8.1.696 START_DATA_FUNCTION — (text) name of <data_function> group.

8.1.697 START_DATA_MANIPULATION — (text) name of group of sequential BOOLEAN and/or <data_fracture> operations. The output pattern data from the first operation is the input pattern data for the next operation and so on. The data field must be a unique identifier within <mask_order> as the results of one <data_manipulation> may be referenced by another.

8.1.698 START_DEFECT_DEFINITION — (text) name of <defect_definition> group.

8.1.699 START_DEFECT_MEASUREMENTS — (text) name of <defect_measurements> group.

8.1.700 START_ETCH_DEPTH_MEASUREMENTS — Indicates the beginning of etch depth measurements within <phase_shift_measurements>.

8.1.701 START_LITHO_INFORMATION — (text) name of <litho_information>.

8.1.702 START_MASK_RESULTS — Indicates the beginning of the file from the vendor to the customer containing actual mask results data. Should match the data field of the START_ORDER to which it is responding AND the data field of END_MASK_RESULTS.

8.1.703 START_MASK_RESULTS_OPTIONS — (text) name of <mask_results_options>.

8.1.704 START_MATERIALS_USED — (text) name of <materials_used>.

8.1.705 START_MEASURED_REGISTR_MARK —(text) name of <measured_registr_mark>.

8.1.706 START_OPC — (text) name of <opc_definition> group.

8.1.707 START_ORDER — Indicates the beginning of order entry data file from the customer to the vendor. Should indicate the name(s) of the mask sets included.

8.1.708 START_PATTERN_GROUP_RESULTS — (text) name of <pattern_group_results>.

8.1.709 START_PATTERN_OPTIONS — (text) name of <pattern_options> group.

8.1.710 START_PHASE_ANGLE_MEASUREMENTS — Indicates the beginning of phase angle measurements within <phase_shift_measurements>.

8.1.711 START_PHASE_SHIFT — (text) name of <phase_shift> group.

8.1.712 START_PHASE_SHIFT_MEASUREMENTS — (text) name of <phase_shift_measurements> group.

8.1.713 START_PLACEMENT — (text) name of <placement> group.

8.1.714 START_REGISTR — Indicates beginning of <registration> collection. Defines separation between multiple <registration>s. Alphanumeric data field identifies the collection to establish which collections are hierarchically superceded by another; also for reference by REGISTR_RELATIVE.

8.1.715 START_REGISTR_MEASUREMENTS — (text) name of <registr_measurements> group.

8.1.716 START_REPAIR_DEFINITION — (text) name of <repair_definition> group.

8.1.717 START_SEM_PHOTO — (text) name of <sem_photo> group.

8.1.718 START_SHIP_PLOT — Indicates beginning of <ship_plot> collection. Alphanumeric data field identifies the collection to establish which collections are hierarchically affected by another. The appearance of a <ship_plot> with the same START_SHIP_PLOT data field at a lower level in the hierarchy (see §6) supersedes the <ship_plot> at a higher level in the hierarchy.

8.1.719 START_SHIP_TO — (text) name of <ship_to> group.

8.1.720 START_SHIPPABLE_DATA — (text) name of <shippable_data> group.

8.1.721 START_SUBSTRATE — (text) name of <substrate> group.

8.1.722 START_SURFACE_DEFINITION — (text) name of <surface_definition> group.

8.1.723 START_SURFACE_INSP_MEASUREMENTS — (text) name of <surface_insp_measurements> group. Must match START_SURFACE_DEFINITION of corresponding <surface_definition> group.

8.1.724 START_TITLE — (title number) Indicates the beginning keywords for a specific title.

8.1.725 START_TRANSMISSION_MEASUREMENTS — Indicates the beginning of transmission measurements within <phase_shift_measurements>.

8.1.726 START_VENDOR_INFO — (text) name of <vendor_info> group.

8.1.727 STATUS — (NEW, OLD, CHANGE, CANCEL, HOLD, STOP, RESTART, RETURNED, PROTESTED, QUOTE ONLY) Present status of mask(s); NEW = new mask which has not been ordered before. OLD = previously ordered mask whose data is included for reference only. CHANGE = previously ordered mask whose data is included because the order data has been changed since the last transmission. CANCEL = previously ordered mask whose order is being cancelled. HOLD = enter a new mask but do not release it to production until customer authorization. STOP = previously ordered mask which is put on hold until further notice. RESTART = changes a previous STATUS of STOP from being on hold to being released for production. RETURNED = a previously delivered mask which has been rejected by the customer and is being returned to the vendor. A data entry transmittal which includes a RETURNED mask should also include a NEW mask if replacement is to be initiated. PRICE of the returned mask should be the negative of the original price in order to track credit. The NEW mask should also contain PRICE and a new schedule. PROTESTED = a RETURNED mask whose rejection is protested by the mask vendor. If a NEW mask accompanied the RETURNED mask to initiate replacement, the NEW mask should also have PROTESTED status. QUOTE_ONLY = the order is not to be manufactured, but is only to be used by the vendor for quoting price and delivery.

8.1.728 STD_PATTERN_NAME — Name of a standard pattern, on file at the vendor, previously supplied or authorized by the customer.

8.1.729 STEPPING_COUNT — (x,y) Count of successive pattern or cell placements.

8.1.730 STEPPING_DISTANCE — (x,y) Spacing between successive pattern or cell placements.

8.1.731 STRIPE_HEIGHT — Stripe height in address units of pattern file.

8.1.732 SUMMARY_FILE_NAME — (text) Name identifying the summary output file for RUNSET_NAME. If this keyword appears in the <mask_order>, it must be explicitly referenced in a RUNSET_NAME and/or a PARAMETER_FILE_NAME.

8.1.733 SURF_DEFECT_TYPE — (CONTAM_ON_CLEAR, DIM_CLEAR, ON_EDGE, UNKOWN, PINHOLE, BRIGHT_CHROME, CONTAM_ON_CHROME, DIM_CHROME, ON_CLEAR, BRIGHT, ON_CHROME, ON_ATT, DIM_ATT, ATT_PINHOLE and others on request) Setup parameter for surface inspection.

8.1.734 SURF_INSP_AREA — (x1,y1,x2,y2) Unscaled coordinates of window for surface inspection, lower left and upper right corners, relative to the nominal center of mask, pattern or cell (chrome side up for masks, unmirrored for patterns or cells).

8.1.735 SURF_INSP_EQUIP_REQD — Alphanumeric identification of acceptable equipment for defect inspection.

8.1.736 SURF_INSP_EQUIP_USED — Surface inspection equipment used.

8.1.737 SURF_INSP_GLASS_SIDE — If present, specifies the maximum dimension of the smallest unacceptable particle on the glass side of the mask. This keyword is generally intended for non-pelliclized masks.

8.1.738 SURF_INSP_METHOD — (LASER, VISUAL, PIXEL or MICROSCOPE) Methodology for detecting surface particles.

8.1.739 SURF_INSP_MODE_REQD — Alphanumeric operating mode required for SURF_INSP_EQUIP_REQD.

8.1.740 SURF_INSP_MODE_USED — (text) SURF_INSP_EQUIP_USED operating mode.

8.1.741 SURF_INSP_PATTERN_SIDE — Specifies the maximum dimension of the smallest unacceptable particle on the patterned side of the mask. This keyword is generally intended for non-pelliclized masks.

8.1.742 SURF_INSP_PELL_BOTTOM — Specifies the maximum dimension of the smallest unacceptable particle on the pellicle on the glass side of the mask on either surface of the pellicle membrane or on the glass surface under the pellicle.

8.1.743 SURF_INSP_PELL_TOP — If present, specifies the maximum dimension of the smallest unacceptable particle on the pellicle on the patterned side of the mask on either surface of the pellicle membrane.

8.1.744 SURF_INSP_PELL_TOP_INSIDE_MEMBRANE — Maximum dimension of the smallest unacceptable particle on the patterned side of the mask on the inside surface of the pellicle membrane.

8.1.745 SURF_INSP_PELL_TOP_INSIDE_ON_FRAME — Maximum dimension of the smallest unacceptable particle on the patterned side of the mask on the inside surface of the pellicle frame.

8.1.746 SURF_INSP_PELL_TOP_ON_CLEAR_PATTERN — Maximum dimension of the smallest unacceptable particle on the patterned surface of the mask under the pellicle, but on the clear pattern of the mask.

8.1.747 SURF_INSP_PELL_TOP_ON_OPAQUE_PATTERN — Maximum dimension of the smallest unacceptable particle on the patterned surface of the mask under the pellicle, but on the opaque pattern of the mask.

8.1.748 SURF_INSP_PELL_TOP_OUTSIDE_FRAME — Maximum dimension of the smallest unacceptable particle on the patterned surface of the mask outside the pellicle frame.

8.1.749 SURF_INSP_PELL_TOP_OUTSIDE_MEMBRANE — Maximum dimension of the smallest unacceptable particle on the patterned side of the mask on the outside surface of the pellicle membrane.

8.1.750 SURF_INSP_PELL_TOP_OUTSIDE_ON_FRAME — Maximum dimension of the smallest unacceptable particle on the patterned side of the mask on the outside surface of the pellicle frame.

8.1.751 SURF_INSP_PELL_TOP_OUTSIDE_ON_OPAQUE — Maximum dimension of the smallest unacceptable particle on the patterned surface of the mask outside the pellicle frame, but on the opaque surface of the mask.

8.1.752 SURF_INSP_PIXEL_SIZE_REQD — Pixel size to use for surface inspection.

8.1.753 SURF_INSP_PIXEL_SIZE_USED — Pixel size used by SURF_INSP_EQUIP_USED.

8.1.754 SURF_INSP_SENSITIVITY_REQD — Sensitivity to be used by SURF_INSP_EQUIP_REQD.

8.1.755 SURF_INSP_SENSITIVITY_USED — Sensitivity used by SURF_INSP_EQUIP_USED.

8.1.756 SURF_INSP_SETUP_FILE_NAME_REQD — Alphanumeric name of setup file for SURF_INSP_EQUIP_REQD.

8.1.757 SURF_INSP_SETUP_FILE_NAME_USED — Alphanumeric name of setup file for SURF_INSP_EQUIP_USED.

8.1.758 SURFACE_INSPECTION — If present, requires surface inspection and specifies the maximum dimension of the smallest unacceptable surface particles.

8.1.759 SURFACE_QUALITY_ID — (text) Customer's label for a collection of surface quality specifications, to be used only in addition to explicit quality requirement keywords. This may be used in the data structure in addition to, but not in place of, explicit quality requirement keywords. This may not be used in combination with QUALITY_GROUP_ID. Customer and vendor should document the meaning of this quality grade before using it in SEMI P10.

8.1.760 SURROUNDING_HEIGHT — Height of clear or dark border around pattern on mask.

8.1.761 SURROUNDING_TONE — (CLEAR or DARK) Border surrounding pattern on mask is to be either clear or dark.

8.1.762 SURROUNDING_WIDTH — Width of clear or dark border around pattern on mask.

8.1.763 THROUGH_PELLICLE_DEFECTS — Precedes <defect_measurements> when delivering defect data measured with pellicle applied.

