

Äager

# Industrial Noise Control

## Case Study

Industrial Silencers



# Industrial Noise Control

## Ergil's significant contribution to sustainable development in alternative energy sector: geothermal silencers



Kizildere III - Zorlu Geothermal Energy Power Plant

This case study gives ideas about the significance of geothermal energy in terms of sustainable development and the functions of ERGIL's innovative products mainly silencers and weir boxes to be effective solution for community concern in a geothermal power plant.

It is possible to explain some parts of this context by exemplifying process of designing, fabricating and delivering of 13 silencers & weir boxes to Zorlu Energy Group's Kizildere III - Geothermal Power Generation project which is a very important development for alternative energy sector in Turkey and international arena in terms of being a vital project to meet approximately 800,000 dwellings' electricity needs by increasing production capacity to 165 MW/.

# Estimated Emission Levels by Pollutant and Energy Source of Power Plants

## How effectively does geothermal help in improving air quality and decreasing greenhouse gas emissions?

At geothermal power plants, billows seen rising from cooling towers are composed of water vapor or steam, not burned fuel or smoke emissions, and are caused by the evaporative cooling system. A binary or flash/binary geothermal plant produces nearly zero air emissions; air emission levels at dry steam plants are considered to be slightly higher because even without human intervention, geothermal systems already contain naturally-occurring dissolved gases.

The exact relationship between human-caused and naturally occurring geothermal emissions at geothermal power plant sites is difficult to characterize and varies based on the site's unique resource chemistry, the resource temperature, type of power plant, and a number of other factors. In summary, though, geothermal technology is considered environmentally benign and any emissions are negligible when compared with using technologies that involve combustion of fossil fuels.



[(lbs/MWh)]	DRY STEAM	FLASH	BINARY	NATURAL GAS	COAL
CO <sub>2</sub>	59.82	396.3	-	861.1	2200
CH <sub>4</sub>	0.0000	0.0000	-	0.0168	0.2523
PM <sub>2.5</sub>	-	-	-	0.1100	0.5900
PM <sub>10</sub>	-	-	-	0.1200	0.7200
SO <sub>2</sub>	0.0002	0.3500	-	0.0043	18.75
N <sub>2</sub> O	0.0000	0.0000	-	0.0017	0.0367

Source: Climate Registry 2012, EIA 2013e, EPA 2009, EPA 2011, NRC 2010

# Zorlu Energy Group Addressed High Noise Levels At Its Kizildere Iii Geothermal Plant

## How do geothermal developers control noise levels?

During drilling, temporary noise shields can be constructed around portions of drilling rigs. Geothermal developers use standard construction equipment noise controls and mufflers, shield impact tools, and exhaust muffling equipment. Once the plant is built, noise from normal operation of power plants comes from cooling tower fans and is very low. Turbine-generator buildings, designed to accommodate cold temperatures, are typically well-insulated acoustically and thermally and are equipped with noise absorptive interior walls.

When noise issues arise, they can be dealt with effectively in ways that do not impact plant performance. **Zorlu Energy Group addressed high noise levels at its Kizildere III geothermal plant:** “In response to unexpected high noise levels experienced during the start-up of ERGIL team worked diligently to design Silencers and

Weir Boxes. The purpose of the Silencer is to significantly reduce the sound levels caused by the acoustical energy flowing in the discharge piping of the turbine, without affecting turbine performance and plant output.

The purpose of the Weir Box is when Tanks are filled with geothermal water and the silencer quietsens the process as the steam and steam fluids which come out of the double sludge system are removed and the geothermal water is then transferred to the liquid weir boxes, where level and flow measurements are carried out. “The final product not only addressed a technical issue but also helped the Zorlu Energy Group effectively respond to community concern about noise levels from the plant.



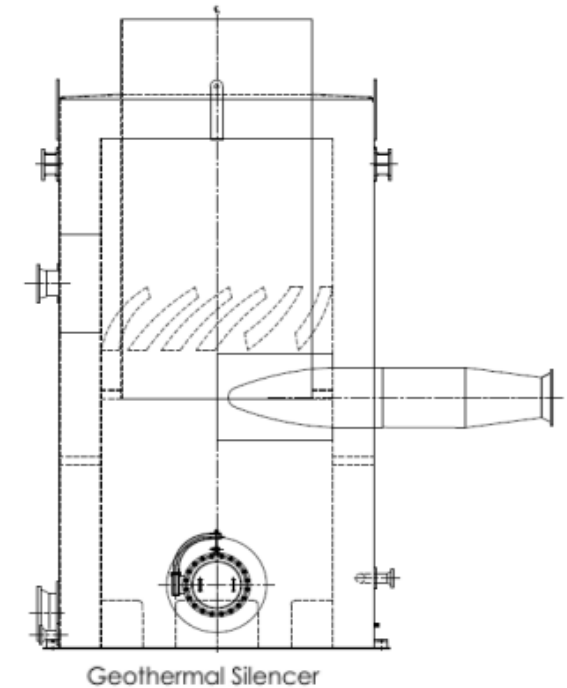
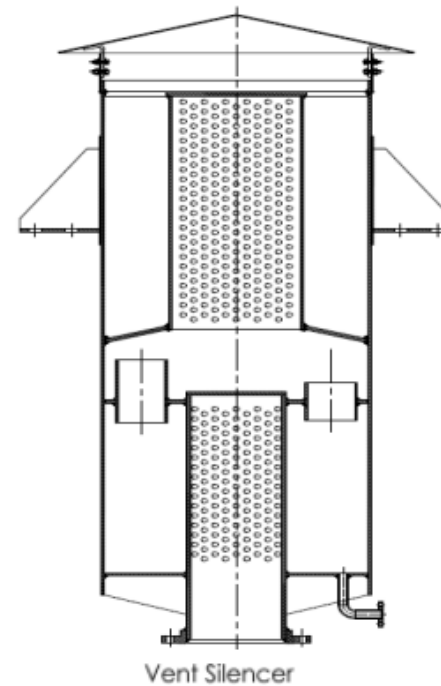
# The Construction Material Of Ergil's Silencers And Weir Boxes Is Carbon Steel

