

Ball Launcher Project

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Introduction

Ball launchers are sports equipment which increase training density. The problem with these products are the cost, which can range from €1000-4000.

Main project aims:

- Create a cost-effective ball launcher.
- Challenge users and increase training density.
- Durability.
- Cater for different sized balls.



Results

Mild steel parts were tested through solidworks simulation. The ball velocity was tested across distances 5, 10, and 15 meters. A football was tested with no initial velocity (u), followed by the initial velocity of ball shoot drop (4.4 m/s).

Football	V (km/h) u = 0 m/s	V (km/h) u = 4.4 m/s
5 meters	35.7	85.7
10 meters	25.5	39.3
15 meters	22.6	25.4

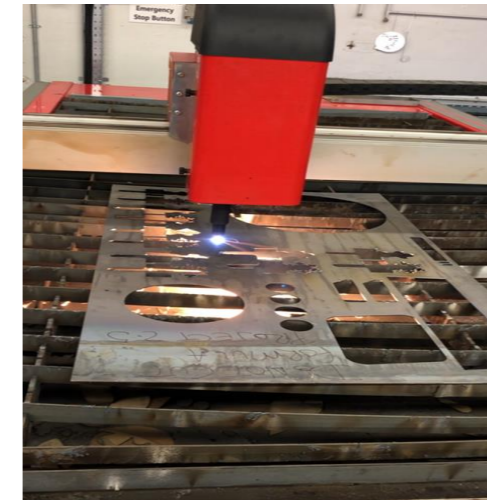
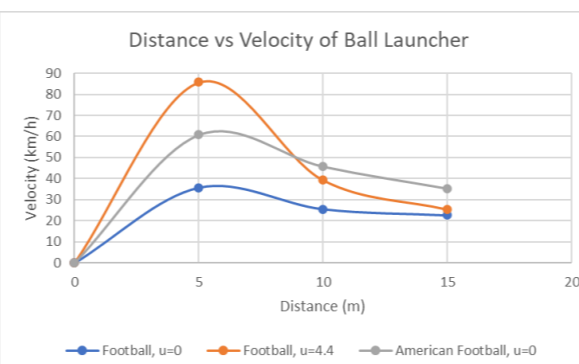
Table 1 – Football Test

American football test:

American Football	V (km/h) u = 0 m/s
5 meters	60.8
10 meters	45.8
15 meters	35.3

Table 2 – American football test

The relationship between the three tests can be seen by the three curves on the distance vs velocity graph.



Conclusions

- Project performed as expected.
- Materials tested in the solidworks simulation studies could withstand loads of 10,000N with ease.
- The ball launcher performed best across 5 meters and is best suited at this distance.
- Times recorded over 5 meters were most consistent.
- The American football launched at a faster velocity than the football as it was 0.1kg lighter.

Materials

- Low carbon mild steel.
- DC motors, a controller, two lithium-ion car batteries, 17-amp wiring, crocodile clamps, block & spade connectors, and a battery inverter cable.
- Pneumatic tyres and castor wheels.

Methods

- TIG & MIG welding.
- Guillotine cutter.
- Schechl bending machine.
- Power tools.
- Hydraulic tube bender.
- Plasma cutting machine.

