

Work package: Fibre Procurement and QA

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Scope

- This - by now completed - work package deals with the specification, procurement and characterisation of the scintillating fibres. During the series production, the WP ensures the reception, qualification and redistribution of the fibres to the mat production centres. The total length of the ordered fibres is 11,000 km. In autumn 2017 it was decided to order additional 1,000 km of fibres as spare.
- We measure geometrical (scan along the fibre), optical and radiation parameters, the latter on a sample basis.
- In 2016 we developed a method to reduce the size of bumps (zones with increased fibre diameter). The fibre is drawn in a controlled way through a hot wire drawing tool with a diameter of 350 um. In this way we manage to 'shrink' bumps of up to 500 um down to 350 um. Bumps of 350 um or less were shown to not cause any significant damage in fibre mat winding. The bump shrinking procedure is fully automatic and part of the fibre scan.
- Bumps larger than 500 um are cut out manually and the fibre ends are joined by UV curing optical glue.

Current main activities

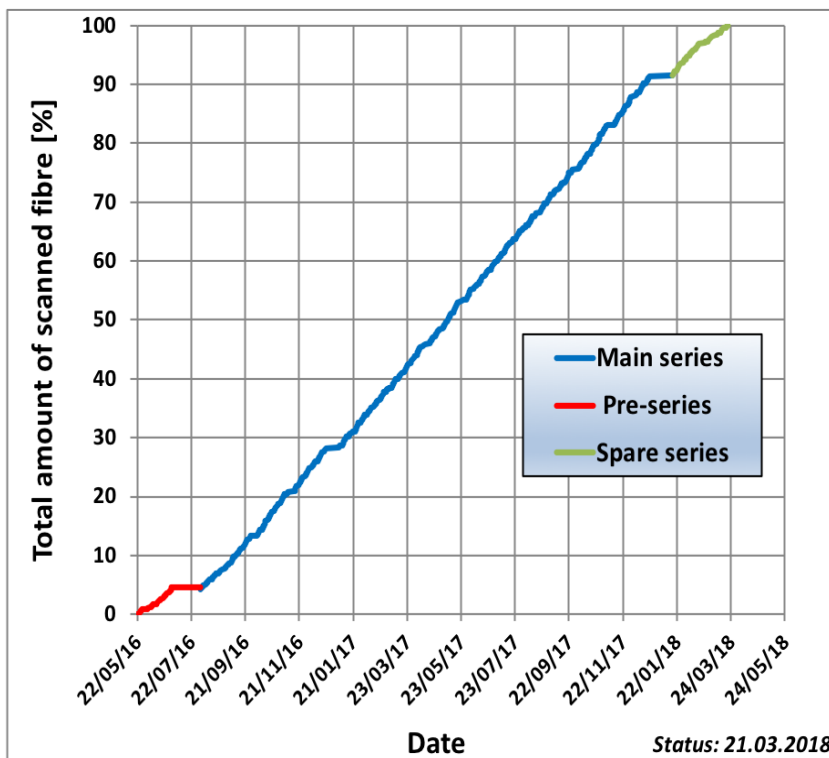
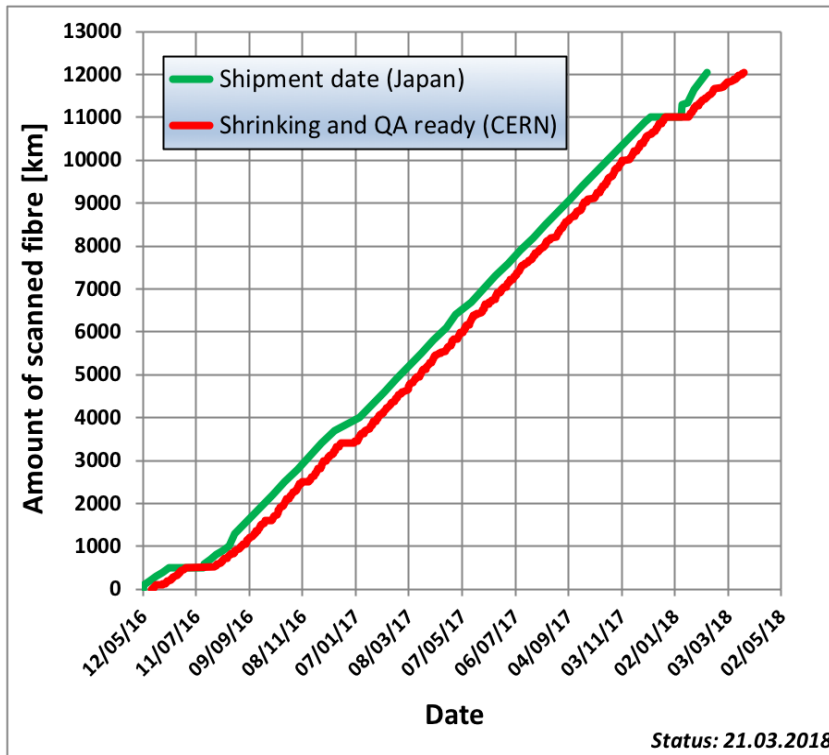
- All 12,000 km have gone through the full QA process incl. de-bumping. The last spool was treated on 21/03/2018.

Guides and instructions for QA procedures

- Fibre scanning
- Attenuation Length
- Light Yield
- Irradiation

Overall status

Overall progress of fibre QA at CERN:



Light yield

Light yield measured at CERN at a distance $d = 240$ cm from the SiPM. LY raw data in attachment.

Issues

- No serious issues at the moment.

Contributing institutes

- Aachen
- CERN
- Dortmund
- Heidelberg
- Russia

Internal planning

- We foresee to receive the last batch (km 10700 - 11000) on 7th of December 2017.

Next milestones and reviews

- EDR (jointly with fibre mats and modules) June 2015. Passed.
- Completion of series production. December 2017.
- Decide on option to order up to 3000 km of fibres (at the same price).

Old schedule, now obsolete

- QA set-ups ready: Attenuation length, scintillation yield, emission spectrum, fibre diameter profile, radiation test (end 2014)
- First results on usability of NOL fibres (end 2014)
- Standard fibre quality (att. length and bumps) consolidated ed at required level (spring 2015)
- Fibre specifications finalised (spring 2015)
- QA Procedures defined (spring 2015)
- Definition and implementation of production data base (summer 2015)
- Final results on performance of NOL fibres (end 2015)

- Fibre procurement
 - ◆ Launch Departemental Request (DR) (January 2015)
 - ◆ Launch Market Survey (MS) (Jan 2015)
 - ◆ Launch Invitation to Tender (IT) (May 2015)
 - ◆ Sign contract (Oct 2015)
 - ◆ First delivery (Nov/Dec 2015)

Further links and material

- FiberInventory: Inventory of the (pre-production) fibres
- ScintFiber: information about fibre characterisation and radiation hardness studies

ChristianJoram - 2017-02-06

This topic: LHCb > SciFiFibreProcurement

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