

ABSTRACT

MAGNET FOR GENERATING A MAGNETIC FIELD IN AN ION SOURCE

An ion source (10) for an ion implanter is provided, comprising (i)
5 an ionization chamber (14) defined at least partially by chamber walls (12) and
having an aperture (18) through which an ion beam (B) may be extracted along a
path (P2); and (ii) a magnet assembly (45) entirely surrounding the ionization
chamber (14), comprising a closed figure yoke (46) about which is wound a pair
10 of coils (49, 51). The yoke (46) is preferably toroidal in shape and further
comprises a pair of opposing poles (48a, 48b), wherein a substantial portion of
magnetic flux (F) generated by the coils leaves a first of the opposing poles
(48a), passes through the ionization chamber (14), and enters a second of the
opposing poles (48b) during operation of the ion source. A non-magnetic shield
15 (52) surrounds the magnet assembly (45) to shield the assembly from
backstreaming electrons. Stray magnetic fields generated by the magnet
assembly (45) are oriented in a direction perpendicular to and kept low within the
path of an ion beam extracted from the aperture. The primary magnetic field
output by the magnetic assembly (45) is relatively homogeneous within the
ionization chamber (14).

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Figure 3