



BOILER WATER TREATMENT

BOILER-OX 10

Carbohydrazide chemistry for boiler-feedwater oxygen control

An aqueous oxygen scavenger designed for a monitored boiler-water treatment programme.

10%

ACTIVE CARBOHYDRAZIDE

Nominal formulation target

100 g

ACTIVE INGREDIENT PER KG

At the nominal assay

200 / 1,000

NET PACK SIZES IN KG

Drums / IBC containers

BOILER-OX 10

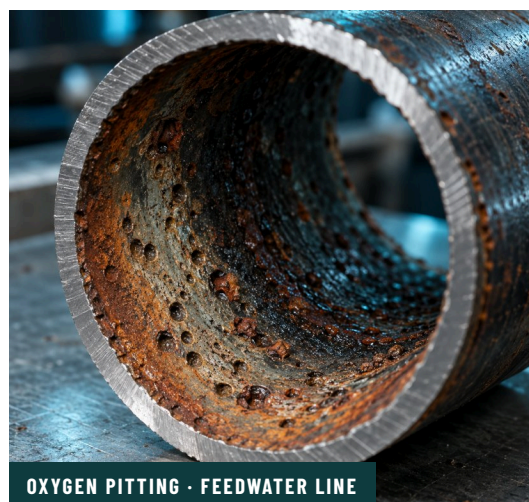
PRODUCT AND CHEMISTRY

THE PRODUCT

Boiler-OX 10 is a proposed concentrated, aqueous formulation with 10.0% active carbohydrazide by weight. It is intended to react with residual dissolved oxygen in boiler feedwater and support control of oxygen-related corrosion. It complements mechanical deaeration within a complete water-treatment programme.

WHY RESIDUAL OXYGEN MATTERS

Oxygen remaining after deaeration, or entering through air leaks, can contribute to localised pitting in feedwater lines, economisers and boilers. Reliable protection depends on deaerator performance, suitable water chemistry and controlled chemical addition.



OXYGEN PITTING · FEEDWATER LINE

THE CHEMISTRY

The ideal overall oxidation of carbohydrazide is shown below. This is a chemical balance, not a guarantee of conversion speed under plant conditions.



CARBOHYDRAZIDE

OXYGEN

CARBON DIOXIDE

NITROGEN

WATER

$\text{CH}_6\text{N}_4\text{O}$ is carbohydrazide. The active reaction produces carbon dioxide, nitrogen and water; it does not generate the sulfate salt associated with sulfite oxidation.

WHAT THE FORMULATION OFFERS

01 DEFINED ACTIVE BASIS

Nominally 100 g of carbohydrazide per kg of product, allowing dose calculations on an active-mass basis.

02 LIQUID SUPPLY

Intended for controlled metering from drums or IBCs through a dedicated dosing system.

03 CORROSION-CONTROL OBJECTIVE

Oxygen removal and support for metal passivation under suitable reducing treatment conditions. Product performance requires qualification.

BOILER-OX 10

PERFORMANCE AND SYSTEM INTEGRATION

WHAT CONTROLS PERFORMANCE

Temperature, pH, mixing and residence time affect oxygen-scavenging behaviour. Feed rate must also account for oxygen loading and the residual required by the treatment programme. A higher concentration alone does not establish faster reaction or better protection.

