



H-CUBE PRO



Be Professional at
Hydrogenation and
Flow Chemistry



PRODUCT OVERVIEW

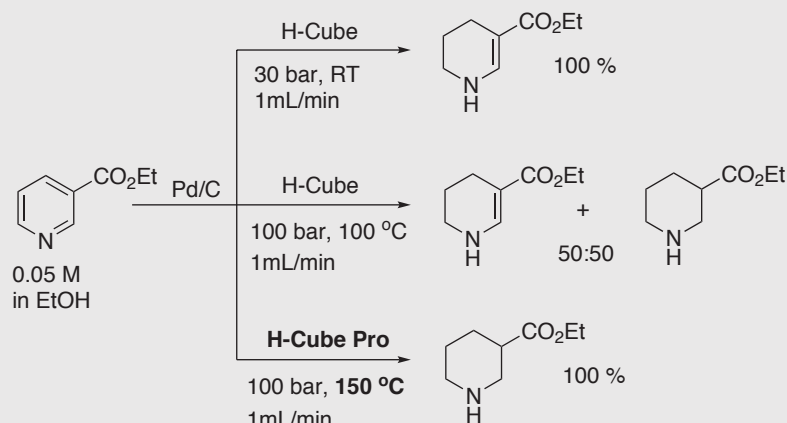
The H-Cube Pro™ is the new standard for hydrogenation. This instrument enables safe hydrogenation in flow at high pressures. Quick reactions can be performed without solid catalyst handling or H₂ gas cylinders. The H-Cube Pro™ provides a wide temperature range and the ability to adjust the amount of H₂ helps to solve selective transformations.

The H-Cube Pro™ offers great hydrogen production for high throughput, wider temperature capability including active cooling for more selective reactions, and a graphical interface with real time reaction monitoring/data logging and method storage capabilities.

HOW DOES IT WORK?

The H-Cube Pro™ system is based on the hydrogenation of a continuous flow of reactant. Additional supplied equipment, HPLC pump, is needed to introduce the reactant into the device, where the solution of reactant is mixed with the in-situ generated hydrogen. The pre-heated mixture is then transferred to a disposable catalyst cartridge (CatCart®) that is preloaded with the required solid catalyst. The product then passed through the cartridge and will be collected in a flask. In most reactions the only work-up required is the evaporation of solvent.

CHEMISTRY EXAMPLE: AROMATIC RING SATURATION



FEATURES

Hydrogenation without cylinders

The H-Cube Pro™ contains two electrolytic cells that generate up to 60 mL/min and 100 bar reaction pressure of high-purity hydrogen from water, eliminating the need for gas storage.

No catalyst filtration

Owing to the catalyst cartridge (CatCart®) technology catalyst filtration is completely eliminated from the process. The mixture of starting material and hydrogen enters through filters into the catalyst bed, after the reaction the product and excess of hydrogen freely leaves the catalyst bed. This allows the safe use of even pyrophoric catalyst such as Raney Nickel.

Higher Throughput and Control

Now reactants can be hydrogenated at up to 2.0 M in concentration (depending on the starting material) applying 1mL/min flow rate with a 70 mm CatCart®. Users may vary the amount of hydrogen produced offering greater reaction control.



1. TOUCH SCREEN

Every operational step of the H-Cube Pro™ and any other module connected to it are conveniently controlled using a touch screen panel. Parameters such as temperature, pressure, hydrogen production, and flow-rate can be adjusted through the screen. Timer function and online monitoring of parameter changes in real time are also displayed on the touch-screen.



3. HEATER/COOLER UNIT

The heater/cooler unit adjusts the temperature of the reaction line and the catalyst cartridge to up to 150 °C and down to 10 °C. Thanks to the great contact surface/volume ratio that continuous flow gives, heat transfer is highly favored, therefore, temperature of the reaction is easy to monitor and control.

Wider Temperature Range

Temperature may now be varied from 10–150 °C offering greater selectivity at lower temperatures and the ability to perform more difficult reactions at higher temperatures.

Intelligent Software

The H-Cube Pro™'s graphical interface is now even easier to use and more powerful. Reaction parameters may be followed in real time and the data exported at the end of the reaction. The Software also has a timer function where users can set the duration of the reaction (automation) and Symplex algorithm makes quick and easy to find the optimal reaction conditions.

Greater Chemistry Capability

The H-Cube Pro™ is compatible with other reactor modules to give chemists chemistry capabilities beyond hydrogenation. Connect a Phoenix Flow Reactor™ for high temperature reactions or the Gas Module to introduce other gases. Connecting the CatCart Changer and Auto Sampler allow a fully automatic system.



2. INLET AND OUTLET VALVE SWITCHES

Two valves help chemists to easily switch between the reaction mixture and solvent. The second valve at the end of the device directs the reaction mixture towards the product collector or waste.



4. CATCART®

ThalesNano's CatCarts® contain sealed heterogenous catalysts, which can be used in hydrogenation and other heterogeneously catalyzed reactions. Exposure to the catalyst is limited by removing the need for filtration, while the cartridges are easy to install and replace. In the CatCarts®, the ratio of catalyst to hydrogen and substrate is significantly increased, which results in faster reaction rates.

CatCarts® come in two standard sizes (30, 70 mm). The smaller CatCarts® are used typically to reduce up to 1 g of substrate, while the longer CatCarts® can be reduce over 10 g of material in a day with no sign of catalyst deactivation.



5. PRODUCT COLLECTOR

The reaction mixture or product collects in the collection vial. The short reaction time means that analytical samples can be taken to measure product conversion in minutes.

TECHNICAL PARAMETERS

Flow rate range	0.3–3 mL/min
Temperature range	10–150 °C
Pressure range of the reaction	Atmospheric to 100 bar
Hydrogen production range	0–60 mL/min
Water reservoir capacity	300 mL
Dimensions including touch screen	Height: 400 mm (15.75") Width: 370 mm (14.6") Length: 510 mm (20.1")
Weight	23 kg (46.3 lbs)
Voltage	115–230 VAC
Frequency	47–63 Hz
Dimensions of HPLC pump	Height: 127 mm (5") Width: 76.2 mm (3") Length: 250 mm (8.84")
Weight of HPLC pump	2.32 kg (5.1 lbs)

For more information on how flow chemistry can benefit you, please, visit www.thalesnano.com

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