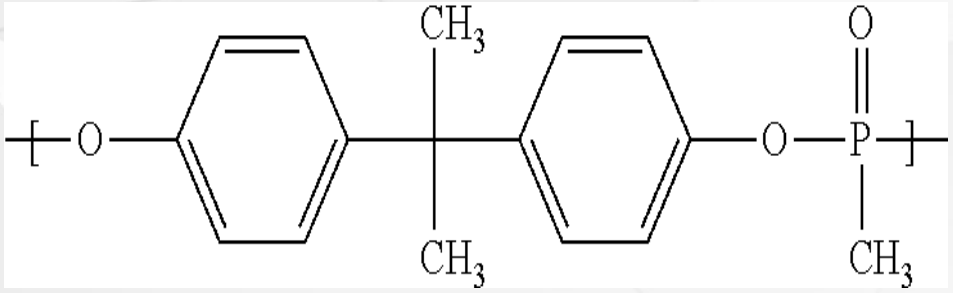
POLYMER COMPOUNDERS LIMITED

# NOTOXICOM®




## Introducing Notoxicom® Flame Retardants B6000 and S6000

"World's first UL94 V0 at 0.75mm halogen-free FR PC/ABS and FR PC/ASA materials that do not compromise on material properties."

Presented by:

**Richard Clay** – Northern Area Sales Manager and **Stephen Blair** – Technical Manager

# Polymer Compounders Limited

- First established in 1993.
- Manufacturer of thermoplastics compounds, based in Durham, UK
- Specialising in ABS, ASA, Polycarbonate, PC/ABS and PC/ASA.
- Supplying large volume automotive thermoplastics into the Tier 1 supply chain.
- Also serving many other markets including aerospace, healthcare, industrial, white goods and electrical.

# Flame Retardants

## A changing landscape

# Flame Retardants in Thermoplastics

- Growing health concerns regarding the toxicity of flame retardants in polymers
- European Chemical Agency (ECHA) has now added the most widely used flame retardant packages to their list of substances of concern (CORAP)

# This is the main Flame Retardant in FR ABS !

**2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol**

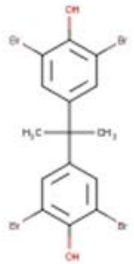
Regulatory process names 30 Translated names 37 CAS names 1 IUPAC names 8 Trade names 5 Other identifiers 13

**Substance identity**

**EC / List no.:** 201-236-9

**CAS no.:** 79-94-7

**Mol. formula:** C15H12Br4O2



**Hazard classification & labelling**

*Warning!* According to the **harmonised classification and labelling** (ATP01) approved by the European Union, this substance is very toxic to aquatic life and is very toxic to aquatic life with long lasting effects.

**Additionally**, the classification provided by companies to ECHA in **REACH registrations** identifies that this substance is suspected of causing cancer.

**Properties of concern**

PBT — Under assessment as Persistent, Bioaccumulative and Toxic

ED — Under assessment as Endocrine Disrupting

**Important to know**

- Substance included in the Community Rolling Action Plan (CoRAP).

**How to use it safely**

- Precautionary measures suggested by manufacturers and importers of this substance.
- Guidance on the safe use of the substance provided by manufacturers and importers of this substance.

**About this substance**

This substance is manufactured and/or imported in the European Economic Area in 10 000 - 100 000 tonnes per year.

This substance is used by consumers, in articles, by professional workers (widespread uses), in formulation or re-packing and at industrial sites.

**Consumer Uses**

This substance is used in the following products: polymers.

Source - ECHA https://echa.europa.eu/

# Flame Retardants in PC/ABS Thermoplastics

- BDP, RDP, ADPs, CDP and TBTPP all contain TPP.
- In Europe TPP is under evaluation for Endocrine Disruption.
- TPP found to be very toxic to aquatic life with long lasting
- effects.
- The bottom line most current FR ABS and FR PC/ABS
- materials could be at risk of removal from the market.

