A5. USE OF BORATES IN OTHER USES

A5.1 Use of Borates in Adhesives, Paper and Pressed Panels

A5.1.1 Background to Use of Borates

This Annex describes the use of borates in adhesives, (corrugated) paper and paperboard products and in veneer sheets and pressed panels. In these uses, borates serve as multi-functional additives with binder/adhesive, flame retardant and fungicidal properties. Due to the multi-functional role of the borates in these products and applications, they have been discussed collectively in this Annex.

A5.1.2 Market Profile and Consultation Findings

Information provided from consultation indicates that there are three key applications for borates which are of relevance: use in starch adhesives; use in cellulose insulation; and use in veneer sheets and pressed panels.

Starch Adhesives

Dextrine/starch-based adhesives are made from natural polymers derived from roots, tubers and seeds of higher plants such as maize, potatoes, wheat, rice and tapioca. Starch-based adhesive is either cold or warm water-soluble depending on the application.

Information on the use of borates in starch adhesives was provided by the Association of European Adhesives and Sealants Manufacturers (FEICA) and the European Federation of Corrugated Board Manufacturers (FEFCO) (on behalf of their members) as well as directly by member companies. The information provided by FEICA has been summarised in Table A5.1 overleaf.

Overall, the information received indicates that while the chemical makeup of the starch polymer makes it a good adhesive; for many industrial applications, its wet tack is too low. If borax is added in the presence of small amounts of sodium hydroxide, it changes the starch polymer to a more highly branched chain polymer with higher molecular weight that improves the wet tack.

The addition of borax:

- gives the required viscosity and structure to the glue;
- increases tack during initial phase of the gluing and holds the fluting and liner in the required position until the starch is gelatinized by water and heat;
- improves film forming of the starch based glue onto the papers;
- improves water holding of the glue so that less water penetrates the paper and enough water remains available for reaction with the starch; and
- adjusts the temperatures sensitivity of the starch based glue recipe to the appropriate temperature on the corrugating production line (FEFCO, 2008).

Wet tack is critical for adhesion processes with little or no compression sections or fast running processes with lot of tension on the web during the bonding process/setting time. Products and processes requiring starch adhesives with increased wet tack / borated ions include: corrugated board production, tube winding (paper and board), laminated paper board and carton sealing adhesives.

Cellulose Insulation

Borates are used as a flame retardant (as well as for fungicidal purposes) in cellulose insulation material. In this application, shredded newspaper is treated with borates to provide flame retardancy and the resulting product is used in attics and in cavity walls. Spray-on cellulose has water or an adhesive binder (which may be non-borate based) added during installation to ensure the product sticks when blown into wall cavities. These materials are indicated to be gaining in importance especially as the energy demand is considerably lower than that for mineral wool or foamed insulation material.

Information was received from three companies involved in the use of borates for cellulose insulation. One company indicates that in 2007, the market accounted for around 70,000 to 80,000 tonnes of cellulose insulation material, while the other suggests a lower estimate of around 50,000 tonnes. Between 10% to 16% of the above tonnages is indicated to be borates suggesting an annual consumption of around 9,000 tonnes of borates (RTM, 2008).

It is estimated that between 150 and 250 people are employed in the production process, around ten times this number involved in the installation and significantly more in sales. One of the companies values the business at between €40 and €50 million with the product sold at a minimum of €0.45 per kg (RTM, 2008).

Veneer Sheets and Pressed Panels

Information received from a number of different companies indicates that:

- borates may be used as a pH buffer (stabilizer) in aminoplastic resins for wooden (medium density fibreboard and chipboard) panels production;
- in gypsum board manufacture, boric acid is widely used to increase the strength of the board (while reducing the board weight) and provide better adhesion of the paper to the board; and
- borates are used in professional and industrial wood preservation (as well as by consumers) where its biostatic action prevents insect and fungal attack of wood.

Where borates are added purely for wood preservation purposes, this would be covered by the Biocidal Products Directive (as discussed in Section 4.3). Such uses are not considered further in this Annex.

