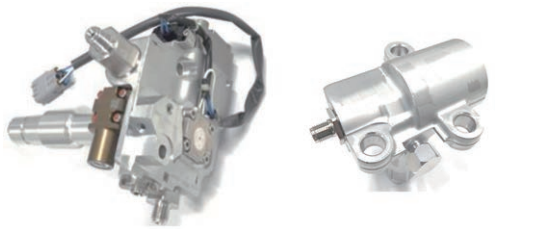
# 2nd Generation High Pressure Hydrogen Gas Valve and Regulator



High pressure hydrogen gas valve　High pressure hydrogen gas regulator

JTEKT has been developing and producing products compatible with high pressure hydrogen for fuel cell electric vehicles (FCEV), which are attracting attention as the "ultimate eco-cars" that do not emit carbon dioxide, nitrogen oxides, or sulfur oxides.

In this paper, we introduce our development of a compact, lightweight, and low-cost high pressure hydrogen gas valve and high pressure hydrogen gas regulator that maintain pressure resistance, sealing performance, and reliability while increasing corresponding flow rates.

## 1. Functions

### 1. 1 High Pressure Hydrogen Gas Valve

・Under normal conditions, this valve functions by sealing and supplying 70 MPa hydrogen contained in a high-pressure hydrogen gas tank, while also functioning to stop the supply of hydrogen in the event of a malfunction. It also features a safety function for discharging hydrogen in the event of a fire.

### 1. 2 High Pressure Hydrogen Gas Regulator

・This regulator functions to reduce the pressure of 70 MPa hydrogen supplied from the high pressure hydrogen gas valve to the 1 to 1.5 MPa required for fuel cells (power generation side).

## 2. Features

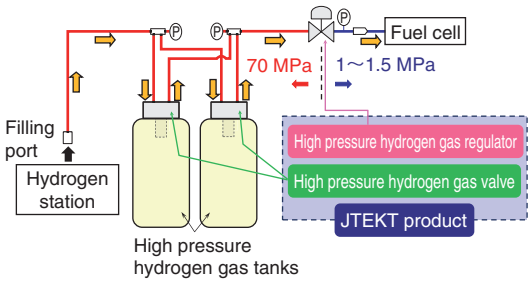
### 2. 1 Technology (High Pressure Hydrogen Gas Valve/High Pressure Hydrogen Gas Regulator)

・High pressure hydrogen gas regulator: A smaller size and lighter weight have been achieved by reducing the mass of the regulator by 30% compared to the current model through design improvements such as a smaller body and fewer parts.

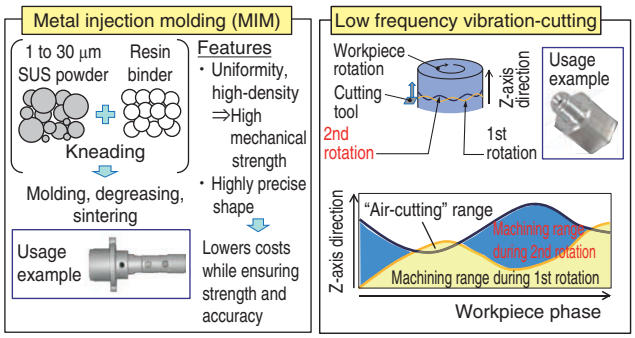
・High pressure hydrogen gas valve: A 140% increase in supply flow rate compared to the current model has been achieved by changing the gas flow path while maintaining body strength.

### 2. 2 Manufacturing Methods (High Pressure Hydrogen Gas Valve/High Pressure Hydrogen Gas Regulator)

・By using metal injection molding for stainless steel parts with complex shapes, the material yield has been improved by 35% compared to when using machining alone.




Overview of hydrogen system for FCEVs




Lower costs through manufacturing method optimization

・The scratching of workpieces due to the entanglement of chips has been prevented by using low frequency vibration-cutting for stainless steel machined parts during which chips are broken up.

### 2. 3 Regulatory Compliance (High Pressure Hydrogen Gas Valve)

・JTEKT's products and production factories have acquired UN Regulation No. 134 certification and the certification of major countries. JTEKT conducts voluntary outgoing inspections to support mass production and contribute to the worldwide popularization of its products.

(Hydraulic System Engineering Dept., Automotive Business Unit)

JTEKT CORPORATION