

CHEMICAL OXYGEN DEMAND (COD)

ECO SERIES

WHAT IS COD?

The pollution caused by organic and inorganic substances in water can be evaluated using a parameter called COD. COD stands for Chemical Oxygen Demand and refers to the oxygen used during the oxidation of substances dissolved and suspended in water. By determining the COD it is possible to determine the quantity of chemically oxidizable substances with energy oxidants such as potassium dichromate present in a strongly acidic solution. The acid environment is created by the addition of concentrated sulfuric acid. Both inorganic compounds and organic substances can be oxidized. This method can also be used to determine the quantity of organic substances such as cellulose, that may not be detected by the equivalent biological method (BOD, Biochemical Oxygen Demand).

THERMOREACTION OF A SAMPLE

Digestion is an extremely important step in many chemical reactions. The aim is to convert low-solubility compounds or substances present in the form of aggregates into soluble compounds in order to degrade organic substances into inorganic molecules, or to eliminate interfering substances and solubilize metallic ions. Digestion takes place by adding decomposition reagents to the sample which is then heated.

VELP Scientifica **ECO** thermoreactors are suitable for COD analysis and for sample preparation in order to determine both metallic and non-metallic elements in organic and inorganic materials such as minerals, alloys, animal feeds, soils, sediments and organic tissues. A typical COD analysis will take 2 hours at 150 °C, however the VELP ECO Series can perform **COD analysis in only 30 minutes** thanks to the higher temperature of 160 °C. The aluminum heating block offers **optimum thermal conditions** and a **high level of homogeneity** at all temperatures.

The ECO- series thermoreactors are also suitable for determining total organic carbon (TOC), total chromium, total nitrogen and total phosphate and ensure **excellent accuracy** and **repeatability**.

GLP Good Laboratory Practice

EPA • ISO • APHA • AWWA • WEF

ECO 6

The **ECO 6** is designed to process 6 samples (200 ml test tubes, Ø 42 mm) simultaneously. Electronic temperature control ensures temperature regulation from ambient to **200 °C** and the analysis time can be set from **1 to 199 minutes** or **continuous**. An LED display shows the temperature and time remaining. Dedicated adapters are available for different sizes and quantities of test tubes making the ECO 6 an **extremely flexible** and versatile instrument: 6 Ø 42 mm test tubes; 6 Ø 22 mm test tubes or 18 Ø 16 mm test tubes.

INSTRUMENT	POWER SUPPLY	CODE No
ECO 6	230 V / 50-60 Hz	F10100120
ECO 6	115 V / 50-60 Hz	F10110120



ECO 16

The **ECO 16** can be used to process 14 Ø 16 mm test tubes plus 2 Ø 22 mm test tubes simultaneously. Electronic temperature control ensures temperature regulation from ambient to **160 °C** and the analysis time can be set from **1 to 199 minutes** or **continuous**. An LED display shows the temperature and time remaining. An acoustic signal indicates the end of analysis and the instrument switches off automatically. For **increased safety** and **reliability** a safety shield is available.

INSTRUMENT	POWER SUPPLY	CODE No
ECO 16	230 V / 50-60 Hz	F10100126
ECO 16	115 V / 50-60 Hz	F10110126

OPTIONAL ACCESSORIES FOR SLUDGE ANALYSIS CODE No

Test tube for sample decomposition Ø 22 mm, NS 19/26 cone with glass cap	CA0091666
Condenser 200 mm type KS with 3 meters polyethylene tube	CA0091667
Absorption attachment for condenser NS 29/32	1000002

ECO 8 AND ECO 25



The **ECO 8** can process 8 samples in Ø 16 mm test tubes plus 1 sample in a Ø 22 mm test tube simultaneously, the **ECO 25** 25 samples in Ø 16 mm test tubes. Both instruments come complete with a test tube cover for **increased safety** and **reliability**. Five **different temperatures** (70, 100, 120, 150 and 160 °C) and four **analysis times** (30, 60, 90 minutes or in continuous) can be set. An acoustic signal indicates the end of analysis and the instrument switches off automatically.

INSTRUMENT	POWER SUPPLY	CODE No
ECO 8	230-115 V / 50-60 Hz	F101A0127
ECO 25	230-115 V / 50-60 Hz	F101A0125

ECO 8 only

OPTIONAL ACCESSORIES FOR SLUDGE ANALYSIS CODE No

Test tube for sample decomposition Ø 22 mm, NS 19/26 cone with glass cap	CA0091666
Condenser 200 mm type KS with 3 meters polyethylene tube	CA0091667
Absorption attachment for condenser NS 29/32	1000002



GENERAL FEATURES AND PERFORMANCE

	ECO 6	ECO 8	ECO 16	ECO 25
NUMBER OF POSITIONS	6 (Ø 42 mm) as standard, 6 (Ø 22 mm) or 18 (Ø 16 mm)	8 (Ø 16 mm) + 1 (Ø 22 mm)	14 (Ø 16 mm) + 2 (Ø 22 mm)	25 (Ø 16 mm)
TEMPERATURE REGULATION °C	from ambient to 200	70, 100, 120, 150 and 160	from ambient to 160	70, 100, 120, 150 and 160
TIME SETTINGS min.	0÷199 or continuous	30, 60, 120 or continuous	0÷199 or continuous	30, 60, 120 or continuous
STABILITY AND HOMOGENEITY OF HEATING BLOCK TEMPERATURE °C	± 0.5	± 0.5	± 0.5	± 0.5
SIGNALS: TEMPERATURE REACHED	visual	acoustic and visual	visual	acoustic and visual
ANALYSIS TIME	visual	visual	visual	visual
END OF CYCLE	acoustic and visual	acoustic and visual	acoustic and visual	acoustic and visual
DAMAGED PROBE	acoustic and visual	acoustic and visual	acoustic and visual	acoustic and visual
OVERTEMPERATURE	acoustic and visual	acoustic and visual	acoustic and visual	acoustic and visual
DIMENSIONS (WxHxD) mm (in)	198x132x319 (7.8x5.2x12.6)	135x95x230 (5.3x3.7x9.1)	168x110x269 (6.6x4.3x10.6)	155x95x275 (6.1x3.7x10.8)
WEIGHT Kg (lb)	5.6 (12.3)	2 (4.4)	3.6 (7.9)	3.8 (8.4)
POWER SUPPLY	115 or 230 V	230-115 V	115 or 230 V	230-115 V
POWER	700 W	140 W	550 W	400 W

OPERATING ACCESSORIES

CODE No

ECO 6 COD test tubes Ø 42x200 mm, 200 ml with cone NS 29/32, 3 pcs/box	A0000145
ECO 6 Sample rack for 6 test tubes Ø 42 mm	A00001043
ECO 6 Air refrigerator with ground cone	A00001041
ECO 6 Antisplash bell	A00001045
ECO 6 PTFE sheath for 29/32 cones	A00001042

OPTIONAL ACCESSORIES

CODE No

ECO 6 Anticorrosal reducer Ø 42 mm with 3 holes Ø16 mm	A00001044
ECO 6 Anticorrosal reducer Ø 42 mm with 1 hole Ø22 mm	A00001046
ECO 8/ECO 16/ECO 25 Set of 20 test tubes with Ø 16 mm	CM0091680
ECO 8/ECO 16/ECO 25 Holder for 12 round glass cells	CA0091636
ECO 16 Safety shield	A00001051
ECO 25 Test tube extractor	A00001039