Table A5.1: Use of Borates in Adhesive Preparations and Applications

Type of Adhesive	Typical Application	Function of the Borates	Effects if Borates were not Available	Comments on Exposure Routes for Consumers (as claimed by FEICA)
Borated Dextrins (for tube winding)	Toilet/kitchen paper rolls - as well as any other rolls for wrapping things around (foil, etc)	To improve the viscosity and tackiness of the adhesives and augment the molecular weight	Machine output would be less. Dextrins are a natural product and renewable raw material but they could not be used without borates as they would be too liquid. This in turn would mean the machines that apply the adhesive would have to run much slower and more of the adhesive would have to be applied to the substrate. Alternatively, dextrins would be replaced by synthetic based adhesives, with mineral oil or gas as primary raw material.	The consumer does not get into contact with the cured adhesives on the finished product which is typically inside hard tube of toilet or kitchen paper roles.
Caseins (for labelling)	Casein adhesives are typically used for glass bottles	As borax, they have been incorporated as a gelling agent for humectants/ plasticiser/ bacteria-stat for casein adhesives	The borates make these products are very strong. This in turn means that fewer preservatives are needed. A low content of preservatives often means that the allergic potency is comparatively low also. Furthermore, a low content of preservatives generally results in easier biodegradability of the product.	The consumer does not get into contact with the adhesive as it under the labels
Starches & derivates (for labelling, paper making and wall covering)	Labelling of glass bottles Wallpaper	Used to increase the viscosity and stability by cross linking giving a "jelly like" shear sensitive rheology.	Without borates, the lower viscosity and less tack of a mere dextrine would greatly limit the potential use of starch-based adhesives, leading to a replacement of those products by non biodegradable and petroleum based synthetical resources. Mileage will be noticeable affected. Means cost per unit will be increased, cost in use is higher.	In glass bottles, the consumer does not get into contact with the adhesive as it under the labels. Similarly in wall papers, the adhesive is under the wallpaper and does not come into contact with the consumer.
Polyvinyl Alcohol (for tube winding and paper lamination)	Manufacturing of paper articles (e.g. corrugated board and all kinds of tubes (toilet paper, foils, etc)	As borax they have been incorporated as a gelling agent for aqueous poly vinyl alcohol solutions.	Borates make poly vinyl alcohol (PVA) solutions tacky and more jelly. Borates crosslink PVA and allow lesser use of synthetic PVA raw material, preservatives and biocides. Currently no alternative is available. Without borates, machine outputs would be much reduced and more of the adhesive would have to be applied to the substrate.	In corrugated board, the adhesive is between the paper layers. As borates don't migrate, there is no exposure to the consumer by skin contact, etc.
Magnesium Phosphate technology (for adhesives grouts & repair products).	Adhesives grouts and repair products	Borates allow to products to be sold in liquid form which is the main form in which these adhesives are sold in certain regions (e.g. the UK)	Without the borates, these grouts and repair product would have to be sold in powder form and to be mixed with water at home. This is more difficult and takes more time. Especially for professional users that buy in big hardware stores this would be a problem. Restrictions on the use of borates hy consumers will tend to have a knock on effect on professional users.	

Source: FEICA, 2008

A5.1.3 Concentration and Types of Borates Used

Starch Adhesives

The precise composition of adhesives varies by application but up to 10% of borate may be added to the dextrine/starch. Aqueous sodium hydroxide and other constituents are added and the mixture is 'cooked'. The presence of sodium hydroxide leads to the formation of sodium metaborate which, in turn, leads to the formation of borate-starch complex (Baumann and Conner, 1994).

Consultation responses suggested that, in some applications at least, the concentrations would be somewhat lower:

- one company reported that in dextrin based formulation for tube winding, concentration is between 3.2% and 6.2% calculated as dry starch adhesive;

- another reported that the level of borax can range from 0.4% to 1.3 % in the dried product, depending on the use. In corrugated board systems, the level of borax mix is about 25 % of the level referred to above (i.e. 0.1% to 0.3%); and

- another reported that borax is used for starch glue at concentrations of 0.3% to 0.5% (in the corrugating industry) which, in turn, is used as an adhesive for corrugated board (at 1% to 2% of the board).

According to FEFCO, borax is normally used in mixes for industrial users (as opposed to use by general public) so that they can operate on big scale (silos) and smaller scale (bags). In practice, the starch industry in most of the cases delivers one bag mix in solid form such that exposure to workers or environment is expected to be very low (FEFCO, 2008).

It is understood that borates are allowed as an additive in paper and board for food packaging by Dutch laws (*VGB (Warenwet) II.1.2.2.h, Adhesives and fibre binding agents for Paper & Board*) and in papers, cardboard and corrugated boards by German laws (*Recommendation 3612 BfR - Papers, Cardboard and Corrugated Boards (baking purposes*).

