

New generation of PVC plastisols

The latest PVC plastisol product from BASF – PLASTICERAM® TOP – provides enhanced ultraviolet and weathering resistance by using new pigments and additives, specifically aimed at increasing resistance to light. The product is also heavy metal- and phthalate-free so has significant health and safety and environmental advantages over alternative products.

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When it comes to applications in tough conditions, plastisol-based coil coatings are virtually mandatory. These polyvinyl chloride (PVC) coatings protect buildings effectively against weathering and ultraviolet (UV) radiation, to mention only two hazards (see *Figure 1*). For some years, BASF Coatings has been devoting special efforts to developing PVC coil coatings that meet the requirements laid down by the legislators for reduced environmental impact. Traditional products contain both heavy metals and phthalates, which have both environmental and health and safety concerns. Doing without these was a major first step in this direction. BASF's latest product, PLASTICERAM® TOP, is both heavy metal- and phthalate-free.

Some aspects of the technology are shown below:

- PVC powder dissolved in speciality softeners
- Highly flexible, bend radius 0T down to 5°C (where T is thickness)
- 100-200µm coating
- Very high corrosion resistance, typically 2mm after 1,000hrs salt spray
- The best water resistance of any liquid coil coating
- Requires acrylic primer

This modern generation of PVC plastisols also stand out because of their excellent physical properties, a high degree of weathering resistance, especially at low temperatures, and enhanced UV resistance.

PRODUCT TESTING

An extensive series of trials carried out on this new product generation. BASF Coatings relies heavily on natural exposure to prove its products and a demanding four-year test regime in the hot and humid Florida, USA, environment has been carried out to prove its UV performance.

Over the test cycle the laboratory panels are held at a 5° inclination towards the sun. One year under these conditions equals up to seven years on a vertical wall in Europe. The panels are evaluated for gloss and colour by instrumental spectrophotometer measurements of the external exposure

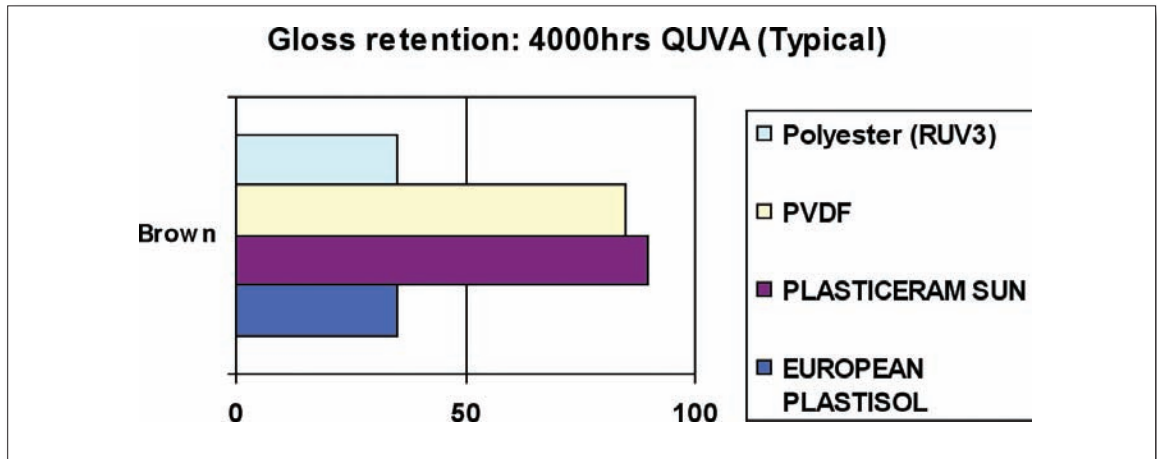


Fig 1 Odyssey Arena in Italy with PVC-coated externals

	Corrosion resistance	UV durability	Line speed (m/ min)	Expected lifetime (yrs)
European plastisols	RC3 – 4	RUV2-3	80	10
Plasticeram®Top	RC5 Over COILTEC A	RUV4 +	180	35 +

📌 **Table 1 Product comparison**

RC, RUV and so on, are classes for corrosion protection and weather resistance as described in ECCA and DIN norms. COILTEC A is our primer used with the PLASTICERAM Topcoat in this test.



📌 **Fig 2 Gloss retention results**

QUVA = a common test method for weather and UV stability.

RUV = the classes for weathering resistance as described in standard EN 10169/2.

Brown = the test colour in this case (because it is quite a difficult one, but common for our applications).

panels, and an estimation of product life is made. Typical UV resistance of a phthalated PVC plastisol would give a gloss retention of 30% over its lifetime. Phthalate-free systems are proving able to maintain their gloss at a level of 70% over the same period. These properties ensure that facades and roof elements retain their fine appearance for a longer time (see *Figure 2*).

A coastal site at Bohus Malmon, Sweden, is used to determine corrosion resistance. Accessible only by water, and battered by the winds of the Baltic, the testing racks at Bohus Malmon sit less than 20m from the sea, and create a natural salt spray effect. With long wet times and high salinity, this provides benchmark testing for corrosion resistance. *Table 1* gives a summary of test result performance.

PRODUCTS

When it comes to the protection of steel facades and roof elements, the merits and properties of plastisols in coil coating topcoats will continue to make them an essential material for state-of-the-art architectural designs. PLASTICERAM® TOP supports this high standard by means of an optional metallic finish that imparts a special high-grade appearance to buildings. In addition, a wide range of colours can be used to meet architects' design

criteria. Reference projects such as the zero-carbon house in Nottingham, England, reflect the product's diversity and its excellent property profile. The specification of the product required optimised solar reflectance with 30-year longevity and the ability to collect the rainwater run-off for grey water usage.

These innovations have also had a lasting impact on processability. The new products enable higher processing speeds to be used and line speeds are now in excess of 180m/min (experimental, see *Table 1*). Hence, process efficiency is increased considerably, directly reducing running costs.

CONCLUSIONS

Since its market launch in 2008, PLASTICERAM® TOP has proved a success. Based on the excellent product properties mentioned and their improved eco-efficiency, we expect PVC plastisols to continue to have excellent market prospects. **MS**

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