

ABSTRACT

MASK-INTEGRATED SURFACE PROTECTIVE TAPE

{Abstract}

- {Technical problem} To provide a mask-integrated surface protective tape for
 5 a plasma dicing method, which has a good protection property of the patterned surface of the semiconductor wafer in the backgrinding step which is performed in a large thinning degree and a good peeling property of the mask material layer from a base film of the surface protective tape, and which is low in adhesive deposits and occurrence of defective chips. Further, to provide a
 10 photolithography process-unnecessary mask-integrated surface protective tape.
- {Solution to problem} A mask-integrated surface protective tape that can be used for production of semiconductor chips, with the production containing the following steps (a) to (d), which tape comprises a base film and a mask material layer provided on the base film, wherein a wetting tension of the base film on the
 15 side from which the mask material layer has been peeled is 20.0 mN/m or more and 48.0 mN/m or less, and wherein a surface roughness Ra of the base film on the side from which the mask material layer has been peeled is within a range of 0.05 μm or more and 2.0 μm or less when measured in conformity to JIS B0601,
 [Steps (a) to (d)]
- 20 (a) a step of, in the state of having laminated the mask-integrated surface protective tape on the side of a patterned surface of a semiconductor wafer, grinding the backing-face side of the semiconductor wafer; laminating a wafer fixing tape on the backing-face side of the ground semiconductor wafer; and supporting and fixing the wafer to a ring frame;
- 25 (b) a step of, after peeling the base film of the mask-integrated surface protective tape, thereby to expose the mask material layer on top, forming an opening of a street of the semiconductor wafer by cutting a portion of the mask material layer corresponding to the street of the semiconductor wafer by laser;

- (c) a plasma-dicing step of segmentalizing the semiconductor wafer on the street by a SF_6 plasma, thereby singulating the semiconductor wafer into semiconductor chips; and
- (d) an ashing step of removing the mask material layer by an O_2 plasma.

5 [Fig. 1]