Cellulose Insulation

In cellulose insulation, for cellulose fibres fire resistance, 12% boric acid is added while for mould and fungus cellulose resistance, 6% borax decahydrate is added.

Veneer Sheets and Pressed Panels

In gypsum board manufacture, the dosing is between 0.03% and 0.15 % by weight, when used.

A5.1.4 Criticality of Borates

According to FEICA, without borates the adhesives for the above applications would be more expensive and the client would have to apply a thicker adhesives film. Also the machines would have to run at a slower speed. The adhesive products would be more expensive and the client would have to buy higher quantities whilst his production would be slowed down. Starch and dextrine based would have to be replaced by non renewing synthetic and petrol based alternatives. Biodegradable casein labelling adhesives for returnable wash off applications are likely to be replaced by synthetic adhesives that are not easily biodegradable. In all systems, there would be the need for higher amounts of preservatives (FEICA, 2008).

Most respondents indicated that there are no alternative technologies to the use of borates in corrugated board adhesives. If borax is removed from these formulations, the production process would not work. The wet tack will be much too low leading to adhesion failure on the current machine configurations. Wet tack is critical for adhesion processes with little or no compression sections or fast running processes with lot of tension on the web during the bonding process/setting time.

A5.1.5 Potential Substitution of Borates

In corrugated board adhesives, industry indicates that there is currently no alternative technology commercially available.

In tube winding adhesives, industry also indicates that there is currently no direct alternative technology commercially available without rebuilding tube winding factories. While some mills use sodium silicates, this is only possible with adapted production equipment such as drying tunnels and they need more energy to dry the tubes. The average dry solids for a sodium silicate-based adhesive is 45% while for a dextrin based adhesive, it is 65% dry solids. Using dextrin based adhesives, a tube winding company does not have to dry the tubes. In order for a tube winding factory to use alternative adhesive technologies, the factory will have to invest in extra stock and drying oven. A drying oven costs around €1 to €2 million and around 35 plants in EU will need to be equipped. Some are too small to sustain this investment and thus will have to be closed.

For use of borates as a pH buffer (stabilizer) in aminoplastic resins for wooden (medium density fibreboard and chipboard) panels production, sodium acetate may be a possible alternative. It is based on the same technology and the technical performance is similar, although there is a higher substance consumption. The costs are indicated to be similar. Borates are not considered critical in this use.

In wood preservation, one company indicates that there are no like for like replacements for borates as wood preservatives. This company estimates the cost of restrictions at around €50,000 per annum in lost sales or revenue. However, another company notes that there are alternatives for use of borates in wood preservation (for consumer use). While this company would not switch to these alternatives due to the development costs and the number of suppliers already on the market, it estimates the cost of restrictions at around €60,000 in annual lost revenue.

A5.1.6 Impact of Potential Restrictions

For adhesives, one company estimates an €8 million reduction of turnover per year because the adhesives can no longer be produced.

Another company sells an estimated 12,000 tonnes of dextrin in the EU in tube winding (direct and via the adhesive companies) and has a gross turnover of €9 million Euro. The total dextrin factory has a turnover of €21 million and around 30-50 people are employed in dextrin related activities. They also recently invested €13 million Euro in a new factory. If the regulation stops the use of borax in adhesive, the indirect effect will be that the company will probably have to close the yellow dextrin production line as only one major market segment would be left for yellow dextrin: a raw material for remoistable envelope *PVAc* adhesives (*note that borates are not used for adhesives for envelopes*). This market is too small and shrinking to be an alternative to fill the production line. Furthermore, increasing market share is also no real option as the company already has already an estimated market share of 80% in the envelope adhesive segment.

Although alternative chemicals for borax and dextrins and starches have been under investigation for decades, no suitable alternative has yet been found.

A5.1.7 Conclusions

For all the uses outlined above, the intention is that the use of borates is done by professionals. As such, there is no direct risk to consumers from the 'formulation' stage (addition of borates). However, the resultant products may be used by consumers in such a way as to result in exposure. This can best be illustrated by an example from each product group:

Starch Adhesive

Cardboard tubes (from kitchen/toilet rolls) are often used as playthings by children. Although exposure from handling would be expected to be minimal, chewing and/or eating a piece of tube would certainly be a possibility. Taking 5% borates in the adhesive and 2% adhesives in the cardboard and eating 2g of cardboard/adhesive would result in an uptake of:

2g x 0.05 x 0.02 = 2 mg of borate (typically borax decahydrate) = 0.23 mg boron

This is well below the tolerable upper intake level of 3 mg B/day recommended by EFSA (2004) for toddlers (aged 1-3).

