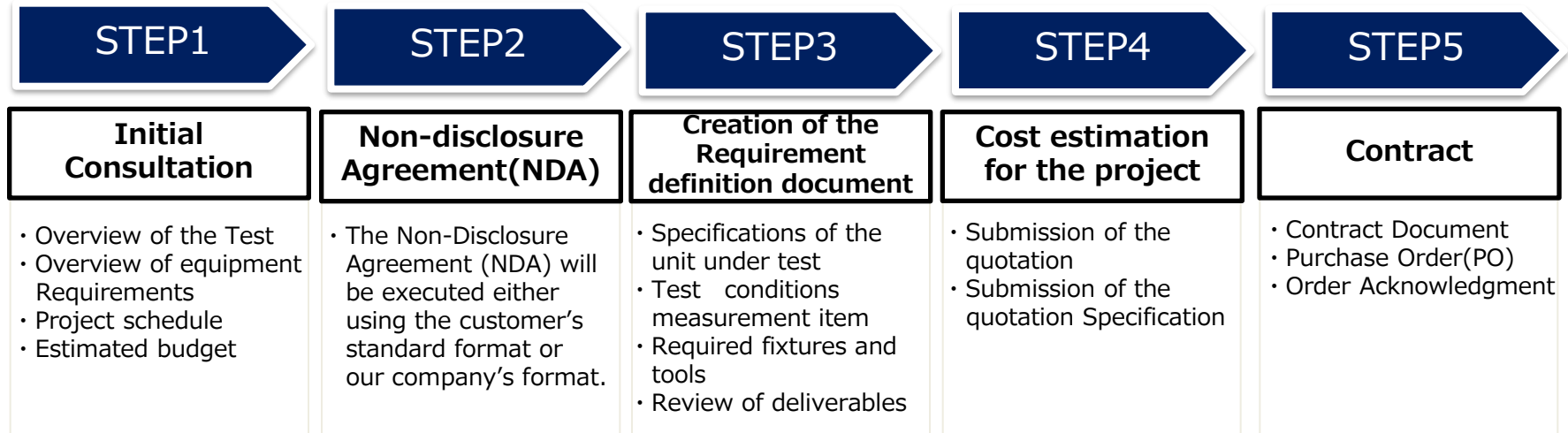


We provide long-term support even after product delivery.

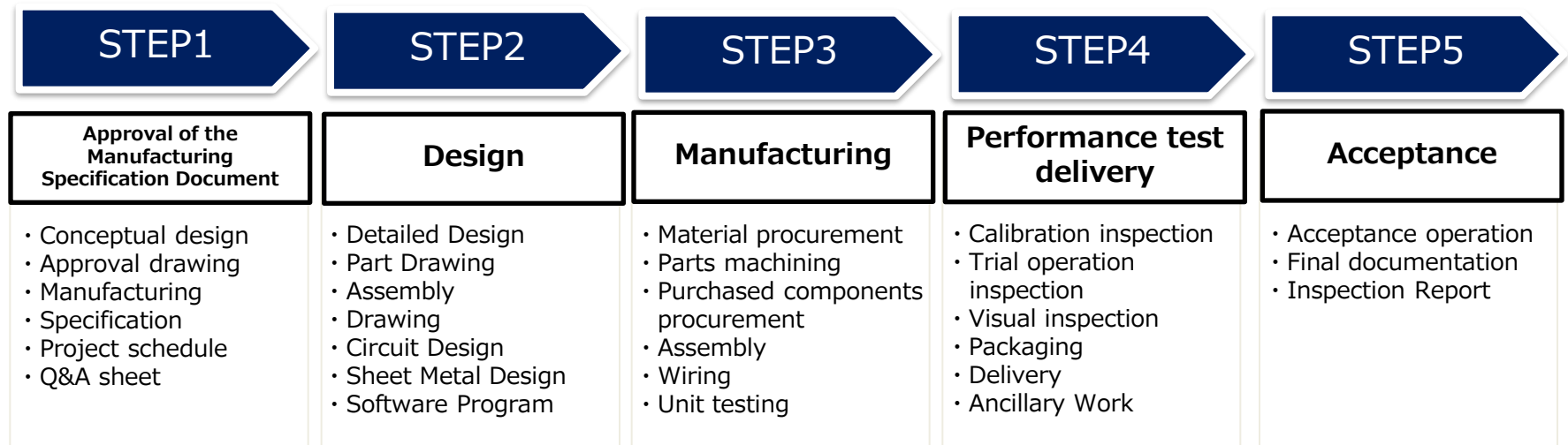
We offer prompt assistance anywhere as needed.

