

DESALINATION / RO

PCB Wastewater RO Recovery Case Study Guangdong, China

At a PCB factory in Guangdong, *Hydro*FLOW® treatment was associated with RO output doubling from 12 to 24 tonnes/hour in 15 days, alongside lower pressure and improved permeate conductivity.

100%	17,000 t	172,800	~67%
Increase in RO output	Reported annual water savings	Reported annual kWh savings	Reduction in permeate conductivity

⇄ BEFORE & AFTER

BEFORE

- Only 12 t/h output after chemical washing
- Output could fall to 8.5 t/h within 30 days
- Permeate conductivity around 45 µS

AFTER

- ✓ Output reached 24 t/h after 15 days
- ✓ Reject flow reduced from 17 to 15 t/h
- ✓ Permeate conductivity reduced by approximately 67%

OVERVIEW

A printed circuit board (PCB) manufacturing facility in Guangdong, China, used reverse osmosis (RO) to treat production wastewater for reuse in cooling towers and cleaning applications. The RO system was originally designed to process 25 tonnes per hour, but scaling had reduced its output to just 12 tonnes per hour after chemical cleaning, falling further to 8.5 tonnes per hour within 30 days. *Hydro*FLOW® technology was introduced to address scaling, improve membrane performance and restore treatment capacity.

⚠ CHALLENGE

Recover RO throughput and improve permeate quality despite recurring scale build-up after chemical cleaning.

- Output was 12 t/h even after chemical washing, against 25 t/h design capacity.
- Scale build-up could reduce throughput to 8.5 t/h within 30 days.
- Permeate conductivity was reported at about 45 µS.
- Treated wastewater was reused in cooling and cleaning applications.

SOLUTION

A *Hydro*FLOW® unit was installed on the factory's RO system. The treatment was evaluated over 15 days, monitoring RO output, pumping pressure and permeate conductivity

UNIT INSTALLED
1 × *Hydro*FLOW® unit

RO DESIGN CAPACITY
25 tonnes/hour

TRIAL PERIOD
15 days

RESULTS

RO output doubled
Output rose 50% in one day and from 12 to 24 t/h by day 15 (96% of design capacity).

Performance
Flow held near 24 t/h for 10 days, then fell to 18 t/h after two months.

Reduced reject flow
Reject flow fell from 17 to 15 t/h; the report cites 17,000 t/year of water savings.

Lower pumping energy
The report cites 172,800 kWh/year saved, from 345,600 to 172,800 kWh/year.

Improved permeate quality
Permeate conductivity reduced by approximately 67%, alongside lower pumping pressure.

Further units ordered
The factory ordered four additional units following the trial.

KEY TAKEAWAY

Summary

At a PCB manufacturing facility in Guangdong, China, HydroFLOW® treatment helped restore reverse osmosis (RO) performance, doubling output from 12 to 24 tonnes per hour within 15 days and reducing permeate conductivity by approximately two-thirds. The original study also reported estimated annual savings of 17,000 tonnes of water and 172,800 kWh of pumping energy. Following the successful trial, the factory ordered four additional *Hydro*FLOW® units.

12→24
RO OUTPUT (T/H)

17,000 t
REPORTED ANNUAL WATER SAVINGS

172,800
REPORTED KWH SAVED/YEAR

HYDROPATH

Improve reverse-osmosis performance

Discuss RO fouling, reject flow and energy use with Hydropath.

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