## What a

ERGIL's brine flash tank silencers (dia 3800mm) and weir boxes (4230x1800x1229mm) are designed as per ASME Sec. VII Div. 1. & AWWA D100, and painted with high temperature endurance Aluminium based, considering the extreme hot vapor and water conditions after quality controls of welding, assembling, nozzle orientation, painting and good practices by our experts. The construction material of ERGIL's silencers and weir boxes is carbon steel. ERGIL's silencers and weir boxes are easy to load and assembly and they provide effective solutions to increase the production of needed electrical energy capacity.

## What are the types of ERGIL's Silencers?

ERGIL's industrial silencers and mufflers are used to control and avoid the unwanted negative noise effect caused by a wide range of the industrial process. Some of these areas consist of engines, compressors, generators, and blowers. Often industries such as the power, oil and gas, petrochemical, refinery and pulp & paper markets require face negative effect of noise related issues. In order to avoid health, safety, and environmental issues, ERGIL designs, fabricate and install different type of silencers and mufflers as listed below



# We Deliver Top-Performing Silencers

## Blow Off Silencers (Vent Silencers)

ERGIL series silencers are designed to attenuate high frequency noise associated with venting of high pressure air, gas or steam into the atmosphere. These ruggedly designed silencers feature all welded construction with concentric acoustically packed panels.

## Exhaust Silencers

ERGIL Series Chamber silencers provide the best noise control across the entire audible range. The basic design incorporates non-resonant side tube arrangements to permit passage of the exhaust gases from one chamber to another. This creates a reversal of flow and develops a predictable amount of back pressure. Another important feature of chamber type silencers is the availability of side inlet exhaust connections. These units can also have side outlet exhaust connections. These side connections, while having little effect on the pressure drop, will in many instances greatly facilitate installation of the silencer by eliminating the need for elbows in the exhaust piping.

## Industrial Silencers

ERGIL Industrial silencers and mufflers are used to control and avoid the unwanted negative noise effect caused by a wide range of the industrial process.



# Let's Build More Harmonious Industrial Landscape Together!

## Services Offered by Ergil

ERGIL's QC Inspectors are well-experienced in all of most recent national regulations and international design requirements. ERGIL usually is kindly recommended to invite it's experienced supervisor during your first site operations to installation and testing process. ERGIL is also able to design and manufacture degassors and seperators for geothermal power generations. We understand it takes a unique person to work in the remote site industry. It is not a market for the faint-hearted, whether you are working in conflict areas or in remote oil and gas installations, we know that only a certain type of individual can thrive and grow in this environment. ERGIL has the highly qualified personnel and equipment to cater clients' needs, whether it is inspection, maintenance or construction.

### Our site services consist of;

- ▣ Site survey
- ▣ Facility or products inspection
- ▣ Maintenance of ERGIL and StorageTech™ products at the site

Field construction and installation.

ERGIL provides after sales inspection and maintenance services for ERGIL storage tanks, pressure vessels, storage tank equipment and firefighting equipment. We are committed to supplying right spare parts for years in the shortest time possible



## Äager GmbH

### Germany Head Office + R&D + Sales

Herzogspitalstraße 24  
Munich 80331  
Germany  
T: +49 89 9040 5200  
W: www.aager.de  
E: sales@aager.de

### Azerbaijan Sales + Warehouse

Ahmad Racabli 222  
Royal Plaza  
5th floor, Suite 8  
Baku, Azerbaijan AZ1106  
T: +994 (12) 564 2256  
E: sales@ergil.com

### U.A.E. Sales + Warehouse

Jumeirah Lake Towers, X2 Tower 1906  
P.O. Box: 123661 Dubai, U.A.E.  
P : +971 4 450 8051  
F: +971 4 450 8041  
E: sales@ergil.com

### Turkey Head Office + Sales

Ağaoğlu My Office 212  
No: 3 B Blok /175  
P.K 34218 Güneşli – Bağcılar  
Istanbul / Turkey  
T: +90 212 485 40 07  
F: +90 212 485 40 42  
W: www.ergil.com  
E: sales@ergil.com

### Turkey Factory + Engineering + R&D + Sales

Mersin Tarsus OSB.13.CD.NO:7  
P.K: 33540 Mersin, Turkey  
T: +90 324 676 44 04  
F: +90 324 676 44 03



### case study series

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