

Table 1: Properties of ANFO explosive

| Properties | ANFO |
|----------------------------------|------------------------|
| Density (g/cm ³) | 0.90 – 0.95 |
| Detonation velocity (m/s) | 2000-2500 |
| Detonation transmission (cm) | Contact |
| Oxygen balance (%) | + 0.11 |
| Gas volume (dm ³ /kg) | 990 |
| Heat of explosion (kJ/kg) | 4250 |
| Explosion temperature (K) | 2700 |
| Initiation | Pentolite booster 300g |

Table 2: Sieve analysis of ground ANFO explosive

| Sieve size (mm) | Mas retained (g) | Percentage retained (%) | Cumulative percentage retained (%) | Percentage passing (%) |
|-----------------|------------------|-------------------------|------------------------------------|------------------------|
| 0,5 | 0,00 | 0,00 | 0,00 | 100,00 |
| 0,25 | 51,29 | 27,27 | 27,27 | 72,73 |
| 0,15 | 61,41 | 32,65 | 59,92 | 40,08 |
| 0,075 | 71,23 | 37,87 | 97,79 | 2,21 |
| 0,01 | 4,16 | 2,21 | 100,00 | 0,00 |

3. Laboratory tests and results

All tests have been conducted in the Laboratory for testing explosive materials, in the Department of Mining Engineering and Geotechnics at the Faculty of Mining, Geology and Petroleum Engineering, at the University of Zagreb.

These tests included a large number of trials to determine the optimal blasting parameters as well as favorable explosive and auxiliary materials and their relations. The results of the trials will be used for making a print of a picture on a larger scale.

Unlike detonography described in the works of Evelyn Rosenberg, explosive materials used and their order (layers) were different. The major difference was that a mould was above the metal plate and made of linoleum instead of plaster. The picture for this detonograph has been found on Google images search page.

For the laboratory tests, an ANFO explosive has been used with properties as shown in **Table 1**.

Ammonium Nitrate has been ground to fine particles and then mixed with Fuel Oil in a volume ratio of Am-

**Figure 1:** Steel zinc coated tin casing**Table 3:** Test results depending on explosive charge

| No. | Mass of explosive used (g) | Surface of metal cube (cm ²) | Velocity of detonation (m/s) | Concentration of explosive per surface (g/cm ²) | Distribution of components |
|-----|----------------------------|--|------------------------------|---|---|
| 1. | 42,95 | 35,00 | 2112 | 1,23 | Hard linoleum with linocut, aluminium cube, two layers of rubber |
| 2. | 39,40 | 35,00 | 2564 | 1,13 | Hard linoleum with linocut, aluminium cube, two layers of rubber |
| 3. | 41,31 | 35,00 | 6818 | 1,18 | Hard linoleum, leaf, aluminium cube, two layers of rubber |
| 4. | 41,46 | 35,00 | 1604 | 1,18 | Hard linoleum with linocut, aluminium cube, two layers of rubber |
| 5. | 38,92 | 35,00 | - | 1,11 | Soft linoleum with linocut, aluminium cube, two layers of rubber |
| 6. | 41,18 | 35,00 | 3030 | 1,17 | Soft linoleum, soft linoleum with linocut, aluminium cube, two layers of rubber |
| 7. | 42,67 | 35,00 | 1973 | 1,22 | Two layers of soft linoleum, soft linoleum with linocut, aluminium cube, two layers of rubber |
| 8. | 44,41 | 35,00 | 2857 | 1,27 | Rubber, carved rubber, aluminium cube, two layers of rubber |
| 9. | 45,06 | 35,00 | 2290 | 1,29 | Rubber, soft linoleum with linocut, aluminium cube, two layers of rubber |
| 10. | 41,77 | 35,00 | - | 1,19 | Hard linoleum with linocut, aluminium cube, two layers of rubber |
| 11. | 42,09 | 35,00 | - | 1,19 | Soft linoleum, hard linoleum with linocut, aluminium cube, two layers of rubber |
| 12. | 42,07 | 35,00 | - | 1,20 | Soft linoleum, hard linoleum with linocut, aluminium cube, two layers of rubber |