8.1.764 TITLE_FONT — Alphanumeric name of the font use in writing TITLE_TEXT, to be previously agreed between customer and vendor.

8.1.765 TITLE_HEIGHT — (height) Height in microns of title characters.

8.1.766 TITLE_JUSTIFICATION — (L or R) Left or right justification within the writable field, before mirroring and before rotation.

8.1.767 TITLE_LOCATION — (x,y) Location of the lower left corner of TITLE_TEXT in the associated <title_data> (before mirroring or rotation), relative to nominal center of mask (chrome side up).

8.1.768 TITLE_MAG — Numeric magnification to the standard font size for the mask writer in writing TITLE_TEXT. This item should not be used in conjunction with TITLE_HEIGHT for the same MASK_SET_ID.

8.1.769 TITLE_TEXT — (text) Alphanumeric contents of human-readable text on the mask.

8.1.770 TITLE_TYPE — (MASK, DEVICE, LAYER, DATE_TIME, SOFTWARE, SERIAL_NUMBER, AUXILIARY)

8.1.771 TOP_PELLICLE_CENTRALITY_ERROR — (x,y,rotation) Maximum misplacement in micrometers and microradians of pellicle mounting, relative to the nominal center of the mask.

8.1.772 TOP_PELLICLE_TYPE — Alphanumeric brand and model of acceptable pellicle for the patterned side of the mask. If multiple pellicles are listed, they are prioritized with the most preferred first and least preferred last.

8.1.773 TOP_PELLICLE_USED — (text) The pellicle vendor's part number of the pellicle applied to the patterned surface of the mask.

8.1.774 TRANSMISSION_DEFECT_CLEAR — Maximum allowable percent transmission of light through a clear defect.

8.1.775 TRANSMISSION_DEFECT_DARK — Maximum allowable percent blocking of light through a dark defect.

8.1.776 TRANSMISSION_EQUIP_REQD — (text) Transmission measurement equipment required by customer.

8.1.777 TRANSMISSION_EQUIP_USED — (text) Transmission measurement equipment used.

8.1.778 TRANSMISSION_ERROR — For phase shift masks, the maximum acceptable deviation of any percent transmission measurement from the TRANSMISSION_TARGET.

8.1.779 TRANSMISSION_MARK_DRAWING — The uniquely identified (for each customer) document which shows the transmission mark structure itself, and may show the place(s) within the transmission mark which are to be measured.

8.1.780 TRANSMISSION_MARK_FEATURE — Text describing the feature to be used for transmission measurement.

8.1.781 TRANSMISSION_MARK_LOCATION — (x,y) Location of transmission mark location relative to the nominal center of the mask (chrome side up).

8.1.782 TRANSMISSION_MARK_LOCATION_DRAWING — The uniquely identified (for each customer) document which shows the location(s) of the transmission mark structure.

8.1.783 TRANSMISSION_MARK_SITE_ID — Unique alphanumeric identifier of each transmission measurement location within MASK_SET_ID to identify individual locations when using <mask_results>. If the same coordinates apply to locations on different masks within the mask set, they may have the same TRANSMISSION_MARK_SITE_ID, but it is not mandatory.

8.1.784 TRANSMISSION_MEASUREMENT_DATE — Transmission measurement date.

8.1.785 TRANSMISSION_MEASUREMENT_FILE_NAME — Name of data file containing results of transmission measurement.

8.1.786 TRANSMISSION_MODE_REQD — (text) Operating mode required by customer for TRANSMISSION_EQUIP_USED.

8.1.787 TRANSMISSION_MODE_USED — (text) Operating mode used on TRANSMISSION_EQUIP_USED operating mode.

8.1.788 TRANSMISSION_RANGE — For phase shift masks, the maximum acceptable variation of all percent transmission measurements, relative to each other.

8.1.789 TRANSMISSION_REFERENCE_ONLY — (T or F) If T, indicates that the transmission feature is to be measured and the data transmitted to the customer (if requested by SHIP_PHASE_SHIFT_MEASUREMENTS), but that deviations in its measured value due to mask processing would NOT be cause for mask rejection.

8.1.790 TRANSMISSION_TARGET — For phase shift masks, the required percent transmission of light at the specified PSM_WAVELENGTH compared to quartz.

8.1.791 TRANSMISSION_TOLERANCE — For phase shift masks, the maximum acceptable deviation of the mean of all percent transmission measurements to the TRANSMISSION_TARGET.

8.1.792 UNSCALED_PATTERN_SIZE — (x,y) Unscaled size of the pattern file. If this is incorrect, the mask will not be written until it is corrected.

8.1.793 USER_UNIT — To be used for fracturing DATABASE_SOURCE into inspection data, as required by some inspection systems.

8.1.794 UT1X_UNCUT — (T or F) If T, indicates that the reticle is to be delivered uncut (i.e., 5 inch square) size. If F, or if the keyword is absent, the reticle is to be delivered in the 3 inch by 5 inch size.

8.1.795 VENDOR — The name of the company from which the masks are ordered.

8.1.796 VENDOR_ADDRESS — Address for VENDOR_CONTACT.

8.1.797 VENDOR_CONTACT — Name of person to contact regarding the mask.

8.1.798 VENDOR_EMAIL — Internet address for VENDOR.

8.1.799 VENDOR_FAX — Phone number for facsimile machine of VENDOR.

8.1.800 VENDOR_ORDER_ID — (text) The mask vendor's order identification used to track the mask order in manufacturing.

8.1.801 VENDOR_PHONE — Phone number for VENDOR_CONTACT.

8.1.802 VIRTUAL_ADDRESS — (T or F) Designates whether "virtual addressing" option is to be used to write the pattern. If T, then the pattern will be written with a writing grid twice the nominal size of the pattern but in such a way that the overall dimensions of the pattern and its internal features are preserved. This option is used only by MEBES systems and is usually limited to writing grids no larger than 0.25 micron.

8.1.803 VISUAL_INSP_CRITERIA — (text) The part of the mask to inspect visually (e.g., "5 mm border").

8.1.804 VISUAL_INSPECTION_OK — (T or F) If T, the area of the preceding pattern may be inspected visually and/or automatically at the vendor's option. VISUAL_INSPECTION_OK is not allowed if either VISUAL_INSPECTION_REQD or AUTO_INSPECTION_REQD is T (true).

8.1.805 VISUAL_INSPECTION_REQD — (T or F) Visual, microscopic inspection of the mask for defects is required.

8.1.806 WAFER_EXPOSURE_ILLUMINATION — (STANDARD, ANNULAR, DIPOLE, QUADRAPOLE, and others on request) Illumination configuration of the scanner, stepper or aligner on which the mask is to be used. If ANNULAR, then both WAFER_EXPOSURE_SIGMA_INNER and WAFER_EXPOSURE_SIGMA_OUTER are required. If not ANNULAR, then only WAFER_EXPOSURE_SIGMA is required.

8.1.807 WAFER_EXPOSURE_NUMERICAL_APERATURE — Numerical aperture in nanometers of the scanner, stepper or aligner on which the mask is to be used.

8.1.808 WAFER_EXPOSURE_SIGMA — Partial coherence of the scanner, stepper or aligner on which the mask is to be used. (This is a unitless parameter.)

8.1.809 WAFER_EXPOSURE_SIGMA_INNER — Inner partial coherence of the scanner, stepper or aligner on which the mask is to be used. (This is a unitless parameter.)

8.1.810 WAFER_EXPOSURE_SIGMA_OUTER — Outer partial coherence of the scanner, stepper or aligner on which the mask is to be used. (This is a unitless parameter.)

8.1.811 WAFER_EXPOSURE_TOOL — Alphanumeric brand and model of the scanner, stepper or aligner on which the mask is to be used.

8.1.812 WAFER_FAB — (text) Identification of the customer's wafer fab at which the mask(s) are intended to be used.

8.1.813 WAIVER — The uniquely identified (for each customer) document which describes specifications which may be ignored by the vendor.

8.1.814 WAIVER_OVERRIDE — The uniquely identified (for each customer) document which describes specifications which usually may be ignored by the vendor, but in this case may NOT be ignored by the vendor. This keyword cancels the effect of the waiver only within the scope of its application in <mask_order>.

8.1.815 WEB_ADDRESS — URL address.

8.1.816 WRITE_DATE_TIME — Date and time at which mask exposure began on the lithography tool.

9 Computing the Checksum

9.1 The cyclic checksum is computed as follows:

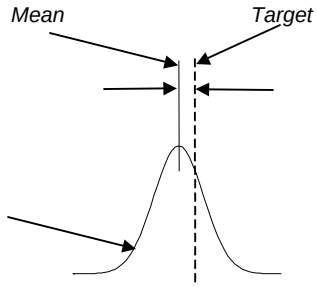
9.1.1 Initialize the 16 bit checksum value to zero. Consider all the records in the data file from START_ORDER through END_ORDER, inclusive. Consider each ASCII character up to and including the "new_line" character. Convert each character to its ASCII numeric equivalent (e.g., space is 32 decimal, "A" is 65 decimal, etc.) Use the value 10 decimal for the new_line function regardless of its internal representation (e.g., CR LF). Use only the 7 bit ASCII representation for each character (i.e., ignore the high order bit in an 8 bit byte).

9.1.2 XOR each of the characters from each of the records in sequence, from the first character in the START_ORDER record to the new_line character in the END_ORDER record. Before each character is XORed with the checksum, circularly rotate the previous value of the accumulated 16 bit checksum one bit to the left.

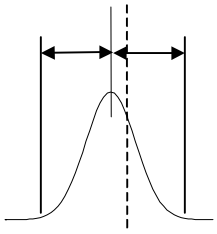
9.1.3 After all of the above characters have been accumulated into the checksum, convert it as an unsigned 16 bit integer into the ASCII representation of its decimal value. This ASCII string is the data field following the CHECKSUM keyword, the last record in the mask order structure.

RELATED INFORMATION 1
CRITICAL DIMENSION KEYWORDS

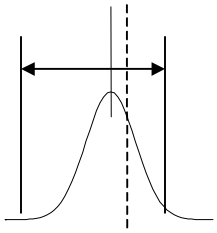
NOTICE: This related information is not an official part of SEMI P10 and was derived from the North American Microlithography Committee. This related information was approved for publication by full letter ballot on April 22, 2004.



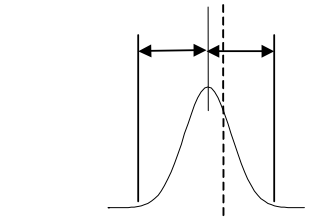
CD_TOLERANCE — Maximum acceptable deviation of the mean of all measured critical dimensions to the CD_TARGET



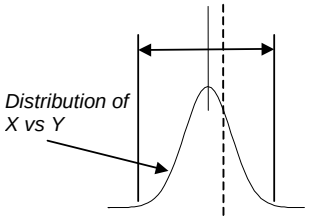
CD_DEVIATION_FROM_MEAN — Maximum acceptable deviation of any of the customer-required CD measurements from the mean of those measurements.



