CONDUCTIVE POLYURETHANE FOAM COMPOSITIONS AND METHOD FOR PRODUCING SAME


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Field of Search 521/123, 128; 252/500

References Cited
U.S. PATENT DOCUMENTS
5,180,755 1/1993 Yasunaga et al. 521/116

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The present invention relates to three-dimensional expanded polyurethane foam materials, such as flexible reticulated polyurethane foam compositions, that are electrically conductive and have antistatic properties. More specifically, the invention relates to a polyurethane foam having long-lasting and reliable electrical conductivity characteristics and a volume resistivity of approximately $10^{12}$ ohm-cm or less at ambient room temperature (about 70° F.). This foam is produced by combining conventional polyurethane foam-forming reactants and an effective amount of an antistatic agent such as tetracyanoquinodimethane (TCNQ) or sodium perchlorate under foam-forming conditions. In one preferred embodiment, the conductive foam is subsequently reticulated by momentary exposure to a flame front.

12 Claims, No Drawings
CONDUCTIVE POLYURETHANE FOAM COMPOSITIONS AND METHOD FOR PRODUCING SAME

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to three-dimensional expanded polyurethane foam materials, such as flexible reticulated polyurethane foam compositions, that are electrically conductive and have antistatic properties. More specifically, the invention relates to a polyurethane foam having long-lasting and reliable electrical conductivity characteristics and a volume resistivity of approximately $10^{12}$ ohm-cm or less at room temperature (about 70°F). This foam is produced by combining conventional polyurethane foam-forming reactants and an effective amount of an antistatic agent, such as tetraacyanoquinodimethane (TCNQ) or sodium perchlorate, under foam-forming conditions. In one preferred embodiment, the conductive foam is subsequently reticulated by momentary exposure to a flame front.

2. Description of the Prior Art

It has long been known that it is not possible to generate an explosion of any fuel/air mixture in the presence of reticulated polyurethane foam structures. Because of this characteristic of reticulated polyurethane foam and the additional benefits of light weight, minimal reduction in a fuel tank’s usable space and attenuation of violent surging of fuel, reticulated polyurethane foam structures have found extensive use in military aircraft and land vehicles. These properties reduce the vulnerability of these vehicles by providing protection against explosive ballistic hits, explosions following fuel tank rupture, explosive static discharge and explosions caused by lightning.

Unfortunately, the use of foam can give rise to a different danger. Since the foam has a low electrical conductivity (or as more conveniently measured, a high electrical resistivity), there can be a build-up of electrostatic charges and the electrostatic charges can result in sparking, leading to a fire or explosion within the non-foam containing areas of the fuel tank. The build-up of electrostatic charges can also adversely effect sensitive aircraft instrumentation.

Consequently, it is an object of this invention to provide a foam for fuel tanks which minimizes the possibility of fuel explosion from gunfire, electric ignition and lightning. It is a further object of this invention to provide a foam which has a higher electrical conductivity needed to minimize the danger of sparking caused by the build-up of electrostatic charges. It is a further object of this invention to provide fuel tanks which minimize the release of fuel in the event of rupture and which resist sparking due to the build-up of electrostatic charge.

U.S. Pat. No. 4,886,626 (Cope et al.) describes a conductive polyurethane foam which contains a charge transfer agent selected from the group consisting of tetracyanoethylene (TCNE), picric acid and analogs thereof. These foams exhibit electrical resistivities (i.e., volume resistivities) of $10^{12}$ ohm-cm or less. However, these foams suffer from the disadvantage that the charge transfer materials used in the foams are dangerous to handle. For example, TCNE is highly toxic and picric acid and its derivatives are explosive.

SUMMARY OF THE INVENTION

It is an object of the invention to provide an electrically conductive polyurethane foam that is suitable for use as a filler material in fuel containers or tanks, particularly in vehicles having combustion powered engines, wherein the polyurethane foam does not contain any highly toxic substances such as TCNE.

It is another object of the invention to provide a stable, reliable and long-lasting electrically conductive reticulated polyurethane foam structure that retains its conductivity characteristics despite repeated mechanical abrasion and use at low temperatures (e.g., 0°F to −30°F), high temperatures (e.g., 120°F to 160°F), organic fluids and aqueous fluids.

A further object of the present invention is to provide an electrically conductive reticulated polyurethane foam having a void volume greater than or less than 90%, and preferably more than about 90%, using relatively small quantities of the agent conferring electrical conductivity in the foam forming reaction mixture.

