



Small Duct High Velocity Heating, Cooling and IAQ Systems

Hi-Velocity Systems Case Study

Spunstrand Manufacturing Facility

Spunstrand manufactures filament wound fiberglass reinforced plastic ductwork, dampers, scrubbers, and tanks in a 12,000 square foot facility in Wallace, Idaho. The winter temperatures average in the 20°F range (-6°C), and the heating was previously done with a 3.2 million BTU air handler. The natural gas costs in the winter months were over \$7,000. The other issue was the poor mixing of the air in the building. The 15' ceilings drew up the heat, and left the floor area cold. Also, the styrene fumes and dust particles that are heavier than air, would settle toward the floor causing negative impact on the air quality.

The new HVAC System called for 10 Energy Saving Products HV-70, 3 Ton Hi-Velocity Air Handlers and is supplied by five Monitor MZ40C 142,000 BTU condensing boilers. The ductwork was made by Spunstrand and utilized drilled outlets rather than flex duct. This provided longer air throws, and much better mixing of the air in the plant. Floor to ceiling temperatures are more even, and the air movement also lowers the styrene fumes at the floor working level. The Hi-Velocity units were also used to air curtain the large roll up doors which has helped reduce heat loss when the doors are open. With the heating load reduced from 3.2 million BTU forced air, to 710,000 BTU in hydronic heat with the Hi-Velocity Air Handlers, the heating bill has been reduced by more than half. The indoor air quality has improved with better air mixing, reduced temperature gradients, and improved particle reduction using the HEPS Merv 13 needle fiber filters on the inlet of the air handlers. They can be seen as the blue box attached to the air handlers.

The new system allows Spunstrand to zone individual areas based on production loading and personnel occupation, and will also allow air conditioning to critical areas in the summer. Three (3) of the units were provided with cooling coils, and this combined with the constant circulation feature will keep the plant cooler and better ventilated in the hot summer months.



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