Cellulose Insulation

Cellulose insulation is usually applied by professionals. Although it is unlikely that consumers would apply such insulation into cavity walls themselves, laying such insulation into the floors and attics could be undertaken by consumers and, indeed, bags of loose insulation designed for DIY (do-it-yourself) use are available.

There would undoubtedly be some exposure to the borates through spreading the loose insulation by hand (without gloves) and/or through inhaling/ingesting particles in the air (particularly if working in confined areas in the roof space).

However, this is not a regular or routine exercise as even the keenest DIY person is unlikely to be insulating their house every few years. As a result, the associated exposure will be very limited (when considered over a period of years).

Veneer Sheets and Pressed Panels

Although consumers would not be involved with the fabrication of veneer sheet and pressed panels, they could be used by consumers in DIY projects. Some exposure could be associated with dust generated when such items are sawn into the desired shape. However, as for the insulation case above, it is very unlikely that this would result in regular or routine exposure.

A5.2 Paints and Coatings

A5.2.1 Background to Use of Borates

Information on the use of borates in paints, varnishes, coatings and printing inks was received from five companies via their European Association - the European Confederation of the Paint, Printing Ink and Artists' Colours Industry (CEPE). Products and applications using borates which are of relevance to the paints and coatings industry (and which are discussed in further detail below) include:

- use in steel works (coil coatings);
- use in body shops (e.g. car refinish painting);
- use in offset printing inks (as specialist driers);
- use in interior wall paint;
- use as a corrosion inhibitor and catalyst; and
- use in marine, protective, yacht and aerospace coatings (MPYA applications) for fire retardance.

Schoeman and Lloyd (1999) also make reference to borates being multi-functional coating additives; wood coatings, in particular, benefit from the biostatic, tannin stain resistance and flame retardant properties of borates. There are also general references in the literature to the role of borates (especially sodium borates) as buffering agents (for controlling pH) in printing inks.

A5.2.2 Market Profile and Consultation Findings

The discussion below on the market for borates in paints and coatings is based on the information provided by the five companies - whose responses where provided in an anonymised form by CEPE.

Company 1 purchases around 50 tonnes of borates, of which less than one tonne relates to one of the borates listed in the ATPs (perboric acid, sodium salt, tetrahydrate (CAS No. 10486-00-7)). It obtains these borates from suppliers in the UK, Germany and Netherlands) and uses them in the manufacture of around 250 end-products which are mainly sold to steel works (for use in coil coatings) and body shops (for use in car refinish painting).

Company 2 purchases around 60 tonnes of borates, of which only eight tonnes relate to one of the borates listed in the ATPs (borax decahydrate (CAS No. 1303-96-4)). According to Company 2, metal borates/perborates are used as specialist driers in oxidation drying sheet fed offset printing inks used for printing paper and board packaging typically. These specialist driers are purchased from/by printers/convertors who print and turn the wet preparation into a dry printed article which can then be used by consumers (where the print is probably 1-2% by weight of the article and the borate no more than 0.5% of the ink). The printed inks may also be used in food packaging; however, they would have to comply with the Food Contact Materials Framework Regulation.

Company 3 used less than 0.5% borax in a polyvinyl acetate (PVA) emulsion binder for interior wall paint; however, this use has been discontinued since 2005.

Company 4 uses around 5 tonnes per year of borates in paints, varnishes, coatings and printing inks to provide three key properties: as a corrosion inhibitor, a siccative (or drier) and as a catalyst. None of the borates being used is, however, listed in the ATPs.

Company 5 uses around 500 to 800 tonnes per year of borates for marine, protective, yacht and aerospace coatings (MPYA applications) and around 0.2 tonnes for decorative coatings. The main borates used are boric acid and borax decahydrate. In MPYA applications, it is used for its fire retardant properties where it helps ensure compliance with fire safety legislation. The company indicates that products containing boric acid are only applied by professional, certified applicators trained in safe use. In decorative applications, their products are sold to the professional painters market.

