THE USE OF BACKSIDE TEMPERATURE MEASUREMENTS IN SYNERGISTIC EFFECT TESTING

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The existence of a combined thermal - blast interaction leading to an enhanced vulnerability of the investigated target, a radome, has been shown in the French - German experiment presented at this symposium by E.Canton (1].It is reasonable to assume that the mechanism of this interaction follows the following pattern: The irradiation causes a thermal wave to travel through the radome material. This wave will have raised the temperature along its path, possibly causing considerable (though at least partly reversible) deterioration of the properties of the material when the blast wave arrives at the target. If the deterioration which exists at this moment has already become, or still is, decisive for the structural strength of the tested specimen, an enhanced damage will result from the impact of the blast wave. Thus, the damage effect will strongly depend on the arrival time of the blast wave. That is just what has been observed experimentally. We call this effect the 'synergistic effect', an effect which will only be detected in a combined blast - thermal test.

To explain the outcome of the aforementioned experiments, it is therefore necessary to estimate the change of properties of the thermally-loaded material at the arrival time. A logical step towards attaining the required knowledge would be the determination of the spatial temperature distribution within the specimen at the blast wave arrival time.