In addition, we propose product upgrades and maintenance planning to ensure continued optimal performance.

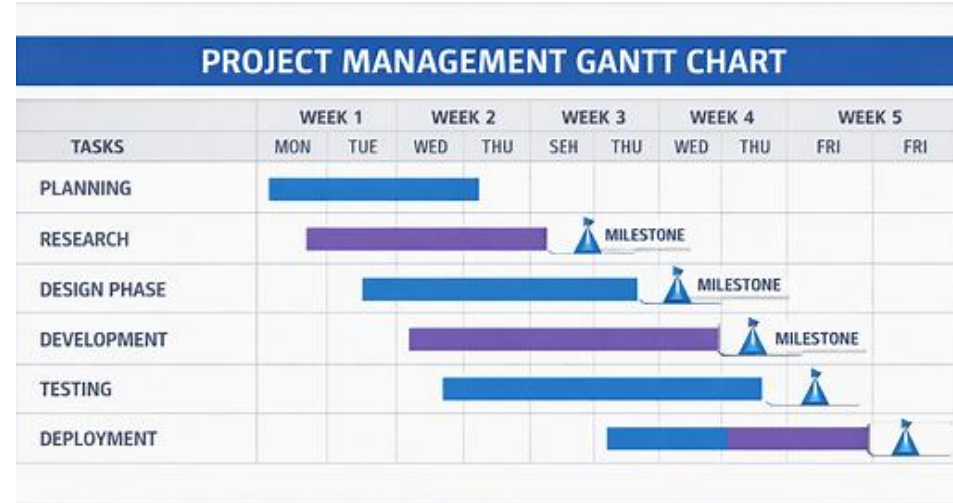
» Process from initial inquiry to contract finalization



» Process from project initiation to completion



» Project execution framework



✓Project Leader and Assigned Members

We assign a Project Leader (responsible person) and project members according to the project's scale and type—whether it is a new installation, repair work, or on-site inspection.

✓Project Management

With clearly defined requirements and a firm commitment to achieving QCD (Quality, Cost, Delivery), we approach every project with the same passion as our customers and work sincerely toward its success.



» Hydrogen engine test bench

Our company not only provides hydrogen-engine test systems, but also maintains a fully equipped hydrogen-engine testing environment, enabling us to conduct contract testing services for customers' hydrogen engines. We are one of the few companies in Japan capable of performing hydrogen-engine testing.



» Hydrogen Gas Supply

- ✓ Installation of a hydrogen trailer with a maximum capacity of approximately 3,000 m³
- ✓ Supply pressure from the trailer to the test bench: 19.6 MPa
- ✓ Supply pressure to the engine: up to 10 MPa
(Pressure is not variable and must be adjusted each time.)
- ✓ Safety assurance through explosion-proof test specifications
Feature: We are one of the few companies capable of conducting hydrogen engine testing.



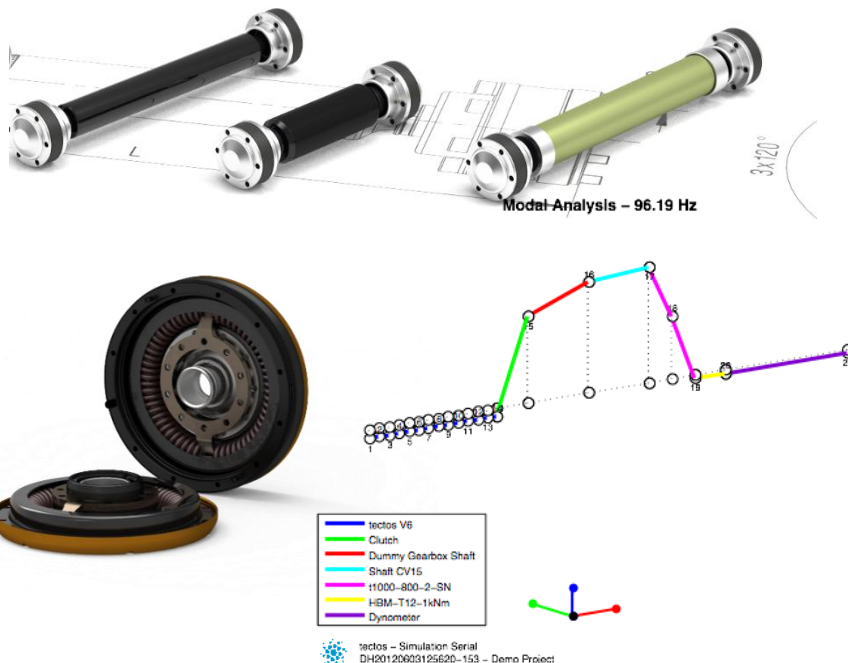
» Issue Example:

Vibration Caused by Backfire

- ✓ Backfire from the engine generates excessive vibration in the test bench.
- ✓ This also leads to unstable control, making data acquisition difficult.

