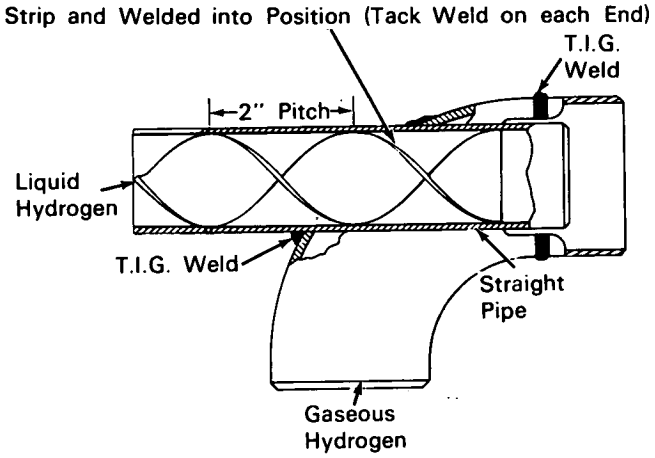
NASA TECH BRIEF

Lewis Research Center

Low Temperature Fluid Blender

A simple blender can be used to supply hydrogen at temperatures of from 289°K to 367°K (60°R to 200°R). The temperature of the hydrogen is controlled by using the blender to combine the flow from a liquid hydrogen tank (276°K) and a gaseous hydrogen cylinder (550°K).



The blender consists of a straight pipe with a swirler and a $\frac{\pi}{2}$ rad. elbow, as shown in the figure. The liquid hydrogen passes through the swirler and is sprayed into the gaseous hydrogen passing through the elbow. The mix and breakup of liquid droplets in the gaseous hydrogen are effected and a homogenous mixture is obtained downstream.

Blenders of this design could be used in other applications where the flow of a controlled low-temperature fluid is desired. An example is in steel mills where methane is used to heat coke ovens. The injectors that mix room-temperature methane with air for burning frequently burn out. A possible solution would be to cool the injector with low temperature methane supplied by a blender in conjunction with an added liquid methane supply.

Note:

No additional documentation is available. Specific questions, however, may be directed to:

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Patent status:

No patent action is contemplated by NASA.

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