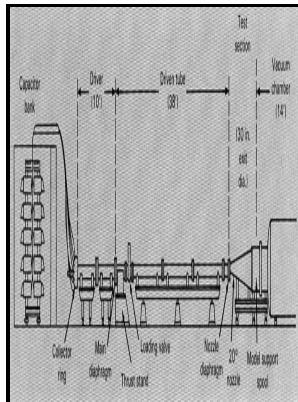


Hypersonic shock tube

California Institute of Technology, Guggenheim Aeronautical Laboratory - Hypersonic Ludwieg Tube



Description: -

-Hypersonic shock tube

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Guggenheim Aeronautical Laboratory. Hypersonic Wind Tunnel.

Memorandum-- no. 18Hypersonic shock tube

Notes: Contract number: DA-04-495-Ord-19

This edition was published in 1954



Filesize: 10.45 MB

Tags: #Shock #Waves #@ #Marseille #I

Hand

This opens the door to some serious areas of research. Continuous progress in wind tunnel engineering and in instrumentation available for flow measurements in hypersonics over the last decades has resulted in a specific wind tunnel configuration that meets these requirements.

Hand

The test time should be in the order of 100 ms in order to allow for a range of useful flow measurement techniques. The Reddy tunnel can be effectively used for basic level experiments in hypersonic flow studies including measurement of pressure profiles, heat flux, lift and drag etc. Spherical micro shock waves few millimetres radius are generated in water, by instantaneously depositing electrical energy 100 J between two stainless steel electrodes 1 mm apart for about 0.

Facilities

The chemical shock tube 1 CST1 is an aluminium tube with inner diameter 50. The shock tube named as Reddy tube works solely with the effect of human force, and the driver gas is pressurized by manual action of a plunger rod. The present contribution describes one of the successful designs of this kind, along with data that characterize the quality and capabilities of this facility.

Facilities

Numerical methods used for the determination of hypersonic flowfields, including chemical effects, are presented and applied to steady and unsteady configurations. An underwater electric discharge device has been designed, fabricated and successfully used for creating spherical micro shock waves. Reddy tunnel, another facility developed in-house, is aimed at bringing the field of shock waves to every educational institution.

Hand

A convergent-divergent nozzle followed by a test section—dump tank assembly is attached to the end of the driven section to realize the Reddy

tunnel. The Reddy tube, and its extension, the Reddy tunnel are two instruments targeted specifically at young scientists and engineers who are at the cusp of entering the field. Any non-ideal effects such as incident shock wave attenuation, boundary layer growth etc.

Facilities

The high voltage applied between the electrodes can be varied to generate shock waves of requisite strength. Currently, research groups are employing the Reddy tube for studies such as combustion of atomized fuel, traumatic brain injury in rats etc.

Facilities

Hand-operated shock tube-the Reddy tube The Reddy tube is a miniaturized shock tube that can be housed on a table top.

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