# 1. OVERVIEW OF OTHER PROCESSES / EU LEGISLATION

**Table: Completed or ongoing processes**

| | | | |
|---|---|---|---|
| RMOA | | ☐ Risk Management Option Analysis (RMOA) other than this RMOA | |
| REACH Processes | Evaluation | ☐ Compliance check | |
| | | ☐ Testing proposal | |
| | | ☒ ~~CoRAP~~ and ~~Substance~~ Evaluation<br>The RDP is on CoRAP list for an evaluation by France in 2019.<br>It should also be noted that one of its constituent and one of its potential metabolite are on the CoRAP list:<br>- Triphenyl phosphate (constituent) is on the CoRAP 2017 list by ~~UK~~ in particular for potential endocrine disrupting properties concern.<br>- Resorcinol (potential metabolite of the parent compound) is on the CoRAP list 2016 by FI in particular for potential endocrine disrupting properties concern. | |
| | Authorisation | ☐ Candidate List | |
| | | ☐ Annex XIV | |

This is one of the main Flame Retardants in FR PC/ABS and FR PC/ASA

Source - ECHA https://echa.europa.eu/

# But it's not all doom and gloom !

By utilizing new patented chemistry we can achieve:

- Superior halogen free flame retardancy
- ECHA compliant, more environmentally friendly product
- Non-migratory chemicals that do not bioaccumulate
- More favourable toxicity profile
- An outstanding balance of thermal & mechanical properties, with light-weighting gains.
- How do we do this?