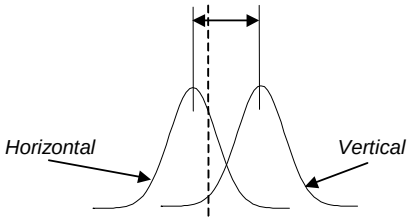
CD_RANGE — Maximum acceptable variation of all measured critical dimensions of same nominal size, same tone and same orientation, relative to each other.



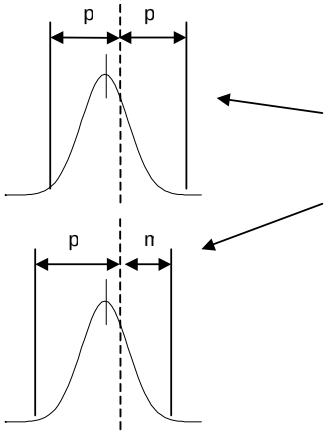
CD_THREE_SIGMA — Maximum acceptable 3-sigma deviation of all measured critical dimensions to the the mean of all measured critical dimensions



CD_XY_DEVIATION — Maximum deviation, on a site-by-site basis, of a horizontal critical dimension to a vertical critical dimension. The two critical dimensions at each site must be the same size in the pattern data and the same tone on the mask.



CD_XY_TOLERANCE — Maximum acceptable deviation of the mean of all measured horizontal critical dimensions to the mean of all measured vertical mask critical dimensions. Critical dimensions at all sites must be the same size in the pattern data.



CD_DEVIATION_FROM_TARGET — Maximum acceptable deviation of any of the customer-required CD measurements from the CD_TARGET.

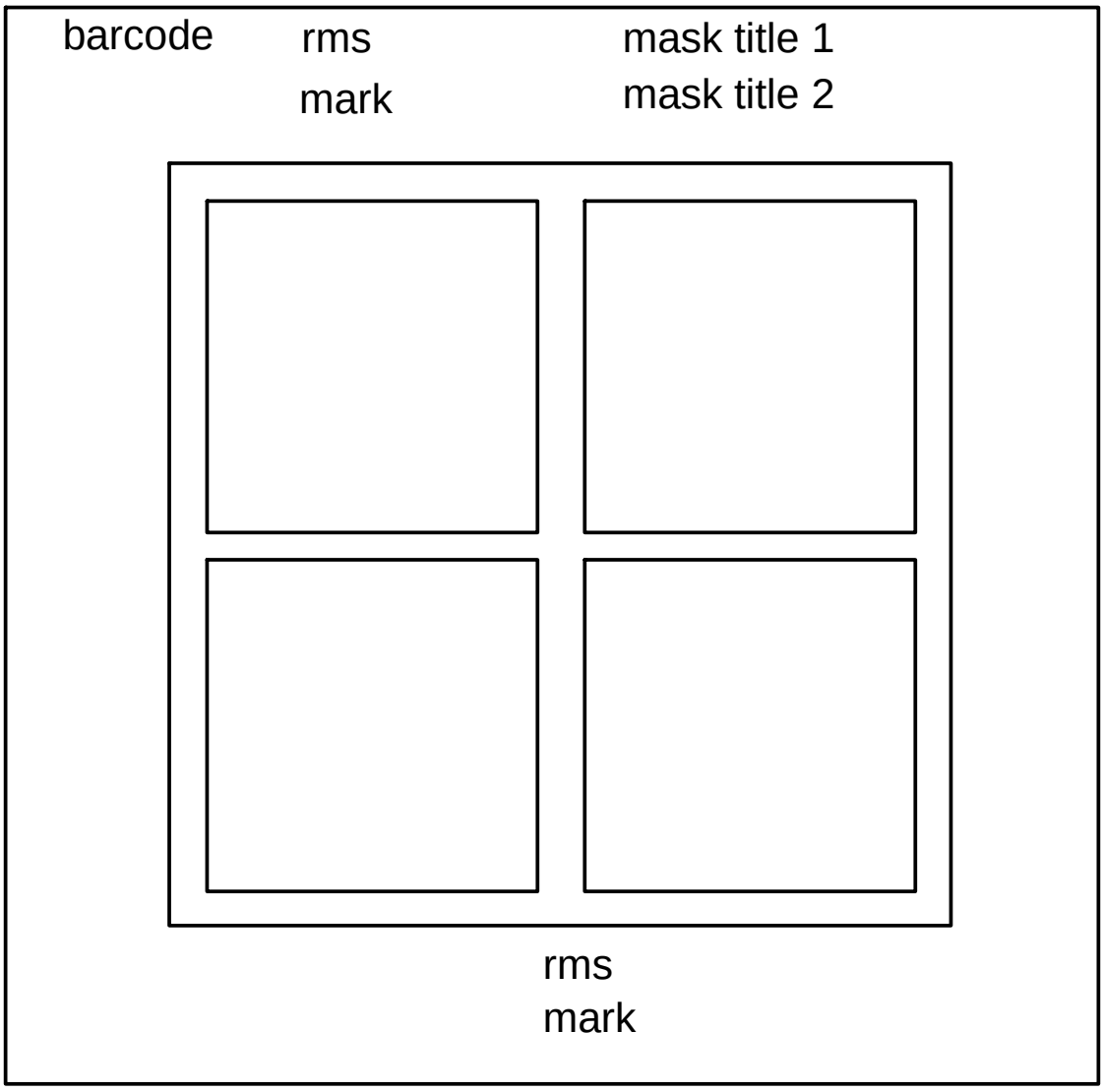
If only one data value (p) appears in the data field, the tolerance is considered +/- symmetrically about CD_TARGET.

If two data values (p [,m]) appear, then the first is the maximum amount by which deviation is allowed larger than CD_TARGET, and the second is the maximum amount by which deviation is allowed smaller than CD_TARGET. The comma and second half of the argument are optional in the syntax (p[,m]) where p = the plus and m = the minus value for non-symmetric tolerances; if only p is specified, the plus and minus values are assumed to be symmetric.

RELATED INFORMATION 2
SEMI PHOTOMASK ORDER DATA FILE EXAMPLE

NOTICE: The information contained in this related information is not an official part of SEMI P10, and it is not intended to modify or supercede the official standard. Rather, this example is offered as an aid to visualizing possible output from software which might implement the standard.

EXAMPLE: A pair of 4-die 5X reticles with separate scribe, barcode, and rms alignment marks. Critical dimensions are defined as pattern options.



START_ORDER	MS999	
SEMI_REVISION	P10-0704	!<mask_order>
CUSTOMER	COMPANY NAME	
VENDOR	ULTIMATE MASK COMPANY	
FILE_DATE_TIME	13-APR-1992, 13:00:00Z	
MASK_SET_ID	9999	!<mask_set>
BILLING_CONTACT	Jean Doe, Accounts Payable	!<mask_set_options>
BILLING_ADDRESS	Company Name	
BILLING_ADDRESS	Street Address	
BILLING_ADDRESS	City, State ZIP	
BILLING_PHONE	4085551212	
PRICE_UNITS	USD	
SHIPPING_CONTACT	Joe Doe, Wafer Fab	
SHIPPING_ADDRESS	Company Name	
SHIPPING_ADDRESS	Street Address	
SHIPPING_ADDRESS	City, State ZIP	
SHIP_CD_DATA	T	
START_SHIP_TO	CD	
EMAIL_ADDRESS	CD_Engineer@Fab.com	
END_SHIP_TO	CD	
SHIP_CD_DATA	T	
START_SHIP_TO	CD Data	
EMAIL_ADDRESS	MaskEngineer@Fab.com	
END_SHIP_TO	CD Data	
DATA_MEDIUM	9 TRACK_TAPE	
DATA_ID	DEVICE 9999	
DATA_FORMAT	MEBES	
DATA_DENSITY	1600BPI	
DATA_PATTERN_NAME	VT9999X-1A-26	
PATTERN_FORMAT	MEBES_RETICLE	
DATA_PATTERN_NAME	VT9999X-1A-10	
PATTERN_FORMAT	MEBES_RETICLE	
DATA_PATTERN_NAME	SC9999X-1A-26	
PATTERN_FORMAT	MEBES_RETICLE	
DATA_PATTERN_NAME	SC9999X-1A-10	
PATTERN_FORMAT	MEBES_RETICLE	
END_DATA_MEDIUM	9 TRACK_TAPE	
STD_PATTERN_NAME	GCARMSB-OX-AA	
PATTERN_FORMAT	MEBES_RETICLE	
END_MASK_SET_OPTIONS	9999	
!		
MASK_GROUP_ID	5X	!<mask_group>
BLANKET_PO_NUMBER	101055C	
RELEASE_NUMBER	42	
MILESTONES	T	

PRODUCT_TYPE	RETICLE	
PRODUCT_MAGNIFICATION	5X	
PRODUCT_IMAGING_TYPE	BINARY	
TITLE_TYPE	DEVICE	
TITLE_LOCATION	12500,58500	
END_TITLE	1	
START_TITLE	2	
TITLE_TYPE	MASK	
TITLE_LOCATION	12500,56500	
END_TITLE	2	
START_BARCODE	A	
BARCODE_TYPE	GCA	
BARCODE_LOCATION	-50000,57500	
END_BARCODE	A	
MIRROR_MASK	T	
START_SUBSTRATE	S1	
BLANK_SIZE	5/90	
BLANK_TYPE	ULTE	
BLANK_FLATNESS	2	
MASK_COATING	LOW_REFLECTANCE_CHROME	
RESIST_TYPE	POSITIVE	
END_SUBSTRATE	S1	
START_REGISTR	RG1	
REGISTR_ERROR	0.25	
REGISTR_REF_MASK_ID	2	
END_REGISTR	RG1	
START_CD	SPECIFICATION	
CD_TOLERANCE	0.25	
CD_RANGE	0.3	
END_CD	SPECIFICATION	
START_DEFECT_DEFINITION	C	
DEFECT_SIZE	2.0	
DEFECT_COUNT	0	
INSPECTION_AREA	-30000,-35000,30000,35000	
END_DEFECT	C	
PACKAGE	H60-51-63A09	
END_MASK_GROUP_OPTIONS	5X	
!		
PLACEMENT_TOP_CELL	C1	
!		
MASK_ID	1	!<mask_definition>
DELIVERABLE_MASK	T	
LINE_ITEM_NUMBER	1	
STATUS	NEW	
DUE_DATE_TIME_REQUESTED	1992-04-20, 14:00Z	

