

Visit Report

Date: 14 February 2013

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RE: Visit to CVT, Halblech, Germany.
Concerning Order CA-5004416 (DR-4918699/TE/LHC) TCDQ - CfC Absorber Blocks

Introduction

CVT provides two different product groups;

CVD – Chemical Vapour Deposition, where from high purity Boron Halides, Nitrogen and Ammonia Boron Nitride (PBN) cubicles are created. The gases are reacted at high temperature and PBN is deposited onto machined graphite mandrels in a controlled atmosphere creating free standing PBN crucibles used in industry for evaporation of pure metals (wafers, solar panels, etc).

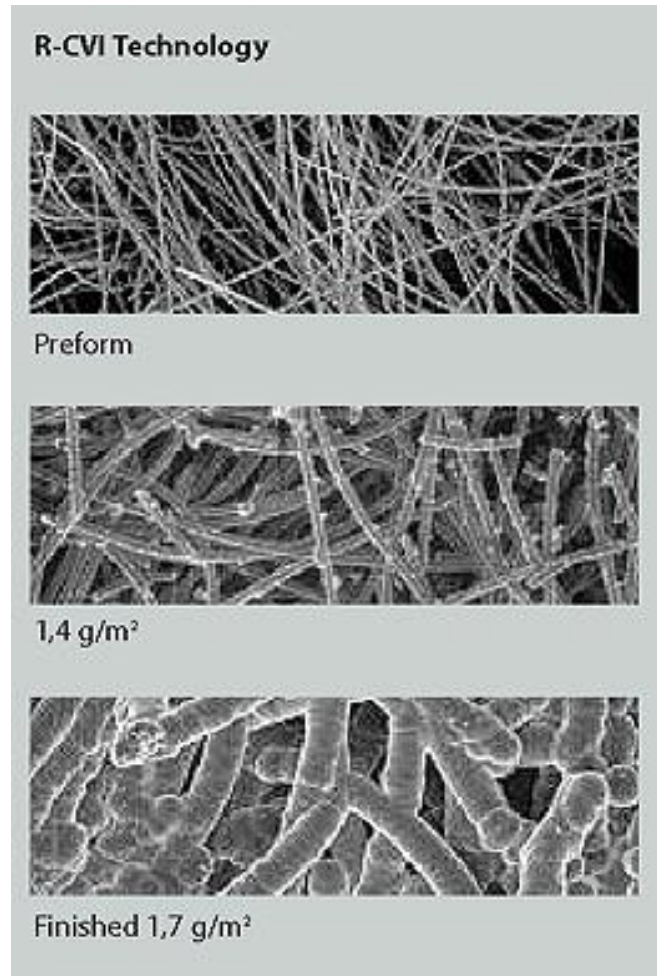
R-CVI – Rapid Chemical Vapour Infiltration, Carbon fibre preforms or pre-pregs are infiltrated with carbon using methane gas at temperatures below 1500°C and controlled atmosphere to build up a carbon matrix. This can graphitise the pre-pregs to ~1.75 g/m³ density. This procedure is used for the TCDQ blocks

Our order CA-5004416 consists of 55 blocks grade RNFF-sg with density of 1.4g/cm³ and 66 blocks of grade RNFF-sag with final density higher than 1.75g/cm³.

Visit of the production plant and inspection of the components

In order to obtain a final density higher than 1.75 g/cm³, 2 infiltration steps are made. A first step to 1.4g/cm³ followed by a second step to 1.75 g/cm³ (see image above). At the moment of our visit, CVT had graphitised 70 blocks to 1.4 g/cm³ densities (see Picture 1). On some of these blocks the machining steps will start. The remaining pre-pregs blocks for are available at CVT for these graphitisation steps (see picture 2).

Pre-pregs can be delivered with a fibre orientation of 0/90/0/90 or 0/0/90/90. The latter is the most common and easily available. The former is the strongest and was specified by CERN, but has a very long delivery time since it is not commonly used. In case of future orders for other applications, the need for 0/90/0/90 pre-pegs shall need to be evaluated for this reason.

