



Product Validation Report

New Reduced length J Young NMR tubes from GPE Scientific for use with Bruker Autosamplers SampleCase & SampleXpress

The product validation was undertaken at Bruker UK limited in Coventry UK by Peter Gierth, Team Leader, NMR applications.

Background.....

SampleCase

Standard length J Young NMR tubes although suitable for the majority of applications are too long for the use with the SampleCase and activate the safety cut-off



fig.1

Bruker probes require a 20mm height see Fig 3. so the J Young NMR tube cannot be pushed down to clear the safety cut-off arm.

SampleXpress

Due to the extended length (when compared to standard length NMR tubes) J. Young NMR tubes are ejected with excessive wobbling of the sample. The additional weight of the J Young tubes also causes problems as the autosampler gas flow has to allow for both J Young and standard NMR tubes . These issues can be eliminated by adjusting the gas flow rate but this isn't ideal. Bruker UK engineer Pete Simpson reported that 'there is quite a small window whereby the heavier tubes are ejected successfully but the gas flow rate isn't so high that too much wobble occurs. Also, this means that light samples have the potential to be ejected too quickly, meaning that they could potentially jam in the sample guide occasionally, requiring manual recovery'



GPE Solution

GPE Scientific (owner of J Young brand) has developed a new shorter length J Young valved NMR tube for use with SampleCase and SampleXpress autosamplers. This has solved the height problem for the SampleCase as shown Fig.2



Fig 2

As illustrated above, the height is reduced so it is no longer necessary to attempt to exceed the max depth of 20mm in the probe to gain clearance above. The validation test also included this check (Fig 3)



Fig 3



When used with SampleXpress the reduced weight the of the new J Young NMR tube ensures that the tube is ejected without excessive wobble and that the gas flow no longer needs to be adjusted for standard NMR tubes, see video clip demonstrating this (Fig 4)

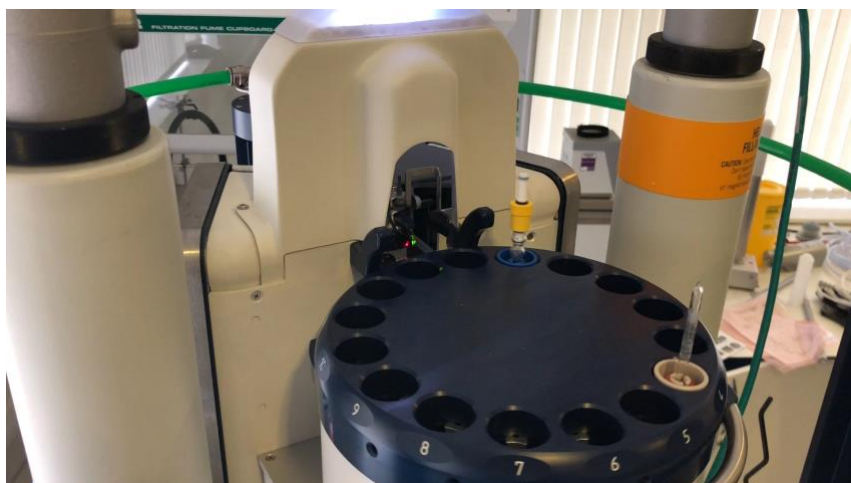


Fig 4

Bruker NMR applications Manager Peter Gierrh checked the spectra obtained in the new J Young NMR tube and a standard NMR tube and reported that there was no noticeable difference (Fig 5)

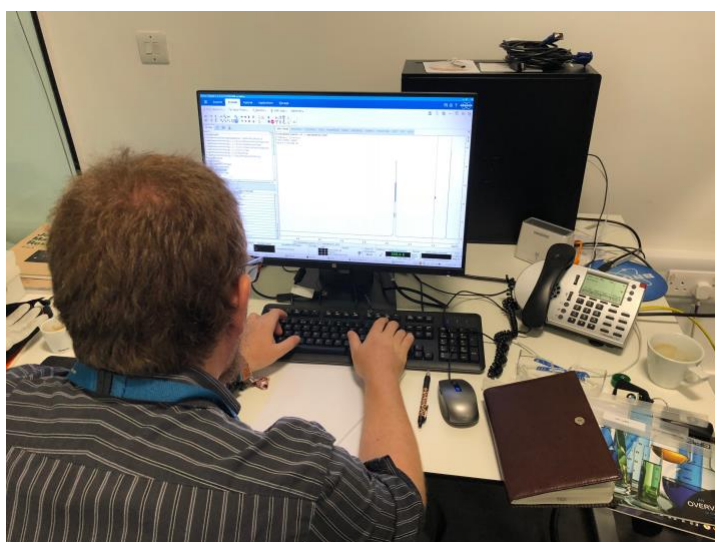


Fig 5



Summary

- It was agreed that the reported issues have been addressed by shortening the J Young NMR tubes.
- The resulting reduction of length has eliminated the height issue with the SampleCase safety cut-off and max 20mm sample depth
- The reduction in length has solved the tube ejection issue for SampleXpress (Gas flow rate issue) due to a reduced mass.
- The reduction in length has reduced the wobbling issue for both SampleCase and SampleXpress due to a lower centre of gravity.
- The reduction of mass will also reduce the possibility of tube slippage in the spinners.

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