PRICE	2000	
START_TITLE	2	
TITLE_TEXT	DIFFUSION	
END_TITLE	2	
START_BARCODE	A	
BARCODE_TEXT	9999-26	
END_BARCODE	A	
MIN_MASK_FEATURE_SIZE	10	
END_MASK	1	
!		
MASK_ID	2	!<mask_definition>
DELIVERABLE_MASK	T	
LINE_ITEM_NUMBER	2	
STATUS	NEW	
DUE_DATE_TIME_REQUESTED	1992-04-21, 14:00Z	
PRICE	2000	
PRICE_UNITS	USD	
START_TITLE	2	
TITLE_TEXT	POLY	
END_TITLE	2	
START_BARCODE	A	
BARCODE_TEXT	9999-10	
END_BARCODE	A	
MIN_MASK_FEATURE_SIZE	10	
END_MASK	2	
!		
CELL_ID	C1	!<cell_definition>
END_CELL_OPTIONS	C1	
CELL_INSTANCE	C2	!MAIN ARRAY
END_CELL_INSTANCE_OPTIONS	C2	
START_PLACEMENT	P2	
LOCATION	0,0	
END_PLACEMENT	P2	
END_CELL_INSTANCE	C2	
PATTERN_GROUP_INSTANCE	PG3	!RMS ALIGNMENT KEYS
START_PLACEMENT	PG3	
LOCATION	0,-57500	
LOCATION	-11000,57500	
END_PLACEMENT	PG3	
END_CELL	C1	!END TOP CELL DEFINITION
!		
CELL_ID	C2	!MAIN ARRAY DEFINITION
END_CELL_OPTIONS	C2	
PATTERN_GROUP_INSTANCE	PG1	!PRIMARY DIE

START_PLACEMENT	PG1	
LOCATION	-15000,-17500	
STEPPING_DISTANCE	30000,35000	
STEPPING_COUNT	2,2	
END_PLACEMENT	PG1	
END_PATTERN_GROUP_INSTANCE	PG1	
PATTERN_GROUP_INSTANCE	PG2	!SCRIBE LINE
START_PLACEMENT	PG2	
LOCATION	0,0	
END_PLACEMENT	PG2	
END_PATTERN_GROUP_INSTANCE	PG2	
END_CELL	C2	
!		
PATTERN_GROUP_ID	PG1	!PRIMARY PATTERN GROUP
START_PATTERN_OPTIONS	PTN1	
PATTERN_ADDRESS_SIZE	0.5	
SCALE_FACTOR	1.0	
STRIPE_HEIGHT	1024	
UNSCALED_PATTERN_SIZE	25000,30000	
END_PATTERN_OPTIONS	PTN1	
END_PATTERN_GROUP_OPTIONS	PG1	
LEVEL_ID	1	
PATTERN_NAME	VT9999X-1A-26	
START_PATTERN_OPTIONS	PTN1.26	
DIGITIZED_DATA_DARK	T	
END_PATTERN_OPTIONS	PTN1.26	
END_PATTERN_DEFINITION	1	
LEVEL_ID	2	
PATTERN_NAME	VT9999X-1A-10	
START_PATTERN_OPTIONS	PTN1.10	
DIGITIZED_DATA_DARK	F	
END_PATTERN_OPTIONS	PTN1.10	
END_PATTERN_DEFINITION	2	
END_PATTERN_GROUP	PG1	
!		
PATTERN_GROUP_ID	PG2	!SCRIBE PATTERN GROUP
START_PATTERN_OPTIONS	PTN2	
PATTERN_ADDRESS_SIZE	0.5	
SCALE_FACTOR	1.0	
STRIPE_HEIGHT	1024	
UNSCALED_PATTERN_SIZE	65000,75000	
START_CD	CD_SITES_1	
CD_SITE_ID	CD_1	
CD_LOCATION	-40000,0	
END_CD	CD_SITE_1	

```
START_CD                    CD_SITE_2
CD_SITE_ID                  CD_2
CD_LOCATION                 0,-40000
END_CD                      CD_SITE_2
START_CD                    CD_SITE_3
CD_SITE_ID                  CD_3
CD_LOCATION                 0,40000
END_CD                      CD_SITE_3
START_CD                    CD_SITE_4
CD_SITE_ID                  CD_4
CD_LOCATION                 0,0
END_CD                      CD_SITE_4
END_PATTERN_OPTIONS         PTN2
END_PATTERN_GROUP_OPTIONS   PG2
LEVEL_ID                    1
PATTERN_NAME                SC9999X-1A-26
START_PATTERN_OPTIONS       PO.26
DIGITIZED_DATA_DARK         T
START_CD                    DIMENSION
CD_DATA                     10
CD_DIGITIZED                T
CD_TARGET                   10
END_CD                      DIMENSION
END_PATTERN_OPTIONS         PO.26
END_PATTERN_DEFINITION      1
LEVEL_ID                    2
PATTERN_NAME                SC9999X-1A-10
START_PATTERN_OPTIONS       PO.10
DIGITIZED_DATA_DARK         F
START_CD                    DIMENSION
CD_DATA                     10
CD_DIGITIZED                T
CD_TARGET                   10.5
END_CD                      DIMENSION
END_PATTERN_OPTIONS         PO.10
END_PATTERN_DEFINITION      2
END_PATTERN_GROUP           PG2             !END SCRIBE GROUP
!
PATTERN_GROUP_ID            PG3             !RMS ALIGNMENT MARK
START_PATTERN_OPTIONS       PTN3
PATTERN_ADDRESS_SIZE        0.5
SCALE_FACTOR                1.0
STRIPE_HEIGHT               1024
UNSCALED_PATTERN_SIZE       2000,2000
START_DEFECT_DEFINITION     DD.1
```

INSPECTION_AREA	-3000,-3000,3000,3000	
END_DEFECT_DEFINITION	DD.1	
END_PATTERN_OPTIONS	PTN3	
END_PATTERN_GROUP_OPTIONS	PG3	
LEVEL_ID	A	
PATTERN_NAME	GCARMSB-OX-AA	
START_PATTERN_OPTIONS	PTN3.AA	
DIGITIZED_DATA_DARK	F	
END_PATTERN_OPTIONS	PTN3.AA	
END_PATTERN_DEFINITION	A	
END_PATTERN_GROUP	PG3	!END ALIGNMENT MARK
!		
END_MASK_GROUP	5X	
END_MASK_SET	9999	
END_ORDER	MS9999	
CHECKSUM	computed checksum	

RELATED INFORMATION 3
SEMI PHOTOMASK ORDER DATA FILE EXAMPLE EMPLOYING MULTIPLE WRITE AND PROCESS STEPS FOR A SINGLE MASK

NOTICE: The information contained in this related information is not an official part of SEMI P10, and it is not intended to modify or supercede the official standard. Rather, this example is offered as an aid to visualizing possible output from software which might implement the standard.

EXAMPLE: One 4-die phase shift reticle requiring two write and process steps.

START_ORDER	MS999	
SEMI_REVISION	P10-0704	!<mask_order>
CUSTOMER	COMPANY NAME	
VENDOR	ULTIMATE MASK COMPANY	
FILE_DATE_TIME	06-JUL-2000, 01:06:00	
MASK_SET_ID	9999	!<mask_set>
END_MASK_SET_OPTIONS	9999	
!		
MASK_GROUP_ID	PSM	!<mask_group>
START_TITLE	1	
TITLE_TEXT	DEVICE 9999	
TITLE_TYPE	DEVICE	
TITLE_LOCATION	12500,58500	
END_TITLE	1	
START_TITLE	2	
TITLE_TEXT	PHASE SHIFT POLY	
TITLE_TYPE	MASK	
TITLE_LOCATION	12500,56500	
END_TITLE	2	
MIRROR_MASK	T	
PRODUCT_TYPE	RETICLE	
PRODUCT_MAGNIFICATION	5X	
PRODUCT_IMAGING_TYPE	EAPSM	
BLANK_SIZE	6/250	
BLANK_TYPE	ULTE	
BLANK_FLATNESS	1	
MASK_COATING	MOSI	
RESIST_TYPE	POSITIVE	
START_CD	SPECIFICATION	
CD_TOLERANCE	0.05	
CD_RANGE	0.06	
END_CD	SPECIFICATION	
END_MASK_GROUP_OPTIONS	5X	
!		
PLACEMENT_TOP_CELL	C1	
!		

MASK_ID	1	!First write and process step
DELIVERABLE_MASK	F	
MULTIWRITE	(1,1)	
START_PHASE_SHIFT	1	
PSM_WAVELENGTH	248	
TRANSMISSION_TARGET	6	
TRANSMISSION_TOLERANCE	0.4	
TRANSMISSION_RANGE	0.8	
PHASE_ANGLE_TARGET	180	
PHASE_ANGLE_TOLERANCE	4	
PHASE_ANGLE_RANGE	8	
END_PHASE_SHIFT	1	
START_REGISTR	1	
REGISTR_ERROR	0.10	
END_REGISTR	1	
MIN_MASK_FEATURE_SIZE	0.8	
END_MASK	1	
!		
MASK_ID	2	!Second write and process step
DELIVERABLE_MASK	T	
MULTIWRITE	(1,2)	
START_PHASE_SHIFT	2	
PSM_WAVELENGTH	248	
TRANSMISSION_TARGET	6	
TRANSMISSION_TOLERANCE	0.4	
TRANSMISSION_RANGE	0.8	
PHASE_ANGLE_TARGET	180	
PHASE_ANGLE_TOLERANCE	4	
PHASE_ANGLE_RANGE	8	
END_PHASE_SHIFT	2	
TOP_PELLICLE_TYPE	CA627P-7043L	
MIN_MASK_FEATURE_SIZE	0.8	
START_DEFECT_DEFINITION	C	
DEFECT_SIZE	0.3	
DEFECT_COUNT	0	
INSPECTION_AREA	-30000,-35000,30000,35000	
END_DEFECT	C	
END_MASK	2	
!		
CELL_ID	C1	!<cell_definition>
END_CELL_OPTIONS	C1	
CELL_INSTANCE	C2	!MAIN ARRAY
END_CELL_INSTANCE	C2	
LOCATION	0,0	
PATTERN_GROUP_INSTANCE	PG3	!RMS ALIGNMENT KEYS

LOCATION	0,-57500	
LOCATION	-11000,57500	
END_CELL	C1	!END TOP CELL DEFINITION
!		
CELL_ID	C2	!MAIN ARRAY DEFINITION
END_CELL_OPTIONS	C2	
PATTERN_GROUP_INSTANCE	PG1	!PRIMARY DIE
LOCATION	-15000,-17500	
STEPPING_DISTANCE	30000,35000	
STEPPING_COUNT	2,2	
PATTERN_GROUP_INSTANCE	PG2	!SCRIBE LINE
LOCATION	0,0	
END_CELL	C2	
!		
PATTERN_GROUP_ID	PG1	!PRIMARY PATTERN GROUP
PATTERN_ADDRESS_SIZE	0.05	
SCALE_FACTOR	1.0	
STRIPE_HEIGHT	1024	
UNSCALED_PATTERN_SIZE	25000,30000	
END_PATTERN_GROUP_OPTIONS	PG1	
LEVEL_ID	1	
PATTERN_NAME	VT9999X-1A-26	
DIGITIZED_DATA_DARK	T	
END_PATTERN_DEFINITION	1	
LEVEL_ID	2	
PATTERN_NAME	VT9999X-1A-10	
DIGITIZED_DATA_DARK	F	
END_PATTERN_DEFINITION	2	
END_PATTERN_GROUP	PG1	
!		
PATTERN_GROUP_ID	PG2	!SCRIBE PATTERN GROUP
PATTERN_ADDRESS_SIZE	0.05	
SCALE_FACTOR	1.0	
STRIPE_HEIGHT	1024	
UNSCALED_PATTERN_SIZE	65000,75000	
START_CD	CD_SITES	
CD_SITE_ID	CD_1	
CD_LOCATION	-40000,0	
CD_SITE_ID	CD_2	
CD_LOCATION	0,-40000	
CD_SITE_ID	CD_3	
CD_LOCATION	0,40000	
CD_SITE_ID	CD_4	
CD_LOCATION	0,0	
END_CD	CD_SITES	