01 Temperature

02 pH

03 Mixing

04 Residence time

05 Oxygen loading

06 Required residual



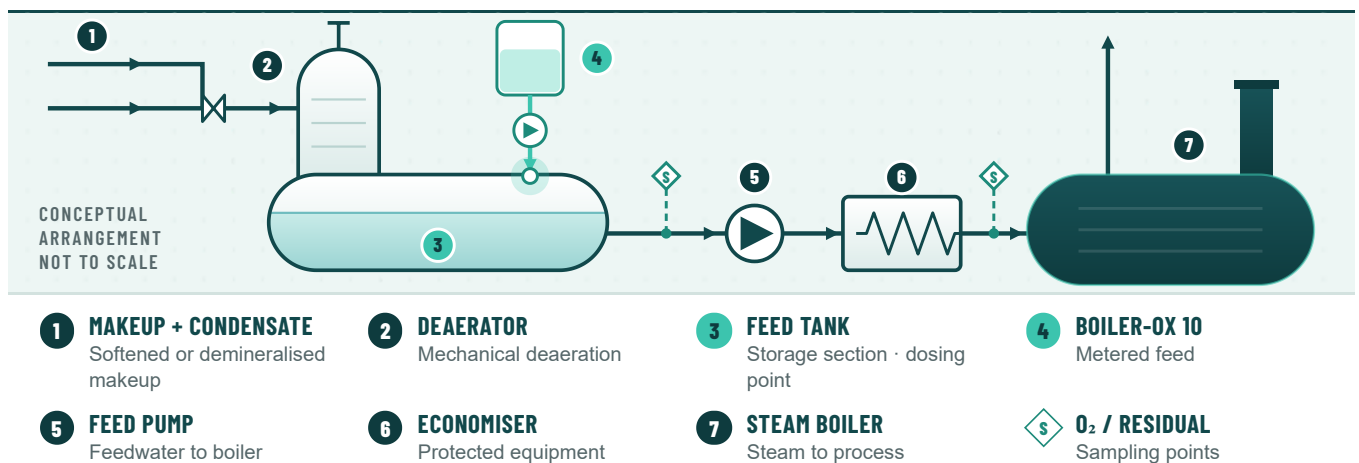
APPLICATION FIT

For assessment in industrial steam-boiler feedwater systems using softened or demineralised makeup. Confirm the reducing treatment regime, operating pressure, metallurgy and steam use before selection. No universal pressure rating or direct-contact steam approval is stated for this formulation.

CONFIRM BEFORE SELECTION

- ✓ Reducing treatment regime
- ✓ Operating pressure
- ✓ Metallurgy
- ✓ Steam use

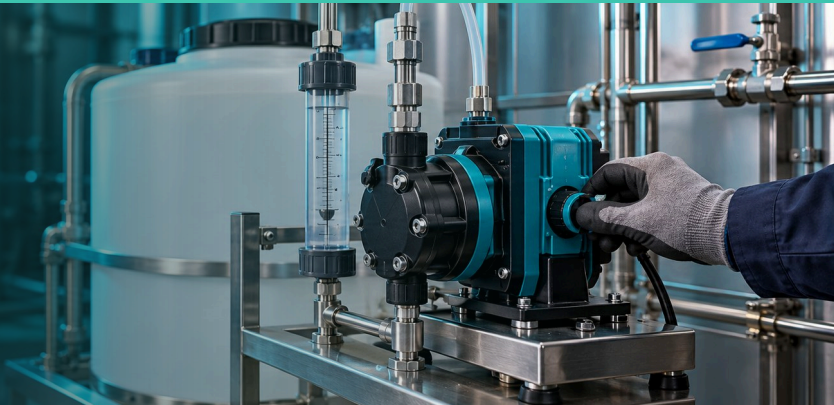
TYPICAL INTEGRATION INTO A BOILER-FEEDWATER SYSTEM



Dose into a suitable deaerator storage section or feed tank to provide mixing and reaction time before the equipment to be protected. Injection and sampling locations must be confirmed for each plant; this diagram does not specify an installation design.

BOILER-OX 10

APPLICATION, DOSING AND CONTROL



A measured operating programme turns the chemistry into effective treatment.

01

ESTABLISH THE OXYGEN DEMAND

At 10.0% active content, ideal stoichiometry requires approximately 14.1 mg of product per mg of O₂. This is the oxygen-reaction minimum only; it excludes a maintained residual and other consumption.

