Shaped Charges.

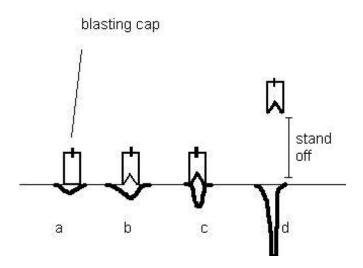
Here is discussed the conically shaped charge.

The main goal of a shaped charge is to cut a tiny hole threw a thick metal plate, most of the time it is used for penetrating thick armed steel.

There is used a cone shape of metal inside a tube, this cone is called the liner.

A good explosive with a high VoD like PETN can also perform very well without an cone if it is a plastic explosive. Like semtex or C-4.

The liner is placed inside the tube like shown at c.



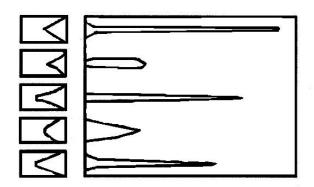
These are a result of tests:

- a) Without an cone shape in the charge.
- b) With an cone shape in the charge.
- c) With a liner* in cone shape in the charge.
- d) With a liner* in cone shape in the charge at a certain height.

This cone will be pressed inside out because of the explosive behind it, and the point of the cone (10% of the complete cone) will shoot out, and the rest of the cone, the sides will collapse inside out and form a tail behind the point downwards.

This will not be solid metal flying down but the metal will become liquid by the enormous pressure and then will be evaporised and then turn into plasma, and then finally cut a hole in whatever it is standing on, and all this happends in 8/1000th of a second.

It will perform better on steel than on wood, since wood has a lower density and will be more like if you would compare hitting on wood or hitting on glass with an hammer, wood will have a dent and glass will break.



Here you can see the result of the jet formed by using different forms of liners.

^{*}a cone made out of copper (or another "soft" metal).

First off you will need a circle cut out of a coke can.



From this circle you will need to make a cone, this cone will be called the liner as already mentioned above, you will need to make a cut in the circle to exactly the middle.



I used a circle which is 50mm diameter. This is then folded and curled up to a cone, you might practice with paper first, to get the feeling of it.



Then after you made the cone you need to glue it. I used super glue which is hard in a few seconds.



After you've glued your cone so it will stay like you want it, you need to insert it into a PVC tube or similair. The PVC tube is 25mm ID, so when you're curling up your cone you can measure the diameter of it so that when it comes to 25mm diameter you know you can stop rolling it up and hold it with your fingers and then glue it. Actually using a martini glass without the stem, would be ideal even beter than a copper cone. But it is a little bit more expensive since you have to buy a lot of martini glasses and break the stem of it, and then "blow it up".

The PVC tube here used is 25mm ID, and 90mm long, and ofcourse the cones diameter is also 25mm OD.



With my hot glue meltgun I glued the cone into the PVC tube.



This is how it should look like from the other side, make sure the cone's point is exactly in the middle or else the jet will not go straight down.





15g AN fertilizer grade.

1,55g TCAP.

*

Okay this is wrong I did a new test with 13gr AN and 3gr AP (2:8 ratio) and this works MUCH better.

*



Quick tutorial on making APAN.



Poured the APAN in the tube.

Pressed the APAN a bit.



This is the blasting cap, made out of a drinkingstraw, with pressed TCAP.



After taping the blasting cap up and inserting the fuse, I pressed it into the APAN carefully, then pressed the APAN slightly, and added more APAN, and pressed that too.



Put some tissuepaper on top to prevent the explosive from falling out, and then tape it up.



The stand off, these are 3 pieces of a metal stick, which is only 2mm diameter. The ends are bent a bit, so it will give the shaped charge better stability when standing on top of the target.



Here you can see the standoff attached to the shaped charge, on the second picture you can see the cone again, and on the third picture if you look well you can see the standoffs.

With standoff 1:10 ratio APAN.



The charge placed next to the other charge which I will tell you more about later on.

With standoff 1:4 ratio APAN.



Without standoff:



Compare:



1st test: APAN 16g with standoff 3cm high legs; 2:8 ratio APAN. 2nd test: APAN 16g with standoff 3cm high legs; 1:10 ratio APAN. 3rd test: APAN 15g without standoff; 2:8 ratio APAN.