RGB layer formation (Color Resist)

RGB layer formation, specifically in the context of color filters for displays, involves creating a patterned array of red, green, and blue (RGB) color resists on a substrate. This is typically achieved using photolithography, where a black matrix is first formed to prevent color mixing, followed by coating the substrate with color resist and selectively exposing it to UV light through a photomask to create the desired RGB pattern

1. Black Matrix Formation:

- The initial step is to create a black matrix (BM) on the substrate. This matrix is made of a low-reflectance material, like chrome or resin, and acts as a barrier to prevent light leakage between the RGB subpixels and to minimize color mixing.
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2. Color Resist Coating:

- Next, a layer of color resist is applied to the entire substrate. This resist contains the three primary colors: red, green, and blue (RGB).

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3. Exposure and Development:

- Photolithography is used to create the RGB pattern. The substrate is coated with a photosensitive color resist, and then exposed to UV light through a photomask. The exposed areas of the resist become insoluble.
- A developing solution is then used to remove the unexposed (and thus soluble) portions of the resist, leaving behind the desired RGB pattern on the substrate.

4. Baking:

- Finally, the remaining resist patterns are baked to further cure and stabilize them.

In essence, color filters are created by selectively depositing and patterning these RGB color resists on a substrate, forming a mosaic of color subpixels that, when viewed together, create a full-color image.

This process is crucial for displays like LCDs, where the color filter selectively filters the light from a backlight to produce the desired colors on the screen.