TECHNICAL NOTE AGL(US)/GT/008B

FIRE TEST RESULTS FOR 'DPF 4550GTX' FILM APPLIED ONTO PLASTERBOARD FOR BUILDING INDUSTRY APPLICATIONS IN THE UK AND EU.

DATE OF ISSUE: 2ND JULY 2019

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1. Background

GTECH Strategies Limited was commissioned by Arlon Graphics LLC to project manage the sample preparation and reaction to fire testing of 'DPF 4550GTX' a 6-mil (150 micron) self-adhesive film (specifically with grey adhesive on a airex liner) for building industry applications in the United Kingdom and European Union.

The main objective, reported in this Technical Note, was to undertake the required testing process defined in the EU Construction Product Regulations (CPR) and to establish the Euroclass classification for this film. These regulations defer the testing regime and acceptability criteria to BS EN 13501-1:2007+A1:2009; 'Fire classification of construction products and building elements'. The specific substrate material, chosen as being most relevant for types of application in which 'DPF 4550GTX' will be used, was 12.5mm gypsum plasterboard (compliant with standard BS EN 520: 2004; 'Gypsum plasterboards; Definitions, requirements and test methods').

The purpose of this work package was as follows:

- To carry out reaction to fire tests on the 'DPF 4550GTX' film applied on 12.5mm gypsum plasterboard.
- On the basis of the reaction to fire test results, to establish the Euroclass classification defined within BS EN 13501-1:2007+A1:2009.

2. Sample Preparation

Samples were prepared as follows:

- 12.5mm gypsum plasterboard panels were procured by GTECH Strategies Limited in the correct quantities and dimensions required for the reaction to fire testing.
- The supplied panels were treated with one coat of clear, water based acrylic resin sealer that dries quickly to provide a thin, hard, moisture proof film (which seals the plasterboard surface and thereby prevents blistering and bubbling of the applied 'DPF 4550GTX' film during the reaction to fire testing process).
- The panels were then allowed to condition for 7 days in a warm enclosure.
- The sample panels were transported to a film application contractor where they were cleaned and the 'DPF 4550GTX' film was applied onto the prepared painted face using a airex-bed laminator. The completed panels were returned to GTECH Strategies Limited.

- After receipt, GTECH Strategies Limited inspected the samples and placed them in a warm enclosure for a 7-day period to allow the bond strength to develop.
- The prepared panels were submitted to the following fire test laboratory, which is UKAS accredited for reaction to fire test work:

Fire Test Laboratory	UKAS Cert. No.	Tests Conducted
BTTG Fire Technology Services (BTTG)	1066	BS EN ISO 11925-2: 2010: Ignitability of products subjected to direct impingement of flame.
		BS EN 13823: 2002: Single burning item test.

3. Results

BTTG provided report no. 27/05033A/06/19 for the set of tests undertaken (copy attached). GTECH Strategies Limited summarises the results below with comments:

Test Method	Results	Comments
Ignitability	• All three samples ignited • Flame spread (Fs) < 150mm • No flaming droplets • No ignition of filter paper	Best possible results achieved – indicative of the product being very well adhered to the substrate
Single Burning Item	Fire Growth Rate Indices: • $FIGRA_{0.2MJ} = 145.0\ Ws^{-1}$ • $FIGRA_{0.4MJ} = 59.2\ W^{-1}$ Total Heat Release Index $THR_{600S} = 1.6$ MJ No Lateral Flame Spread (LFS) to edge	**Classification C** ($FIGRA_{0.4MJ} \leq 250\ Ws^{-1}$ $THR_{600S} \leq 15$ MJ No LFS to edge)
	Smoke Growth Rate Index $SMOGRA = 0.0\ m^2s^{-2}$ Total Smoke Production Index $TSP_{600S} = 1.6\ m^2$	**Classification s1** ($SMOGRA \leq 30\ m^2s^{-2}$ $TSP_{600S} \leq 50\ m^2$)
	No flaming droplet production before 10 secs No flaming droplet production after 10 secs	**Classification d0** (no flaming droplets)

The test report is accompanied by BTTG's Classification Report No. 27/05033B/06/19 which confirms the overall classification to BS EN 13501-1:2007+A1:2009 of **Euroclass C; s1; d0**. It is this classification report that will be most useful to asset owners wishing to validate the suitability of the 'DPF 4550GTX' film for specific applications.

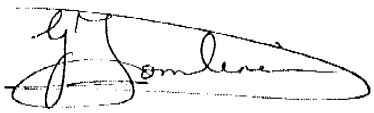
4. Conclusions

The results demonstrate that 'DPF 4550GTX' film applied on top of 12.5mm gypsum plasterboard achieves Euroclass C with additional indices S1 and d0. This is an excellent set of results which confirms that 'DPF 4550GTX' would give a 'limited contribution to fire' as stated in the classification criteria in BS EN 13501. This means that 'DPF 4550GTX' would be satisfactory for use in situation where the asset owners (e.g. county council, hospital trust, housing association etc.) require a Euroclass Classification C, D or E.

GTECH Strategies Limited draws attention to the four points listed below:

- The performance of 'DPF 4550GTX' has been very good in all reaction to fire index results yielded by the BS EN ISO 11925-2 and BS EN 13823 test regimes.
- It is worth noting that the product only failed to achieve the Euroclass B classification due to the slightly high Fire Growth Rate $FIGRA_{0.2MJ}$ Index (the acceptability criterion for Euroclass B being $\leq 120\ Ws^{-1}$).
- The FIGRA indices are derived from the heat released rate (measured within the test apparatus by the rate of consumption of oxygen at two energy thresholds of 0.2 and 0.4MJ).
- If Euroclass B classification were to be required for specific applications, it may be possible to achieve a lower $FIGRA_{0.2MJ}$ Index by considering the incorporation of new/alternative fire-retardant additives in the formulation of the 'DPF 4550GTX' film or slightly reducing the overall film thickness.

Finally, GTECH Strategies Limited draws attention to the fact that the definition of required Euroclass and choice of any material is the responsibility of the asset owner and the reaction to fire test data for that material will need to be subjected to their own mandatory technical reassurance and installation documentation procedures.



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