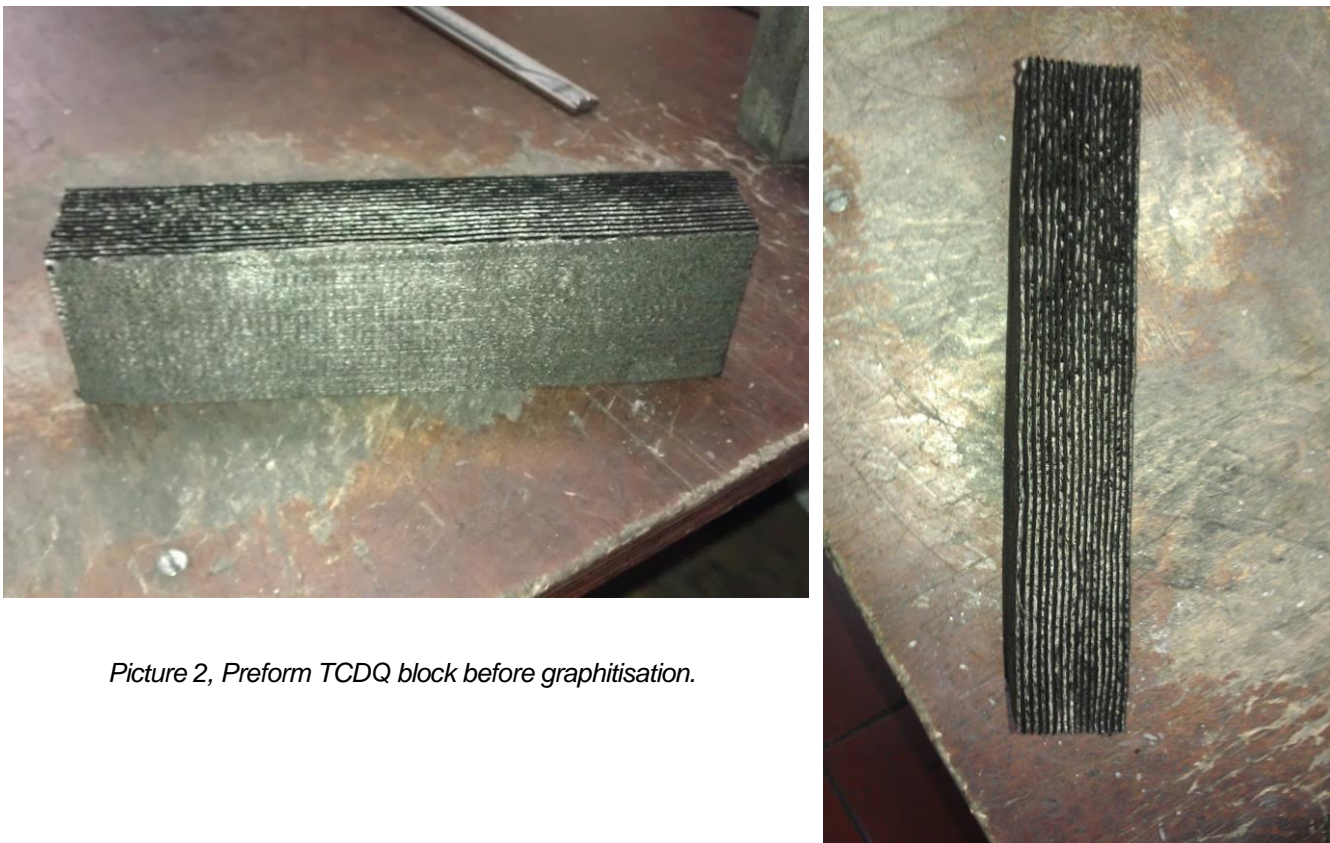


CVT does not foresee a batch delivery as requested but is planning to send all parts by mid of April to CERN.

A possible order for TPSG parts was also discussed and CVT will make an offer for this enquiry.



Picture 1, TCDQ block graphitized to 1.4g/cm³ density.



Picture 2, Preform TCDQ block before graphitisation.