

RESEARCH / HYDROGEN LABORATORY · SOUTHERN EUROPE

Laboratory hydrogen drying after a PEM electrolyser

A research centre wanted to dry wet hydrogen from a lab PEM electrolyser at a few litres per minute. We estimated the water load first and then built a drying train around it.


SOURCE

Lab PEM electrolyser

FLOW

1–7 L/min

PRESSURE

Close to atmospheric

TEMPERATURE

25 °C

GAS

Hydrogen, water-saturated

SITUATION

A research team operates a small PEM electrolyser on a lab bench. The hydrogen leaves the stack saturated with water and must be dried before it reaches the downstream experiment.

TASK

Quantify how much water has to be removed, choose a suitable adsorbent and protect the drying stage from liquid water and the experiment from desiccant dust.

ENGINEERING APPROACH

1 Estimate the water load

Saturated hydrogen at 25 °C carries about 3.1 vol.-% water: roughly 1.4 g/h at 1 L/min and 10 g/h at 7 L/min (estimate). Cooling to 5 °C first reduces this to about 2.8 g/h at 7 L/min.

2 Size the adsorbent

Molecular sieve takes up roughly 15–20 % of its own weight in water (guide value). The refill or change interval follows directly from the water load.

3 Choose the media

RF-AC-25064-4A is pre-filled with 4A molecular sieve. 3A molecular sieve is available as loose refill media only.

4 Build the train

Catch pot RF-H-122-CP for water slugs → coalescer RF-H-122 with RF-C-12057-HE → adsorption stage (sized on request) → dust filter RF-H-126 with RF-P-12057-HE.

PRODUCTS USED IN THIS CASE



RF-H-122-CP
LIQUID SEPARATION



RF-H-122 + RF-C-12057-HE
COALESCER



RF-AC-25064-4A
ADSORPTION



RF-H-126 + RF-P-12057-HE
DUST FILTER

Anonymised application example. Customer name, project data and prices are not disclosed.

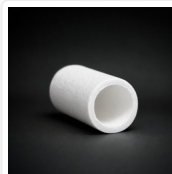
RECOMMENDED R+F CONFIGURATION



LIQUID SEPARATION

RF-H-122-CP

Catch pot for water slugs ahead of the dryer.



COALESCER

RF-H-122 + RF-C-12057-HE

Removes fine water droplets and aerosol.



ADSORPTION

RF-AC-25064-4A

Cartridge pre-filled with 4A molecular sieve; adsorber housing sized on request.



DUST FILTER

RF-H-126 + RF-P-12057-HE

Holds back desiccant dust before the experiment.

LIMITS & OPEN POINTS

- Water-load figures are estimates for saturated gas; the adsorber is sized on request with the real operating data.
- Regeneration of molecular sieve (approx. 175–315 °C with dry purge gas) takes place externally, not in the filter housings.
- No dew-point guarantee is given without a sizing based on the actual data.

Result: A transparent water balance and a modular drying train the lab can start with and extend, with refill media instead of disposable dryers.

HOW WE WORK WITH YOU

1 · Send your data

Gas, flow, pressure, temperature, contamination and connection size.

2 · Get a configuration

Housing and element with R+F article numbers, limits stated openly.

3 · Order and service

Housings supplied with element fitted; replacement elements available individually.

Similar application? Let us size it for you.

Send us your operating data and we return a concrete filter configuration with R+F article numbers.

- Gas / medium and contamination
- Flow (Nm³/h or L/min), pressure, temperature
- Connection size (NPT) and installation position

info@filter-elements.eu

Online inquiry: process-gas-filter.com

Free filtration engineering tool

Read more: Gas drying & adsorption · Hydrogen drying & conditioning train · Water slugs reaching the dryer · Desiccant dust downstream