END_PATTERN_GROUP_OPTIONS	PG2	
LEVEL_ID	1	
PATTERN_NAME	SC9999X-1A-26	
DIGITIZED_DATA_DARK	T	
START_CD	DIMENSION	
CD_DATA	0.8	
CD_DIGITIZED	T	
CD_TARGET	0.8	
END_CD	DIMENSION	
END_PATTERN_DEFINITION	1	
LEVEL_ID	2	
PATTERN_NAME	SC9999X-1A-10	
DIGITIZED_DATA_DARK	F	
START_CD	DIMENSION	
CD_DATA	0.8	
CD_DIGITIZED	T	
CD_TARGET	0.8	
END_CD	DIMENSION	
END_PATTERN_DEFINITION	2	
END_PATTERN_GROUP	PG2	!END SCRIBE GROUP
!		
PATTERN_GROUP_ID	PG3	!RMS ALIGNMENT MARK
PATTERN_ADDRESS_SIZE	0.5	
SCALE_FACTOR	1.0	
STRIPE_HEIGHT	1024	
UNSCALED_PATTERN_SIZE	2000,2000	
INSPECTION_AREA	-3000,-3000,3000,3000	
END_PATTERN_GROUP_OPTIONS	PG3	
LEVEL_ID	A	
PATTERN_NAME	GCARMSB-OX-AA	
DIGITIZED_DATA_DARK	F	
END_PATTERN_DEFINITION	A	
END_PATTERN_GROUP	PG3	!END ALIGNMENT MARK
!		
END_MASK_GROUP	PSM	
END_MASK_SET	9999	
END_ORDER	MS9999	
CHECKSUM	computed checksum	

RELATED INFORMATION 4
SEMI PHOTOMASK MASK RESULTS DATA FILE EXAMPLE

NOTICE: The information contained in this related information is not an official part of SEMI P10, and it is not intended to modify or supercede the official standard. Rather, this example is offered as an aid to visualizing possible output from software which might implement the standard.

EXAMPLE: The actual mask CD data sent by the vendor to the customer for a 4-die 5X reticle with SHIP_CD_DATA set to TRUE. (For reference, see Related Information 2, for MASK_ID = 1.)

START_MASK_RESULTS	MS999	
SEMI_REVISION	P10-0704	!<mask_order>
CUSTOMER	COMPANY NAME	
VENDOR	ULTIMATE MASK COMPANY	
FILE_DATE_TIME	13-APR-1992, 13:00:00	
MASK_SET_ID	9999	!<mask_set>
MASK_GROUP_ID	5X	
MASK_ID	1	
TITLE_TEXT	DEVICE 9999	
TITLE_TEXT	DIFFUSION	
START_CD_GROUP_MEASUREMENTS	SPECIFICATION	
CD_TARGET	10	
CD_TOLERANCE	0.25	
CD_RANGE	0.3	
START_CD_MEASUREMENT	CD_1	
CD_SITE_ID	CD_1	
CD_LOCATION	-40000,0	
MEASURED_CD_SITE_ID	CD_1	
MEASURED_CD_LOCATION	-40000.1,0.08	
MEASURED_CD	9.95	
END_CD_MEASUREMENT	CD_1	
START_CD_MEASUREMENT	CD_2	
CD_SITE_ID	CD_2	
CD_LOCATION	0,-40000	
MEASURED_CD_SITE_ID	CD_2	
MEASURED_CD_LOCATION	-0.07,-40000.11	
MEASURED_CD	10.01	
END_CD_MEASUREMENT	CD_2	
START_CD_MEASUREMENT	CD_3	
CD_SITE_ID	CD_3	
CD_LOCATION	0,40000	
MEASURED_CD_LOCATION	0.03,39999.95	
MEASURED_CD	9.98	
END_CD_MEASUREMENT	CD_3	
START_CD_MEASUREMENT	CD_4	
CD_SITE_ID	CD_4	
CD_LOCATION	0,0	

MEASURED_CD_SITE_ID	CD_4
MEASURED_CD_LOCATION	0.01,-0.04
MEASURED_CD	10.07
END_CD_MEASUREMENT	CD_4
END_CD_GROUP_MEASUREMENTS	SPECIFICATION
END_MASK	1
END_MASK_GROUP	5X
END_MASK_SET	9999
END_ORDER	MS9999
CHECKSUM	computed checksum

RELATED INFORMATION 5
SEMI PHOTOMASK ORDER EXAMPLE FOR 5X RETICLES

NOTICE: The information contained in this related information is not an official part of SEMI P10, and it is not intended to modify or supercede the official standard. Rather, this example is offered as an aid to visualizing possible output from software which might implement the standard.

```
! Sample of 5X reticle order corresponding to recent practices
!
START_ORDER                 O555555
SEMI_REVISION               P10-0704
CUSTOMER                    CUSTOMER NAME
VENDOR                      ACME PHOTOMASKS
FILE_DATE_TIME              14-Oct-2002, 10:39:26
!
MASK_SET_ID                 S55555
!
BUSINESS_CONTACT            ORDER FROM CONTACT NAME
BUSINESS_ADDRESS            ORDER FROM ADDRESS LINE1    !Use as few or as
BUSINESS_ADDRESS            ORDER FROM ADDRESS LINE2    !many lines as
BUSINESS_ADDRESS            ORDER FROM ADDRESS LINE3    !needed - min=1
BUSINESS_PHONE              555-555-5555
BUSINESS_FAX                555-555-5555
BUSINESS_EMAIL              BUSINESS EMAIL ADDRESS
!
BILLING_CONTACT             BILL CONTACT NAME
BILLING_ADDRESS             BILL ADDRESS LINE1          !Use as few or as
BILLING_ADDRESS             BILL ADDRESS LINE2          !many lines as
BILLING_ADDRESS             BILL ADDRESS LINE3          !needed - min=1
BILLING_PHONE               555-555-5555
BILLING_FAX                 555-555-5555
BILLING_EMAIL               BILL EMAIL ADDRESS
!
DESIGN_RULE                 0.35
PRICE_UNITS                 USD
!
ENGINEERING_CONTACT         ENGR CONTACT NAME
ENGINEERING_ADDRESS         ENGR ADDRESS LINE1          !Use as few or as
ENGINEERING_ADDRESS         ENGR ADDRESS LINE2          !many lines as
ENGINEERING_ADDRESS         ENGR ADDRESS LINE3          !needed - min=1
ENGINEERING_PHONE           555-555-5555
ENGINEERING_FAX             555-555-5555
ENGINEERING_EMAIL           ENGR EMAIL ADDRESS
!
SHIPPING_CONTACT            SHIP CONTACT NAME
SHIPPING_ADDRESS            SHIP ADDRESS LINE1
SHIPPING_ADDRESS            SHIP ADDRESS LINE2
SHIPPING_PHONE              555-555-5555
SHIPPING_FAX                555-555-5555
SHIPPING_EMAIL              EMAIL ADDRESS
!
!
SHIPPING_METHOD             COURIER NAME
SHIPPING_METHOD             TERMS
!
REPAIRS_AUTHORIZED          T
!
START_SHIPPABLE_DATA        S1
SHIP_CD_DATA                T
START_SHIP_TO               S1CD                        ! <different shipto address>
```

```
MAILING_ADDRESS                 123 SOMEWHERE ELSE ST.
MAILING_ADDRESS                 A CITY
MAILING_ADDRESS                 THE STATE, THE ZIP
MAILING_ADDRESS                 COUNTRY
END_SHIP_TO                     S1CD
SHIP_DEFECT_DATA                T
SHIP_THRU_PELLICLE_DATA         T
SHIP_INSP_DATABASE_DATA         F
SHIP_REPAIR_DATA                T
SHIP_REGISTR_DATA               T
END_SHIPPABLE_DATA              S1
!
!
DATA_MEDIUM                     FTP
DATA_FILE_SIZE                  12121212
DATA_PATTERN_NAME               FILESNAME.01
PATTERN_FORMAT                  MEBES_RETICLE
DATA_PATTERN_WINDOW             0.0, 0.0, 34555.500, 10987.500
END_DATA_PATTERN_NAME           FILESNAME.01
END_DATA_MEDIUM                 FTP
!
DATA_MEDIUM                     FTP
DATA_FILE_SIZE                  12171212
DATA_PATTERN_NAME               FILESNAME.02
PATTERN_FORMAT                  MEBES_RETICLE
DATA_PATTERN_WINDOW             0.0, 0.0, 34555.500, 10987.500
END_DATA_PATTERN_NAME           FILESNAME.02
END_DATA_MEDIUM                 FTP
!
DATA_MEDIUM                     FTP
DATA_FILE_SIZE                  13101056
DATA_PATTERN_NAME               FILESNAME.03
PATTERN_FORMAT                  MEBES_RETICLE
DATA_PATTERN_WINDOW             0.0, 0.0, 34555.500, 10987.500
END_DATA_PATTERN_NAME           FILESNAME.03
END_DATA_MEDIUM                 FTP
!
! MET2ALL
DATA_MEDIUM                     FTP
DATA_FILE_SIZE                  13101058
DATA_PATTERN_NAME               FILESNAME.04
PATTERN_FORMAT                  MEBES_RETICLE
DATA_PATTERN_WINDOW             0.0, 0.0, 34555.500, 10987.500
END_DATA_PATTERN_NAME           FILESNAME.04
END_DATA_MEDIUM                 FTP
!
MASK_SET_NAME                   DEVICE NAME
ORDER_ID                        ORDER ID NUMBER
!
END_MASK_SET_OPTIONS            S55555
!
MASK_GROUP_ID                   G5555
PO_NUMBER                       P.O. NUMBER
!
PRODUCT_TYPE                    RETICLE
PRODUCT_MAGNIFICATION           5X
PRODUCT_IMAGING_TYPE            BINARY
!
END_MASK_GROUP_OPTIONS          G5555
!
PLACEMENT_TOP_CELL              TC
!
```

