Detail C

Front View (Optical Surface)

Section A-A

Optical Surface (Concave)

Back Surface (Convex)

Scale 1:1
DETAIL L
SHEET 6, ZONE B3
VIEW NORMAL TO ESPCRS-Z

SECTION M-M
SCALE 2:1
VIEW NORMAL TO ESPCRS-X

VIEW N-N
VIEW NORMAL TO ESPCRS-Y

THIS TOLERANCE ALWAYS APPLIES TO THE LEFT FACE OF THE POCKET.
NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL DIMENSIONS IN MILLIMETERS
2. DIMENSIONS AND TOLERANCING PER ASME Y14.5M-1994
3. THIS DRAWING IS COMPLETE ONLY WHEN USED IN CONJUNCTION WITH THE FINISHED PRIMARY MIRROR SEGMENT SPECIFICATION (TMT.OPT.SPE.07.002), THE SEGMENTATION DATABASE (TMT.OPT.TEC.07.044) AND THE EDGE SENSOR TO SEGMENT INTERFACE CONTROL DOCUMENT (TMT.CTR.ICD.08.001).
4. MAKE FROM CIRCULAR MENISCUS MIRROR BLANK PER SPECIFICATION FOR PRIMARY SEGMENT BLANKS (TMT.OPT.SPE.07.001). BLANKS SHALL BE INSPECTED PRIOR TO ANY POLISHING OR MACHINING OPERATIONS. FOR REFERENCE ONLY, BLANK THICKNESS IS AS FOLLOWS:

<table>
<thead>
<tr>
<th>Material</th>
<th>Blanks Thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass / Ceramic</td>
<td>46</td>
</tr>
<tr>
<td>Fused Silica</td>
<td>51</td>
</tr>
</tbody>
</table>

INDICATED SURFACES SHALL BE GROUND AND POLISHED OR ETCHED. IN ORDER TO REMOVE SUBSURFACE DAMAGE, GRINDING SHALL BE PERFORMED IN STEPS USING PROGRESSIVELY SMALLER ABRASIVE GRAINS. EACH GRINDING STEP SHALL REMOVE MATERIAL TO A DEPTH OF AT LEAST 1.5X THE MAXIMUM GRAIN SIZE OF THE PREVIOUS GRINDING STEP. THE FINAL GRINDING STEP SHALL UTILIZE AN ABRASIVE GRAIN SIZE OF 1um MAX. AFTER GRINDING, THE SURFACE SHALL BE POLISHED OR ACID ETCHED TO REMOVE 25um (MIN) OF MATERIAL. ALL DIMENSIONS AND TOLERANCES APPLY AFTER ETCHING.

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- DATUM -A- SHALL BE THE XPSA - YPSA PLANE
- DATUM -B- SHALL BE THE XPSA - ZPSA PLANE
- DATUM -C- SHALL BE THE YPSA - ZPSA PLANE

THREE FIDUCIALS (SHOWN SCHEMATICALLY) SHALL BE ENGRAVED INTO THE OPTICAL SURFACE. SIZE AND SHAPE OF THE FIDUCIALS ARE TBD. BY DEFINITION, EACH FIDUCIAL LIES ON THE THEORETICAL OPTICAL SURFACE. THE THREE FIDUCIALS FORM A KINEMATIC CONSTRAINT WITH RESPECT TO DATUMS -A-, -B- AND -C- AS FOLLOWS:

HEXAGON VERTEX CORNER POINTS (P1-6) ARE DEFINED IN THE SEGMENTATION DATABASE (TMT.OPT.TEC.07.044). VERTEX POINT COORDINATES ARE TO BE TREATED AS BASIC DIMENSIONS PRIOR TO ADDING FILLET RADIUS OR CHAMFERS.

SEGMENT THICKNESS SHALL BE MEASURED AT THE SIX VERTICES AND RECORDED AS VALUES T1-T6. MEASUREMENT SHALL BE MADE WITHIN 10mm OF THE VERTEX.

MEAN SEGMENT THICKNESS T_MEAN SHALL BE DEFINED AS THE AVERAGE OF THE THICKNESS AT EACH VERTEX (T_i). THE MEAN THICKNESS SHALL BE 45±0.5mm FOR A GLASS-CERAMIC SEGMENT, AND 50±0.5mm FOR A FUSED SILICA SEGMENT.

THE CENTRAL POCKET DEPTH IS DETERMINED BASED ON THE MEASURED MEAN SEGMENT THICKNESS DETERMINED IN NOTE 10. THE POCKET DEPTH DIMENSION Z_POCKET IS CALCULATED AS 19.693*(T_MEAN / T_NOM) WHERE T_NOM IS 45mm FOR GLASS-CERAMIC OR 50mm FOR FUSED SILICA. THE DIMENSION Z_POCKET IS TO BE TREATED AS A BASIC DIMENSION.

FINISHED OPTICAL SURFACE SHAPE AND MEASUREMENT REQUIREMENTS ARE SPECIFIED IN THE FINISHED PRIMARY MIRROR SEGMENT SPECIFICATION (TMT.OPT.SPE.07.002).

AFTER MARKING OR ENGRAVING, FEATURES SHALL BE ETCHED TO REDUCE SUBSURFACE DAMAGE.

THE M1 ORIENTATION MARKING SHALL BE ENGRAVED AS SHOWN AT THE ANGLE SPECIFIED IN THE DATUM SPECIFICATION (TMT.OPT.TEC.07.044).

