An experimental verification of the accuracy of the asymmetric fields calculation algorithm incorporated into a commercial 3D treatment planning system is presented. A method for extracting primary off-centre ratios (POCRs) is provided. A formula for monitor units calculation of such fields is developed. This formula uses the POCRs and dosimetric data for symmetric fields which are normally measured during machine commissioning. Experimental tests of this formula show that it is accurate to within 0.5% and 2% for open and wedged asymmetric fields, respectively, for treatment fields normally encountered in clinical practice.