Solution)

- ✓ Implementation of vibration analysis
- ✓ Optimization of the Dummy Shaft and Damper



» Issue Example:

Difficulty Installing a Test Bench In-House

- ✓ Installing a hydrogen trailer falls under the High-Pressure Gas Safety Act, making installation impossible in the customer's laboratory area.

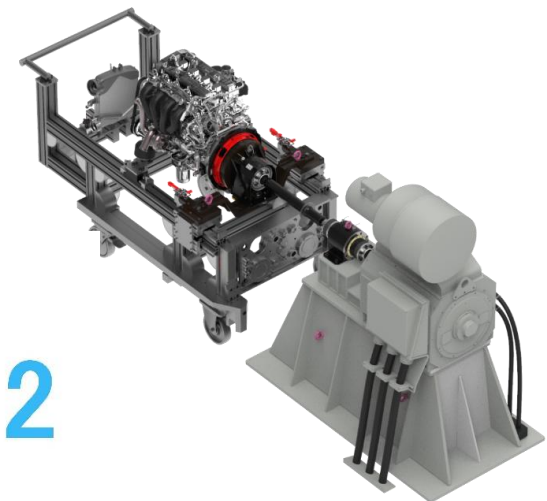
Solution)

- ✓ Provision of a hydrogen-engine testing environment .We conduct contract testing using our in-house engine test bench.

Customer's Benefit)

- ✓ Significant reduction in initial and running costs
- ✓ Ability to accelerate the development schedule

H₂



》 Ministry of the Environment: “Demonstration Project for Decarbonizing Heavy-Duty Vehicles through the Use of Hydrogen Internal-Combustion Engines”

As part of this project, a portion of the hydrogen-engine testing is being conducted using our contract testing bench. In addition, our company's logo has been placed on the hydrogen-engine demonstration truck used in the project.



※The photo shows the hydrogen-engine demonstration truck at the departure ceremony for the demonstration run held on Wednesday, June 27, 2023, where our company's CEO, Mr. Tanaka, attended as an invited guest.

※It has also been featured in Nikkei Business, which is available on their paid subscription platform.
<https://business.nikkei.com/atcl/gen/19/00109/071000228/>



» Outline

We support a wide range of activities as a trusted partner in our customers' research and development.

Our engineers participate in the project from the customer's planning phase. From defining project requirements to acquiring and analyzing test data, we ensure smooth and efficient execution.

We build the optimal test environment based on the customer's test specimen and technical requirements.

Planning



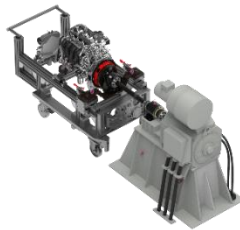
Please share your requirements, requests, and expectations with us. We can provide a wide range of proposals tailored to your budget and testing needs. By aligning with your project goals, we will support you throughout the process to ensure successful outcomes.

Contract



Once the requirements and project cost have been finalized, we proceed with the contract procedures. We will advance the project with careful coordination, fully aligned with the schedule requested by the customer.

Bench up



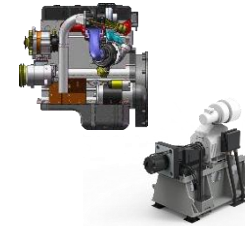
We manufacture the necessary test fixtures. We receive the customer's unit under test and build an optimized test environment for the evaluation. A pre-test is conducted in advance to ensure smooth and reliable execution.

Execution



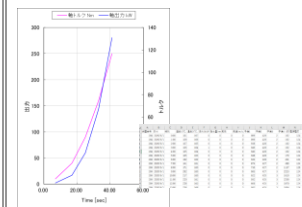
We conduct testing in accordance with the customer's defined requirements. The test operation can be performed either by the customer's own operator or by our operator, depending on your preference.

