Curable Siloxane Composition With Modified Surface Properties

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Application of release coatings, which are non-adherent to adhesives is well known in the coatings art. For example paper release coatings are used to release adhesives, e.g. pressure sensitive adhesives, from labels, decorative laminates, transfer tapes etc. Linear polydimethylsiloxanes provide, when cross-linked, easy release coatings. This means that an adhesive-laminated face stock may be detached with very little force required which is desired for many release applications. However, in other applications a higher release force is required. For example in laser printer application or at high speed converting machines, pre-dispensing has to be prevented by such a higher release level. Another example in which a higher release level is needed, is the usage in differential release liners wherein one side of the substrate is coated with a premium release silicone (low release forces) while the other side is coated with a tight (high release forces) release silicone layer.

The additive, which can give the tight or modified release characteristics, is the so-called Controlled Release Additive (CRA).

Vinyl-functionalized MQ-resins are widely used as a CRA in the industry. A disadvantage of using above described MQ-resin types is that they slow down the cure rate of mixes containing premium release silicones. Low curing rates has to be regarded as a disadvantage, since coating machines are running faster and faster.

Another problem, which current MQ-resin types show when used as a CRA, is the efficiency and the release response dependent on the amount of CRA used in the silicone bath. Normally a very low release response is observed up to a CRA-loading level of 20% in the silicone composition. At higher loadings the release force increases exponentially. A more ideal situation would be if the release response shows a linear relationship with respect to the loading level of the CRA. In addition to above mentioned effect on cure speed the use of higher loadings of CRA has a negative effect on other coating properties like the anchorage of the silicone coating on the substrate, the coverage of the substrate by the silicone coating and on the processing of the silicone on the coating machine.

Surprisingly, the above-mentioned negative effects can be solved with a new curable siloxane composition, which provides a curable siloxane composition as a release film, with a different type of a release modifier. Within this siloxane composition one can adjust the release properties of adhesives by a small amount of a modifying additive. The negative effects of compositions with a high level of known CRA composition can be avoided.