Imperial Ammunition

I am pleased to be able to inform members of our findings from the investigation into reports that a number of competitors experienced unexplained wide shots and/or larger groups than usual or expected during last year's Imperial using the issue Lot of GGG ammunition (020-GGG-18).

We have been fully supported by GGG (supplier of the ammunition) and Sierra (manufacturer of the bullet) in our investigations, and I should record my thanks to both for engaging in a positive and honest manner.

Our investigations have included dismantling 2018 and earlier batches of Imperial ammunition; analysing and assessing key components including sectioning bullets; re-assembling various combinations of components and extensive test firings.

We also analysed completed questionnaires of 91 competitors and 47 sets of plot sheets; to record anomalous shots by competition, rifle type, barrel characteristics, competitor, target location on the range, shot number and time of day (as an indicator of temperature). Again I would like to record our thanks to competitors who assisted us in the survey.

The key findings are as follows:-

(1) Sectioning the 2018 batch bullets identified a small number where the lead core was shorter than expected, not fully formed and where the forward extension appears to be asymmetric. Such bullets may result in a ‘flyer’. Other bullets with a longer and more fully formed core exhibited asymmetric voids. These bullets would possibly result in the enlarged groups experienced rather than ‘flyers’ (see images (a), (b), (c) & (d) attached).
(2) Bullets with such shorter cores are likely to be on the lower range of weight distribution.
(3) The size of groups from cartridges re-assembled using components from the 2018 batch varied with the weight of bullets used. Groups using the lighter weight bullets were significantly larger than those using the heavier weight bullets from the 2018 batch.
(4) Anomalous shots in the surveyed competitors appear to have occurred on average one in every 100 rounds.

It is well known that bullets with asymmetric voids or other features in the core are likely to be unbalanced in flight; one of a number of factors that can produce “flyers”. The greater the dynamic imbalance, the further the bullet is likely to impact from the remainder of the group. Such bullets are extremely difficult, if not impossible, to identify prior to loading and would produce larger groups and ‘flyers’ even if handloaded by an expert. Weighing bullets prior to loading will not identify those which are imbalanced.

It should be emphasised that the length of the core, and in particular the length of the core extension is NOT, of itself, believed to be the cause of the anomalous shots or enlarged groups. It appears that the bullets with the shorter extensions were those in which the extension was also asymmetric and consequently had some dynamic imbalance.

The result of plotting anomalous shots identified from the 47 sets of plot sheets is consistent with the possibility that asymmetric voids or other defects were present in the lead core of some bullets, causing wide shots and / or larger groups than expected. Test groups using Sierra 2155 bullets (taken from a lot of known accuracy) which had been deliberately modified to be dynamically unbalanced exhibited a similar distribution of shots to the plot of anomalous shots derived from the plot sheets provided by competitors.

We visited GGG's factory in Lithuania in November 2018 to discuss our findings and review quality control for the production of the 2019 batch. In addition to usual procedures:-

(1) Sierra will increase the inspection regime during the production of future orders of this projectile to ensure the high levels of consistency delivered over many previous years.
(2) A sample of bullets will be sent from GGG to the NRA for analysis and testing ahead of the manufacture of the 2019 batch.
(3) GGG will increase their testing regime for the bullets and completed ammunition
(4) The NRA will increase our own testing regime of the 2019 batch ammunition at Bisley.

We consider both Sierra and GGG to be manufacturers of good quality, keen value ammunition and components; their products have served the target shooting community well for many years.

No manufacturing process can be perfect all of the time and when concerns occur it is essential that potential problems are reviewed in an open and honest manner. We have been reassured by the professional response from both GGG and Sierra; and I have therefore confirmed the ammunition order for the 2019 season and 150th Anniversary Imperial meeting due for delivery to Bisley in the Spring.

The price per round of GGG 155gr Imperial ammunition for 2019 is 89 pence; exceptional value in the current economic climate.

Finally, I must record my grateful thanks to John Bloomfield for his exemplary technical assistance; and Charles Dickenson for his diligent and thorough analysis of competitor questionnaires and plot sheets.

We are excited at the prospect of a very special 2019 Imperial – the 150th Anniversary – and look forward to welcoming our target shooting friends from across the world to Bisley in the summer.

