



DANIEL-LM s.r.o. | AquaTech North Bohemia

ACCLO

Removing chlorates, perchlorates
and nitrates from pool water —
engineered for the smallest
swimmers.

Chlorinated Pool Water Is Not the End of the Story

Pools disinfected with hypochlorite solutions or chlorine gas gradually accumulate a group of by-products that standard sand filtration and UV lamps cannot remove:

Chlorates (ClO_3^-)

from decomposition of hypochlorite disinfectants

Perchlorates (ClO_4^-)

trace by-products of electrochemical and chemical disinfection processes

Chlorites (ClO_2^-)

from chlorine dioxide systems

Nitrates (NO_3^-)

from swimmer inputs (urine, sweat)

Chloramines and disinfection by-products (DBPs)

the irritating, mutagenic side of chlorination

Rising Total Organic Carbon (TOC) and salinity

the water simply grows heavier

Once these substances enter the water, they stay there — until the pool is emptied and refilled.

Small Bodies. Higher Exposure. Different Chemistry.

Children in learning pools, splash pools, and family whirlpools face a fundamentally higher exposure than adults:

Higher water-to-body ratio

a toddler ingests and absorbs proportionally far more pool water than an adult

Longer time in the water

swimming lessons and family sessions run several times a week

Developing endocrine and haematological systems

more sensitive to specific contaminants

The substances of concern for children:

Perchlorates

competitively block iodide uptake by the thyroid gland. The European Union classifies perchlorate as a substance of concern for infant and child health (Commission Regulation (EU) 2020/685 for food; Drinking Water Directive 2020/2184).

Nitrates

associated with methemoglobinemia ("blue baby syndrome") in infants; WHO drinking-water guideline: 50 mg/l.

Chloramines and DBPs

trichloramine has been linked in peer-reviewed studies (Bernard et al.) to airway irritation and elevated asthma risk in children who swim in indoor pools.

Operators of children's pools carry a duty of care that goes beyond meeting the free-chlorine minimum.

The Rules Are Tightening

Framework	Parameter	Limit
EU Drinking Water Directive 2020/2184	Perchlorate	10 µg/l (drinking water)
EU 2020/2184	Chlorate	250 µg/l (drinking water); transitional 700 µg/l
Czech Decree 238/2011 Coll.	Chlorate in pool water	30 mg/l
Czech Decree 252/2004 Coll.	Nitrate (drinking water)	50 mg/l
WHO Guidelines (2022)	Perchlorate (provisional)	70 µg/l
DIN 19643 (Germany)	Combined chlorine, DBP control	Pool water treatment standard

Public and commercial pools across the EU are increasingly required to monitor and report these parameters. ACCLO is engineered to meet all of them in a single passive treatment stage.

A Three-Stage Passive Treatment Chain

ACCLO is the next evolutionary step of the ART CARBON® pool platform, following ACPool (filter backwash recycling) and ACDeC (combined chlorine and microbial control).

Three stages, one compact unit:



Water treated in this way is returned to the pool. The concentrated waste stream is discharged to sewer.

The result: measurably safer water for the smallest swimmers, without emptying the pool.

Compact Bypass Installation

ACCLO is connected as a bypass to the main circulation loop of the pool. Rack-mounted, self-contained, unattended operation.

Flow sequence:

#	Component	Specification
X.1	ART CARBON® composite filter — 1 µm filtration and dechlorination	Composite ART CARBON® filter
X.2 A/B	AQUA VIVA® catalytic decomposition of chloramines	Catalytic cartridge AQUA VIVA® 10"
X.3	Booster pump	230 V, 0.5 kW, H80 m, 300 l/min
X.4	ART CARBON® chlorate separator	250–500 l/h
X.5	Frequency converter	1ph/1ph, 1 kW, 2–24 mV I/O
X.6	Vortex flow meter	d32 / DN25

Frequency-driven booster pump. Remote parameter control optional. Servicing quarterly.



Aquaforum Františkovy Lázně — Chlorates Held Below the Limit

Aquaforum Františkovy Lázně (Czech Republic) is a spa-town aquatic centre with children's pools, thermal pools, and wellness facilities. Long-term hypochlorite disinfection had led to persistent accumulation of chlorates approaching and exceeding the Czech pool-water limit (30 mg/l under Decree 238/2011 Coll.).