ILLUSTRATIVE CALCULATION

For 100 m³/h feedwater containing 0.020 mg/L O₂, the theoretical demand is 0.282 mg/L product, equivalent to 0.0282 kg/h. This is not an operating feed-rate recommendation; actual dosing must be established from plant measurements.

$$D_{\text{theoretical}} = 14.1 \times \text{dissolved O}_2$$

D in mg/L product; dissolved O₂ in mg/L.

Basis: 90.08 g carbohydrazide reacts with 64.00 g O₂.

14.1 mg

product per mg of O₂

0.282 mg/L

theoretical demand in the example

02

SET AND VERIFY THE FEED RATE

Select the operating dose using oxygen loading, water chemistry, reaction time and the agreed residual target. Calibrate the dosing pump and confirm actual delivery against flow and tank consumption. Recheck the programme after changes in load or makeup-water quality.

$$\text{Feed (kg/h)} = D_{\text{operating}} \times Q / 1,000$$

D in mg/L product; Q in m³/h feedwater.

A pump setting in L/h requires the measured product density.

03

MONITOR AND ADJUST

- Measure dissolved oxygen and a suitable scavenger residual at agreed sample points.
- Trend feedwater flow, temperature and pH; use iron and copper trends where relevant to assess corrosion control.
- Check deaerator operation, air ingress, pump calibration and sample-line condition before increasing dose.



BOILER-OX 10

PRODUCT PROFILE, HANDLING AND SAFETY

PRODUCT PROFILE

Chemical basis	Carbohydrazide-based aqueous formulation
Active content	10.0% w/w nominal target
Active mass	100 g/kg at nominal assay
Appearance	Clear, colourless to pale yellow (target)
Water miscibility	Complete (target)
pH, undiluted	> 7 (target)
O ₂ demand	≈ 14.1 mg product per mg O₂ (ideal stoichiometry)
Reaction products	CO₂, N₂ and H₂O

FEEDING, HANDLING AND STORAGE

Use a dedicated controlled-feed system and closed transfer. Confirm compatibility of tanks, pumps, seals and pipework. Do not blend with other treatment chemicals or introduce dilution without technical review. Keep containers closed and protected from freezing, excessive heat and contamination.

☐ **CLOSED TRANSFER**

🔒 **KEEP CLOSED**

❄️ **NO FREEZING**

🔥 **NO EXCESS HEAT**



SAFETY AND PROGRAMME LIMITS

Use the product-specific Safety Data Sheet (SDS) to set PPE, handling and emergency measures; the brochure does not replace it. Carbohydrazide can form hydrazine under boiler conditions, so decomposition behaviour and monitoring must be assessed. Do not assume suitability for drinking water, food-contact steam or an oxidising treatment regime.

BEFORE COMMERCIAL USE

Nominal values describe formulation targets, not certified batch results.



SPECIFICATIONS

Confirm final product specifications



SAFETY DATA SHEET

Product-specific SDS for PPE and handling



COMPATIBILITY

Tanks, pumps, seals and pipework



SITE PERFORMANCE

Qualified under actual plant conditions



SUPPLY AND PACKAGING

200 kg
DRUMS

20 kg
active carbonyhydrazide

1,000 kg
IBC CONTAINERS

100 kg
active carbonyhydrazide

200 kg drums or 1,000 kg IBC containers, net product mass. At nominal assay, these contain 20 kg and 100 kg of active carbonyhydrazide respectively.

TREATMENT PROGRAMME IN THREE STEPS

01 ESTABLISH

Calculate the theoretical demand from dissolved oxygen and feedwater flow.

02 SET AND VERIFY

Select the operating dose, calibrate the pump and confirm actual delivery.

03 MONITOR

Trend dissolved oxygen, residual, flow, temperature and pH; adjust as needed.



TECHNICAL SUPPORT

Contact your Watch Water representative for application review, final product specifications and dosing guidance.



BOILER-OX 10 · CHEMICAL OXYGEN SCAVENGER

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