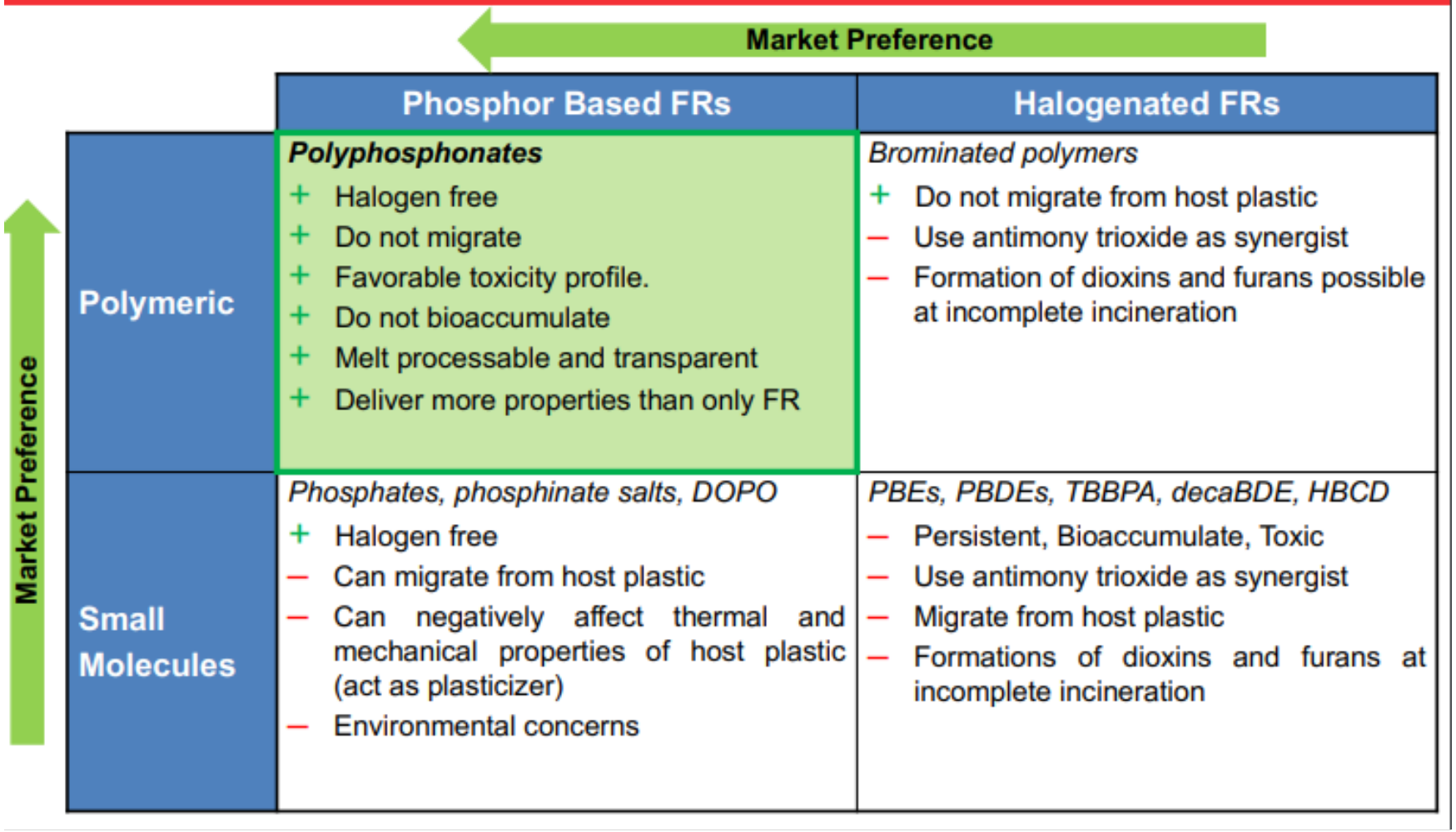
NOTOXICOM®

# Notoxicom® Flame Retardant FR PC/ABS B6000 and FR PC/ASA S6000

*World's first UL94 V0 at 0.75mm halogen-free FR PC/ABS and FR PC/ASA using Polyphosphonate co-carbonates*

'December 2019 patent'

# Flame Retardant Types



# Evolution of Flame Retardants

## NOTOXICOM®

Polyphosphonate co-carbonates. The future ?

→ Does not bioaccumulate


RDP/BDP: Organophosphates used in most FR PC/ABS today

→ Click here for Link to study on harmful effects

PBDE's : Brominated technology used since 1970's, Banned in 2004

→ Although TBBA is still used in FR ABS today....

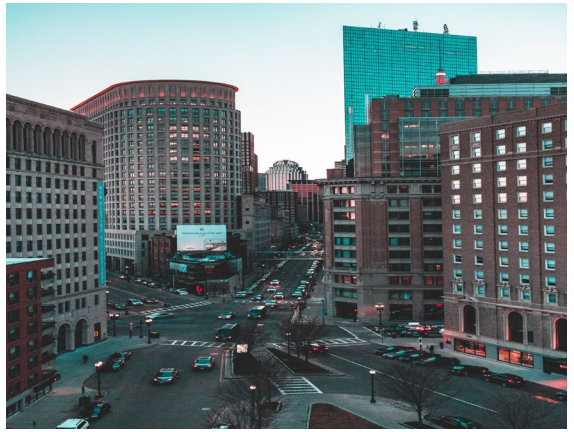
# Other Advantages of Notoxicom®

- No drop in heat or strength performance as with current FR systems
- Lower density
- Lower processing fumes even with long residence times
- Low smoke toxicity during combustion

(Meets aircraft standard ABD0031 para 7.4)

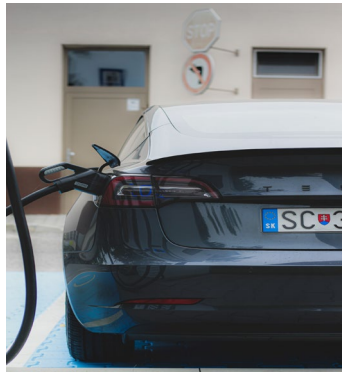
# Where could these products be used ?

## Building safety

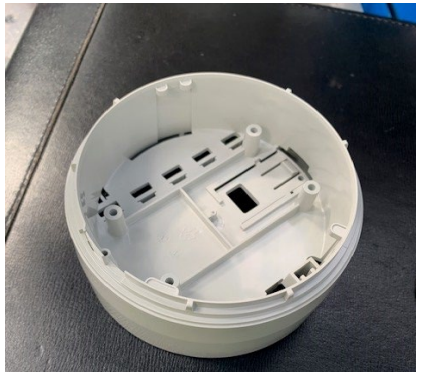


## Transport safety

## Electric Vehicles



## Fire and Security devices



POLYMER COMPOUNDERS LIMITED

NOTOXICOM®

# Notoxicom® FR PC/ABS B6000 - Technical Data

- High flow and excellent complex tooling processability.
- Good heat performance Vicat (B/50) - 125 deg C.
- Excellent Impact performance – 46 kJ/m2.
- Halogen-Free UL94 V0 rating at 0.75mm.
- GWIT at 960 deg C.
- Approx. 5% Lower density (Sg of 1.14g/cm3) compared to similar FR PC/ABS materials.

Scan QR Code to download full ISO Datasheet.

Notoxicom® FR PC/ABS B6000, being the slightly tougher of the two products with an impact of 46 kJ/m2 would be an excellent choice for highly specialised automotive applications such as EV battery casings or applications that require toughness, with exceptional flame retardancy.

