

# High-Clean-DX, A New Technology for Removing Dioxins from Fly Ash<sup>†</sup>

## 1. Introduction

Recently, dioxin emissions from waste incinerators are posing a serious social problem, and countermeasures are urgently required.

The Ministry of Health and Welfare issued a guideline in Jan. 1997, and set environmental standards on dioxin concentrations in flue gas. The guideline refers to the necessity of regulating the total pollutant load. It is expected that the reduction target for dioxins contained in fly ash needs to be set at a level below 0.1 ng-TEQ/g in view of the total pollutant load regulation expected to be introduced in the future.<sup>1)</sup>

JEF Engineering has developed a new technology for removing dioxins from fly ash by volatilization, and has commercialized it under the name of High-Clean-DX. The first incinerator using this technology is the Eco Center Banjo located in Saiki City, Oita Pref., which was started up in Apr. 2003, and is continuing stable operation.

## 2. Features of High-Clean-DX

As shown in Fig. 1, in this system, fly ash is heated in the high-temperature airflow. Dioxins and other organic compounds are removed by volatilization and transferred into the gas phase. Dioxins and other organic compounds transferred into the gas phase are decomposed by the Pt honeycomb catalyst with high oxidation activity and rendered harmless. Through this process, fly ash becomes completely free of organic compounds that

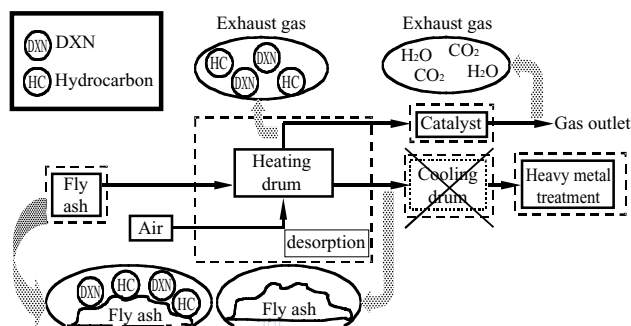


Fig.1 Flow chart of "High-Clean-DX"

cause the reformation of dioxins. Therefore, this system does not require a rapid cooling process for preventing reformation of dioxins in the downstream.

## 3. Highly Efficient Fly Ash Heating Drum

The High-Clean-DX system employs a highly efficient fly ash heating drum as shown in Fig. 2. By stirring effected by high-temperature air blown in from the bottom and an agitating device, fly ash charged into the heating drum forms a circulating homogeneous fluidized bed. This movement induces a high heat transfer coefficient between fly ash and the inner wall of the heating drum. The contact efficiency between fly ash and high-temperature air is also high. These two heating paths, one through the heating drum wall and the other through the high-temperature air, enable highly efficient heating.

The agitating-fluidized-bed-type heating drum has the following advantages:

- (1) The heating drum is small in scale, which brings about an excellent heating efficiency.
- (2) Melted fly ash adhesion to the heating drum wall is prevented, because it is not necessary to increase the wall temperature excessively.
- (3) Dioxins are easily removed by volatilization due to an excellent contact efficiency between fly ash and high-temperature air.

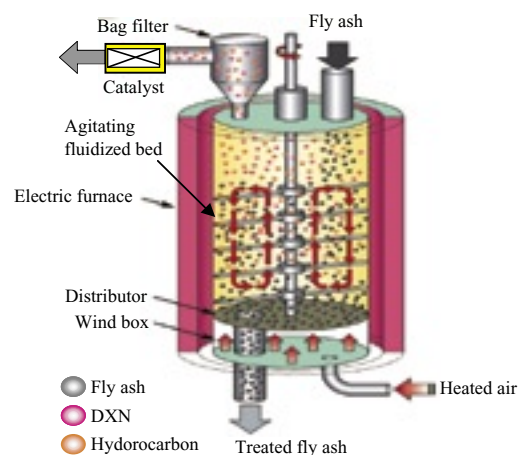


Fig.2 Agitating fluidized bed heating drum

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#### **4. Closing Remark**

In addition to its excellent performance in removing dioxins, the High-Clean-DX system provides an advantage in reducing the amount of heavy metal stabilizing agents. Utilizing these advantages, JFE Engineering is promoting a wide use of this system. In June 2003, the High-Clean-DX technology received the Chairman's Award for Excellent Environmental Equipment from the

Japan Society of Industrial Machinery Manufactures.

#### **Reference**

- 1) Sakai, Shinichi. Haikibutsu-gakkaishi. vol. 8, 1997, p. 322.

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