Another object of the present invention is an electrically conductive thermally reticulated polyurethane foam prepared from a polyol and an isocyanate and containing about 0.10 to 0.15 parts of TCNQ per hundred parts by weight of polyol (pph) in the foam forming mixture. In a preferred embodiment of the present invention, the electrically conductive thermally reticulated polyurethane foam contains from 0.08 to 0.15 parts of TCNQ in the foam forming mixture. In a particularly preferred embodiment of the present invention, the electrically conductive thermally reticulated polyurethane foam contains from 0.10 to 0.15 parts of TCNQ in the foam forming mixture.

A still further object of the present invention is an electrically conductive thermally reticulated polyurethane foam prepared from a polyol and an isocyanate and containing about 0.06 to 1.00 parts of sodium perchlorate (NaClO$_4$) per hundred parts by weight of polyol (pph), preferably 0.06 to 0.80 pph sodium perchlorate and most preferably 0.075 to 0.80 pph sodium perchlorate, in the foam forming mixture. Since sodium perchlorate, by itself, is a potentially explosive material, it is preferable to use a solution of sodium perchlorate in an aqueous or organic solvent during the foam forming procedure. A preferred sodium perchlorate solution is MP100 (from Akishima Chemical Industries Co., Ltd., Tokyo, Japan), which is a solution of 30-40% by weight sodium perchlorate in diethylene glycol methyl ether. Accordingly, when MP100 is used as the source of sodium perchlorate in the foam forming mixture, the following amounts of MP100 are used: 0.20 to 2.50 parts of MP100 per hundred parts by weight of polyol (pph), preferably 0.20 to 2.00 pph MP100 and most preferably 0.25 to 2.00 pph MP100, in the foam forming mixture.

It is another object of the present invention to provide a polyurethane foam composition having a non-degrading electrical volume resistivity of less than about $10^{12}$ ohm-cm (at room temperature) and a lower volume resistivity at low temperatures (e.g., 0°F to −30°F) than conventional polyurethane foams.

The objects of the invention are achieved by providing an electrically conductive polyurethane foam, wherein the electrical resistivity of the foam is desirably decreased to approximately $10^{12}$ ohm-cm or less by the integral incorporation of relatively small yet effective amounts of a specific antistatic agent (i.e., TCNQ or sodium perchlorate) into the structure of the foam during foam formation.

Advantageous polyurethane foam forming reactants include well-known polyester and polyether polyols and diisocyanate compounds. Additional reaction materials include water, catalyst compounds, and cell control agents. According to the invention, the effective amount of antistatic
agent (e.g., TCNQ or sodium perchlorate) ranges from about 0.08 to 0.20 parts per hundred parts polyol (php), preferably 0.08 to 0.15 php and most preferably 0.10-0.15 php, when the antistatic agent is TCNQ and from about 0.06 to 1.00 php, preferably 0.06 to 0.80 php and most preferably 0.075 to 0.80 php, when the antistatic agent is sodium perchlorate.

Surprisingly, the electrical conductivity properties afforded by in situ incorporation of TCNQ or sodium perchlorate survive the exotherm (on the order of about 300°F) accompanying polyurethane foam formation, subsequent reticulation of the foam under plasma temperature conditions (of about 2000°F or more), mechanical abrasion, use at low temperatures (e.g., 0°F to −30°F) and high temperatures (e.g., 120°F to 160°F) and long-term exposure to aqueous and organic fluids. Accordingly, the foam products of the invention are particularly well suited for use as an antistatic material, for example as a filler in aircraft fuel tanks or as a packaging material for delicate electronic components.

According to the invention, a conductive polyurethane foam is formed in situ, by known means, using conventional foam forming reactants comprising one or more polyols, an isocyanate compound or composition, and an effective amount of an antistatic agent such as TCNQ or sodium perchlorate, for providing said polyurethane foam with an electrical resistivity of less than 1×10^12 ohm-cm at ambient room temperature (about 70°F). According to the present invention, a polyester or polyether urethane foam is formed from isocyanate and hydroxyl containing (polyol) reactants by known means, with the antistatic agent incorporated into the reaction mixture prior to foam formation. The resulting polyurethane foam has a solids volume of from about 2% to about 3.3% and a void volume of from about 96.7% to about 98%. The resulting polyurethane foam may thereafter be reticulated. For example, the foam can be reticulated according to the thermal reticulation method taught in Geen et al., U.S. Pat. No. 3,175,025 which is incorporated herein by reference or by any of the other thermal reticulation methods known in the art.