A5.2.3 Concentrations and Types of Borates Used

Very little information was provided on the concentrations of borates used in the various products; *Company 2* notes that the print is probably 1-2% by weight of the article and the borate no more than 0.5% of the ink. *Company 3* used less than 0.5% borax in its emulsion binders for interior wall paint.

None of the companies indicated that their products were sold directly by consumers; two indicated that 100% of their products were used in industrial products and applications; while two indicated that apart from use by professionals which accounted for 5% and 0.04% respectively, the rest of their products were used in industrial products and applications.

A5.2.4 Criticality of Borates

Company 2 indicates that when used at no more than 0.5% by weight in a specific number of types of printing inks (e.g. oxidation drying sheet-fed offset inks), specialist driers are used to reduce the overall level of driers and specifically the levels of cobalt driers (such as cobalt octoate). These transition metal borate and perborate complexes are unique in being water activated driers; i.e. they are inactive in the ink until they meet the aqueous fount solutions used on lithographic printing presses at the point of printing. This means that they are effective at the point where they are needed thereby allowing smaller quantities of driers to be used overall. This saves on resources, reduces the overall hazards, and limits the rejection of the printed product resulting from oxidation by-products due to excessive drier. It is a niche application, but a key application that is difficult to replace (CEPE, 2008).

Possible alternatives include cobalt carboxylates, manganese carboxylates and other transition metal carboxylates; however, replacing metal borate driers would require higher levels (up to 150% more) of cobalt and manganese carboxylate driers to be used.

Company 5 indicates that boric acid is used in an intumescent fireproofing coating for use on structural metalwork (e.g. buildings). The presence of the boric acid is essential to achieving the necessary technical performance required to protect structural metalwork during fires. They allow time for building evacuation and for any fire to be dealt with by the fire services. They note that their product is required to meet national and international fire safety standards and has Lloyds Register and Det Norske Veritas structural and divisional certificates. Products are only applied by trained, certified, professional applicators using full protective equipment to manage the risk from exposure to the coating. These products are therefore vital for avoiding loss of life and this should outweigh any residual risk.

In decorative applications, the borax powder is being used in recipes for interior wall paint (the so-called multi-colours), in amounts ranging from 0.009% – 0.0615%. These are products in which you have colored particles in a continuous phase and due to a partial incompatibility, the two different colors will show up when applied on the substrate (by means of a roller for instance). The borax powder is used to obtain a good fleck formation and fleck strength by causing flocculation. Replacement would mean a considerable R&D effort with an extremely slim change of finding an alternative and thus could lead to a total withdrawal from the market of these products.

A5.2.5 Potential Substitution of Borates

Intumescent coatings are considered to be the most efficient of flame retardant paint/coatings. Such coatings normally consist of: a polymeric binder and primer to create good adherence, an intumescent base coat and a protective decorative top coat - and were initially applied to steel surfaces and later adopted for wood surfaces. Intumescent coatings provide an appearance similar to that of a paint finish, and remain stable at ambient temperatures. It is indicated that most intumescent coatings can traditionally provide up to 60 minutes fire resistance, with improvements in technology meaning that a limited number of intumescent coatings can achieve 120 minutes fire resistance (Special Chem, 2006). CEFIC/EFRA (2006) note that borates can be used as multi-functional synergistic additives to improve flame retardant properties, reduce smoke evolution and adjust the balance of flame retardant properties versus mechanical, electrical and other properties. They have been widely used in many PVC applications such as flooring, transport belting, wire and cable materials and appear to be an important application in paints and coatings. *Company 5* considers it vital that the use of borates as an intumescent fireproofing coating is allowed to continue until technically equivalent alternatives are available.

More broadly, borates are clearly multi-functional coatings; wood coatings benefit from the biostatic, tannin stain resistance and flame retardant properties of borates. They are also considered to be highly cost-effective; as the use of borates for its tannin stain resistance would make it unnecessary to use a separate dry film fungicide, in-can preservative or in-can corrosion inhibitor (Schoeman and Lloyd, 2007). Borates also have diverse physical characteristics, in particular pH characteristics (of pH 4 and 11) which make it an effective buffer for most formulations. Other useful characteristics include their low effect on the optical properties of the dry paint film and, unlike certain organic additives, borates will not alter the transmission properties of transparent coatings - an important characteristic at a time when semi-transparent wood stains are gaining popularity.

