The Perception of Needs Versus Wants

Technical problems in the plastics and coatings industry never go away and appear to reinvent themselves every five or ten years depending on the industry involved. The real solution to the perceived technical problem rarely ends well due to many factors. The one big factor of "Want" versus true "Need" always clouds the course of action to providing a solution that fits the problem rather than finding solutions to problems that do not exist!

A case in point was the "Bug Light". The manufacturer of the lamps needed to coat the lamps with a plastic coating that would not degrade over time and protect the lamp from breaking. These lamps were put into a device that when lite attracted insects and were zapped by electrical current in the vicinity of the lamp. The vendor supplying the light stabilizer recommended a solution and a purchase was made followed by thousands of lamps and bug lights being assembled for sale to a large store selling the lamps commercially to consumers.

Shortly after consumers found the lamps were NOT attracting insects and returned the lamps as flawed. This recall was followed by the lamp manufacturer going out of business and laying off 1,376 workers. When investigated by outside consultants it was found the additive vendor had recommended a light stabilizer that would have protected the coating but also absorbed the wavelengths of light that were transmitted by the lamp to attract the insects! Basically the wrong solution to the problem and end use "Need".

This among many problems shows that by satisfying a perceived "Want" does not truly solve the end use problem or true "Need".

Another problem involved the discoloration of a polyolefin fabric that was being cured in a gas oven. The amount of waste created by the problem was short of shutting down production. The vendor provided a solution based on the discoloration of the polyolefin. However, the problem did not go away and the company shut down production.

When further investigated it was discovered the additive vendors immediate perception was an issue of "Gas Yellowing" sometimes referred to as "Gas Fading" or "Gas Staining".

Gas Yellowing is typically due to prompt oxides of nitrogen from burning exhaust fumes and other sources of heating from gas fired furnaces.

The mechanism and chemistry is well understood today. However, in attempting to solve a discoloration problem the assumption based on the "Want" from the carpet manufacture and the perception of the source of the problem were clouded by the lack of facts.

The real problem was found related to the curing cycle and the curing agents involved in the backing of the carpet.

The additive vendors "Want" to sell an additive alternative based on flawed information from the carpet manufacturer who "wanted" a solution drove the dynamics but did not solve the problem. The true "Need" once again was different from the perceived "Want".

In the coatings arena one problem sticks out among many past problems that of delamination of coatings. Over ten years ago a major auto manufacturer recalled millions of cars due to top coat delamination. This problem created a big opportunity for additive vendors who flooded to the auto suppliers who were looking for a solution to the problem.

Those who provided a solution to this problem stated the auto manufacturer needed to add more ultraviolet absorber and provided arguments based on the technical merits of the additive. This did not solve the problem but rather created a further problem in the bake ovens. Alternative companies speculated the problem was wavelength and absorptivity of the UVA being used and provided their own solutions but the problem did not go away. This continued for several years until the root cause of the problem was discovered.

In removing the surface primer between the E coat and pigmented coats and the top coat and increasing bake temperatures and increasing line speeds no only removed the more volatile ultraviolet absorber from the coating to the adjacent cooler walls of the bake ovens but degraded the E coat that protected the metal. Degradation of the E coat changed the wavelength sensitivity and activation energy of the E coat causing premature degradation that could have never been protected by the alternative UVA. The root solution to the problem did not involve light stabilizers but rather thermo-oxidative stabilization of the E coat which was not protected at the time from thermal degradation.

Once again the driving desire of "Want" and not true "Need" drives the industry even today with increase challenges now global and more complicated by light irradiance and higher thermal gradients.

In conclusion we can sum this issue into a simple phrase that should be considered by all technical support individuals globally in the plastics and coatings industry. The phrase "A persons NEEDS are best shaped by their understanding of what is potentially possible". Ask the proper questions based on the problem and drill down on end use requirements. Determine the application and the expectations of the final product in all aspects. Determine Cost Benefit Performance ratio of the solution and problem.

For example if a ultraviolet absorber is needed and the customer states it wants to protect 390 nm specifically you will need to ask questions regarding the thickness of the plastic or coating and what transmission requirements over time is required.

If you start with providing a cost and concentration of the additive in many cases the customer will go with the cheapest alternative. This happens frequently when two solutions from two vendors clash over price. One vendor quotes $30 per pound the other $60 per pound both provide the 390 nm protection. However, neither provides further information that can show the cost benefit performance between the cost and the performance.

So, if the $30 per pound additive has an absorptivity of 35 l/gm-cm at 390 nm and the $60 per pound has an absorptivity of 85 l/gm-cm at 390nm the true value is the $60/pound UVA.

Why? Because the $30/pound additive is 41.18% weaker than the $60/pound UVA. Equivalency between the two additives shows the $60 per pound additive is 2.428 times more effective at 390 nm so to achieve equivalency with the $30 per pound UVA you would require 2.428 times more making the true cost of the additive $72.85 per pound instead of $30.

Therefore, the key to choosing a UVA on wavelength and transmission or absorbance alone is best done by using absorptivity as the yardstick.

Other factors like volatility, permanence, blooming, migration and in-situ conversion rates must be considered in this comparison for maximum cost benefit performance ratio.

Remember there is no substitute for asking the right questions and never assume the information you are getting is complete.

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