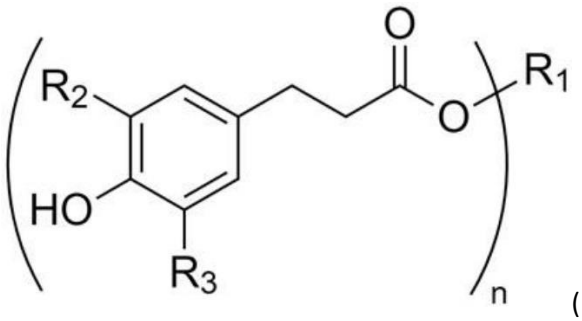
CLAIMS

1. A stabilising composition for a polyol and/or a polyurethane, comprising:
    i. a first derivatised phenolic antioxidant having a molecular weight of at least 400 g/mol and a melting point of less than 100°C ;
    ii. a second derivatised phenolic antioxidant comprising a sulphur-bridged bisphenol and/or a di-hydroxybenzene and having lower steric hindrance than the first derivatised phenolic antioxidant, which is a solid at ambient conditions; and
    iii. a secondary antioxidant comprising a phosphite and/or a thioester.

2. The stabilising composition according to Claim 1 which is absent any diphenylamine and/or alkylated diphenylamine.

3. The stabilising composition according to Claim 1 or Claim 2, wherein the contribution to VOC of the first derivatised phenolic antioxidant is less than 10 ppm and/or wherein the contribution to FOG of the first derivatised phenolic antioxidant is less than 100 ppm.

4. The stabilising composition according to any one of claims 1 to 3, wherein the first derivatised phenolic antioxidant comprises one or more derivatised phenolic antioxidants of formula (I):



(I)

wherein n is 1 or 2;

wherein R_1 is a linear or branched alkyl group having from 1 to 30 carbons, optionally substituted with one or more ether groups; and

wherein R_2 and R_3 are each independently selected from straight or branched chain alkyl groups having from 1 to 5 carbon atoms.

5. The stabilising composition according to Claim 4, wherein both R_2 and R_3 are t-butyl groups.

6. The stabilising composition according to any one of claims 1 to 5, wherein the first derivatised phenolic antioxidant comprises 3,5-bis(1,1-dimethylethyl)-4-hydroxy-benzenepropanoic acid, C13-15 alkyl esters; a blend of 3,5-bis(1,1-dimethylethyl)-4-hydroxy-benzenepropanoic acid, C13-15 alkyl esters and tetrakismethylene (3,5-di-t-butyl-4-hydroxyhydrocinnamate) methane; octadecyl-3-(3',5'-di-t-butyl-4'-hydroxyphenyl) propionate; and/or a blend of octadecyl-3-(3',5'-di-t-butyl-4'-hydroxyphenyl) propionate and tetrakismethylene (3,5-di-t-butyl-4-hydroxyhydrocinnamate) methane.

7. The stabilising composition according to any one of claims 1 to 6, wherein the first derivatised phenolic antioxidant is present in the stabilising composition in an amount of from 30 wt. % to 95 wt. %, from 40 wt. % to 95 wt. %, from 50 wt. % to 95 wt. %, or from 60 wt. % to 90 wt. %, based on the total weight of the stabilising composition.

8. The stabilising composition according to any one of claims 1 to 7, wherein the second derivatised phenolic antioxidant has a lower molecular weight than the first derivatised phenolic antioxidant.

9. The stabilising composition according to any one of claims 1 to 8, wherein the second derivatised phenolic antioxidant has a molecular weight of lower than 400 g/mol.

10. The stabilising composition according to any one of claims 1 to 9, wherein the second derivatised phenolic antioxidant comprises:

    a di-hydroxybenzene.

11. The stabilising composition according to any one of claims 1 to 10, wherein the second derivatised phenolic antioxidant is present in the stabilising composition in an amount of from 0.1 wt. % to 50 wt. %, from 0.5 wt. % to 45 wt. %, from 1 wt. % to 40 wt. %, from 5 wt. % to 35 wt. %, from 1 wt. % to 20 wt. %, or from 5 wt. % to 20 wt. %, based on the total weight of the stabilising composition.

