

CASE WEIGHT, VOLUME, AND VELOCITY.

In the quest for more consistent results – especially at very long range – some work was done on sorting cases in the hope that more consistent velocity could be achieved before the Worlds in Raton.

At the time I was shooting a slightly modified 6.5 X 55 Swede. Others had moved to a 7mm in a 284 case although some SAUMs were starting to appear.

There were various issues.

- 1/ Did weight sorting of cases correlate at all with internal Volume sorting ?
- 2/ Did either improve velocity consistency ?
- 3/ Were the methods suggested practical to apply to large numbers of cases ?

THESE QUESTIONS ARE AS RELEVANT TODAY AS THEY WERE BACK THEN ALTHOUGH I MUST POINT OUT THAT THE CONSISTENCY OF QUALITY CASES SEEMS TO HAVE IMPROVED.

This was before LabRadars became available and all measurements were taken with one or two Magnetospeeds for these trials. I had two of these and had compared one against the other. They were better than any other Chronographs I had, and more practical to use, but never showed a really solid correlation with each other. Later on I acquired what was probably the first LabRadar in Australia. Some of these experiments were eventually repeated with the LabRadar and the correlation between sorted cases and velocity became more certain. Unfortunately, I cannot seem to find these results. Maybe they will turn up some day.

Right from the beginning, a small group from North Queensland realised that Weight Sorting would be seriously degraded unless all of the cases were from the same batch of brass, and all were fired and trimmed the same number of times.

Initial tests showed that any determination was right on the edge of our available equipment. Because of this, I deliberately searched for cases as far from the mean weight as possible. It is a common engineering technique to deliberately magnify the variable we wish to concentrate on.

We did try filling the cases with water but went to Methylated Spirits because this did not form a convex meniscus and seemed to more uniformly fill cases. It's wetting ability and lower surface tension were useful but I always thought it was too messy to be practical. I used a few powders available to me – deliberately choosing ones with smaller kernels. I see in my (very inadequate) notes that for a more careful experiment I repeated - filling each case 5 times - and took an average. Here are my original notes.

After much trial, my 'Standard' way to fill cases was to pour from a scale pan nearly full of powder above a tray. The spout was placed in contact with the very edge of the case top. This ensured consistent drop and gap.

I poured at a consistent steady rate until the case was full and overflowing. A conical hill of powder forms above the neck. For this to be uniform the spout must be the same small amount over the case top. Of course much powder is spilled so this needs to be done over a tray. The pan and spout is removed while still pouring powder.

There has to be a better way !!!!

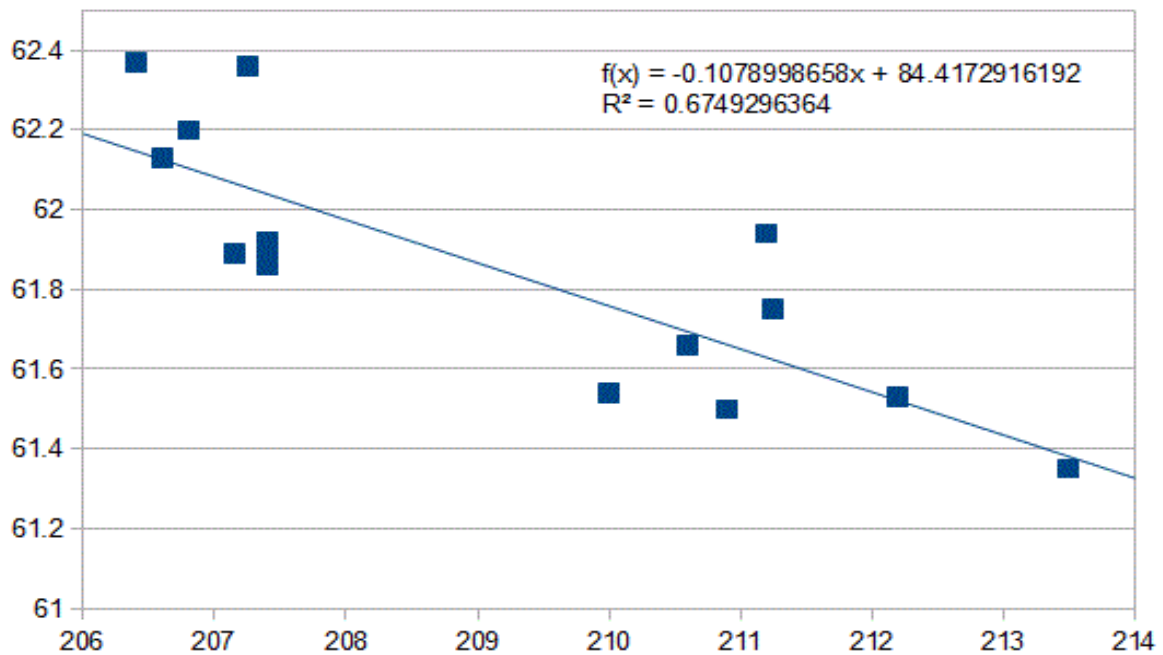
Correlation between WEIGHING and VOLUME measurement of cases.

Volume was determined by filling with 2206H powder in a standard manner, then weighing the powder.

