

Industrial Discharge Effluent Monitoring

Industrial Organized Zone, Tuzla, Turkey

Case Study

Expertise in Sampling

Benefits of the 5800 Refrigerated Sampler:

- Environmental friendly, weather and chemical resistant housing.
- Double-wall and thick insulation.
- Active temperature regulation (-29°C – 49°C).
- Separate and modular design of electronics and refrigeration.
- Environmentally sealed controller (IP 67).
- Powerful and separate peristaltic pump (8.3 m lift).
- Non-contact liquid detector ensures accurate sample volume.
- Powerful compressor delivers energy-efficient, high-performance cooling.
- Compliant with ISO 5667-10 MCERTS



5800 Refrigerated Sampler

The Teledyne Isco 5800 refrigerated sampler is used to sample discharge effluent from manufacturers in an Industrial Organized Zone at Tuzla, Turkey to give a comprehensive and reliable source of water quality data.



Teledyne Isco 5800 refrigerated sampler installed at an industrial outlet

Organized Industrial Zones in Turkey

Manufacturing and production industries in Turkey are located in special Organized Industrial Zones (OIZs). The OIZs are designed to allow companies to operate within an investor-friendly environment with ready-to-use infrastructure and social facilities. The existing infrastructure provided in the zones includes roads, water, natural gas, electricity, communications, waste treatment, and other services.

Water Quality Monitoring in an Organized Industrial Zone

Chemical Producers Organized Zone (CPOZ) in Tuzla outside of Istanbul, Turkey has no separate treatment of their wastewater. A total combined discharge from 72 industrial sites and 69 sites with domestic water is discharged into the public sewer network. The water quality at the discharge point is routinely monitored and controlled by Istanbul Municipality Water and Waste Water Management (ISKI) and reports to the Ministry of Environment Istanbul City Office. Water samples are collected and tested in an accredited laboratory for water quality parameters like COD, TSS, pH, conductivity, and dissolved oxygen. If it is found that concentrations in the discharged water exceed limitations given by Ministry of Environment, ISKI will provide a fine to the management of the zone.

Management of the CPOZ is representing all industries in the area, but all industries are not discharging polluted water. A general bill distributed to all industries based on the fine received from ISKI is therefore not accepted. A "Polluter Pay" system was therefore developed.



5800 Refrigerated Sampler Controller

System options:

- Composite or sequential sampling
- Stores up to 4 programs
- Pacing by:
 - Constant time – constant volume
 - Constant time – variable volume (flow)
 - Flow – constant volume
- Large selection of bottle configurations in Glass and PE (from 4 x 20 liters to 24 x 1 liter).
- Communication with a single multipurpose cable:
 - Analog flow input (4-20 mA)
 - DC pulse flow input
 - 4 x digital alarm outputs
- Optional kit for sampling from pressurized pipes (10 – 300 PSI)

Site Requirements

Enotek, the Teledyne Isco distributor in Turkey, analyzed conditions at the site to determine how best to meet the CPOZ requirements. The first step was to design a permanent water quality monitoring station at the combined discharge point from the zone. This station design would require an automatic water sampler, a flow meter, and on-line water quality sensors. This way, the CPOZ could continuously control when water quality was exceeding limits. The next step was to control each industry discharging water to the common sewer network in the zone. It was imperative to ensure accurate and reliable samples of the water quality by installing an automatic water sampler at each discharge point. Water sample temperature of 4°C or below had to be maintained at all times.

Teledyne Isco 5800 Refrigerated Sampler

Based on the site requirements, Enotek determined that the most suitable product was the Teledyne Isco 5800 refrigerated sampler. A key advantage with this refrigerated sampler is its operating range of -29° to 49°C, meaning the sampler is able to provide accurate samples under any conditions at each site. The 5800 refrigerated sampler has three temperature sensors to actively regulate the sample compartment temperature.

The 5800's revolutionary design utilizes a tough, double walled, insulated polyethylene (LLDPE) cabinet to ensure reliable cooling performance in both outdoor conditions and harsh environments, without any extra protection needed.

A 24 x 1 liter bottle system is used to collect water samples. If water quality exceeds limits at the combined discharge point from the zone, the CPOZ management sends a team to collect samples from each industry to determine the source of the pollution. Water samples are also collected routinely every day.



5800 Refrigerated Sampler with 24 Bottle Configuration

Results and Feedback

The Chemical Producers Organized Zone management is impressed by the good and consistent performance of the Teledyne Isco 5800 refrigerated sampler.

“At the centre of our monitoring solution is the Teledyne Isco 5800 refrigerated sampler. Now we are not only monitoring the water quality, but effectively controlling it through the extensive monitoring program of the discharge from each industrial plant. A fair system is developed where the industries discharging the highest concentration have to pay for their discharge. We find that the Teledyne Isco 5800 refrigerated sampler is easy to use and ideal for harsh environments,” said Mr. Sefer Hayrunnaz AKBATI, Chemical Producers Organized Zone.

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