

## **BACKGROUND ON CEMENT ISSUES**

### **Cement**

1. About 12 million tonnes of cement are manufactured in Great Britain each year, with another 1 million tonnes imported. Approximately 1 million tonnes of cement per year are incorporated into cement-containing preparations. The large majority of cement is “ordinary portland cement” (OPC). OPC has high levels of chromium (VI) (Cr VI), an agent implicated in the occurrence of allergic contact dermatitis. In typical OPC cement the concentration of Cr VI is about 10 parts per million (ppm).

### **The Directive**

2. Inspired by experience in Scandinavian countries where prohibition of high chromium (VI) cement lead to large reductions in the incidence of allergic contact dermatitis, EC Directive 2003/53/EC was adopted. The Directive prohibits the marketing and use of cement and cement-containing preparations with more than 2 ppm of Cr VI measured with respect to the dry weight of the cement.

3. The practical effect of the prohibition is that cement manufacturers will have to dose their cement with a reducing agent (typically ferrous sulfate) to bring its Cr VI concentration down to permitted levels. Because such dosing is effective for a limited period only, the Directive prescribes that packages of dosed cements and cement preparations must bear information on safe shelf life. The British Cement Association (BCA), which represents the 4 major British cement manufacturers, has indicated that its members will add 0.5% of ferrous sulfate and thereby obtain a shelf life of 2 months.

4. The Directive contains a derogation which permits marketing and use of cement and cement preparations which exceed the 2 ppm Cr VI limit (typically this would be undosed material) provided that it is supplied for use in “controlled closed and totally automated processes in which cement and cement-containing preparations are handled solely by machines and in which there is no possibility of contact with the skin”. HSE’s view is that very few cement processes will meet this standard. The Directive must be implemented by 17 January 2005.

### **Issue – cement preparations**

5. The Directive’s provisions apply to cement preparations. These products (eg tile adhesives, grouts, floor levelling compounds, etc) have a cement content of anything up to 50%. Most of the annual tonnage of cement preparations is made by a group of “dry packed product formulators” which, in most cases, are closely related to the cement manufacturing companies. A much smaller tonnage of cement preparations is made by member companies of the British Adhesives and Sealants Association (BASA) and a few other non-member companies.

6. Because they move slowly through the supply chain, cement preparations need shelf lives of up to one year. Consequently, it is likely that their manufacturers, even though they will be using dosed cement, will have to do additional (secondary) dosing of their products to get the necessary shelf life.
7. A further reason for secondary dosing is found in the way the Directive treats preparations. The Directive limits Cr VI concentration measured with respect to the weight of contained cement (rather than weight of the whole preparation). The effect of this is to inflate measured concentration figures thereby necessitating higher levels of dosing to get and stay below the Directive's limit on Cr VI concentration of 2 ppm.
8. During and after consultation some preparation manufacturers complained that the Directive was unfair to their products. They argued that preparations were, in effect, subjected, without any justification in health protection, to a higher standard of Cr VI reduction than pure cements, and that to meet this standard and obtain commercially viable shelf lives they would have to add unreasonably large amounts of reducing agent to their products. They urged that the transposing legislation depart from the Directive by specifying the limit on Cr VI concentration with respect to the weight of the whole preparation.
9. HSE, in discussions with BASA and non-BASA member manufacturers, agreed the Directive appeared anomalous. We offered to consider recommending under-implementation to HSC if evidence was produced showing that manufacturers would have to add so much reducing agent to their products to achieve compliance that product performance would be unacceptably impaired or excessive cost incurred.
10. No evidence of product performance impairment was received. A submission on excessive cost was received from one manufacturer but it relied on very high estimated prices for ferrous sulfate. Other sources showed that likely costs would be less than estimated by this manufacturer. At a meeting with the dry packed products formulators, facilitated by the British Cement Association, no request was made for under-implementation. And, subsequently, BASA indicated that it was considering other options, including improved packaging and storage conditions (each of which tend to reduce the rate of deterioration of the reducing agent and therefore extend the shelf life).
11. Finally, information was received from BASA that a considerable number of preparations would, for technical reasons, have to use stannous sulfate as a reducing agent instead of ferrous sulfate. However, although stannous sulfate is much more expensive than ferrous sulfate no claim was made that its use entailed unacceptable cost or that its adoption resulted from the apparent anomaly in the Directive.
12. Subsequently, HSE's offer lapsed and HSE now proposes full implementation of the Directive in the Regulations as originally set out in the Consultative Document.

### **Issue – oil-well cement**

13. Oil-well cement is used in crude oil extraction to seal the gap between the well shaft and the steel pipe inside it that conveys oil to the surface. Pressures and temperatures vary by depth in a well so the cement must be adjusted for each depth level. This is done at the well-head by a specialist cementing contractor who selectively adds chemicals to the cement. However, if the effect of the additions is to be predictable it is essential that the cement delivered to the well be of a known and constant quality. Accordingly, the American Petroleum Institute (API) standard governing oil-well cements specifies that they must be plain OPC with no additives.

14. Clearly, there is a conflict between the need for oil-well cement to be free of additives, and the imperative under the proposed legislation to limit the Cr VI content of the cement by adding a reducing agent. The proposed legislation reproduces a derogation in the Directive (see paragraph 4) which permits the supply and use of unreduced cement in certain circumstances. However, the opinion of HSE experts is that oil-well cement is not used in a way in which this derogation would apply.

15. The British Cement Association, on behalf of its member companies, has asked HSE to issue an exemption certificate so that they can supply undosed oil-well cement. HSE has brought the issue to the attention of the users of oil-well cement, ie the petroleum extraction companies (represented by the United Kingdom Offshore Operators Association (UKOOA)) and the cementing contractors. Although informal contacts confirm that they would support BCA's position, no formal response has been received so far.

16. HSE's Solicitor has confirmed that there is power to issue a certificate under COSHH. However, because the certificate would be in conflict with the terms of the Directive, the Solicitor has advised that it should impose conditions on methods of work so as to ensure that there is no loss of health protection to those using undosed oil-well cement. Additionally, the validity of the certificate should be strictly time limited with a view to encouraging the industry to carry out investigations into the effect of adding a reducing agent to oil-well cement.

17. HSE is of the view that in light of all the circumstances it may well be necessary to grant an exemption for oil-well cement.

### **Initial approach to enforcement**

18. Because of the long shelf lives of cement preparations, much non-compliant product will be in the supply chain when the Regulations come into force on 17 January.

19. Additionally, in order to obtain initial assessments of the amount of dosing necessary to achieve desired shelf lives, preparations companies will need to undertake preliminary testing, and for this they will need samples of dosed cement. The cement manufacturers have indicated that very little

dosed cement will be available until January 2005 (ie the same month the Regulations come into force).

20. Finally, periodic further testing will be needed to check that the initial assessment of dosing was correct and the products are remaining compliant for the expected period. In some cases the assessment will be found to have been incorrect and although companies will be able to adjust dosing for future production batches it will be impractical to do anything about non-compliant product already in the supply chain.

21. For all these reasons HSE is of the view that it will be sensible to enforce in a flexible way for the first several months of the new regime. This approach will be conveyed to HSE inspectors and to Local Authority trading standards officers (who will enforce in respect of products sold to consumers), and to all those organisations representing those involved in the supply chain.