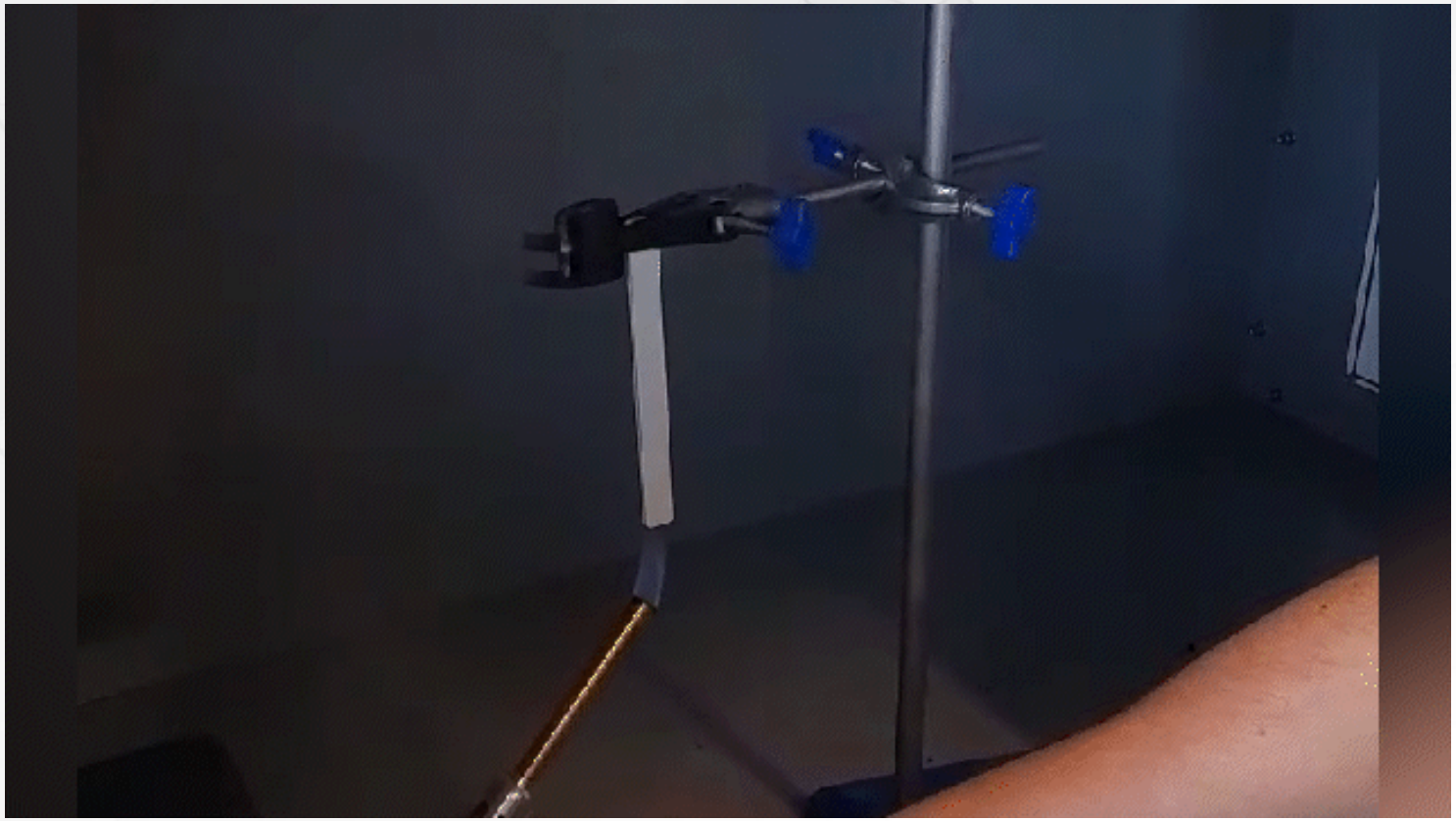
# Notoxicom® FR PC/ABS B6000 - Recycling robustness

| | RDP<br>Average J/m | BPA-DP<br>Average J/m | B6000<br>Average J/m |
|---|---|---|---|
| **Notched Izod at 3.2mm** | | | |
| | 140 | 150 | 170 |
| *After recycling through TSE* | | | |
| | 130 | 150 | 160 |

| | RDP | BPA-DP | B6000 |
|---|---|---|---|
| **UL94VO 0.8mm** | | | |
| UL Rating | V1 | V0 | V0 |
| *After recycling through TSE* | | | |
| Ttotal | 61 | 54 | 18 |
| UL Rating | V2 | V1 | V0 |

Notoxicom® B6000 has superior property retention after recycling compared with other FR PC/ABS grades.