MASK_ID	M111	
MASK_NAME	CONTACT 1	
DELIVERABLE_MASK	T	
STATUS	NEW	
DUE_DATE_TIME_REQUESTED	24-Oct-2002, 10:39:26	
LAYER_PRIORITY	1	
PRICE	15000	
LITHO_EQUIP_REQD	EBEAM	
JOB_NAME	JOBDECK NAME	
JOB_LEVEL	1	
!		
START_TITLE	1	
TITLE_TEXT	TITLE TEXT	
TITLE_TYPE	MASK	
TITLE_JUSTIFICATION	L	
TITLE_LOCATION	13400, 8650	
ROTATE_TITLE	90	
END_TITLE	1	
!		
START_TITLE	2	
TITLE_TEXT	DEVICE NAME	
TITLE_TYPE	DEVICE	
TITLE_JUSTIFICATION	L	
TITLE_LOCATION	14400, 8050	
ROTATE_TITLE	90	
END_TITLE	2	
!		
START_TITLE	3	
TITLE_TEXT	CUSTOMER PROPRIETARY	
TITLE_TYPE	AUXILIARY	
TITLE_JUSTIFICATION	L	
TITLE_LOCATION	14700, 2000	
ROTATE_TITLE	90	
END_TITLE	3	
!		
START_BARCODE	1	
BARCODE_TYPE	ASM	
BARCODE_TEXT	BARCODE TEXT	
BARCODE_LOCATION	63000,55000	
BARCODE_ROTATION	0	
END_BARCODE	1	
!		
START_BARCODE	2	
BARCODE_TYPE	CANON	
BARCODE_TEXT	BARCODE TEXT	
BARCODE_LOCATION	-62222,-22000	
BARCODE_ROTATION	0	
END_BARCODE	2	
!		
MIRROR_MASK	T	
BLANK_SIZE	6/250	
BLANK_TYPE	ULTE	
BLANK_FLATNESS	2	
MASK_COATING	LOW_REFLECTIVE_CHROME	
RESIST_TYPE	POSITIVE	
!		
TOP_PELLICLE_TYPE	PELLICLE PART NUMBER1	!First choice
TOP_PELLICLE_TYPE	PELLICLE PART NUMBER2	!Second choice
!		
START_REGISTR	1	
REGISTR_ERROR	10	
REGISTR_REF_METHOD_REQD	PTB	

REGISTR_ALGORITHIM	MULTI-POINT
MASK_REGISTR_MARK	0,0
MEASURE_FILE_NAME	MEASURE FILENAME
END_REGISTR	1
!	
MIN_MASK_FEATURE_SIZE	15
!	
START_DEFECT_DEFINITION	1
VISUAL_INSPECTION_REQD	F
AUTO_INSPECTION_REQD	T
DEFECT_SIZE	0.75
DEFECT_COUNT	0
!	
INSPECTION_AREA	-54388, -54388, 53994, 56053
DATABASE_INSPECTION	T
END_DEFECT_DEFINITION	1
!	
!	
SURF_INSP_METHOD	LASER
SURF_INSP_PELL_TOP	1.0
SURF_INSP_PELL_BOTTOM	1.0
SURF_INSP_GLASS_SIDE	2.0
SURF_INSP_PATTERN_SIDE	.75
!	
!	
INSPECT_THROUGH_PELLICLE	T
!	
START_DEFECT_DEFINITION	2
DIE_TO_DIE_INSPECTION	T
DEFECT_SIZE	1.50
DEFECT_COUNT	0
DATABASE_INSPECTION	T
END_DEFECT_DEFINITION	2
!	
QUALITY_GROUP_ID	Q1
PACKAGE	COMPACT PART NUMBER
!	
END_MASK	M111
!	
!	
MASK_ID	M222
MASK_NAME	METAL 1
DELIVERABLE_MASK	T
STATUS	NEW
DUE_DATE_TIME_REQUESTED	26-Oct-2002, 10:39:26
LAYER_PRIORITY	1
PRICE	10000
LITHO_EQUIP_REQD	EBEAM
JOB_NAME	JOBDECK NAME
JOB_LEVEL	1
!	
START_TITLE	1
TITLE_TEXT	TITLE TEXT
TITLE_TYPE	MASK
TITLE_JUSTIFICATION	L
TITLE_LOCATION	13400, 86500
ROTATE_TITLE	90
END_TITLE	1
!	
START_TITLE	2
TITLE_TEXT	DEVICE NAME
TITLE_TYPE	DEVICE

TITLE_JUSTIFICATION	L
TITLE_LOCATION	14400, 80500
ROTATE_TITLE	90
END_TITLE	2
!	
START_TITLE	3
TITLE_TEXT	CUSTOMER PROPRIETARY
TITLE_TYPE	AUXILIARY
TITLE_JUSTIFICATION	L
TITLE_LOCATION	14700, 20000
ROTATE_TITLE	90
END_TITLE	3
!	
START_BARCODE	1
BARCODE_TYPE	ASM
BARCODE_TEXT	BARCODE TEXT
BARCODE_LOCATION	63000,32000
BARCODE_ROTATION	0
END_BARCODE	1
!	
START_BARCODE	2
BARCODE_TYPE	CANON
BARCODE_TEXT	BARCODE TEXT
BARCODE_LOCATION	-62222,-22000
BARCODE_ROTATION	0
END_BARCODE	2
!	
MIRROR_MASK	T
BLANK_SIZE	6/250
BLANK_TYPE	ULTE
BLANK_FLATNESS	2.0
MASK_COATING	LOW_REFLECTIVE_CHROME
RESIST_TYPE	POSITIVE
!	
TOP_PELLICLE_TYPE	PELLICLE PART NUMBER1
TOP_PELLICLE_TYPE	PELLICLE PART NUMBER2
!	
START_REGISTR	1
REGISTR_ERROR	10
REGISTR_REF_METHOD_REQD	PTB
REGISTR_ALGORITHIM	MULTI-POINT
MASK_REGISTR_MARK	0,0
MEASURE_FILE_NAME	MEASURE FILENAME
END_REGISTR	1
!	
MIN_MASK_FEATURE_SIZE	.25
!	
START_DEFECT_DEFINITION	1
VISUAL_INSPECTION_REQD	F
AUTO_INSPECTION_REQD	T
DEFECT_SIZE	0.85
DEFECT_COUNT	0
!	
INSPECTION_AREA	-59388, -57388, 51994, 53053
DATABASE_INSPECTION	T
END_DEFECT_DEFINITION	1
!	
!	
SURF_INSP_METHOD	LASER
SURF_INSP_PELL_TOP	1.0
SURF_INSP_PELL_BOTTOM	1.0
SURF_INSP_GLASS_SIDE	2.0

```
SURF_INSP_PATTERN_SIDE          .75
!
!
INSPECT_THROUGH_PELLICLE        T
!
START_DEFECT_DEFINITION         2
DIE_TO_DIE_INSPECTION           T
DEFECT_SIZE                     1.50
DEFECT_COUNT                    0
DATABASE_INSPECTION             T
END_DEFECT_DEFINITION           2
!
QUALITY_GROUP_ID                Q1
PACKAGE                         COMPACT PART NUMBER
!
END_MASK                        M222
!
!
CELL_ID                         TC
END_CELL_OPTIONS                TC
 !
PATTERN_GROUP_INSTANCE          PRIMARY
START_PLACEMENT                 1
LOCATION                        0.000, 0.000
STEPPING_DISTANCE               0, 0
STEPPING_COUNT                  1, 1
END_PLACEMENT                   1
END_PATTERN_GROUP_INSTANCE      PRIMARY
 !
PATTERN_GROUP_INSTANCE          CLEAR_BOX
START_PLACEMENT                 CBP1
LOCATION                        33000, -33000
STEPPING_DISTANCE               0, 0
STEPPING_COUNT                  1, 1
END_PLACEMENT                   CBP1
!
START_PLACEMENT                 CBP2
LOCATION                        -33000, 33000
STEPPING_DISTANCE               0, 0
END_PLACEMENT                   CBP2
STEPPING_COUNT                  1, 1
END_PATTERN_GROUP_INSTANCE      CLEAR_BOX
 !
PATTERN_GROUP_INSTANCE          FID
START_PLACEMENT                 FP1
LOCATION                        60000, 60000
STEPPING_DISTANCE               0, 0
STEPPING_COUNT                  1, 1
END_PLACEMENT                   FP1
END_PATTERN_GROUP_INSTANCE      FID
!
END_CELL                        TC
!
!
PATTERN_GROUP_ID                PRIMARY
END_PATTERN_GROUP_OPTIONS       PRIMARY
!
LEVEL_ID                        M111
PATTERN_NAME                    FILESNAME.01
START_PATTERN_OPTIONS           1PPO
PATTERN_ADDRESS_SIZE            0.25
DIGITIZED_DATA_DARK             F
```

```
!
START_CD                        1
CD_DATA                         1.250
CD_DIGITIZED                    T
CD_TONE_CLEAR                   T
CD_TARGET                       1.300
CD_ORIENTATION                  HORIZONTAL
CD_REFERENCE_ONLY               F
CD_TOLERANCE                    .12
CD_RANGE                        .12
NUMBER_OF_CDS                   4
CD_LOCATION                     -53448.100, -43783.375
CD_LOCATION                     -53448.100, 55576.625
CD_LOCATION                     -49070.125, -53343.000
CD_LOCATION                     -49070.125, 47017.000
CD_FEATURE                      TUNING FORK
END_CD                          1
END_PATTERN_OPTIONS             1PPO
END_PATTERN_DEFINITION          M111
!
LEVEL_ID                        M222
PATTERN_NAME                    FILESNAME.02
START_PATTERN_OPTIONS           2PPO
PATTERN_ADDRESS_SIZE            0.25
DIGITIZED_DATA_DARK             T
!
START_CD                        1
CD_DATA                         2.25
CD_DIGITIZED                    T
CD_TONE_CLEAR                   T
CD_TARGET                       2.30
CD_ORIENTATION                  HORIZONTAL
CD_REFERENCE_ONLY               F
CD_TOLERANCE                    .12
CD_RANGE                        .12
NUMBER_OF_CDS                   4
CD_LOCATION                     -33448.100, -53783.375
CD_LOCATION                     -33448.100, 45576.625
CD_LOCATION                     -39070.125, -13343.000
CD_LOCATION                     -39070.125, 27017.000
CD_FEATURE                      L BAR
END_CD                          1
END_PATTERN_OPTIONS             2PPO
END_PATTERN_DEFINITION          M222
!
END_PATTERN_GROUP               PRIMARY
!
!
PATTERN_GROUP_ID                CLEAR_BOX ! Only for Mask M111
END_PATTERN_GROUP_OPTIONS       CLEAR_BOX
!
LEVEL_ID                        M111
PATTERN_NAME                    FILESNAME.03
START_PATTERN_OPTIONS           1CPO
PATTERN_ADDRESS_SIZE            0.25
DIGITIZED_DATA_DARK             F
END_PATTERN_OPTIONS             1CPO
END_PATTERN_DEFINITION          M111
!
END_PATTERN_GROUP               CLEAR_BOX
!
PATTERN_GROUP_ID                FID
```

PATTERN_ADDRESS_SIZE	0.25
END_PATTERN_GROUP_OPTIONS	FID
!	
LEVEL_ID	M111
PATTERN_NAME	FILESNAME.04
START_PATTERN_OPTIONS	1CPO
DIGITIZED_DATA_DARK	F
END_PATTERN_OPTIONS	1CPO
END_PATTERN_DEFINITION	M111
!	
LEVEL_ID	M222
PATTERN_NAME	FILESNAME.04
START_PATTERN_OPTIONS	2CPO
DIGITIZED_DATA_DARK	T
END_PATTERN_OPTIONS	2CPO
END_PATTERN_DEFINITION	M222
!	
END_PATTERN_GROUP	FID
!	
!	
END_MASK_GROUP	G5555
END_MASK_SET	S55555
END_ORDER	O555555
CHECKSUM	118