Andrew Mercer
Secretary General **15th January 2019**

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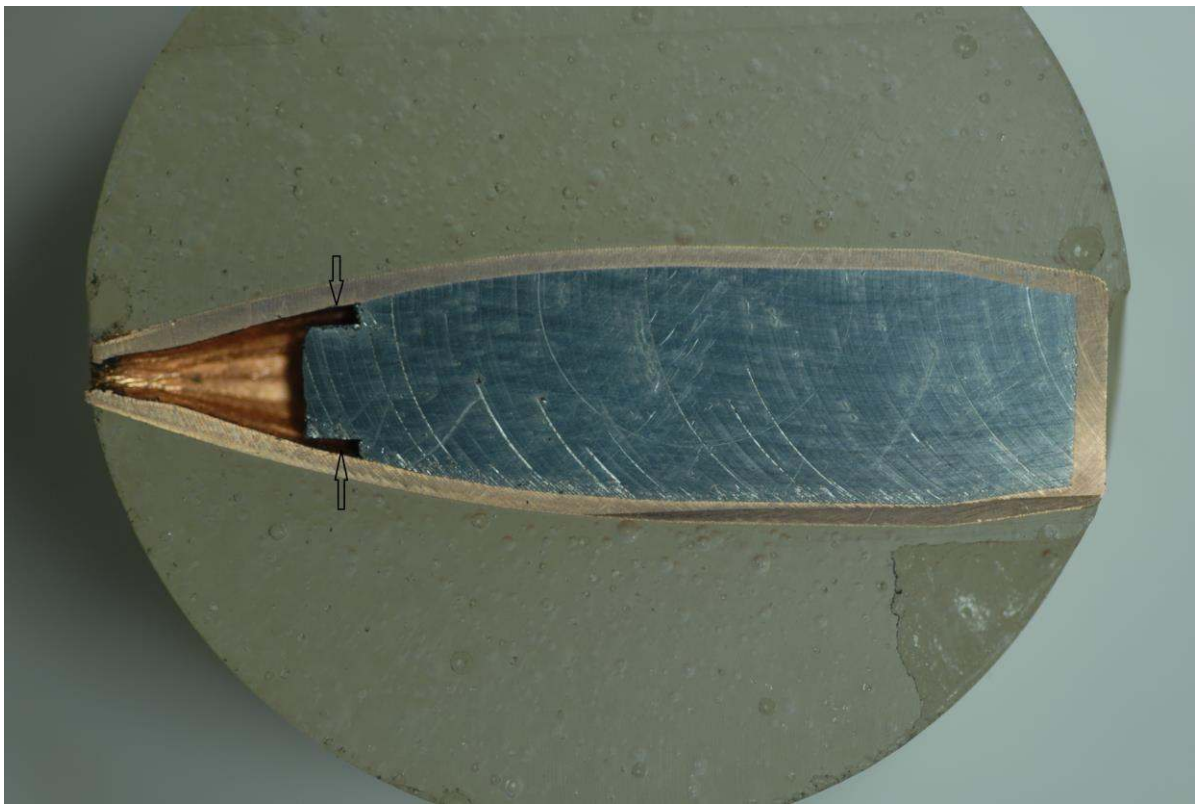
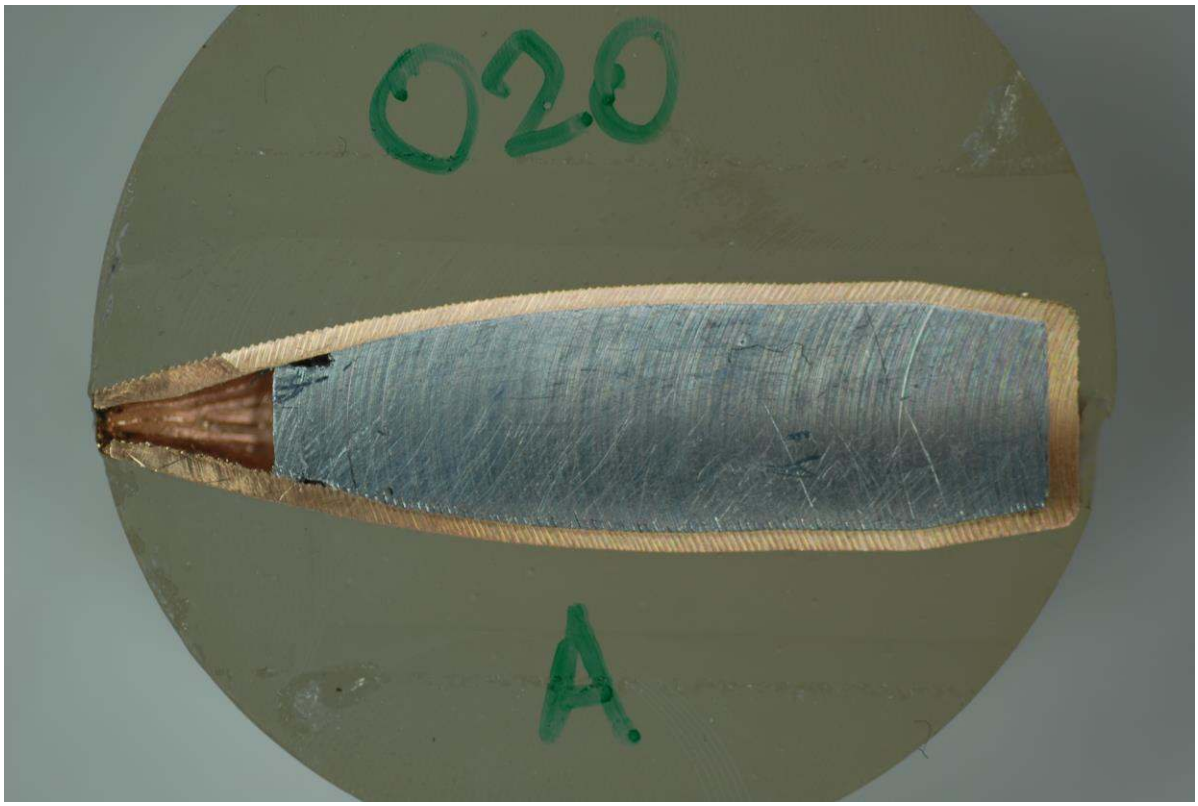
(A) 2018 Batch – sectioned bullet showing short core with asymmetric forward extension



