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Form reference: SC-A-064B (Ver 7 – 10/19)

ANNEX A - PRODUCT QUESTIONNAIRE A-2 MACHINE TOOLS

SECTION A BASIC PRODUCT INFORMATION

(1) Name of the Manufacturer:

(2) Product Details	(a) Brand	(b) Model No.	(c) Serial No.
Machine Tool			
Numerical Control Unit <i>(To be used with machine tool, if any)</i>			

SECTION B FUNCTIONALITY OF PRODUCT

(3) Machine Function(s):
(You may select more than one)

- Turning
- Milling
- Grinding
- Electrical Discharge Machine of the non-wire type
- Others, please specify:

(4) Is the machine tool a special purpose machine tool?

- Yes No

If 'Yes', please specify if it is limited to the manufacture of the following:

(a) Gears

- Yes No

(b) Crankshafts or camshafts

- Yes No

(c) Tools or cutters

- Yes No

(d) Extruder worms

- Yes No

(e) Engraved or faceted jewellery parts

Yes No

(f) Dental prostheses

Yes No

SECTION C TECHNICAL QUESTIONS

Please answer specifically based on the machine function(s) in (3).

The terms in quotation marks (“”) and abbreviations used in this Section are defined in Section D.

(5) Please state the axis specifications for machine with turning, milling and / or grinding function.

Number of Linear Axis	Number of Rotary Axis	Maximum Travel		“Unidirectional Positioning Repeatability” in accordance with ISO 230-2:2014	Positioning accuracy with “all compensations available” in accordance with ISO 230-2:1988
		X-axis	mm	µm	µm
		Y-axis	mm	µm	µm
		Z-axis	mm	µm	µm
Others (if any):			mm	µm	µm
			mm	µm	µm

For Turning

(6) Does the machine tool have two or more axes which can be coordinated simultaneously for “contouring control”?

Yes No

(7) Is the machine tool specially designed for the production of contact lenses?

Yes No

If ‘Yes’, please state the following:

(a) Is the machine controller limited to using ophthalmic based software for part programming data input?

Yes No

(b) Does the machine tool have vacuum chucking?

Yes No

(8) Is the machine tool capable of machining diameters greater than 35 mm?

Yes No

(9) Is the machine tool a bar machine (Swissturn) limited to machining only bar feed through?

Yes No

If 'Yes', please state the following:

(a) Does the bar machine have a maximum bar diameter equal to or less than 42 mm?

Yes No

(b) Does the bar machine have the capability of mounting chucks?

Yes No

For Milling

(10) Does the machine have three linear axes plus one rotary axis which can be coordinated simultaneously for "contouring control"?

Yes No

(11) Does the machine tool have five or more axes which can be coordinated simultaneously for "contouring control"?

Yes No

(12) Is the machine tool a jig boring machine?

Yes No

(13) Is the machine tool a fly cutting machine?

Yes No

If 'Yes', please state the following:

(a) Is the spindle "run-out" and "camming" less (better) than 0.0004 mm TIR?

Yes No

(b) Is the angular deviation of slide movement (yaw, pitch and roll) less (better) than 2 seconds of arc, TIR over 300 mm of travel?

Yes No

(14) Does the machine tool have two or more contouring rotary axes?

Yes No

(15) Is the machine based on parallel linear kinematic design (e.g. hexapods) that have 5 or more axes none of which are rotary axes?

Yes No

For Grinding

(16) Does the machine tool have three or four axes which can be coordinated simultaneously for “contouring control”?

Yes No

(17) Does the machine tool have five or more axes which can be coordinated simultaneously for “contouring control”?

Yes No

(18) Does the machine tool have two or more contouring rotary axes?

Yes No

(19) Is the machine tool a cylindrical external, internal or external-internal grinding machine?

Yes No

If ‘Yes’, please state the following:

(a) Is the machine tool limited to cylindrical grinding?

Yes No

(b) Is the machine tool limited to a maximum workpiece capacity of 150 mm outside diameter or length?

Yes No

(c) Are the machine tool axes limited to x, z and c?

Yes No

(20) Is the machine tool designed specifically as jig grinders that do not have a z-axis or a w-axis?

Yes No

(21) Is the machine tool a surface grinder?

Yes No

(22) Is the machine based on parallel linear kinematic design (e.g. hexapods) that have 5 or more axes none of which are rotary axes?

Yes No

For Electrical Discharge Machine of the non-wire type

(23) Does the machine tool have two or more rotary axes which can be coordinated simultaneously for “contouring control”?

Yes No

For Numerical Control Unit (to be used with machine tool, if any)

(24) Is the software residing in the “numerical control” unit capable of coordinating simultaneously more than four axes for “contouring control”?

Yes

No

SECTION D DEFINITION OF TERMS / ABBREVIATIONS

“all compensations available” means after all feasible measures available to the manufacturer to minimise all systematic positioning errors for the particular machine-tool model are considered.

“camming” means axial displacement in one revolution of the main spindle measured in a plane perpendicular to the spindle faceplate, at a point next to the circumference of the spindle faceplate. (Ref. ISO 230-1:1986, paragraph 5.63)

“contouring control” means two or more “numerically controlled” motions operating in accordance with instructions that specify the next required position and the required feed rates to that position. These feed rates are varied in relation to each other so that a desired contour is generated. (Ref. ISO/DIS 2806-1980)

“numerical control” means the automatic control of a process performed by a device that makes use of numeric data usually introduced as the operation is in progress. (Ref. ISO 2382)

“run-out” (out-of-true running) means radial displacement in one revolution of the main spindle measured in a plane perpendicular to the spindle axis at a point on the external or internal roving surface to be tested. (Ref. ISO 230-1:1986, paragraph 5.61)

“Unidirectional Positioning Repeatability” means the smaller of values R_{\uparrow} and R_{\downarrow} (forward and backward), as defined by 3.21 of Ref. ISO 230-2:2014 or national equivalents, of an individual machine tool axis.

TIR means Total Indicated Reading.