Subject: Visit report Brandenburger from 06/05/2012 6/5/2012 9:58:55 PM
To:
Abdel.Boutrid@buergofol.deDr.FS@online.deGregor.Schleicher@buergofol.deHanni.Guertner@buergofol.deTobias.Abfall@buergofol.de
From: kurt.stark@buergofol.de
Priority: Normal
Attachments: 1

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enclosed.

Mr. Boutrid, I have the samples in my car. Please let us discuss the details soon, which I may not be able to present in the report.

Yours sincerely
Dr. Kurt Stark
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BUERGO.FOL
OUR QUALITY – YOUR SUCCESS

Visit report

Kunde/Customer: BRANDENBURGER, 76829 Landau/Pfalz

Date: 05.06.2012

Participants: Dr. Stark, BUERGO.FOL;
Mr. Gütermann, Rüdiger Kinzebach (Team Leader R&D), Peter Duttenhöfer (Product Manager), Mr. Zügel (Process and AT), Michael Haas (Head of QA), BRANDENBURGER

cc: Gregor Schleicher, Dr. FS, Ms. Gürtner, Dr. Boutrid, T. Abfall

Topic/Topics	Responsibility	Zu erledigt bis/ to be completed before
1. inner tube foil - call for help! We have already been informed of the "blanket complaints" about film tears when removing the inner tube film after resin curing. These are: 2006: 0 2007: 2 2008: 8 2009: 10 2010: 49 **could something have happened here?** 2011: 56 2012: 29 (to date) This is a huge problem for Brandenburger, they lose customers and their good reputation. The problem mainly occurs with smaller DNs 200 to 300. Despite 1000 % elongation in the tensile test, PA (presumably) splits radially in the hose even at 10 % elongation. Possible causes were discussed intensively: - Adhesion and interaction of the film with the resin; film sticks properly to the resin in some cases and cannot be removed without destroying it (additional costs due to loss of time, use of robots, etc.). Film not "homogeneous". - Outer layer cracks, adhesion promoter gets through to the resin?; other adhesion promoter? - Humidity, water content, "softener" - Storage of the film; ageing? - Crystal vs. amorphous areas in PA - Problem with our raw materials? - Layer thickness distribution +/- 20% PA and PE - PA leaking?? Spills? Holes?	**Dr. Boutrid; KS** Microtome sections Hydrotracer measurement? DSC? Control? MS?	**ASAP**

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Possible solutions discussed: - Introduction of a PE "protective layer"; 5-layer - Make the film thicker, i.e. 50/100 (= limit) - Test series Influence of water. Drying (thermal or chemical), cold storage, etc. - Followed by inflation tests with us - Introducing new tubular films from Dr. Boutrid. Brandenburger wants samples in DN 300, 432 mm wide, quantity 100 running meters I brought 2 samples of the "claimed" films for the laboratory, which show pronounced stripes. Brandenburger trusts that we will solve the problem soon. They are very happy with us and don't want any other manufacturers, unless the problem is not resolved, in which case they will have to "look around". ACTION: Examination by QM, Dr. Boutrid. **Find solutions!** Sampling to customers. AB/KS	PE-PA-PE? 150 µ? Test Influence of water? Inflation tests ? **Sample**	
2. NEW: Sliding film, HDPE, 500 µ (up to 800 µ) Here I said that we in IN now also produce this film, in line with my previous experience. They would like to test our products soon = variant purchase Metzeler Metzo Plast HDPE/T (via GS) as well as our blocked blown films. You can come to terms with my approximate non-binding price estimate of €1.8/sqm and would switch to us if suitable. Important parameters: - Mechanics (elongation/resetting behavior) - Sliding value against liner - No wrinkling - Maximum width 1500 mm. However, **the main quantity** is < 1100 mm (Racio?) ACTIONS: • Sampling 2-3 variants • For DN 300= Width 500 mm • 100 running meters each	**AB/KS/GS** **2-3 samples** **Test COF**	**ASAP**
3. outer film We lost the business. Allegedly, our outer film was not UV-tight enough (stripes). Complaints processing was also supposedly slow. **The fact is, however, that Brandenburger is now getting the outer film laminated with fleece, which is a major advantage.** I have received samples for analysis! The supplier for this is LANTOR. From the history I said that LANTOR is certainly not a partner for BF, only if it has to be. The LANTOR patent application connection foil/fleece for sewer rehabilitation was at	**AB/KS/GS** Analyze patterns Partner Find fleece	**07-12/2012**

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Brandenburger is already aware of this and is not bothered by it, even though Brandenburger has patents from the 1990s that are detrimental to novelty. We may have to object to this if granted. ACTION: We need to find an alternative outer film/fleece product.	Opposition Lantor patent?	
4. Inner foil with fleece I have received samples! Can be sealed to the hose. - Objective: The inner foil should remain in place for> 50 years. - Resistant to abrasion, rinsing and chemicals - Sealing seam must be 100 % tight - Fleece must not melt! - PE-PA-PE (non-woven) or PE/PA (non-woven) - When sealing comes inside against outside (overlapping) - PE fleece? Polyester? - According to Brandenburger, PA is more difficult to conceal - Adhesive not favored (as fleece can then absorb less resin) - Better thermal lamination Here I referred to our extensive experience in the LM sector with regard to thermal lamination. ACTIONS: • Start project, find solution	**AB/KS/GS** **Analysis**	**07 - 12/2012**
5. NEW: black "resin protection film" Requirement approx. 75,000 sqm/a; protection for prepreg rolls. Formats in width 1200 mm x 1200 mm or 1200 mm x 1300 mm Is glued. Currently Colamin film from Obermühle. You want cheaper film, and not so stiff. Analyze thickness and structure I have received samples AKTIONEN: • Adjust the foil	**AB/KS** Format cutter ? Analysis	**07 - 12/2012**
6. other Metal-coated conductive foil. A request from Mr. Zügel. Strips, width 3-4 cm, approx. 1 cm metal layer at the edges (no aluminum, no copper; better Ni) ACTION: Specialty. KS asks why not the entire strip may be metallized.	**KS**	**If required**
7. next date: Brandenburger wishes wishes also higher visitor frequency on our part. Next date September 2012 at the latest.		

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