In preparing electrically conductive polyurethane foams for use as fuel tank filler materials, graft polyols are preferred as the polyol constituent of the foam. One preferred graft copolymer is an ethylene oxide-propylene oxide ether of glycerin to which a copolymer of styrene and acrylonitrile has been grafted. The invention is not limited, however, to the use of these graft materials as the polyol constituent. The flexible three dimensional polyurethane foams of the invention may be prepared by reacting isocyanate compounds with polyester polyols, polyester polyols, mixtures of polyester polyols and copolymer polyols such as, for example, the grafted polyether containing styrene and acrylonitrile as described above, in the presence of the antistatic agent. The resulting electrically conductive polyurethane foams exhibit a resistivity of about 10^13 ohm-cm or less at ambient room temperature, and retain this advantageously decreased electrical resistivity despite exposure to exothermic foam forming conditions, relatively violent high temperature reticulation procedures, immersion in water or fuel, use at low temperatures (e.g., 0°F to −30°F) and high temperatures (e.g., 120°F to 160°F) and dry heat aging.

DETAILED DESCRIPTION OF THE INVENTION

The invention is described with reference to a number of examples and embodiments, and with reference to a number of comparative tests. It will be understood by skilled prac-
All of the above ingredients except the isocyanate were combined in a vessel and mixed thoroughly to form a mixture. The TCNQ was added as a solution of the TCNQ in the NMP. The isocyanate was then added to the mixture and further mixing was performed to form a final mixture. The final mixture was then poured into a box shaped vessel and allowed to rise into a foam. After the foam had stopped rising, the vessel containing the foam was placed into an oven at 250° F. for one hour to cure. After the one hour curing period, the foam was removed from the vessel as the final foam product.

The foam produced in this example had a density of 1.4 lbs/ft³.

The resistivity (volume resistivity in ohms-cm) of the foam produced in this example was measured at various temperatures. The results are reported in Table 1.

EXAMPLE 2

A polyol mixture is prepared from 50 parts of a polyether polyol (Voranol 3010—Dow Chemical) and 50 parts of a graft polyol (HS100 from Arco). The polyol mixture (100 total parts) is reacted with 38.4 parts of TDI (toluene diisocyanate—TD80 from Olin Corp.), 25.5 parts of TDI (TD65 from Olin Corp.), 5.6 parts water, 0.5 parts tin catalyst (T-9 from Air Products), 1.0 part amine catalyst 1 (C124—Niax A-1, a proprietary tertiary amine product of Air Products, in dipropylene glycol in a ratio of 1:6), 1.1 parts amine catalyst 2 (NEM from Air Products), 1.2 parts of a silicone surfactant (L6202 from OSI), 2.0 parts of a pigment (4824 from Ferro/PDI) and 0.1 parts TCNQ. The isocyanate index was 105 (i.e., a 5% excess of isocyanate over the stoichiometric amount).

All of the above ingredients except the isocyanates were combined in a vessel and mixed thoroughly to form a mixture. The TCNQ was added in powder form (TCNQ powder was obtained from TCI America, 9211 N. Harbor Gate Street, Portland, Ore. 97203). The isocyanates were then added to the mixture and further mixing was performed to form a final mixture. The final mixture was then poured into a box shaped vessel and allowed to rise into a foam. After the foam had stopped rising, the vessel containing the foam was placed into an oven at 250° F. for one hour to cure. After the one hour curing period, the foam was removed from the vessel as the final foam product.

The foam produced in this example had a density of 1.2 lbs/ft³.

The resistivity (volume resistivity in ohms-cm) of the foam produced in this example was measured at various temperatures. The results are reported in Table 1.

