

INFRARED SIGNATURE SUPPRESSION SYSTEM TECHNOLOGY

Though there are many IR suppression philosophies present, film cooled multi ring educator--diffuser type IR suppresser integrated with exhaust line of Diesel best suited for present application, as it imposes relatively low back pressure for a given level of suppression and view angle protection and reduces lock-on range to less than 10 Km.

Design considerations for IRSS device is based on availability of space within the funnel, weight, view angle protection required, for a given exhaust flow rate, temperature and size of the exhaust piping apart from permissible back pressure on engine.

The design and development of IRSS devices involves aero-thermal design calculations, Computational Fluid Dynamic analysis for flow simulation and optimization, scale model studies and prototype testing.

IRSS device consists of ejector nozzle, mixing tube and multi ring diffuser. Nozzle together with mixing tube acts as educator, where in large quantities of ambient cool air is sucked in to mixing tube and mixes with hot exhaust gas. At the same time, ambient air enters through radial gaps provided between the adjacent diffuser rings. This continuously moving film of cool ambient air forms an insulating layer between metal surface of diffuser ring and exhausts plumes, there by avoids convective heat transfer between metal and plume.

The IRSS devices designed and developed by NSTL has been accepted by IHQ (Navy) for P-17 Class, ASW corvette and IAC. IRSS device already installed on INS Shivalik and cleared all sea trials.

DRDO has been granted patent on "An Infrared Signature Suppression Device" with Patent No.IN238202 dated 29 Jan 2010 for design of IRSS device.