

Angel Fire Brand of Indoor Pyrotechnics

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Recently, a supply of indoor (proximate audience) pyrotechnic items was supplied for our casual (non-quantitative) evaluation. The claim to fame for this product line is reputed to be its low smoke output and its high purity flame colors. The principals of the company (DMD Systems, LLC) are some of the same researchers that previously developed and wrote about similarly performing pyrotechnics in the *Journal of Pyrotechnics*.^[1,2] We were willing to provide such a cursory evaluation (without cost) because of our general curiosity regarding these products.

The Angel Fire products were definitely found to perform exceptionally well. Although side-by-side comparisons with other manufacturers' products were not performed, it was estimated that the Angel Fire products generated no more than approximately half of the smoke of typical items with similar performance characteristics. The colors appeared to have higher purity (and in some cases much higher purity) than typical items on the market. Also, the colors seemed significantly brighter than those from typical items on the market.

The authors have no information about how the price of Angel Fire products compare with those of other producers. However, if the costs are roughly comparable, being able to produce items that have a distinct performance advantage aesthetically (better color and lower smoke), as well as presumably having lower potential health impacts (less smoke), should prove to provide a major competitive advantage for DMD Systems' products.

Below, in response to our request, is some information provided by DMD Systems, about their company and products.

Two explosives chemists, seeing a need for low-smoke theatrical pyrotechnics, formed DMD Systems LLC. DMD specializes in the manufacture of Angel Fire brand indoor pyrotechnic special effects

(see www.angelfirepyro.com, or call 505-583-2278 for more details). Our products burn with vivid colors and large flame envelopes, yet produce little smoke.

The formulations are mainly composed of stabilized nitrocellulose with patented burn rate modifiers. Our gerbs and line rockets utilize a patented "core burn" geometry to produce sufficient gas pressure without a traditional-style clay nozzle. This "nozzleless" configuration enhances the size of the flame envelope and reduces the need for smoke producing colorants. Currently DMD Systems is only distributing through both Luna Tech and RES Specialty Pyrotechnics in the US. We currently offer red, orange, yellow, green, blue, purple and white 3s x 20', 10s x 10' gerbs and 3s wire rockets with or without Ti flitter as well as 10 s flares with or without Ti. Special order items with custom spark heights are available on request. In addition, star mines in all the above colors plus hot pink and lime-green are available in two different heights, either 15-20' range or 35'. All mines contain approximately 40 to 50 stars and are available in any combination of colors as well as with or without Ti flitter. In the near future DMD will introduce a line of low-smoke colored waterfalls, larger colored gerbs, and uncolored end-burning gerbs in a variety of sizes, durations and heights.

References

- 1) D. E. Chavez and M. A. Hiskey, "High-Nitrogen Pyrotechnic Compositions", *Journal of Pyrotechnics*, No. 7, 1998.
- 2) D. E. Chavez, M. A. Hiskey and D. L. Naud, "High-Nitrogen Fuels for Low-Smoke Pyrotechnics", *Journal of Pyrotechnics*, No. 10, 1999.