MUCH experiment was done to achieve a consistent way to fill the cases. Because this was to determine relationships an Av of about 5 attempts was done. This is a real pain and hardly usable for large numbers of cases but was considered necessary to prove one way or the other if Volume rather than Weighing is best.

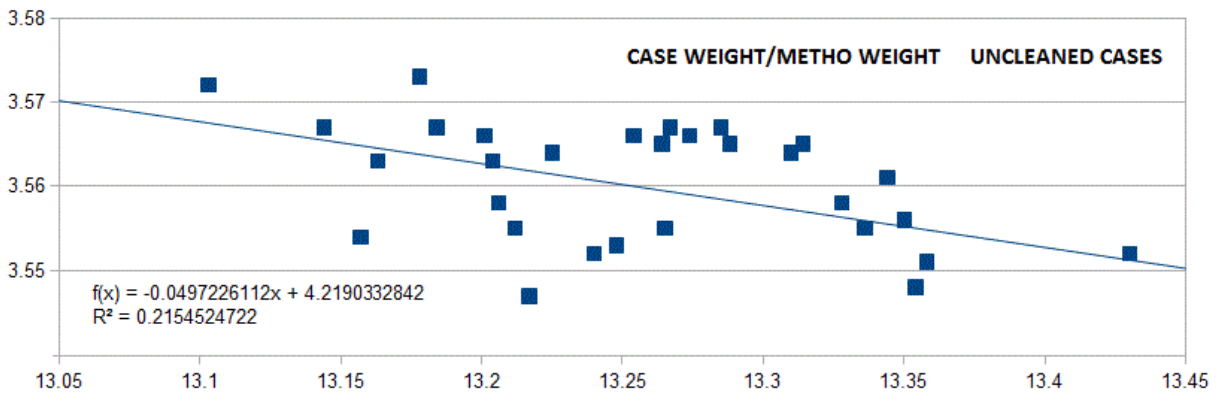
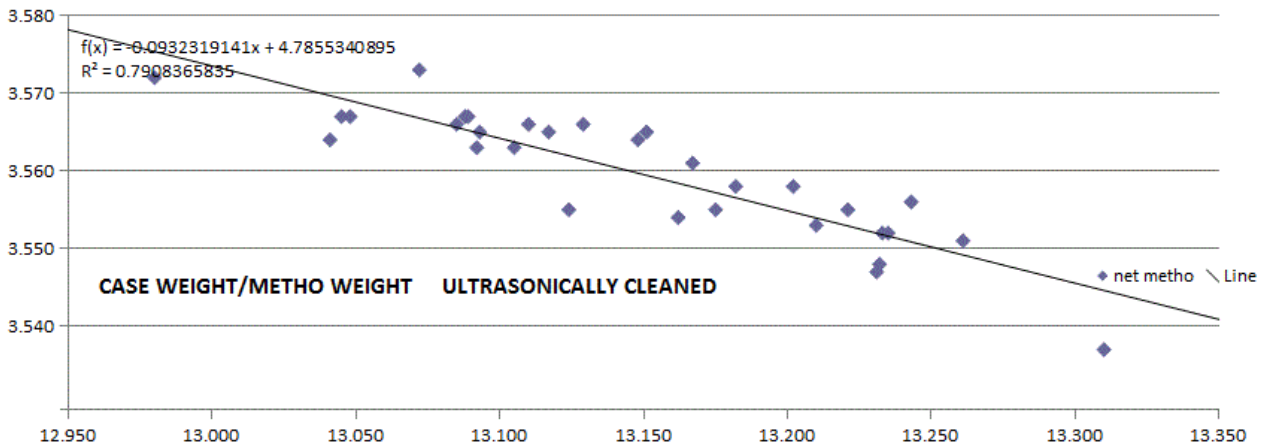
I do not claim this is the best method – just a record of what I did. In fact there has to be a better method. But this was all about testing an hypothesis as carefully as possible.

Wt	Filled 2206G hilled wt 2206H
206.8	62.2
211.2	61.94
206.6	62.13
211.25	61.75
206.4	62.37
212.2	61.53
207.25	62.36
213.5	61.35
207.15	61.89
210.6	61.66
207.4	61.92
210.9	61.5
207.4	61.86
210	61.54
207.4	61.88



There is no doubt that there is a correlation between mass of case along the bottom and mass of powder that filled the case. It is far from perfect but looks useful.

While I did this experiment using Powder, DaveMc persevered with Methylated Spirits to fill the cases. From memory, these were 284 cases which had been fired previously. He definitely achieved a better correlation than using powder for the case volume measurement.



NOTE. THESE WERE WELL USED CASES AND THE MEAN CARBON DEPOSIT FROM EACH SHELL WAS 100mg.

The positive thing about all of these measurements was that – at least for the cases we used – case weighing did correlate fairly well with internal volume. It is very fast and not messy and in my opinion it is the only practical way to indirectly batch cases by ‘volume’.

Many claim that, because of variations in case geometry and metallurgy, weighing cases is of little use. While there is undoubtedly some truth to this, it is not what we found.

Maybe a better method will be developed eventually !

Peter Smith.

And I must acknowledge input from DaveMc and Marty Lobert in some of these experiments.

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