

LITHOGRAPHIC APPARATUS AND DEVICE MANUFACTURING METHOD

Abstract of the Disclosure

A system and method to manufacturing a device provide a substrate and perform at least one exposure step. Each exposure step projects a patterned beam of radiation, which was patterned using an individually controllable elements, onto a target portion of the substrate. The projected patterned beam includes a plurality of pixels. Each exposure step also: (a) ordinarily controls the elements, such that each pixel delivers a radiation dose no greater than a predetermined normal maximum dose to the target portion in the exposure step; and (b) exceptionally controls the elements, such that at least one selected pixel delivers an increased radiation dose, greater than the normal maximum dose. The increased dose may be delivered to compensate for the effect of a defective element at a known position in the array on a pixel adjacent a selected pixel. Alternatively, it may compensate for underexposure of the target portion at the location of a selected pixel resulting from exposure of that location to a pixel affected by a known defective element in another exposure step. The invention uses doses up to the predetermined normal maximum for normal printing, but reserves at least one increased dose for compensation purposes. Accordingly, even when a dead black pixel falls in the middle of a group of surrounding white pixels it can be compensated for by increasing the radiation dose delivered by one or more of those neighboring white pixels, above the normal fully white value.

Figure 1