

● CHROMIUM

EZ Series: Continuous Monitoring of Chromium

Key Applications: Production and treatment of drinking water and surface water, industrial wastewater treatment

Chromium is used in the manufacture of steel, for chrome plating a wide variety of metal and plastic products, and in a number of other manufacturing processes. Trivalent Chromium Cr(III) is non-toxic, whereas the hexavalent Cr(VI) is the most toxic form, and has also been determined as carcinogenic to humans. Regulations therefore exist to protect human health and the environment from Chromium in water, food, beverages and wastewater. Regulatory Standards generally require the monitoring of either Total Chromium or dissolved hexavalent Chromium Cr(VI).

Features EZ Series Analyzers

- Continuously monitor Total Chromium and Dissolved Chromium Cr(VI) to detect trends, peaks, and excursions
- Accurate at low levels starting at 1 µg/L
- Multiple stream analysis (1 - 8 streams)
- Analogue and digital communication options

**Explore the full range of parameters and technologies.
Call your Hach representative today,
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The Why, Where and How of Chromium Monitoring

About

Chromite ore provides an abundant source of Chromium in the Earth's crust. As a key component of steel, Chromium adds strength and anti-corrosive properties. It is also wear-resistant and highly reflective, and is used in the metal plating of many products ranging from automotive parts to domestic appliances. Chromium compounds (Chromium III or Chromium VI), are also used in the manufacture of dyes and pigments, catalysts, leather and wood preservation, and water treatment chemicals.

The health effects of Chromium vary according to its oxidation state. Cr(III) is a nutritionally essential, non-toxic trace element, involved in insulin function, whereas Cr(VI) is the most toxic form; producing kidney and liver damage, haemorrhages and respiratory disorders. Cr(VI) has also been determined as carcinogenic and was the pollutant at the heart of the famous lawsuit brought by Erin Brockovich against the Pacific Gas & Electric Company of California in 1993.

Chromium in Wastewater

EU Member States regulate Chromium emissions in the aquatic environment, and national discharge limits vary according to industry type and the receiving water body, with most countries imposing discharge limits between 50 and 5000 µg/L Total Chromium. Some countries also impose limits for hexavalent Cr(VI) between 50 and 2000 µg/L.

In the USA, Chromium and its compounds are listed as toxic pollutants, and the US EPA publishes criteria which provide guidance for States and Tribes to use to establish water quality standards and provide a basis for controlling discharges of pollutants. The US Clean Water Act prohibits anybody from discharging pollutants unless they have a NPDES (National Pollutant Discharge Elimination System) permit, which contains discharge limits as well as monitoring and reporting requirements. Each permit is written to reflect the site-specific conditions of the discharger and may include limits for both dissolved Hexavalent and Total Chromium.

Chromium in Drinking Water

The World Health Organization has set 50 µg/L Total Chromium in drinking water as a provisional guideline value. Europe also has a maximum value of 50 µg/L Total Chromium both in water intended for human consumption and in natural mineral waters (Directive (EU) 2020/2184 and Commission Directive 2003/40/EC). In the USA, the federal drinking water standard for Total Chromium is 100 µg/L.

Chromium in Surface Water

In surface waters, Chromium exists in the two oxidation states, Cr(III) and Cr(VI), but Cr(VI) is more stable. According to the World Health Organization the natural Total Chromium content of surface waters is approximately 0.5 - 2 µg/L. However, most surface waters contain between 1 and 10 µg/L of Total Chromium due to industrial activity. In the USA, levels of up to 84 µg/L have been found in surface water. In Europe, the Water Framework Directive sets long-term mean standards for Cr(III) 4.7 µg/L and Cr(VI) 3.4 µg/L.

Chromium Monitoring Solutions

EZ Series Chromium Analyzers are available in several models:

EZ1009	Chromium Cr(VI), dissolved
EZ2001	Chromium, total
EZ2301	Chromium, total & Chromium Cr(VI), dissolved
EZ2400	Chromium, total & Chromium Cr(VI), dissolved & Chromium Cr(III), dissolved

Options

- Selection of measuring ranges to match your application
- Monitoring of up to 8 sample streams per analyser, reducing cost per sampling point
- Analog and/or digital outputs for communication
- Self-cleaning sample preconditioning panel