Bench down



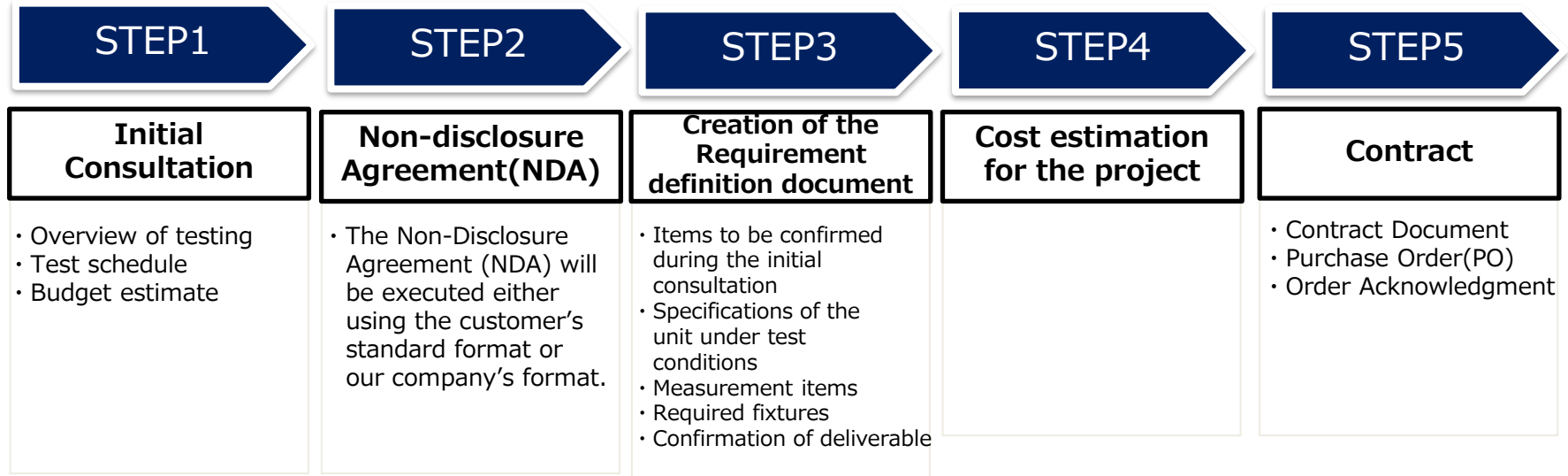
We return all unit under test, harnesses, fixtures, and related items entrusted to us by the customer. At the same time, we carry out the teardown and removal of the test bench.

Test data Acceptance

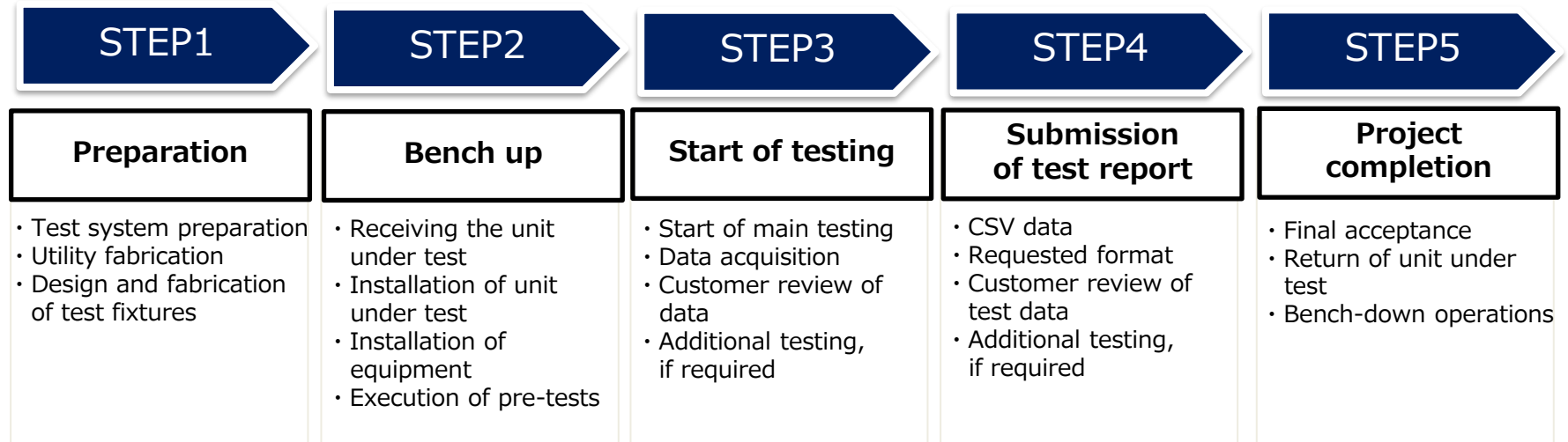


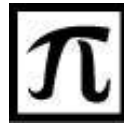
Unless otherwise instructed, we provide the deliverables in CSV format. After the customer's review, the results will proceed to final acceptance.

» Process from initial inquiry to contract finalization



» Process from project initiation to completion





Since 1948



Contact Information

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