Installation

April 2026

Treatment flow

0.3 m³/h, continuous 24/7 operation

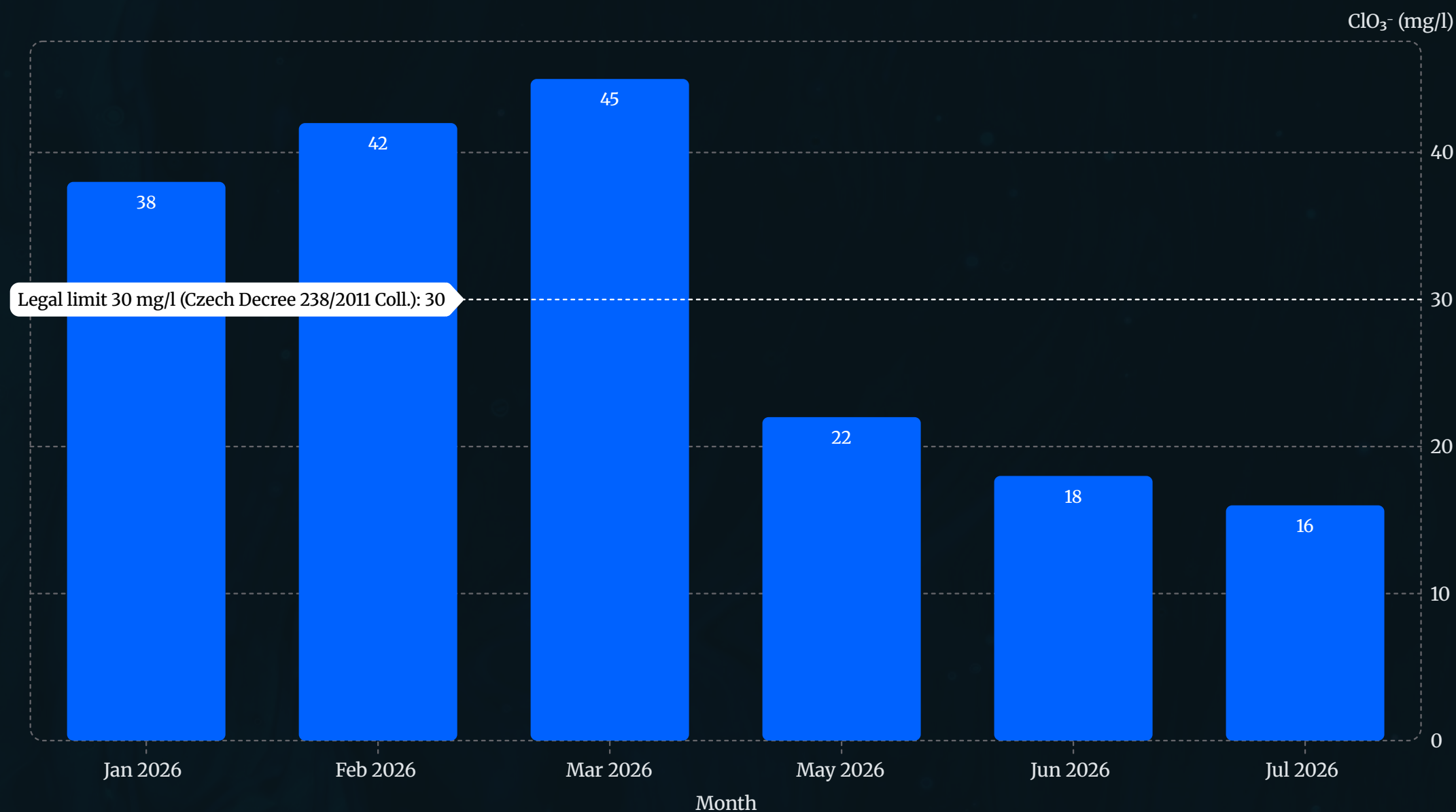
Result

chlorate concentration held consistently below the legal limit of 30 mg/l; simultaneous reduction of chloramines and improved organoleptic quality of the water reported by operators.

The installation demonstrates that a single ACCLO unit, sized for the specific pool volume, can keep a heavily loaded commercial pool in permanent compliance without emptying the basin.

Chlorate Concentration — Before and After ACCLO Installation

Chlorate ClO_3^- concentration (mg/l), monthly average — illustrative operating profile at Aquaforum Františkovy Lázně, 2026



① ACCLO commissioned April 2026. Dashed reference line: legal limit 30 mg/l (Czech Decree 238/2011 Coll.). Values shown as monthly averages from continuous operator monitoring; presented as an illustrative operating profile.

Beyond Compliance — What the Operator Actually Gets



Chlorates and perchlorates reduced below regulatory limits



Nitrates and rising salinity removed — no more full pool drain-downs



Chloramines and DBPs catalytically decomposed — no itchy eyes, no irritating "pool smell"



Passive antimicrobial effect of the ART CARBON® stage — improved microbial stability of the water



Water and heating cost savings — dramatically extended interval between full pool refills



Fully passive operation — one small booster pump; quarterly service by internal staff or by our service team



A verifiable duty-of-care improvement for children's facilities — measurable, documented, defensible

Compact. Precise. Maintenance-Light.

Parameter	Value
Treatment flow	250–500 l/h
Installation	Bypass on main circulation loop, rack-mounted
Power supply	230 V, single-phase
Total power	~1.5 kW (booster pump + frequency converter)
Filtration stage	1 µm composite ART CARBON® filter
Catalytic stage	2× AQUA VIVA® 10" cartridges
Separation stage	Reverse osmosis membrane
Waste stream	Discharged to sewer
Control	Frequency converter; remote parameter control optional
Servicing	Quarterly (in-house or by manufacturer's service team)

Interested in ACCLO?

We will size and quote ACCLO to the specific volume, hydraulics, and duty cycle of your facility.

DANIEL-LM s.r.o. |
AquaTech North Bohemia

Vinořské nám. 34,
Praha 9 – Vinoř
Czech Republic 190 17 Praha

Management: +420 777 321 846
Technology: +420 777 919 877
Sales: +420 773 992 321
International: +420 777 298 868

info@aquananotech.eu
aquananotech.eu

Based on ART CARBON®
technology

Patented in the Czech Republic
(WO2022/152338A1), developed
with the Technical University of
Liberec.

ACCLO is the evolutionary
continuation of the ACPool and
ACDeC family — the world of
children's pool water treatment,
reimagined.