EXAMPLE 3

A polyol mixture is prepared from 50 parts of a polyether polyol (Voranol 3010—Dow Chemical) and 50 parts of a graft polyol (HS100 from Arco). The polyol mixture (100 total parts) is reacted with 38.4 parts of TDI (toluene diisocyanate—TD80 from Olin Corp.), 25.5 parts of TDI (TD65 from Olin Corp.), 5.6 parts water, 0.5 parts tin catalyst (T-9 from Air Products), 1.0 part amine catalyst 1 (C124—Niax A-1, a proprietary tertiary amine product of Air Products, in dipropylene glycol in a ratio of 1:6), 1.1 parts amine catalyst 2 (NEM from Air Products), 1.0 parts of a silicone surfactant (L6202 from OSI), 2.0 parts of a pigment (4824 from Ferro/PDI) and 0.2 parts TCNQ. The isocyanate index was 105 (i.e., a 5% excess of isocyanate over the stoichiometric amount).
All of the above ingredients except the isocyanates were combined in a vessel and mixed thoroughly to form a mixture. The TCNO powder was added in powder form (TCNO powder obtained from TCI America, Portland, Oreg.). The isocyanates were then added to the mixture and further mixing was performed to form a final mixture. The final mixture was then poured into a box shaped vessel and allowed to rise into a foam. After the foam had stopped rising, the vessel containing the foam was placed into an oven at 250°F for one hour to cure. After the one hour curing period, the foam was removed from the vessel as the final foam product.

The foam produced in this example had a density of 1.2 lbs/ft³.

The resistivity (volume resistivity in ohms-cm) of the foam produced in this example was measured at various temperatures. The results are reported in Table 1.

**EXAMPLE 4**

A polyol mixture is prepared from 50 parts of a polyester polyol (Voranol 3010—Dow Chemical) and 50 parts of a graft polyol (HS100 from Arco). The polyol mixture (100 total parts) is reacted with 48.9 parts of TDI (toluene diisocyanate—TD80 from Olin Corp.), 4.1 parts water, 0.25 parts tin catalyst (T-9 from Air Products), 1.0 part amine catalyst 1 (C124—Niax A-1, a proprietary tertiary amine product of Air Products, in dipropylene glycol in a ratio of 1:6), 1.1 parts amine catalyst 2 (NEM from Air Products), 1.2 parts of a silicone surfactant (L6202 from OSI), 2.0 parts of a pigment (4824 from Ferro/PDI) and 0.25 parts MP100 (from Akishima Chemical Industries Co., Ltd., Tokyo, Japan). The isocyanate index was 110 (i.e., a 10% excess of isocyanate over the stoichiometric amount).

All of the above ingredients except the isocyanate were combined in a vessel and mixed thoroughly to form a mixture. The isocyanate was then added to the mixture and further mixing was performed to form a final mixture. The final mixture was then poured into a box shaped vessel and allowed to rise into a foam. After the foam had stopped rising, the vessel containing the foam was placed into an oven at 250°F for one hour to cure. After the one hour curing period, the foam was removed from the vessel as the final foam product.

The foam produced in this example had a density of 1.6 lbs/ft³.

The resistivity (volume resistivity in ohms-cm) of the foam produced in this example was measured at various temperatures. The results are reported in Table 1.

**EXAMPLE 5**

A polyol mixture is prepared from 50 parts of a polyester polyol (Voranol 3010—Dow Chemical) and 50 parts of a graft polyol (HS100 from Arco). The polyol mixture (100 total parts) is reacted with 48.9 parts of TDI (toluene diisocyanate—TD80 from Olin Corp.), 4.1 parts water, 0.25 parts tin catalyst (T-9 from Air Products), 1.0 part amine catalyst 1 (C124—Niax A-1, a proprietary tertiary amine product of Air Products, in dipropylene glycol in a ratio of 1:6), 1.1 parts amine catalyst 2 (NEM from Air Products), 1.2 parts of a silicone surfactant (L6202 from OSI), 2.0 parts of a pigment (4824 from Ferro/PDI) and 0.25 parts MP100 (from Akishima Chemical Industries Co., Ltd., Tokyo, Japan). The isocyanate index was 110 (i.e., a 10% excess of isocyanate over the stoichiometric amount).

All of the above ingredients except the isocyanate were combined in a vessel and mixed thoroughly to form a mixture. The isocyanate was then added to the mixture and further mixing was performed to form a final mixture. The final mixture was then poured into a box shaped vessel and allowed to rise into a foam. After the foam had stopped rising, the vessel containing the foam was placed into an oven at 250°F for one hour to cure. After the one hour curing period, the foam was removed from the vessel as the final foam product.

The foam produced in this example had a density of 1.6 lbs/ft³.

