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Hot Smoke Tests

Temperature resistant artificial smoke can be a very useful aid in simulating the movement of "hot smoke" in atriums, workshops, hangers, offices, car parks etc, allowing the practical testing of smoke ventilation systems, smoke detection systems (beam, conventional optical or ionization, aspirating or video), and associated systems in a controlled yet safe environment.

The ViCount smoke system supplied by Corona was designed to add realism to "Hot Fire" training exercises within the military and fire training establishment, where the use of water based smokes is ineffective (the heat literally vaporizing the "smoke" effect and destroying it as a visible effect).

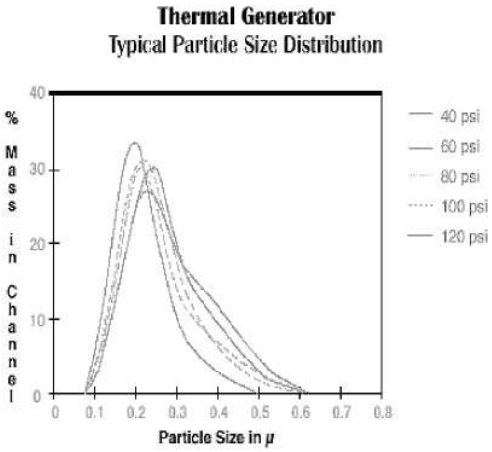
The temperature resistance of the ViCount smoke also makes it a very effective tool in the simulation of "hot smoke".

High Temperature Resistance of ViCount Smoke

Airbus Industries - Hamburg

1.0 Physical Properties of ViCount Smoke

The smoke from the ViCount has a particle size of just 0.2 micron (mass median diameter), giving it a very settling velocity in still air of < 8mm/hr. The small particle size means that the chemical concentration required to achieve reduced visibility is dramatically reduced compared to conventional smoke systems, and the exceptionally high boiling range of the smoke chemical ensures that it can be introduced into rising airstreams of very high temperature without breaking down.



Data provided by AEA Harwell

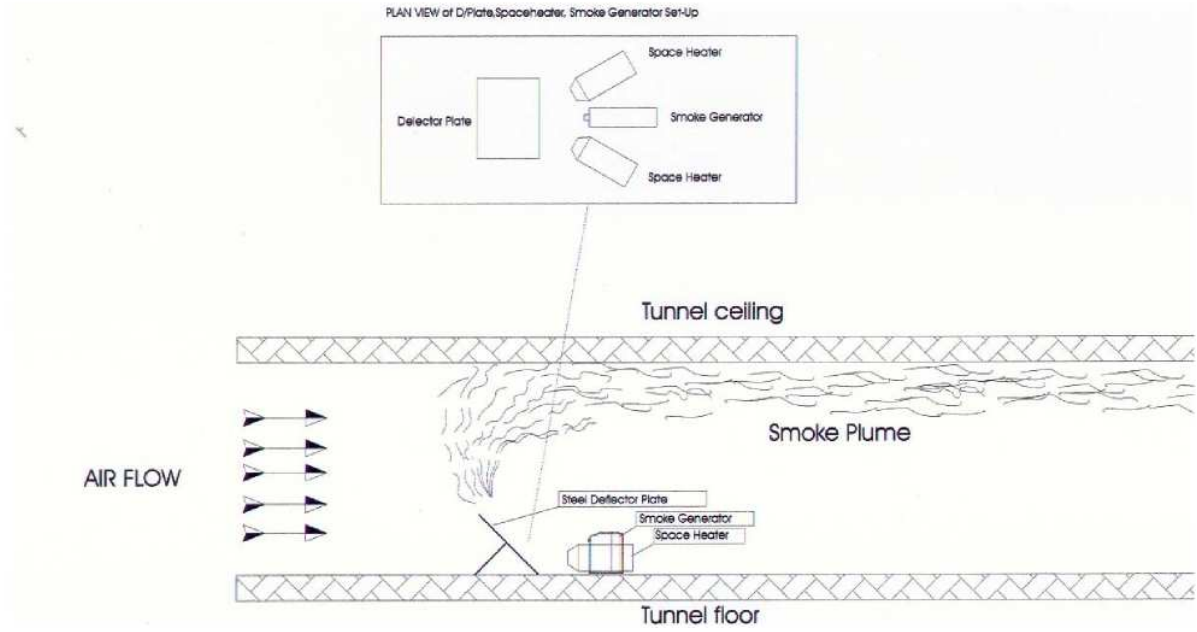
2.0 Adding thermal buoyancy

With such a low settling velocity, ViCount smoke can effectively be described as being of neutral buoyancy. In other words, the smoke will travel where the air is traveling. If smoke is introduced into a thermally buoyant air stream, it will rise with that air.

2.1 Simple thermal buoyancy

Conventional propane fuelled space heaters, used in conjunction with a simple deflector plate and ViCount smoke system can produce a very effective thermally buoyant plum of smoke, rising 50 metres plus in practical trials. The set up can very quick, and very simple. Typically the space heater would heat the deflector plate for 1 minutes prior to smoke production, and then smoke produced onto the same plate. The smoke is entrained in the rising hot air, and "hot smoke" is produced.

Typically the Space Heaters would be rated at 300,000 BTU, and one or two units would be used for a typical test.



2.2 Burn Tray

Some of our clients have used a simple burn tray (open propane fuelled) as the heat source, and introduced ViCount smoke above the said tray. Ideally we would recommend that the smoke is entrained in air that is < 250C for optimum effect. (See Airbus Industries photo)

2.3 Representative Burn Trays

If a specific amount of "heat" is required for an test or experiment, we would recommend the approach of the Fire Research Station (Part of Building Research Establishment), who carry out thermal modeling, both CFD and practical. To produce a "fire" of a known and quantifiable output they use trays of burning methylated spirit, introducing the ViCount smoke into the resulting rising air.

3.0 Other Considerations

3.1 Safety

The ViCount smoke is primarily designed as a training aid for fire and emergency evacuation purposes. The smoke has been independently tested to ensure that it is non-toxic and non-flammable. Full Health and Safety data pack is available on request

3.2 Cleanliness

The very small particle size means that only a small amount of Smoke Chemical is required to achieve dense plume of smoke. Glass atriums, warehouses, aircraft hangers and tunnels have effectively been tested with Thermally Buoyant Smoke without any traceable deposition.

3.3 Simplicity

From arrival on site to being in a state ready to produce ViCount smoke takes as little as 15 minutes. Smoke production can then take place on demand. The recommended ViCount Type (v5000/180/2.2) has sufficient Smoke Chemical storage capacity to produce smoke at full output for approx 1.75 hrs continuously if required. No "reheat" cycle is required

4.0 Recommended equipment

Smoke Generator	Corona ViCount v5000/180/2.2kw (110 v or 230v available) 5kg capacity CO2 cylinder
Smoke Chemical	Smoke Oil 180

Ancillary Equip Deflector Plate if propane space heater is used as recommended Or Burn Trays