

X-RAY DIFFRACTION (POWDER AND SOLID FORMS)

SRMs 656, 676, 674b, 1878a and 1879a consist of high phase purity materials for use in the quantitative analysis of samples by the internal standard method. SRM 656 consists of 2 silicon nitride powders, one high in α , the other high in β . SRMs 640d, 660a, 675, and 1976 consist of materials with select crystallographic and microstructure properties used in the evaluation of diffraction equipment for the following variables; 1) d-spacing or line position, 2) line or instrument intensity, and 3) instrumental or sample contributions to the shape of reflection profiles. SRM 1976, a sintered alumina plate, is also certified with respect to lattice parameters as well as 12 relative intensity values from 25° to 145° 2 θ (Cu K α). SRM 1990 is certified for lattice parameter. SRM 1994 is certified for angular deviation of the crystal axis relative to the surface normal.

REFERENCE	DESCRIPTION	XRD APPLICATION	LATTICE PARAMETERS (IN NM)	UNIT SIZE (in g)
SRM 640 D	Silicon Powder	Line Position Line Shape	(0,543159 + 0,000020)	7,5
SRM 656	Silicon Nitride	Quantitative Analysis	α - (0,7752630 / 0,5619372) β - (0,7602293 / 0,2906827)	10 10
SRM 660 A	Lanthanum Hexaboride Powder	Line Position Line Shape	(0,41569162+ 0,00000097)	6
SRM 674 B	X-RAY powder Diffraction Intensity Set CeO2 (fluorite structure) Cr2O3 (corundum structure) TiO2 (rutile) ZnO (wurtzite structure)	Quantitative Analysis	(0,5411651) (0,4958979 / 1,359592) (0,4593927 / 0,2958875) (0,3249897 / 0,520653)	10 10 10 10
SRM 675	Mica	Line Position - Low 2 θ	0,998104	7,5
SRM 676 A	Alumina Powder for Quantitative Analysis by X-ray Diffraction	Quantitative Analysis	0,47590914 / 1,2991779	20
SRM 1878 A	Respirable Alpha Quartz	Quantitative Analysis		5
SRM 1879 A	Respirable Cristobalite	Quantitative Analysis		5
SRM 1976 A	Instrument Response Standard for X-ray Diffraction		0,4758877 + 1,2992877	25,6 mm x 2,2 mm
SRM 1990	Single Crystal Diffractometer Alignment Standard	Quantitative Analysis		3 Spheres
SRM 1994	Standard Silicon Single Crystal Wafer for Crystalline orientation	Crystalline Orientation		100 mm wafer
SRM 1995	Standard Sapphire Single Crystal Wafer for Crystalline Orientation	Crystalline Orientation		50 mm wafer
SRM 2000	Calibration Standard for High-Resolution X-Ray Diffraction	Line Position		(25 x 25 x 0,725) mm

Values in parentheses are not certified but are provided as reference values or are given for information only.

SECONDARY FERRITE STANDARD

Secondary Ferrite Standards, RM8480 and RM8481, are designed for use in welding construction and repair operations where the ferrite content of corrosive-resistant austenitic stainless steel welds must be controlled within tight ranges. RM8480 covers the low range (ferrite numbers 0 to 30) and RM8481 covers the high range (ferrite numbers 30 to 120).

These standard required the development of an advanced calibration procedure. The process included over 25 000 individual measurements.

REFERENCE	DESCRIPTION	UNIT SIZE
RM 8480	Eight individually measured specimens	10 mm x 12 mm x 20 mm

QUARTZ CONTENT IN SILICA MATRIX FOR POWDER X-RAY DIFFRACTION

The set is designed for the calibration in quantitative analyses by the X-ray diffraction and other structure (sensitive analytical techniques).

The issue materials are dinas as matrix and the natural crystalline alpha quartz from Brazil as certified constituent.

PROCEDURE OF PREPARATION :

Both basic components were first ground separately by the continuous vibration cup mill. Reground materials we're carefully mixed to achieve the content of 5, 10, 20 and 40 wt % of alpha quartz in the consecutive samples.

The homogeneity tests we're performed by measuring the intensity of the main diffraction line of alpha quartz (hkl=101) using 21 random selected packings (bottles) from each RM of the set.

The certified values are based on the procedure of preparation (according to the ISO Remco Guide 35 - 1985 (E)) i.e. the mass portions of both constituents and are verified by the complementary XRD measurements. The correction for the amorphous phase decrease, which was determined by wel way (powder diffraction, vol.4, March 1989, page 9-13) and represent decrease by 5.1 wt %.

The certified values after correction on the amorphous phase are as follows:

REFERENCE	CONC. (wt %) OF QUARTZ	UNIT SIZE
Q1	4	50 g each in bottle
Q2	9	
Q3	19	
Q4	38	