



ADHESIVES
& SEALANTS

AUTOMOTIVE ADHESIVES & SEALANTS

Application
and
Product
Information

Automotive adhesives and sealants play an essential role in the car manufacturing industry, and they are applied in almost every step of the vehicle production process. euroFillers portfolio is designed to satisfy the needs from the customer when looking for functional fillers in the different stages of the car manufacturing. The group is a long-term partner of the key players in the industry and has been present in the market for more than 30 years.

inpcc

CALPREC PR

inlime Micronized Calcium Oxide

The best filler combination for the automotive industry

Automotive adhesives and sealants play an essential role in the car manufacturing industry, and they are applied in almost every step of the vehicle production process. euroFillers group is a long-term partner of the key players in this industry and has been present in the market for more than 30 years. Due to this broad experience, the group has gained deep knowledge on market needs and can offer the best filler combination to be used in multiple formulations depending on customer parameters and OEM requirements.

One of the most common products are PVC-based plastisols. They are applied in the paint shop as, for instance, underbody coating. These products are usually applied from below by means of a flat stream. Depending on the technology, plastisol must be adapted to fulfil the pressure requirements for the correct application.



As a consequence, the rheological needs for PVC plastisols have increased continuously over recent years. The paste has to bond immediately after being applied to the sheets and must not 'sag' while, at the same time, must have a high yield value.

Generally speaking, in order to be good for processing, a PVC plastisol must exhibit at the same time two requirements:

- High viscosity at low shear rates (so the material does not sag once applied)
- Low viscosity at high shear rates (so the plastisol can be spread easily)

Therefore, there must be a special relation between the viscosity and the yield value (which is the minimum stress that needs to be applied for the plastisol to begin flowing). This relation is enhanced through specific surface treatment which also serves to reduce plasticizer absorption and improve the dispersion of the filler.

Another key parameter to be controlled is moisture, which normally gets into the plastisol by means of the formulation ingredients (PVC, filling agents and additives). During the gelation process, moisture can lead to the formation of bubbles and a poor bonding on the EC-coated metal plates.

Moisture can also have an influence on the rheological properties of the system. In fact, even pre-dried Calprec PR shows a higher yield value than another Calprec PR to which a drying agent has been added. In this case, moisture enters into the mixture during the dispersion process by means of atmospheric humidity. This is the reason why



calcium oxide (CaO) is added to PVC plastisols as drying agents.

CaO itself must have some specific properties in order to be suitable for the plastisol system. The product has to be properly micronized to have a small enough mean particle size. Indeed, big particles must be avoided, as they may block the small nozzles that OEM use in their dispensing systems. inlime Micronized calcium oxide provides a precise control over the top cut to minimize the residue on 40 µm sieve and allow for the best performance for automotive application.

Despite the good effect of using CaO as drying agent, the PCC still has to be especially designed to grab as less moisture as possible from ambient. Due to that, Calprec PR is coated with fatty acids so it is less sensitive to moisture and improves long-terms stability of the plastisols while not compromising the good bonding properties of the material.

As an example, the following formulation can be used to show the properties of inPCC and inlime grades in a PVC plastisol:

COMPONENTS	amount (%)
DINP Plasticizer	35
inPCC Calprec PR	18
Ground Calcium Carbonate	15.8
Adhesion promotor	1
ZnO	0.2
inlime Micronized CaO	2
PVC resin	28
Total:	100

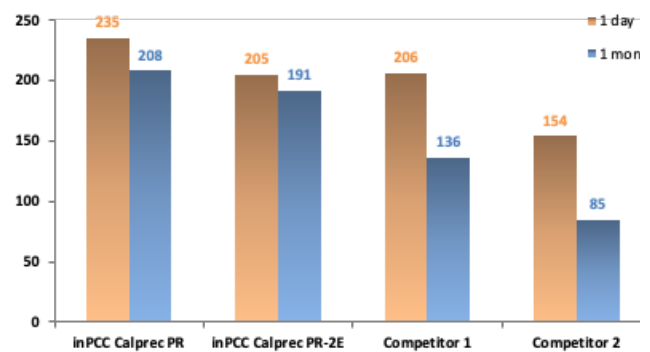
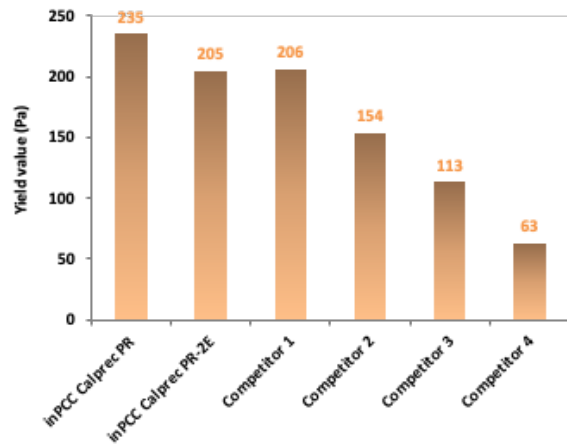
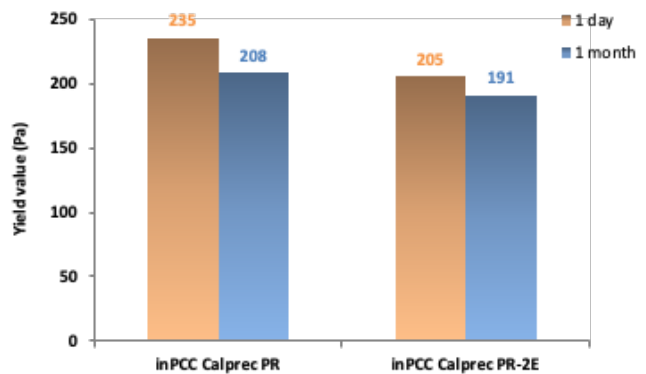
With this base formulation, many different results can be achieved depending on the nature of adhesion promotor and the type of PVC resin. Then it is essential to choose the correct type of PCC product depending on the coating content and its effect on formulation rheology.



There are different inPCC products available to cover a wide range of yield value needs. All these products combined with inlime grades are able to provide good rheological properties while maintaining a good stability along time, one of the key properties that is always demanded.

These yield value properties are essential and give inPCC products a great advantage versus other competitors in the market, with lower performance in these terms:

In fact, if a more in-depth comparison is made on the basis of stability given by the closest PCC competitors, the inPCC grades are also the best available option in the market.



On the other hand, inlime Micronized CaO can offer different drying properties depending on fineness and reactivity. Fineness is a key property that defines the reactivity of the product and thus the drying effect it has on the plastisol composition. Besides, it is essential to control this fineness to avoid problems of clogging in the nozzles.

Fineness can be compared by means of the residue obtained on a 40 µm sieve. The more residue the worse the top cut is, and the more probable is to have problems in the nozzles when dispensing the plastisol.

Aside, reactivity depends on the t30 value. The t30 is a clear indicator on the reactivity and is defined as the time it takes the composition to increase the temperature in 30 °C. For the following test comparison, initial temperature was 20 °C so t30 was the time it took the samples to reach the value of 50 °C. This comparison shows how inlime Micronized CaO offers the best combination of fineness and reactivity when applied to a PVC plastisol.