SEGMENT IDENTIFICATION (CONSISTING OF THE TWO DIGIT SEGMENT NUMBER AND SINGLE DIGIT SERIAL NUMBER) SHALL BE ENGRAVED IN THE LOCATION SHOWN WITH 25+/-1mm HIGH CHARACTERS. EXAMPLE 50-S/N5 CORRESPONDS TO SEGMENT TYPE NUMBER 5, SERIAL NUMBER 5. MARKING ON EDGE OF SEGMENT SHALL BE APPROXIMATELY CENTERED ACROSS THE THICKNESS.

SEGMENT EDGES, EDGE CHAMFERS, EDGE CORNER RADIUS, TOOLING INTERFACE COUNTERSINKS AND DIAPHRAGM CLOCKING HOLE SHALL HAVE A SMOOTH GROUND FINISH. SURFACE ROUGHNESS SHALL BE 0.4 MICRONS RMS MAX. IN ORDER TO MINIMIZE SUBSURFACE DAMAGE, GRINDING SHALL BE DONE IN STEPS USING PROGRESSIVELY SMALLER ABRASIVE GRAINS. EACH GRINDING STEP SHALL REMOVE MATERIAL TO A DEPTH OF AT LEAST 1.5X THE MAXIMUM GRAIN SIZE OF THE PREVIOUS GRINDING STEP. THE FINAL GRINDING STEP SHALL UTILIZE AN ABRASIVE GRAIN SIZE OF 1um MAX. ACID ETCHING OF THESE FEATURES AFTER GRINDING IS PERMISSIBLE.

OPTICAL SURFACE ROUGHNESS SHALL BE AS SPECIFIED IN THE FINISHED PRIMARY MIRROR SEGMENT SPECIFICATION (TMT.OPT.SPE.07.002).

OPTICAL SURFACE SCRATCH-DIG SHALL BE AS SPECIFIED IN THE FINISHED PRIMARY MIRROR SEGMENT SPECIFICATION (TMT.OPT.SPE.07.002).

ASSEMBLY FEATURE: DIAPHRAGM INSTALLATION TOOL CLOCKING SLOTTED HOLE.

ASSEMBLY FEATURE: ASSEMBLY TOOLING KINEMATIC LOCATING FEATURES.
NOTES: UNLESS OTHERWISE SPECIFIED (CONTINUED)

22. VIEWS SHOWN ON SHEET 6 DETAIL THE DIMENSIONS, LOCATION AND ORIENTATION FOR 1 OF THE 12 EDGE SENSOR INTERFACES. THE LOCATION AND ORIENTATION OF EACH OF THE 12 INTERFACES IS UNIQUE.


FOR EACH POCKET, THE REFERENCED DOCUMENTS DEFINE A THEORETICAL EDGE SENSOR MOUNTING SURFACE, ORIGIN, AND COORDINATE SYSTEM. THE ESPCRS-Z AXIS IS NORMAL TO THE EDGE SENSOR MOUNTING FACE. THE PLANES OF EACH INDIVIDUAL THEORETICAL EDGE SENSOR POCKET COORDINATE SYSTEM ARE SPECIFIED AS DATUMS -D-, -E-, AND -F- AS FOLLOWS:

DATUM -D- SHALL BE THE ESPCRS X / ESPCRS Y PLANE
DATUM -E- SHALL BE THE ESPCRS X / ESPCRS Z PLANE
DATUM -F- SHALL BE THE ESPCRS Y / ESPCRS Z PLANE

ALL SURFACES OF THE POCKETS SHALL BE FINELY GROUND TO MINIMIZE SUBSURFACE DAMAGE. GRINDING SHALL BE PERFORMED IN STEPS USING PROGRESSIVELY SMALLER ABRASIVE GRAINS. EACH GRINDING STEP SHALL REMOVE MATERIAL TO A DEPTH OF AT LEAST 1 IN THE MAXIMUM GRAIN SIZE OF THE PREVIOUS GRINDING STEP. THE FINAL GRINDING STEP SHALL UTILIZE AN ABRASIVE GRAIN SIZE OF 15 MICRONS MAX.

ZONE Z2 TO BE ETCHED PRIOR TO BONDING OF EDGE SENSOR PUCK PER PROCEDURE TBD.

MARK SEGMENT IN AREA INDICATED WITH EDGE SENSOR IDENTIFIER. IDENTIFIER SHALL BE OF THE FORM "nD" OR "nS" WHERE n IS THE NUMBER OF THE EDGE SENSOR, "D" REPRESENTS A DRIVE HALF, AND "S" REPRESENTS A SENSE HALF. CHARACTER HEIGHT SHALL BE 12+/-3MM. ARROWS SHALL INDICATE THE TWO PRECISE REFERENCE EDGES OF THE EDGE SENSOR POCKET. MARKING METHOD SHALL BE (TBD).

DATUM G SHALL BE DEFINED INDIVIDUALLY FOR EACH Edge SENSOR POCKET AS THE PRECISE LEFT REFERENCE FACE OF EACH POCKET AS VIEWED FROM BACK SURFACE. DATUM H SHALL BE DEFINED INDIVIDUALLY FOR EACH EDGE SENSOR POCKET AS THE PRECISE REFERENCE FACE PARALLEL TO THE SEGMENT MIDDLE GAP PLANE.

MEASURE AND RECORD MIRROR THICKNESS AT THE THREE EDGE SENSOR FOOT CENTERS OF CONTACT SHOWN, AS VIEWED FROM THE BACK FACE FOR EACH EDGE SENSOR POCKET.