| Table 3.4.4 R: List of Mixed Metal Heat Stabilizers: | | | | |
|---|---|---|---|---|
| **Manufacturer** | **Data Source** | **Model** | **Chemical (s)** | **Performance** |
| Akrochem Corp. | Bill Allen<br>Datasheet<br>MSDS | Zeocros P-321 | Magnesium aluminum hydroxy carbonate (95%) CAS 11097-59-9<br>water (<5%) CAS 7732-18-5 | Can be used for wire and cable applications, however, not as effective as lead for water resistance. Has the added benefit of releasing water at 300 degrees Celsius and therefore can be used as a flame retardant. |
| Akcros (part of Akzo Nobel) | | Akcrostab BZ-5043, Lankromark LZB 248 | Barium-zinc: | |
| Amfine Chemical Corp. (Mitsubishi, Asahi Denka) | Jay Kolaya<br>Website<br>Datasheet<br>MSDS | RUP-103 | Magnesium-zinc:<br>Inorganic compounds trade secret (< 80%)<br>Zinc stearate (< 20%)<br>Calcium cilicate (< 10%) | For automobile PVC wire harness insulation. |
| Amfine Chemical Corp. (Mitsubishi, Asahi Denka) | Jay Kolaya<br>Website<br>MSDS | RUP – 110GP | Magnesium-zinc:<br>magnesium compounds trade secret (<80%)<br>Zinc stearate (< 20%)<br>Inorganic compounds trade secret (< 10%)<br>Organic compounds trade secret (<10%) | For automobile PVC wire harness. |
| Amfine Chemical Corp. (Mitsubishi, Asahi Denka) | Jay Kolaya<br>Datasheet<br>MSDS | RUP – 144 RT | Magnesium-zinc:<br>Inorganic compounds trade secret (< 75%)<br>Zinc stearate (< 25%)<br>Organic compounds trade secret (< 20%) | For automotive PVC wire harnesses and UL building wires (such as THW-2 and THWN-2) requiring long term wet properties. |

| Table 3.4.4 R: List of Mixed Metal Heat Stabilizers: | | | | |
|---|---|---|---|---|
| **Manufacturer** | **Data Source** | **Model** | **Chemical (s)** | **Performance** |
| Arkema (previously Atofina) | Peg Duffy Additives Customer Service | Stavinor | Calcium-zinc | Product no longer manufactured in the U.S., and is only available for purchase in Europe. |
| Associated Additives | Ingrid Lane<br>Datasheet<br>MSDS | Almstab PCZ4 | Zinc stearate and calcium stearate | Can replace liquid cadmium-barium-zinc systems. Typical loading levels are 4 t0 6 phr. Would need to be modified for use with wire and cable applications. |
| Baerlocher | | Baeropan, Baerostab | | |
| Blachford | Howard Gunn | Chemstab | Barium-zinc | Products no longer manufactured. |
| Chemson | Sent email | Naftomix, Naftosafe | Calcium-zinc, magnesium-aluminum-zinc, organic based stabilizers? | |
| Chemtura (GL and Crompton) | Marge Biercevicz<br>MSDS<br>Website | Mark EZ 760 | Magnesium/aluminum/zinc:<br>Isopropylidenediphenol (< 20%)<br>zinc stearate (< 15%)<br>magnesium aluminum hydroxide carbonate CAS 11097-59-9 (? %) | Mark EZ 760 is a low zinc containing solid stabilizer specifically developed to meet the general requirements of PVC cable insulation compounds, e.g. heat stability and volume resistance, as well as excellent low water absorption properties. This product is also suitable for flame retarded and transparent formulation. |
| Chemtura (GL and Crompton) | Marge Biercevicz<br>MSDS<br>Website | Mark 6731 | Barium/zinc:<br>Barium stearate (< 50%)<br>Metal oxide trade secret (< 25%)<br>Metal oxide trade secret (< 20%)<br>Zinc stearate (< 12%)<br>Trade secret (< 5%)<br>calcium silicate (< 5%) | When used with Drapex® 6.8, epoxidized soybean oil, Mark 6731 can be used as a replacement for lead and cadmium containing stabilizers in wire and cable jacketing and primary insulation compounds. |

