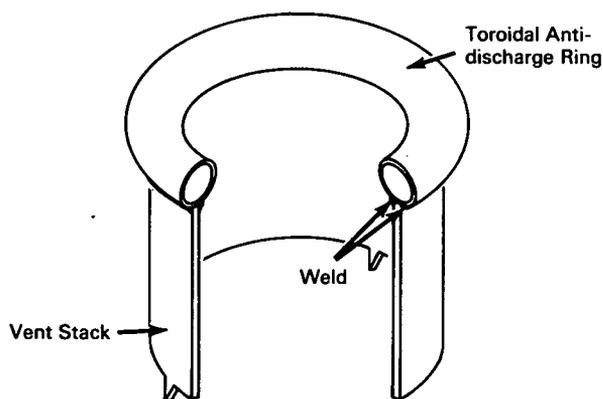


# NASA TECH BRIEF



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## Toroidal Ring Prevents Gas Ignition at Vent Stack Outlet



The venting of combustible gases, such as hydrogen, to atmosphere can result in undesirable ignition of accumulated gas-air mixtures in the vicinity of the vent stack outlet should static discharge occur. Gas flow through a piping system during venting induces a static charge on the gas stream and any included solid or liquid particles contacting the pipe walls. As the gas reaches the sharp edges of the vent outlet, static discharge may occur either by complete electrical breakdown (spark discharge) or by partial electrical breakdown (corona discharge).

To prevent such unwanted discharge, a toroidal ring is fabricated to the dimensions of the vent stack outlet and welded to it. This ring inhibits the flow of current at the vent stack lip by removing the cause of turbulence characteristic of a sharply defined vent exit. Additional preventive effect is realized by sizing the vent piping to assure low velocity flow and by pro-

viding the piping system with a good path to earth ground.

### Notes:

1. In general, tests have shown that hydrogen gas at flow rates no greater than 1.0 lb/sec may be safely vented through stacks averaging 30 to 40 ft. in height without antidischarge modification. For greater flow rates, antidischarge modification should be employed unless normal ambient air movement is sufficient to rapidly disperse the vented gas to prevent combustible accumulations in the stack outlet vicinity.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
Reference: B67-10098

(continued overleaf)

**Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: T. R. Spring  
of North American Aviation, Inc.  
under contract to  
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