12. The stabilising composition according to any one of claims 1 to 11, wherein the phosphite comprises one or more alkyl phosphites, optionally one or more trialkyl phosphites.

13. The stabilising composition according to any one of claims 1 to 12, wherein the secondary antioxidant is present in the stabilising composition in an amount of from 0.01 wt. % to 20 wt. %, from 0.05 wt. % to 15 wt. %, or from 0.1 wt. % to 10 wt. %, based on the total weight of the stabilising composition.

14. The stabilising composition according to any one of claims 1 to 13 which has a melting point of less than 100°C.

15. The stabilising composition according to any one of claims 1 to 14, wherein the contribution to VOC of the stabilising composition is less than 20 ppm, less than 15 ppm, less than 10 ppm, or less than 5 ppm.

16. The stabilising composition according to any one of claims 1 to 15, wherein the contribution to FOG of the stabilising composition is less than 200 ppm, less than 150 ppm, less than 100 ppm, or less than 50 ppm.

17. A stabilising composition for a polyol and/or a polyurethane, comprising:
    a) a first derivatised phenolic antioxidant having a molecular weight of at least 400 g/mol effective to provide a contribution to VOC of less than 10 ppm and/or a contribution to FOG of less than 100 ppm, and having a melting point of less than 100°C;
    b) a second derivatised phenolic antioxidant comprising a sulphur-bridged bisphenol and/or a di-hydroxybenzene and having lower steric hindrance than the first derivatised phenolic antioxidant, which is a solid at ambient conditions; and
    c) a secondary antioxidant comprising a phosphite and/or a thioester.

18. A stabilising composition for a polyol and/or a polyurethane, comprising:
    a) a first derivatised phenolic antioxidant having a contribution to VOC of less than 10 ppm and/or a contribution to FOG of less than 100 ppm, and having a melting point of less than 100°C;
    b) a second derivatised phenolic antioxidant comprising a sulphur-bridged bisphenol and/or a di-hydroxybenzene and having lower steric hindrance than the first derivatised phenolic antioxidant, which is a solid at ambient conditions; and
    c) a secondary antioxidant comprising a phosphite and/or a thioester.

19. The stabilising composition according to any one of claims 1 to 18, which when incorporated into a polyurethane foam causes the foam to undergo, on the application of a microwave scorch test, a colour change ΔE less than that of an equivalent foam into which an equivalent

amount of industry-available stabilising composition (optionally any one of industry-available stabilising composition 1, 2, 3 or 4) has been incorporated..

20. The stabilising composition according to any one of claims 1 to 19, which when incorporated into a polyurethane foam exhibits a contribution to VOC and/or FOG, as measured according to standard test method VDA 278, less than the contribution exhibited by an equivalent foam into which an equivalent amount of industry-available stabilising composition (optionally any one of industry-available stabilising composition 1, 2, 3 or 4) has been incorporated.

21. A fire retardant blend, comprising:
    i. a stabilising composition according to any one of claims 1 to 20; and
    ii. a fire retardant.

22. The use of the stabilising composition according to any one of claims 1 to 20 or the fire retardant blend of Claim 21 to stabilise a polyol and/or a polyurethane.

23. A stabilised composition, comprising:

    a polyol and/or a polyurethane; and

    the stabilising composition according to any one of claims 1 to 20 or the fire retardant blend of Claim 21.

24. The stabilised composition according to Claim 23, wherein the polyurethane is a polyurethane foam, optionally wherein the polyurethane foam has a density of greater than 15 kg/m^3.

25. The stabilised composition according to Claim 23 or Claim 24, wherein the stabilising composition is present in the stabilised composition in an amount of from 0.01% to 10%, from 0.01% to 5%, from 0.01% to 3.5% or from 0.01% to 2% by weight of the polyol and/or polyurethane.