



"An ISO 9001 registered company"

Technical Service Report TRS#10

Spot Cure or Flood Light -That is the question

Spot	-Very high intensity. -Very little heat. -Small area of illumination.
Flood	-Large area of illumination. -Considerable heat development. -Lower intensity.

Which to choose?

There are several factors which effect cure under U.V. light.

- Distance from the source of the material being cured
- Intensity of U.V. delivered to the material.
- Amount of heat if any generated by the U.V. source.
- Time of exposure.
- If the material is on a "heat sink" - a dense material, usually a metal, with a large capacity to absorb heat without much temperature rise. This acts to prevent the epoxy from increasing temperature from its own "cure generated" heat and any U.V. generated heat. Since heat accelerates cure and drives it towards completion, Therefore a "heat sink" slows the cure.

Some tests were run by an independent testing lab, on a very high intensity spot cure system with liquid light guide.

Here are the results:-

Distance-end of Light guide to Radiometer	U.V. -A Power mW/cm ²	% Drop
1/8"	1,450.	-
1/4"	1,100.	-25
1/2"	600.	-59
3/4"	300.	-80
1"	200.	-86
1.1/2"	100	-93

This means that moving the light guide from 1/8" to 1/4" away - a change only of 1/8" drops the power by 25%. Move it another 1/4" now its only 1/2" away, drops the power to 60%. At 1" you have only 14% of the power you had at 1/8".

Therefore unless the light guide is about 1/8 from the material, you are wasting a lot, or most of the power you are paying for.

Next the lab looked at the power drop as you move laterally away from the dead center of the light spot.

mWcm ² @ spot center.	1,4450mW	0% change
1/8" off center	800mW	-45%change
1/4" off center	200mW	-85%change

Conclusions

- When using a spot cure, hit the "bulls eye" or lose 1/2 or more of your power.
- Stay a maximum of 1/8" away from material or lose more power

Recommendations

Some of this data confirms our experience (We have a twin to the unit tested) and also customer experience.

We recommend:-

- When using a spot cure , the end of the light guide should be as close as possible, without actually touching the material.
- The light spot should be a minimum of 2 times as wide as the blob of material to be cured.
- If you think you can cover the blob of material as a large or larger than the light spot, by moving the spot around to get complete coverage...don't waste your time, it does not work.

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