# Notoxicom® Flame Test – DEMO



POLYMER COMPOUNDERS LIMITED

# Notoxicom® FR PC/ABS S6000 - Technical Data

- Excellent UV Stability
- High flow and excellent complex tooling processability.
- Good heat performance Vicat (B/50) - 125°C.
- Excellent Impact performance –15 kJ/m2.
- Halogen Free UL94 V0 rating at 0.75mm.
- GWIT at 960°C.
- Approx. 5% Lower density (SG of 1.14g/cm3) compared to similar FR PC/ASA materials.

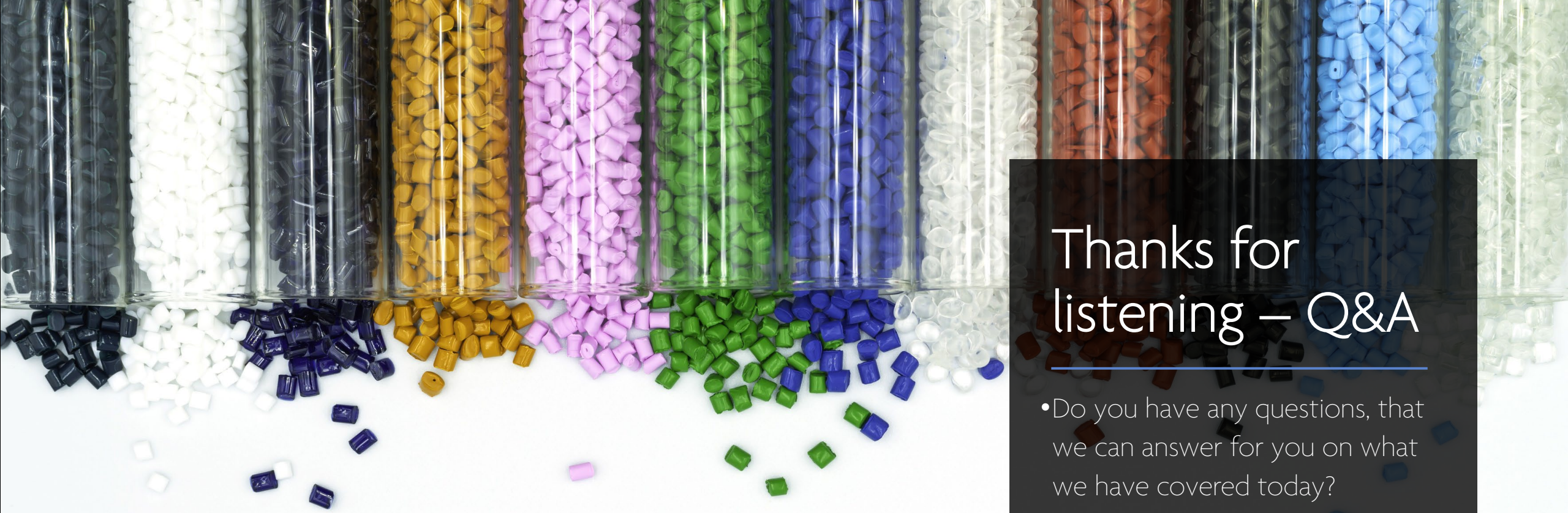
Scan QR Code to download full ISO Datasheet.

Notoxicom® FR PC/ASA S6000, with its brilliant weathering capabilities, is an excellent choice for any outdoor application that also requires class-leading flame retardancy.

# Let's start the conversation together...

The Burning Questions:

- Are current FR customers/OEMs aware of the potential future changes in flame retardant materials ?
- What plans do they have in place to tackle these changes ?
- When do they want to start trialling these next generation novel FR materials ?



# Thanks for listening – Q&A

- Do you have any questions, that we can answer for you on what we have covered today?
- sales@polymer-compounders.co.uk
- +44 (0)191 378 3737

POLYMER COMPOUNDERS LIMITED

WWW.POLYMER-COMPOUNDERS.COM/NOTOXICOM

## NOTOXICOM®

Presented by:

Richard Clay – Northern Area Sales Manager and Stephen Blair – Technical Manager