Claims:

1. A high energy return foam derived from a composition comprising from about 30 wt% to about 100 wt% of a polyolefin elastomer having a density of between about 0.857 g/cc and about 0.884 g/cc and a MI of not greater than about 5 g/10 min and from about 0 wt% to about 70 wt% of a polyolefin derivative having a density less than about 0.857 g/cc or greater than about 0.884 g/cc or having a MI of greater than about 5 g/10 min, based on the weight of the composition.

2. The high energy return foam of claim 1, wherein the polyolefin elastomer is selected from ethylene/α-olefin random copolymer, ethylene/α-olefin multi-block interpolymer, ethylene/α-olefin/nonconjugated polyene interpolymer or a mixture of any two or more of them.

3. The high energy return foam of claim 1, wherein the foam has a rebound of not less than 70%.

4. The high energy return foam of claim 1, wherein the polymer in the composition is crosslinked by peroxide or by irradiation and the crosslinked polymer has a gel% of from about 50% to about 100% by weight by a hot xylene extraction method.

~~5. The high energy return foam of claim 1, wherein the crosslinking is performed by peroxide or by irradiation.~~

~~6~~ 5. The high energy return foam of claim 4 ~~or 5~~, wherein the crosslinked polymer is foamed at temperature of not less than about 90 ^{o}C and at a pressure from about 10 to about 80 MPa.

~~7. The high energy return foam of claim 4 or 5, wherein the crosslinked polymer is foamed at temperature from about 100 ^{o}C to about 150 ^{o}C and at a pressure from about 15 to about 70 MPa.~~

~~8.~~ 6. The high energy return foam of claim 4 or 5, wherein the foam has a rebound of not less than 72%.

~~9.~~ 7. The high energy return foam of claim 1, wherein the composition comprises from about 35 wt% to about 100 wt% of a polyolefin elastomer having a density of between about 0.857 g/cc and about 0.884 g/cc and a MI of not greater than about 5 g/10 min and from about 0 wt% to about 65 wt% of a polyolefin derivative having a density less than about 0.857 g/cc or greater than about 0.884 g/cc or having a MI of greater than about 5 g/10 min, based on the weight of the composition.

~~10. The high energy return foam of claim 1, wherein the composition comprises from about 50 wt% to about 100 wt% of a polyolefin elastomer having a density of between about 0.857 g/cc and about 0.884 g/cc and a MI of not greater than about 5 g/10 min and from about 0 wt% to about 50 wt% of a polyolefin derivative having a density less than about 0.857 g/cc or greater than about 0.884 g/cc or having a MI of greater than about 5 g/10 min, based on the weight of the composition.~~

~~11~~ 8. A method for preparing the high energy return foam of any one of the preceding claims, comprising:

a) providing a composition comprising from about 30 wt% to about 100 wt% of a polyolefin elastomer having a density of between about 0.857 g/cc and about 0.884 g/cc and a MI of not greater than about 5 g/10 min and from about 0 wt% to about 70 wt% of a polyolefin derivative having a density less than about 0.857 g/cc or greater than about 0.884 g/cc or having a MI of greater than about 5 g/10 min, based on the weight of the composition;

b) crosslinking by peroxide or irradiation the polymers in the composition obtained in step a);

c) foaming the resulting crosslinked polymers obtained in step b).

~~12~~ 9. The method of claim ~~11, wherein the crosslinking is performed by peroxide or by irradiation.~~

~~13. The method of claim 11~~8, wherein the crosslinked polymer is foamed at temperature of not less than about 90 ºC and at a pressure from about 10 to about 80 MPa.

~~14~~ 10. The method of claim ~~11, wherein the crosslinked polymer is foamed at temperature from about 100 ºC to about 150 ºC and at a pressure from about 15 to about 70 MPa.~~

~~15. The method of claim 11~~8, wherein the foam has a rebound of not less than 70%.