It is currently unclear that borates can be substituted in the paints and coatings industry; it is, however, the case that a significant amount of the borates used may not be affected by the restrictions.

A5.2.6 Impact of Potential Restrictions

Of the five companies which responded to the consultation, only Company 5 is likely to be significantly impacted by any restrictions[1]. It uses around 500 to 800 tonnes per year of borates and the main borates used are boric acid and borax decahydrate. However, it provides no indication of the scale of costs likely to be incurred in the case of restrictions.

More broadly, however, the number of companies in the paints and coatings industry using borates is unknown. Table 6.3 suggests that around 3,000 tonnes are used annually in this sector. While in theory, this would suggest a significant cost to this sector, it is noted that majority of respondents use other borates not listed in the ATP and the thresholds mentioned in the ATPs mean that many products will not be affected - especially as they are targeted mainly at professional and industrial uses.

A5.2.7 Conclusions

In paints and coatings, borates are multi-functional coating additives with flame retardant, corrosion inhibiting and buffering properties which may be found in offset printing inks and interior wall paint.

While it is estimated that around 3,000 tonnes of borates are used annually in this sector, it is noted that majority of respondents use other borates not listed in the ATP and the thresholds mentioned in the ATPs mean that many products will not be affected (due to the low concentrations of borates used). In addition, it is the case that these products are targeted mainly at professional and industrial uses that are covered by the relevant worker safety legislation.

Overall, based on the information provided, the impacts of the proposed classification and labelling on the use of borates in the paints and coatings industry may be expected to be minimal.

None of the companies which provided information for this study indicated that their products were sold directly by consumers and in some of the applications, it is currently unclear that borates can be substituted (e.g. in intumesent coatings, where they serve a critical life-saving function).

1 Companies 3 and 4 do not use any borates listed on the ATPs while Companies 1 and 2 use less than one and eight tonnes respectively of borates listed in the ATPs per annum.

A5.3 Mattresses

A5.3.1 Background to Use of Borates

Borates (boric acid) has been used in the wadding (or cotton batting) in mattresses (and other upholstered furniture) for flame and smoulder resistance for over 30 years.

However, in the last few years, this has become a controversial issue in North America.

A5.3.2 Market Profile and Consultation Findings

No information on the use of boric acid in mattresses marketed in the EU was provided during the consultation.

A5.3.3 Concentrations and Types of Borates Used

As noted in NCBI (2004), the boric acid is ground to a very fine consistency and mixed with a small amount of oil and surfactant to ensure a consistent and even distribution throughout the cotton fibres. The boric acid concentration is typically 10% in the cotton batting (Wakelyn *et al*, 2003).

A5.3.4 Criticality of Borates

Ensuring flame and smoulder resistance to mattresses is a critical public safety issue since fires starting in the bedroom have led to numerous fires and deaths over the years.

A5.3.5 Potential Substitution of Borates

There are numerous fire retardant chemicals available including both organic and inorganic compounds. However, there are concerns over the use of many of these compounds in terms of risks to human health and/or to the environment - as considered, for example, in a detailed report by the US Consumer Product Safety Commission (CPSC, 2006) on fire retardants used in mattresses.

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A5.3.6 Impact of Potential Restrictions

The impact of a restriction on borates would necessitate those uses of borates in mattresses (and in furniture) to reformulate (or redesign) their products. It has not been possible to estimate the associated impacts in financial terms.

A5.3.7 Conclusions

Sleeping on a mattress containing borates will result in regular and routine exposure to borates. However, the level of exposure is generally acknowledged to be low.

In studies on mattresses in the US for the industry, Murray (2005) provides upper bound estimates for daily doses of 0.013 and 0.140 mgB/day for adults and children respectively. These are similar to those presented by CPSC (2006) of 0.081 and 0.088 mgB/day for adults and children respectively.

Even for regular, routine exposure these values are substantially lower than the tolerable upper intake level (UL) recommended by EFSA (2004) of 10 mgB/day for adults and, say, the 5 mgB/day for children aged 7-10.

Although the consumer product (article) contains borate, the application of the borate to the cotton batting will be undertaken by professionals as will the incorporation of the batting into the mattress. Thus, this use of borates is unlikely to be covered by potential marketing and use restrictions in any event.

More generally, given the importance of borates as a fire retardant and the low level of associated risks, there would be merit in considering a derogation (should restrictions on borates be introduced) for the use of borates as (primarily) a fire retardant.