The resistivity (volume resistivity in ohms-cm) of the foam produced in this example was measured at various temperatures. The results are reported in Table 1.

**EXAMPLE 6**

A polyol mixture is prepared from 50 parts of a polyester polyol (Voranol 3010—Dow Chemical) and 50 parts of a graft polyol (HS100 from Arco). The polyol mixture (100 total parts) is reacted with 48.9 parts of TDI (toluene diisocyanate—TD80 from Olin Corp.), 4.1 parts water, 0.25 parts tin catalyst (T-9 from Air Products), 1.0 part amine catalyst 1 (C124—Niax A-1, a proprietary tertiary amine product of Air Products, in dipropylene glycol in a ratio of 1:6), 1.1 parts amine catalyst 2 (NEM from Air Products), 1.2 parts of a silicone surfactant (L6202 from OSI), 2.0 parts of a pigment (4824 from Ferro/PDI) and 1.0 parts MP100 (from Akishima Chemical Industries Co., Ltd., Tokyo, Japan). The isocyanate index was 110 (i.e., a 10% excess of isocyanate over the stoichiometric amount).

All of the above ingredients except the isocyanate were combined in a vessel and mixed thoroughly to form a mixture. The isocyanate was then added to the mixture and further mixing was performed to form a final mixture. The final mixture was then poured into a box shaped vessel and allowed to rise into a foam. After the foam had stopped rising, the vessel containing the foam was placed into an oven at 250°F for one hour to cure. After the one hour curing period, the foam was removed from the vessel as the final foam product.

The foam produced in this example had a density of 1.6 lbs/ft³.

The resistivity (volume resistivity in ohms-cm) of the foam produced in this example was measured at various temperatures. The results are reported in Table 1.
further mixing was performed to form a final mixture. The final mixture was then poured into a box shaped vessel and allowed to rise into a foam. After the foam had stopped rising, the vessel containing the foam was placed into an oven at 250° F. for one hour to cure. After the one hour curing period, the foam was removed from the vessel as the final foam product.

The foam produced in this example had a density of 1.6 lbs/ft³.

The resistivity (volume resistivity in ohms-cm) of the foam produced in this example was measured at various temperatures. The results are reported in Table 1.

**EXAMPLE 8 (COMPARISON)**

A polyol mixture is prepared from 50 parts of a polyether polyol (Voranol 3010—Dow Chemical) and 50 parts of a graft polyol (HS100 from Arco). The polyol mixture (100 total parts) is reacted with 58.2 parts of TDI (toluene diisocyanate—TDI50 from Olin Corp.), 4.8 parts water, 0.5 parts tin catalyst (T-9 from Air Products), 1.0 parts amine catalyst 1 (CI24—Niax A-1, a proprietary tertiary amine product of Air Products, in dipropylene glycol in a ratio of 1:6), 1.1 parts amine catalyst 2 (NEM from Air Products), 1.2 parts of a silicone surfactant (L6202 from OSI), 2.0 parts of a pigment (4824 from Ferro/PDI) and 5.0 parts NMP (N-methyl pyrrolidone). The isocyanate index was 110 (i.e., a 10% excess of isocyanate over the stoichiometric amount).

All of the above ingredients except the isocyanate were combined in a vessel and mixed thoroughly to form a mixture. The isocyanate was then added to the mixture and further mixing was performed to form a final mixture. The final mixture was then poured into a box shaped vessel and allowed to rise into a foam. After the foam had stopped rising, the vessel containing the foam was placed into an oven at 250° F. for one hour to cure. After the one hour curing period, the foam was removed from the vessel as the final foam product.

The foam produced in this example had a density of 1.5 lbs/ft³.

The resistivity (volume resistivity in ohms-cm) of the foam produced in this example was measured at room temperature. The result is reported in Table 1.