| Table 3.4.4 R: List of Mixed Metal Heat Stabilizers: | | | | |
|---|---|---|---|---|
| **Manufacturer** | **Data Source** | **Model** | **Chemical (s)** | **Performance** |
| Chemtura (GL and Crompton) | Marge Biercevicz<br>MSDS<br>Website | Mark 6750 | Calcium/barium/zinc: Calcium hydroxide (45 – 55%)<br>Barium stearate (20 – 30%)<br>Zinc stearate (10 – 20%)<br>Titanium dioxide (5 – 10%)<br>Trade secret (? %) | Used for flexible wire and cable jacket compounds. Mark 6750 is a highly efficient powder stabilizer intended to replace lead stabilizers in UL-62, UL-444, UL-493 and UL-719 jacket compounds. Mark 6750 imparts excellent early color hold and long term dynamic stability. Where solid Barium/Cadmium stabilizers are used, Mark 6750 can be substituted resulting in equivalent color hold and improved long term stability. |
| Chemtura (GL and Crompton) | Website | Mark 6736 ACM | Barium/zinc:<br>Barium stearate (< 45%)<br>Metal oxide trade secret (< 20%)<br>Zinc stearate (< 20%)<br>Titanium dioxide (< 15%)<br>Hydrotalcite trade secret (< 10%)<br>Trade secret (< 5%)<br>Calcium silicate (< 5%)<br>Metal oxide trade secret (< 2%)<br>Zinc compound (< 1.5%) | Designed as a replacement for conventional lead heat stabilizers for wire and cable primary insulation compounds. Compared to leads, Mark 6736ACM will improve the early color hold of the insulation compound. In addition long-term heat stability will be better than a previously available barium/zinc stabilizer. Mark 6736ACM imparts electrical properties to insulation compounds only slightly less than that of lead stabilizers. |
| Chemtura (GL and Crompton) | Website | Mark 6751 | Calcium/barium/zinc:<br>Calcium hydroxide (45 – 55%)<br>Barium stearate (20 – 30%)<br>Zinc stearate (10 – 20%)<br>Titanium dioxide (5 – 10%)<br>Trade secret (?%) | Used for flexible wire and cable jacket compounds, and is intended to replace lead stabilizers in UL-62, UL-444, UL-493 and UL-719 jacket compounds. Mark 6751 imparts excellent early color hold and long term dynamic stability. Where solid Barium/Cadmium stabilizers are used, Mark 6751 can be substituted resulting in equivalent color hold and improved long term stability. |

| Table 3.4.4 R: List of Mixed Metal Heat Stabilizers: | | | | |
|---|---|---|---|---|
| **Manufacturer** | **Data Source** | **Model** | **Chemical (s)** | **Performance** |
| Chemtura (GL and Crompton) | Website | Mark 6767 | Calcium/barium/ magnesium/zinc:<br>Calcium hydroxide (<45%)<br>Magnesium oxide (<15%)<br>Titanium dioxide (<15%)<br>Barium carboxylate trade secret (< 12%)<br>Barium carboxylate trade secret (< 12%)<br>Calcium silicate (< 8%)<br>Antioxidant trade secret (< 8%)<br>Trade secret (< 6%)<br>Zinc carboxylate trade secret (< 5%)<br>Zinc carboxylate trade secret (< 4%) | Used for flexible wire and cable PVC compounds, and is intended to replace lead stabilizers in UL-62, UL-493 and UL-719 jacket and insulation compounds. Mark 6767 is cost competitive with lead stabilizers in simple jacket compounds at lower loadings. The pound-volume cost will be virtually the same. |
| Chemtura (GL and Crompton) | | Mark 6796 | Calcium-zinc | |
| Chemtura (GL and Crompton) | | Mark 6797 | Calcium-zinc | |
| Chemtura (GL and Crompton) | | Mark 6784 ACM | Calcium-zinc | |
| Durachemicals | | Durastab | Calcium-zinc | |
| Ferro | | Therm-chek RC 149, 216, 197, 215, 217 | Great article | |
| Ferro | Datasheet | Therm-chek PD 958 P | Calcium-zinc | Developed as a replacement for lead-based heat stabilizers in wire and cable formulations. Useful in general jacketing applications, that do not require wet electrical properties |