RELATED INFORMATION 6
SEMI PHOTOMASK ORDER EXAMPLE FOR UT1X RETICLES

NOTICE: The information contained in this related information is not an official part of SEMI P10, and it is not intended to modify or supercede the official standard. Rather, this example is offered as an aid to visualizing possible output from software which might implement the standard.

```
!NOTE: Indentation is for clarity only and is not required.
!
START_ORDER                     ORDER11111
 SEMI_REVISION                  P10-0704
 CUSTOMER                       AAA CUSTOMER
 VENDOR                         ANY VENDOR
 FILE_DATE_TIME                 01-Jan-2002, 12:00
 OPERATOR_NAME                  AN OPERATOR
 !
 MASK_SET_ID                    ABC123
  BILLING_CONTACT               CONTACT NAME
  BILLING_ADDRESS               BILLING ADDRESS LINE 1
  BILLING_ADDRESS               BILLING ADDRESS LINE 2
  PRICE_UNITS                   USD
  SHIPPING_CONTACT              CONTACT NAME
  SHIPPING_ADDRESS              SHIPPING ADDRESS LINE 1
  SHIPPING_ADDRESS              SHIPPING ADDRESS LINE 2
  SHIPPING_ADDRESS              SHIPPING ADDRESS LINE 3
 !
  DATA_MEDIUM                   FTP
   DATA_PATTERN_NAME            FILENAME01.1$
    PATTERN_FORMAT              MEBES_RETICLE
   END_DATA_PATTERN_NAME        FILENAME01.1$
   DATA_PATTERN_NAME            FILENAME01.2$
    PATTERN_FORMAT              MEBES_RETICLE
   END_DATA_PATTERN_NAME        FILENAME01.2$
   DATA_PATTERN_NAME            FILENAME02.1$
    PATTERN_FORMAT              MEBES_RETICLE
   END_DATA_PATTERN_NAME        FILENAME02.1$
   DATA_PATTERN_NAME            FILENAME03.50
    PATTERN_FORMAT               MEBES_RETICLE
   END_DATA_PATTERN_NAME        FILENAME03.50
   DATA_PATTERN_NAME            FILENAME04.50
    PATTERN_FORMAT              MEBES_RETICLE
   END_DATA_PATTERN_NAME        FILENAME04.50
   DATA_PATTERN_NAME            FILENAME05.S$
    PATTERN_FORMAT              MEBES_RETICLE
   END_DATA_PATTERN_NAME        FILENAME05.S$
   DATA_PATTERN_NAME            FILENAME06.25
    PATTERN_FORMAT              MEBES_RETICLE
   END_DATA_PATTERN_NAME        FILENAME06.25
  END_DATA_MEDIUM               FTP
```

```
!
MASK_SET_NAME                   ABC123
MASK_SET_VERSION                ABC123
!
END_MASK_SET_OPTIONS            ABC123
!
MASK_GROUP_ID                   UT1X_GROUP_1
 END_MASK_GROUP_OPTIONS         UT1X_GROUP_1
 !
 PLACEMENT_TOP_CELL             UT_1X_TOP_CELL
 !
 !----------MASKS-------------------------
 MASK_ID                        100001
  MASK_NAME                     NAME100001
  DELIVERABLE_MASK              T
  PO_NUMBER                     123456789
  RELEASE_NUMBER                987654
  STATUS                        NEW
  DUE_DATE_TIME_REQUESTED       01-Jan-2002, 10:44
  PRICE                         1111.0
  REPAIRS_AUTHORIZED            T
  !
  START_SHIPPABLE_DATA          1
   SHIP_CD_PRINTOUT             T
   SHIP_DEFECT_DATA             T
   SHIP_REGISTR_DATA            T
  END_SHIPPABLE_DATA            1
  !
  PRODUCT_TYPE                  1X_STD_FIELD_RETICLE
  PRODUCT_MAGNIFICATION         1X
  PRODUCT_IMAGING_TYPE          BINARY
  QUANTITY                      1
  WAFER_EXPOSURE_TOOL           ULTRATECH
  JOB_NAME                      j1000001.jb
  JOB_LEVEL                     1
  !
  START_TITLE                   TITLE_1
   TITLE_TEXT                   ABC123
   TITLE_TYPE                   DEVICE
   TITLE_JUSTIFICATION          L
   TITLE_LOCATION               -33000.0, -1000.0
   MIRROR_TITLE                 F
   ROTATE_TITLE                 0
   ROTATE_TITLE_CHARACTERS      0
  END_TITLE                     TITLE_1
  !
  START_TITLE                   TITLE_2
   TITLE_TEXT                   NAME100001
```

```
  TITLE_TYPE                  MASK
  TITLE_JUSTIFICATION         L
  TITLE_LOCATION              -22000.0, 1000.0
  MIRROR_TITLE                F
  ROTATE_TITLE                0
  ROTATE_TITLE_CHARACTERS     0
 END_TITLE                    TITLE_2
 !(
 MIRROR_MASK                  T
 BLANK_SIZE                   5/90
 BLANK_TYPE                   ULTE
 BLANK_FLATNESS               2
 MASK_COATING                 LOW_REFLECTIVE_CHROME
 UT1X_UNCUT                   T
 TOP_PELLICLE_TYPE            Pellicle Part Number
 GUIDES_REQD                  STANDARD
 !
 START_DEFECT_DEFINITION      UT1X_1
  GOOD_FIELDS                 (1 AND 2)
 END_DEFECT_DEFINITION        UT1X_1
 !
 START_DEFECT_DEFINITION      PREPELL_DIE2DIE_1
  AUTO_INSPECTION_REQD        T
  DIE_TO_DIE_INSPECTION       T
  DEFECT_SIZE_CL              1.0
  DEFECT_SIZE_DK              1.0
  DEFECT_COUNT                0
 END_DEFECT_DEFINITION        PREPELL_DIE2DIE_1
 !
 QUALITY_GROUP_ID             ABC123
 PACKAGE                      Package Part Number
END_MASK                      1000001
!-----------------------------------------
!
! The TOP_CELL's role in the P10 Standard is to provide a means to list and locate all of the
! Patterns on the Mask.  Within the TOP_CELL Cell ID section (below) both Patterns and other Cells
! can be listed.  The value for the Top Cell is given by the PLACEMENT_TOP_CELL keyword in the
! MASK_GROUP section above.
!
! This example lays out each component of the Mask using the "CELL_INSTANCE" keyword.
! Each Ultratech Field is represented by a "FLD_x" designation for a Cell Instance, where "x" is
! the field number. The general idea is to designate a cell for each Field separately and to let
! the MASK_PATTERNS cell hold the remaining data.  In this example the FLD_1 cell contains Field 1,
! the FLD_2 cell holds Field 2, and the MASK_PATTERNS cell holds Barcode, BOJ, EOJ, Fiducial,
! and Logo data.  Other types of Patterns could also be included in the MASK_PATTERNS cell.
!
!
!----------CELLS-------------------------
```

```
 CELL_ID                          UT_1X_TOP_CELL        !-- refers to PLACEMENT_TOP_CELL
END_CELL_OPTIONS                  UT_1X_TOP_CELL
 !
 CELL_INSTANCE                    FLD_1                 !--Field 1 cell within TOP_CELL
 END_CELL_INSTANCE_OPTIONS        FLD_1
  START_PLACEMENT                 F1
    LOCATION                      -32000.0, 28000.0
  END_PLACEMENT                   F1
 END_CELL_INSTANCE                FLD_1
 !
 CELL_INSTANCE                    FLD_2                 !--Field 2 cell within TOP_CELL
 END_CELL_INSTANCE_OPTIONS        FLD_2
  START_PLACEMENT                 F2
    LOCATION                      25500.0, 28500.0
  END_PLACEMENT                   F2
 END_CELL_INSTANCE                FLD_2
 !
 CELL_INSTANCE                    MASK_PATTERNS         !--Other data cell with TOP_CELL
 END_CELL_INSTANCE_OPTIONS        MASK_PATTERNS
 END_CELL_INSTANCE                MASK_PATTERNS
END_CELL                          UT_1X_TOP_CELL
!
!
! Each CELL_ID below lists the components in that cell, using the PATTERN_GROUP_INSTANCE keyword,
! along with placement data.
!
! Field 1
CELL_ID                           FLD_1   !--This refers to CELL_INSTANCE FLD_1
END_CELL_OPTIONS                  FLD_1
 !
 PATTERN_GROUP_INSTANCE           FLD_1_PG
  START_PLACEMENT                 FDPN1
    LOCATION                      -20000.0, 20000.0
    STEPPING_DISTANCE             10000.0, 0.0
    STEPPING_COUNT                2, 1
  END_PLACEMENT                   FDP_1
 END_PATTERN_GROUP_INSTANCE       FLD_1_PG
END_CELL                          FLD_1
!
! Field 2
CELL_ID                           FLD_2                 !--This refers to CELL_INSTANCE FLD_2
END_CELL_OPTIONS                  FLD_2
 !
 PATTERN_GROUP_INSTANCE           FLD_2_PG
  START_PLACEMENT                 FDP_2
    LOCATION                      50000.0, 20000.0
    STEPPING_DISTANCE             0.0, 0.0
    STEPPING_COUNT                1, 1
```

```
  END_PLACEMENT                 FDP_2
 END_PATTERN_GROUP_INSTANCE     FLD_2_PG
END_CELL                        FLD_2
!
CELL_ID                         MASK_PATTERNS       !--This refers to CELL_INSTANCE
                                                    !MASK_PATTERNS
END_CELL_OPTIONS                MASK_PATTERNS
 !
 PATTERN_GROUP_INSTANCE         BARCODES
  START_PLACEMENT               BC_1
   LOCATION                     85500.000, 113350.000
   STEPPING_DISTANCE            0.0, 0.0
   STEPPING_COUNT               1, 1
  END_PLACEMENT                 BC_1
 END_PATTERN_GROUP_INSTANCE     BARCODES
 !
 PATTERN_GROUP_INSTANCE         BOJ
  START_PLACEMENT               BJ_1
   LOCATION                     119000, 88000
   STEPPING_DISTANCE            0.0, 0.0
   STEPPING_COUNT               1, 1
  END_PLACEMENT                 BJ_1
  START_PLACEMENT               BJ_2
   LOCATION                     9700, 37000
   STEPPING_DISTANCE            0, 0
   STEPPING_COUNT               1, 1
  END_PLACEMENT                 BJ_2
 END_PATTERN_GROUP_INSTANCE     BOJ
 !
 PATTERN_GROUP_INSTANCE         EOJ
  START_PLACEMENT               EJ_1
   LOCATION                     119000, 88000
   STEPPING_DISTANCE            0.0, 0.0
   STEPPING_COUNT               1, 1
  END_PLACEMENT                 EJ_1
  START_PLACEMENT               EJ_2
   LOCATION                     9800, 3800
   STEPPING_DISTANCE            0, 0
   STEPPING_COUNT               1, 1
  END_PLACEMENT                 EJ_2
 END_PATTERN_GROUP_INSTANCE     EOJ
 !
 PATTERN_GROUP_INSTANCE         FIDUCIAL
  START_PLACEMENT               FD_1
   LOCATION                     63500, 63500
   STEPPING_DISTANCE            0.0, 0.0
   STEPPING_COUNT               1, 1
  END_PLACEMENT                 FD_1
 END_PATTERN_GROUP_INSTANCE     FIDUCIAL
```

```
 !
 PATTERN_GROUP_INSTANCE          LOGO
  START_PLACEMENT                LG_1
   LOCATION                      10000, 7500
   STEPPING_DISTANCE             0.0, 0.0
   STEPPING_COUNT                1, 1
  END_PLACEMENT                  LG_1
 END_PATTERN_GROUP_INSTANCE      LOGO
 !
END_CELL                        MASK_PATTERNS
!-----------------------------------------
!
! The PATTERN_GROUP_ID section relates patterns to specific groups of Masks.  The LEVEL_ID
! value MUST agree with a specific MASK_ID value.  When multiple Masks are ordered, there
! will be multiple LEVEL_ID sections within each PATTERN_GROUP_ID section.
!
! The PATTERN_NAME values should agree with those listed in the DATA_MEDIUM section.
!
!----------PATTERN_GROUPS-----------------
! Field 1
PATTERN_GROUP_ID                FLD_1_PG        !refers to PATTERN_GROUP_INSTANCE  FLD_1_PG
END_PATTERN_GROUP_OPTIONS       FLD_1_PG
 !
 LEVEL_ID                       1000001
 PATTERN_NAME                   FILENAME01.1$
 START_PATTERN_OPTIONS          FLD_1_1
  PATTERN_ADDRESS_SIZE           0.25
  SCALE_FACTOR                  1.0
  DIGITIZED_DATA_DARK           T
  UNSCALED_PATTERN_SIZE         15000.0, 15000.0
  MIRROR_PATTERN                F
 END_PATTERN_OPTIONS            FLD_1_1
 END_PATTERN_DEFINITION         1000001
END_PATTERN_GROUP               FLD_1_PG
!
! Field 2
PATTERN_GROUP_ID                FLD_2_PG        !refers to PATTERN_GROUP_INSTANCE  FLD_2_PG
END_PATTERN_GROUP_OPTIONS       FLD_2_PG
 !
 LEVEL_ID                       100001
 PATTERN_NAME                   FILENAME01.2$
 START_PATTERN_OPTIONS          FLD2_2
  PATTERN_ADDRESS_SIZE          0.25
  SCALE_FACTOR                  1.0
  DIGITIZED_DATA_DARK           F
  UNSCALED_PATTERN_SIZE         15000.0, 15000.0
  MIRROR_PATTERN                F
 END_PATTERN_OPTIONS            FLD2_2
```

```
  END_PATTERN_DEFINITION          1000001
 END_PATTERN_GROUP                FLD_2_PG
!
 ! BARCODE Component
 PATTERN_GROUP_ID                 BARCODES
 END_PATTERN_GROUP_OPTIONS        BARCODES
  !
  LEVEL_ID                        1000001
  PATTERN_NAME                    FILENAME02.1$
  START_PATTERN_OPTIONS           BC1
    PATTERN_ADDRESS_SIZE          0.25
    DIGITIZED_DATA_DARK           F
  END_PATTERN_OPTIONS             BC1
  END_PATTERN_DEFINITION          1000001
 !
 END_PATTERN_GROUP                BARCODES
 !
 ! BOJ Component
 PATTERN_GROUP_ID                 BOJ
 END_PATTERN_GROUP_OPTIONS        BOJ
  !
  LEVEL_ID                        1000001
  PATTERN_NAME                    FILENAME03.50
  START_PATTERN_OPTIONS           BJ1
    PATTERN_ADDRESS_SIZE          0.250
    DIGITIZED_DATA_DARK           F
  END_PATTERN_OPTIONS             BJ1
  END_PATTERN_DEFINITION          1000001
 !
 END_PATTERN_GROUP                BOJ
 !
 ! EOJ Component
 PATTERN_GROUP_ID                 EOJ
 END_PATTERN_GROUP_OPTIONS        EOJ
  !
  LEVEL_ID                        1000001
  PATTERN_NAME                    FILENAME04.50
  START_PATTERN_OPTIONS           EJ1
    PATTERN_ADDRESS_SIZE          0.250
    DIGITIZED_DATA_DARK           F
  END_PATTERN_OPTIONS             EJ1
  END_PATTERN_DEFINITION          1000001
 !
 END_PATTERN_GROUP                EOJ
 !
 ! Fiducial Component
 PATTERN_GROUP_ID                 FID
 END_PATTERN_GROUP_OPTIONS        FID
```

```
      !
      LEVEL_ID                        1000001
      PATTERN_NAME                    FILENAME05.S$
      START_PATTERN_OPTIONS           FL1
        PATTERN_ADDRESS_SIZE          .25
        DIGITIZED_DATA_DARK           F
      END_PATTERN_OPTIONS             FL1
      END_PATTERN_DEFINITION          1000001
    !
    END_PATTERN_GROUP                 FID
    !
    ! LOGO Component
    PATTERN_GROUP_ID                  LOGO
    END_PATTERN_GROUP_OPTIONS         LOGO
      !
      LEVEL_ID                        1000001
      PATTERN_NAME                    FILENAME06.25
      START_PATTERN_OPTIONS           LO1
        PATTERN_ADDRESS_SIZE          .25
        DIGITIZED_DATA_DARK           F
      END_PATTERN_OPTIONS             LO1
      END_PATTERN_DEFINITION          1000001
      !
    END_PATTERN_GROUP                 LOGO
    !-----------------------------------------
    !
   END_MASK_GROUP                     UT1X_GROUP_1
   !
 END_MASK_SET                         ABC123
!
END_ORDER                             ORDER1111
CHECKSUM                              0
```