### Table 1

<table>
<thead>
<tr>
<th>Temp.</th>
<th>Ex. 1</th>
<th>Ex. 2</th>
<th>Ex. 3</th>
<th>Ex. 4</th>
<th>Ex. 5</th>
<th>Ex. 6</th>
<th>Ex. 7</th>
<th>Ex. 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>70° F.</td>
<td>5.3E11</td>
<td>8.5E11</td>
<td>3.4E11</td>
<td>1.1E12</td>
<td>4.1E11</td>
<td>3.3E11</td>
<td>1.5E11</td>
<td>1.19E14</td>
</tr>
<tr>
<td>20° F.</td>
<td>5.3E13</td>
<td>1.8E13</td>
<td>2.7E14</td>
<td>3.9E13</td>
<td>5.1E13</td>
<td>3.1E13</td>
<td>1.5E13</td>
<td>1.5E14</td>
</tr>
<tr>
<td>0° F.</td>
<td>6.8E13</td>
<td>5.7E14</td>
<td>1.0E14</td>
<td>3.4E14</td>
<td>2.8E14</td>
<td>1.6E14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-30° F.</td>
<td>8.5E14</td>
<td>1.4E15</td>
<td>&gt;1.0E14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The static decay properties of the foams of Examples 1 and 8 were compared by applying a 5000 volt charge to a 3" by 5" by 0.50" piece of the foam at about 70° F. (room temperature) and measuring the time required for the foam to dissipate 90% of the charge. Each piece was subjected to a positive 5000 volt charge and a negative 5000 volt charge. The results are shown in Table 2.

### Table 2

<table>
<thead>
<tr>
<th></th>
<th>Polarity of 5000 Volt Charge</th>
<th>Example 1</th>
<th>Example 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissipation Time for Foam</td>
<td>+</td>
<td>0.71 seconds</td>
<td>0.72 seconds</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>&gt;500 seconds</td>
<td>320 seconds</td>
</tr>
</tbody>
</table>

From the above examples it can be seen that the foams of the present invention that contain TCNQ or sodium perchlorate have a reduced electrical resistivity and an excellent static decay rate in comparison to conventional polyurethane foams with identical or equivalent compositions which do not contain TCNQ or sodium perchlorate.

What is claimed is:

1. A three dimensional electrically conductive plastic foam structure comprising a polyurethane foam containing an effective amount for lowering the volume resistivity of said foam of an antistatic agent consisting essentially of tetracyanoquinodimethane.

2. A three dimensional electrically conductive structure according to claim 1, wherein said structure is prepared by reacting a polyol and an isocyanate and comprises 0.08 to 0.20 parts per hundred parts by weight of said polyol of said tetracyanoquinodimethane as said antistatic agent.

3. A three dimensional electrically conductive structure according to claim 1, wherein said polyurethane foam comprises a reticulated polyurethane foam.

4. A three dimensional electrically conductive structure according to claim 1, wherein said polyurethane foam is formed from at least one polyol and at least one isocyanate and further wherein said antistatic agent is tetracyanoquinodimethane which is dissolved in a suitable solvent.

5. A three dimensional electrically conductive structure according to claim 1, wherein said polyurethane foam is formed from a reaction mixture containing at least one polyol and at least one isocyanate and further wherein said antistatic agent is tetracyanoquinodimethane which is not dissolved in a solvent but is added directly to the reaction mixture.

6. A three dimensional electrically conductive structure according to claim 2, wherein said polyurethane foam contains 0.08 to 0.15 parts per hundred parts by weight of said polyol of said tetracyanoquinodimethane.

7. A three dimensional electrically conductive structure according to claim 2, wherein said polyurethane foam contains 0.10 to 0.15 parts per hundred parts by weight of said polyol of said tetracyanoquinodimethane.

8. A three dimensional electrically conductive structure having a volume resistivity at about 70° F. of less than 10¹² ohm-cm, comprising a polyurethane foam containing an effective amount for reducing the electrical resistivity of said foam to less than 10¹² ohm-cm of an antistatic agent consisting essentially of tetracyanoquinodimethane incorpored into said foam in situ.

9. A three dimensional electrically conductive structure...
11. According to claim 8, wherein said antistatic agent is tetracyanoquinodimethane which is present in an amount of from about 0.08 to 0.20 phr.

10. A method of preparing an electrically conductive polyurethane foam composition which comprises reacting, under foam forming conditions, at least one polyester or polyether polyol with an isocyanate compound in the presence of an effective amount for lowering the electrical resistance of said polyurethane foam of an antistatic agent consisting essentially of tetracyanoquinodimethane.

11. A method according to claim 10, wherein said electrically conductive polyurethane foam has an electrical resistivity of less than $10^{12}$ ohm-cm at about 70°F.

12. A method according to claim 10, wherein said antistatic agent is tetracyanoquinodimethane and the amount of said tetracyanoquinodimethane in said polyurethane foam composition is from about 0.08 to 0.20 phr.

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