| Table 3.4.4 R: List of Mixed Metal Heat Stabilizers: | | | | |
|---|---|---|---|---|
| **Manufacturer** | **Data Source** | **Model** | **Chemical (s)** | **Performance** |
| Ferro | SpecialChem | Therm-Chek RC 376P and RC 377P | Calcium-zinc | Designed to replace tribasic lead sulfate on a part for part basis in general purpose wire and cable jacketing applications. |
| Ferro | | Therm-Chek SP1797 | Barium/cadmium/zinc | Used for flexible PVC extrusion applications. |
| Ferro | | Therm-Chek MX 125 | Barium/cadmium/zinc | Used for flexible PVC extrusion applications. |
| Ferro | SpecialChem | Them-Chek RC 556P | Calcium-zinc | Replacement for lead-based heat stabilizers in general purpose jacketing and insulation applications that do not require wet electrical properties. Does not require ESO as a co-stabilizer. |
| Ferro | Jim Keenan Datasheet | Therm Chek 7206 | Calcium-zinc | Used for a wide range of cable applications including energy and telecommunications. Used for both primary insulation and sheathing. Designed to have processing characteristics similar to those of lead. The dosage for sheathing and low temperature cables is 3 – 5 phr. |
| Ferro | SpecialChem | Therm-Chek 7208P | Calcium-zinc | Used for hight temperature cable and automotive wire applications. Suitable for use in 105 degree Celsius rated automotive and UL insulation products. |
| Ferro | Jim Keenan Datasheet | Therm Chek 7209 | Calcium-zinc | Used for a wide range of cable applications including energy and telecommunications. Used for both primary insulation and sheathing. For some applications the level of lubrication may need to be adjusted. The dosage for sheathing and low temperature cables is 3 – 5 phr. |
| Ferro | Jim Keenan Datasheet | Therm Chek 7700 | Aluminum-magnesium-zinc | Used for high temperature cable and automotive wire applications. Designed to have processing characteristics similar to those of lead. Outperforms lead in the Congo Red test. Compounds stabilized with this product exhibit lower levels of water absorption than compounds stabilized with calcium-zinc stabilizers. Recommended dosage is 7 – 12 phr. |

| Table 3.4.4 R: List of Mixed Metal Heat Stabilizers: | | | | |
|---|---|---|---|---|
| **Manufacturer** | **Data Source** | **Model** | **Chemical (s)** | **Performance** |
| Halstab | | Plastistab | | |
| Kyowa (Kisuma) | K. Kakinuma, Robert Groenhagen<br>Datasheet<br>MSDS | Alcamizer P93 | Magnesium zinc aluminum hydroxide carbonate hydrate, CAS 169314-88-9, (95 - 100%)<br>$MgO/Al_2O_3$ Molar ratio: 3<br>$ZnO/Al_2O_3$ Molar ratio: 1 | No deterioration of the insulating characteristics of PVC. |
| Kyowa (Kisuma) | K. Kakinuma, Robert Groenhagen<br>Datasheet<br>MSDS | Alcamizer 1 | Magnesium aluminum hydroxide carbonate hydrate, CAS 11097-59-9, (95 – 100%)<br>$MgO/Al_2O_3$ Molar ratio: 4 | No deterioration of the insulating characteristics of PVC. |