

# Sections used in Pollution Control Equipments-ESPs

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In this Twentieth series of articles on Rollforming we will discuss about Rollforming of Sections used in Pollution Control Equipments i.e. Electro Static Precipitators (ESPs). ESPs are air cleaning devices which are increasingly gaining in popularity especially in the advanced countries.

They use this type of control over normal ventilation systems as they offer many advantages which are enumerated as follows:

High collection efficiency which is greater than 99.5% is obtained on particles as small as 0.01 micrometer. The operating costs are low and large volumes can be handled effectively. A variety of air flow rates may be used. Particulate concentrations from 2.0 to 250,000 milligrams per cubic meter can

be handled. They can be used for higher air temperatures.

Many industrial operations produce exhaust gases that contain dust, fly ash (unburned

constituents from burning), fumes (fine elemental particles such as cadmium, sulfur and lead) and mist (such as coal tar), which is bad for human health and environment. A prime example is the production of fly ash in coal fired electric power generation. A lot of other industries also produce particulate air pollution on a large scale.

The predominant such industries are- thermal plants, aluminium, Iron & Steel, Non Ferrous Metals & Glass making industries, Pulp & Paper, Petrochemical, Cement industries, Waste Incineration units etc. Especially countries like USA wants to go smokefree by the year 2010. The American Lung Association has been stressing for enacting stringent smokefree laws.

Even everyday activities, such as cooking produce particle concentration in the air, often at unacceptable levels. Although particulates can be removed from air by mechanical filters, for industrial pollution electrostatic precipitation, usually in the form of the electrofilter is the answer.

The electrofilter is the oldest application of static electric principles dating back to 1906. In the simplest terms, a precipitator is a large box. The dust laden gases are drawn into one side of the box. Inside, high voltage electrodes impart a negative charge to the particles entrained in the gas. These negatively charged particles are then attracted to a grounded collecting surface which is positively charged. The gas then leaves the box up to 99.9% cleaner than when it entered.

ESPs have a negatively charged electrode near a positively charged collecting plate. A high voltage charge passed through the electrode makes an electrical field between the electrode and the grounded collection surface. Airborne particles pass between the electrodes. They become negatively charged and are attracted to the positively charged collection plate(s). ESPs may be used as general air cleaning systems. They are usually

hung from ceilings or walls in various numbers or combinations. The two major sections of a precipitator are the chamber and the electrical power unit.

The chamber has discharge (negative) and collection electrodes (positive). It also has a self-cleaning system, an air distribution device and a precipitator shell and hopper. Periodically, the collecting electrodes are rapped mechanically to dislodge collected particulate, which falls into hoppers for removal.

A typical collecting electrode system consists of Rollformed Panels that maintain dimensional

stability and uniformity of transmitting rapping energy. To enable maximum performance over long-term operation, the individual non interlocked panels are specifically designed to accommodate thermal expansion during temperature variations and maintain electrode alignment throughout the life of the installation.

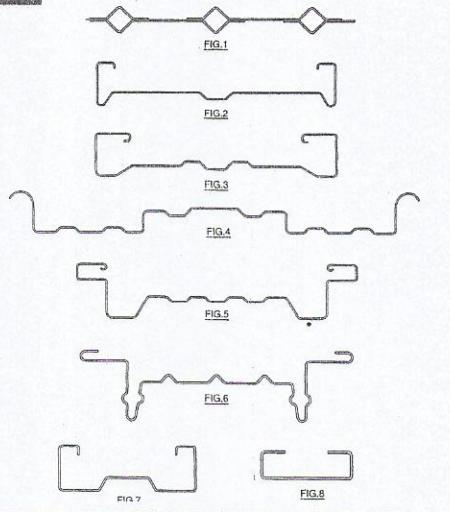
These sections are available in 16 or 18 Gauge carbon or stainless steel, in lengths upto 15 meters. Because of the requirement of maintaining electrode gaps over long lengths flatness, camber and twist tolerances of the sections are to be properly maintained.

Fig. 1 to Fig 7 are a few examples of the Rollformed ESP Sections being used. Fig.8 is used for discharge electrodes. There are many types of ESP Sections in use and also still many more are going to be developed in the years to come all over the world.

The author had been involved in developing several rollformed ESP sections during his working with multinational companies as well as consultancy work.

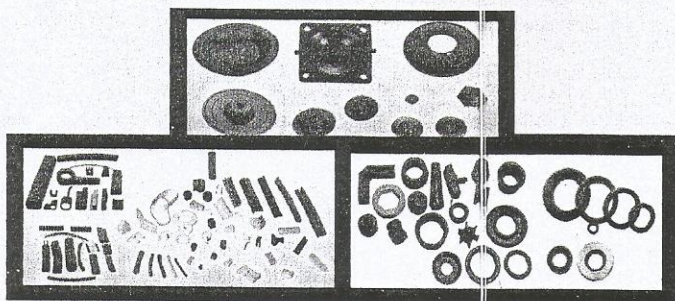
From the sections shown one could see the advantages of adopting Rollforming technology to produce intricate and long ESP sections of consistent quality and dimensions.

The author Mr A S Shetty is the honorary editor and the chief executive of Sedvik Industries. For your queries you can contact him at 080-25452669 or email him at sedvik@vsnl.com



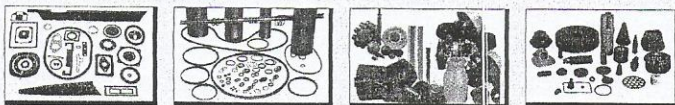
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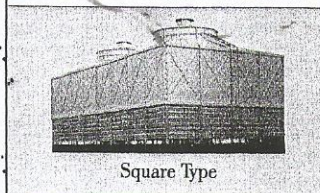
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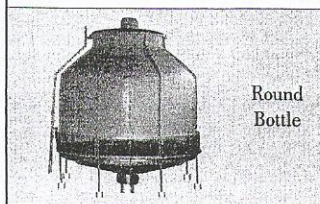
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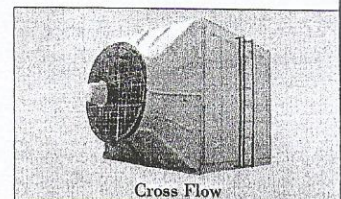
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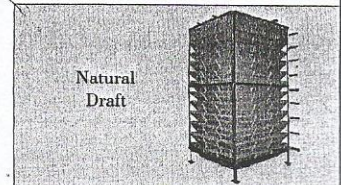


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