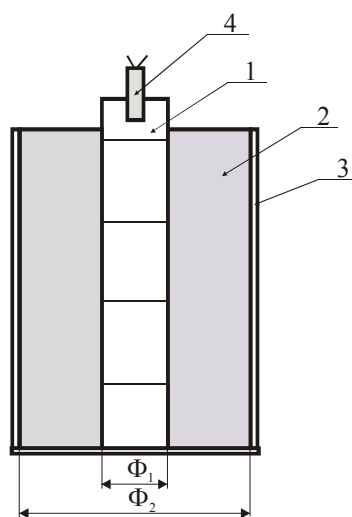


# INVESTIGATION OF BLAST WAVE CHARACTERISTICS FOR LAYERED THERMOBARIC CHARGES

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The research on explosion of cylindrical layered charges containing phlegmatized RDX and a mixture of ammonium nitrate (AN) and aluminium powder (Fig. 1) was carried out. The mixtures with 25, 50 or 75 % wt. of ammonium nitrate were used in the investigation. The pressure blast characteristics and the light output of explosion cloud were measured in bunkers which have different size (25 and 40 m<sup>3</sup>) and level of opening (a ratio of holes' surface to the total bunker surface). Overpressure amplitudes and impulses of the incident waves as well as the total impulses were analysed.



**Fig. 1.** A scheme of investigated layered charge: 1 – phlegmatized RDX, 2 - AN/Al mixture, 3 – paper tube, 4 – detonator,  $\Phi_1$  – diameter of the internal charge (16 or 25 mm),  $\Phi_2$  – diameter of the paper tube (62 mm)

The analysis of the results leads to the following conclusions:

1. The measured blast wave characteristics and the light outputs of explosion clouds confirm the initiation of ammonium nitrate decomposition and aluminium powder combustion by the shock wave generated by the detonation of the RDX charge.
2. Mass of used RDX charge influences slightly aluminium reaction degree in the blast process. However, this influence is noticeable in the case of charges with the biggest contents of Al powder (75 %).
3. Oxygen from air is utilized undoubtedly for the combustion of aluminium during the powder expansion.
4. The ratio of charge mass to bunker volume influences the oxidation level of Al powder.