(B) 2018 Batch – sectioned bullet with longer core but asymmetric voids



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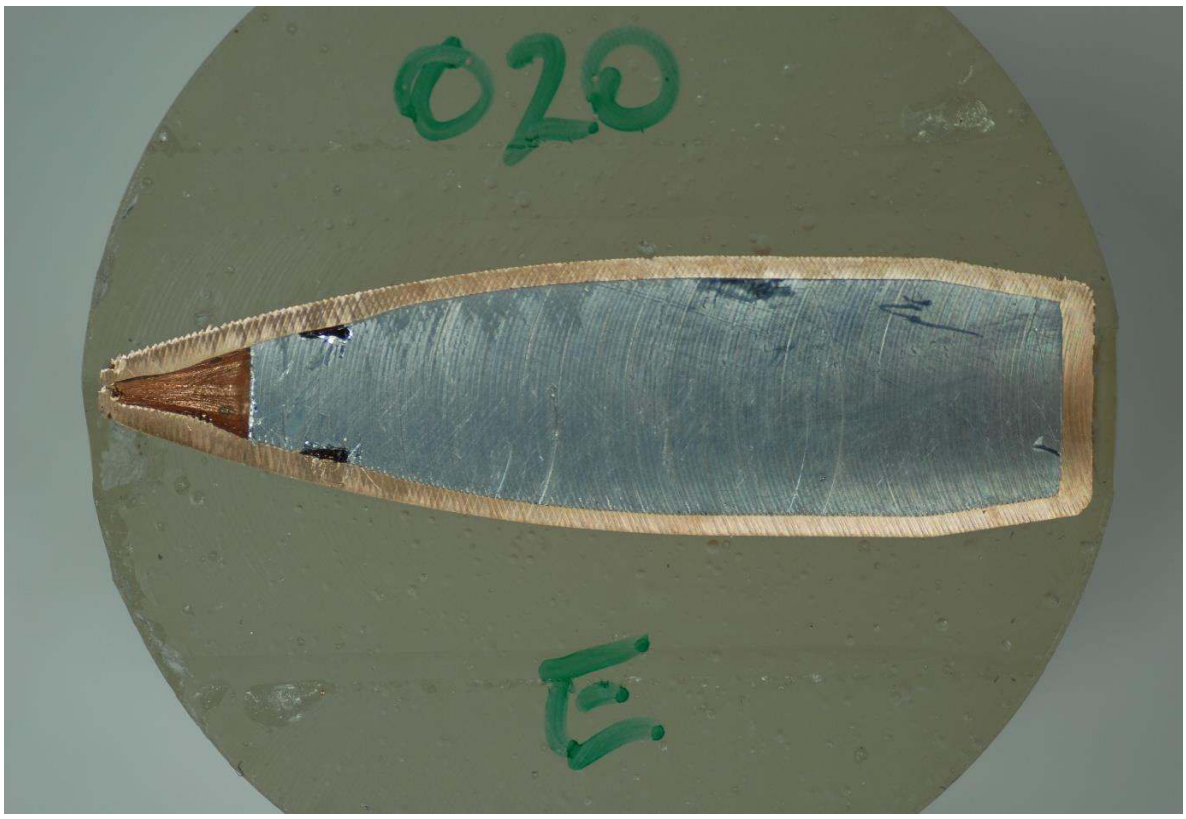
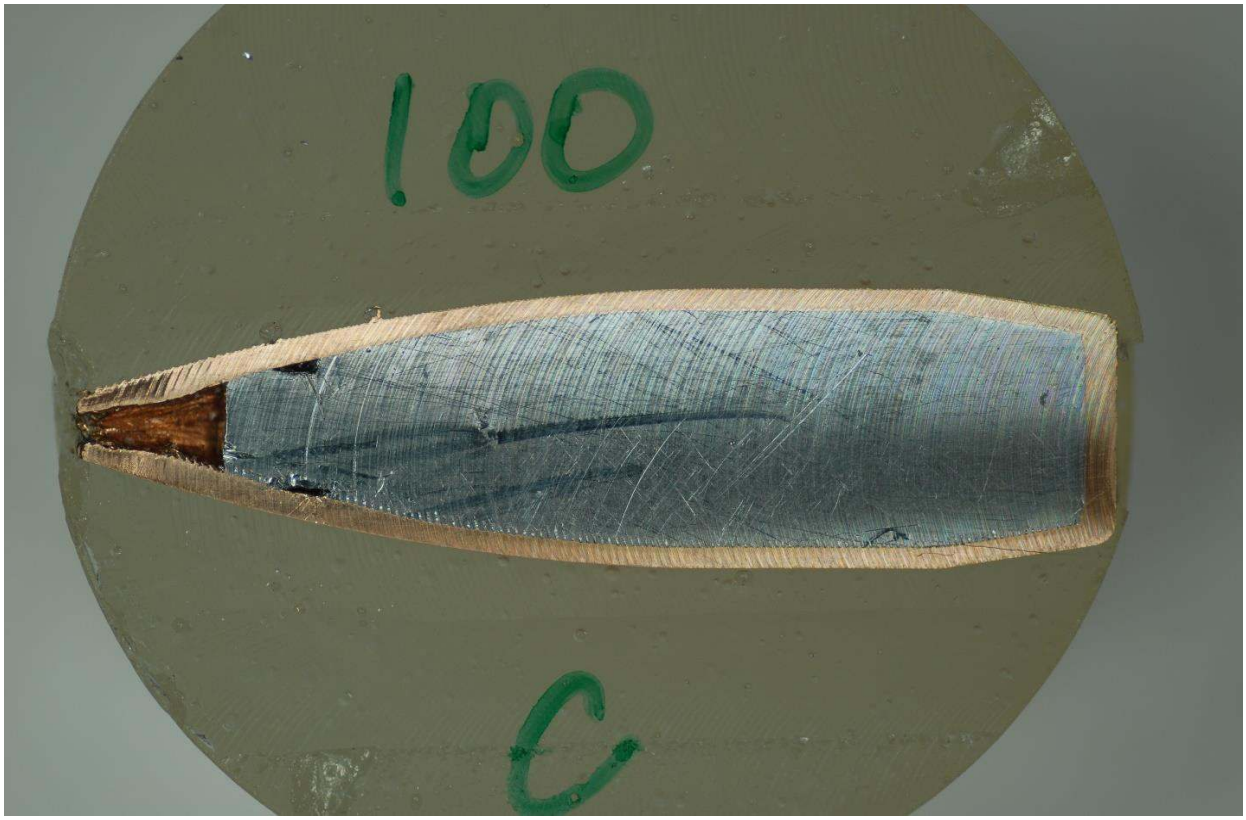
(C) 2018 Batch – sectioned bullet with longer core but symmetric voids



(D) 2017 Batch (Lot 100) – sectioned bullet



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