

TECHNICAL NOTE AGL(US)/GT/009B

INDICATIVE FIRE TEST RESULTS TO EN13823 FOR 'DPF 4550G' FILM APPLIED ONTO PLASTERBOARD FOR BUILDING INDUSTRY APPLICATIONS IN THE UK AND EU.

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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 4550G' film a 6-mil (150 micron) self-adhesive film (specifically with clear adhesive on a flat liner) for building industry applications in the United Kingdom and European Union.

The main objective, reported in this Technical Note, was to undertake indicative testing to EN13823; this test forms part of the requirements defined in the EU Construction Product Regulations (CPR) and enable the **expected** Euroclass classification for this film to be established. The CPR 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 4550G' 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 indicative reaction to fire tests to EN13823 on the 'DPF 4550G' film applied on 12.5mm gypsum plasterboard.
- On the basis of the reaction to fire test results, to determine the expected Euroclass classification for this film (defined within BS EN 13501-1:2007+A1:2009).
- To provide a comparison with the sister product 'DPF 4550GTX' for which full test data to EN13501 is available.

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 4550G' film during the reaction to fire testing process).
- The panels were then allowed to condition for 4 days in a warm enclosure.

- The sample panels were transported to a film application contractor where they were cleaned and the 'DPF 4550G' film was applied onto the prepared painted face using a flat-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	1 x indicative test to BS EN 13823: 2010: Single burning item test.

3. Results

BTTG provided report no. 27/05032A/06/19 for the set of tests undertaken (copy attached). GTECH Strategies Limited summarises the results below with comments:

Test Method	Results	Comments
Single Burning Item	Fire Growth Rate Indices: <ul style="list-style-type: none"> • $FIGRA_{0.2MJ} = 116.5 \text{ W s}^{-1}$ • $FIGRA_{0.4MJ} = 36.7 \text{ W}^{-1}$ Total Heat Release Index $THR_{600S} = 1.5 \text{ MJ}$ No Lateral Flame Spread (LFS) to edge	Classification B $(FIGRA_{0.2MJ} \leq 120 \text{ W s}^{-1})$ $THR_{600S} \leq 7.5 \text{ MJ}$ No LFS to edge)
	Smoke Growth Rate Index $SMOGRA = 0.0 \text{ m}^2\text{s}^{-2}$ Total Smoke Production Index $TSP_{600S} = 7.7 \text{ m}^2$	Classification s1 $(SMOGRA \leq 30 \text{ m}^2\text{s}^{-2})$ $TSP_{600S} \leq 50 \text{ m}^2$)
	No flaming droplet production before 10 secs No flaming droplet production after 10 secs	Classification d0 (no flaming droplets)

4. Commentary

GTECH Strategies Limited comments as follows:

- Full fire test data has already been obtained for the sister product 'DPF 4550GTX', which is presented in GTECH Strategies Limited Technical Note AGL (US)/GT/008.
- Arlon Graphics LLC has provided written confirmation that:
 - The films 'DPF 4550G' and 'DPF 4550GTX' are identical in terms of the film type, film thickness and generic type of adhesive.
 - The only difference between the two films is the presentation of the two adhesives; namely that 'DPF 4550G' has clear adhesive on a flat liner, whilst 'DPF 4550GTX' has white adhesive on a flat liner.

Consequently, GTECH Strategies Limited can confirm that the test results to BS EN ISO 11925-2: 2010 (ignitability of products subjected to direct impingement of flame) for 'DPF 4550GTX' would be equally applicable for 'DPF 4550G'. These are summarised overleaf:

- All three samples ignited
- Flame spread (Fs) < 150mm
- No flaming droplets
- No ignition of filter paper

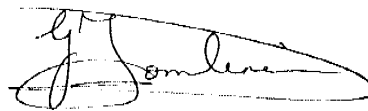
These are the best possible results that can be achieved for this test and are indicative of this film being well adhered to the substrate.

4. Conclusions

GTECH Strategies Limited comments as follows:

- The indicative results to BS EN 13823 demonstrate that 'DPF 4550G' film applied on top of 12.5mm gypsum plasterboard would be expected to achieve Euroclass B.
- Taken with the applicable results to BS EN ISO 11925-2: 2010, it therefore seems highly likely that, if a full set of tests were undertaken, 'DPF 4550G' should be capable of achieving the full classification of **Euroclass B; s1; d0**.
- This is the best classification achievable for self-adhesive films and it indicates that 'DPF 4550G' should give a 'limited contribution to fire' as stated in the classification criteria in BS EN 13501.
- This means that 'DPF 4550G' would be expected to be satisfactory for use in situations where the asset owners (e.g. county councils, hospital trusts, housing associations etc.) require a Euroclass Classification B, C, D or E.
- 'DPF 4550G' would be expected to perform better than its sister product 'DPF 4550GTX', (which achieved Euroclass C; s1; d0).

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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