RELATED INFORMATION 7
EXAMPLE OF A COMPLEX BOOLEAN FUNCTION

NOTICE: The information contained in this related information is not an official part of SEMI P10, and it is not intended to modify or supercede the official standard. Rather, this example is offered as an aid to visualizing possible output from software which might implement the standard.

The following is an excerpt of a P10 file which demonstrates how the <data_manipulation> capability may be applied.

```
DATA_PATTERN_NAME             METAL-1
  PATTERN_FORMAT              MEBES
!-------------------------------------------------------------------------
------------
  START_DATA_MANIPULATION           1
    BOOLEAN                   MINUS
!
    DATA_SOURCE_FILE                source1.gds
      DATA_FORMAT             GDSII
      DATA_TOP_CELL                 gds_top_cell
      DATA_LAYER_ID                 1;0
      DATA_PATTERN_WINDOW           012600,-13000,-12600,13000
      START_DATA_FRACTURE           1
          PATTERN_ADDRESS_SIZE      .05
        END_DATA_FRACTURE           1
    END_DATA_SOURCE_FILE            source1.gds
!
    DATA_SOURCE_FILE                source1.gds
      DATA_FORMAT             GDSII
      DATA_TOP_CELL                 gds_top_cell
      DATA_LAYER_ID                 2;0
      DATA_PATTERN_WINDOW           012600,-13000,-12600,13000
      START_DATA_FRACTURE           1
          PATTERN_ADDRESS_SIZE      .05
        END_DATA_FRACTURE           1
    END_DATA_SOURCE_FILE            source1.gds
!
  END_DATA_MANIPULATION             1
!
  START_DATA_MANIPULATION           2
    BOOLEAN                   MINUS
!
    DATA_SOURCE_FILE                source1.gds
      DATA_FORMAT             GDSII
      DATA_TOP_CELL                 gds_top_cell
      DATA_LAYER_ID                 3;0
      DATA_PATTERN_WINDOW           012600,-13000,-12600,13000
      START_DATA_FRACTURE           1
          PATTERN_ADDRESS_SIZE      .05
        END_DATA_FRACTURE           1
    END_DATA_SOURCE_FILE            source1.gds
!
    DATA_SOURCE_FILE                source1.gds
      DATA_FORMAT             GDSII
      DATA_TOP_CELL                 gds_top_cell
      DATA_LAYER_ID                 4;0
```

```
      DATA_PATTERN_WINDOW           012600,-13000,-12600,13000
      START_DATA_FRACTURE           1
          PATTERN_ADDRESS_SIZE      .05
        END_DATA_FRACTURE           1
    END_DATA_SOURCE_FILE            source1.gds
!
  END_DATA_MANIPULATION             2
!-------------------------------------------------------------------------
---------------------------------
  START_DATA_MANIPULATION           3
    BOOLEAN                     AND       !Note:The input to manipulation 3 is the output
from
                                          ! manipulations #1 and #2. Discrete names of
temporary files
                                          !are not required, just a reference to a
previous manipulation.
                                          !This represents the output from both 1 and 2
                                          ! (1-2) and (3-4) with the logical operation of
anding them
                                          ! together ((1-2)*(3-4)).
    DATA_SOURCE_FILE                1
      DATA_FORMAT               DATA_MANIPULATION
    END_DATA_SOURCE_FILE            1
!
    DATA_SOURCE_FILE                2
      DATA_FORMAT               DATA_MANIPULATION
    END_DATA_SOURCE_FILE            2
  END_DATA_MANIPULATION             3
!-------------------------------------------------------------------------
---------------------------------
  START_DATA_MANIPULATION           4
    BOOLEAN                     OR
!
    DATA_SOURCE_FILE                source1.gds
      DATA_FORMAT               GDSII
      DATA_TOP_CELL                 gds_top_cell
      DATA_LAYER_ID                 6;0
      DATA_PATTERN_WINDOW           012600,-13000,-12600,13000
      START_DATA_FRACTURE           1
           PATTERN_ADDRESS_SIZE     .05
        END_DATA_FRACTURE           1
    END_DATA_SOURCE_FILE            source1.gds
!
    DATA_SOURCE_FILE                3
      DATA_FORMAT               DATA_MANIPULATION
    END_DATA_SOURCE_FILE            3
!
  END_DATA_MANIPULATION             4
!-------------------------------------------------------------------------
---------------------------------
  START_DATA_MANIPULATION           5
    BOOLEAN                     AND
!
    DATA_SOURCE_FILE                source1.gds
      DATA_FORMAT               GDSII
      DATA_TOP_CELL                 gds_top_cell
      DATA_LAYER_ID                 5-7
      DATA_PATTERN_WINDOW           012600,-13000,-12600,13000
      START_DATA_FRACTURE           1
```

```
          PATTERN_ADDRESS_SIZE     .05
        END_DATA_FRACTURE          1
    END_DATA_SOURCE_FILE           source1.gds
!
DATA_SOURCE_FILE             source1.gds
      DATA_FORMAT            GDSII
      DATA_TOP_CELL                gds_top_cell
      DATA_LAYER_ID                17-19;8-9
      DATA_PATTERN_WINDOW          112600,-13000,-112600,13000
      START_DATA_FRACTURE          1
           PATTERN_ADDRESS_SIZE    .05
        END_DATA_FRACTURE          1
    END_DATA_SOURCE_FILE           source1.gds
!
    DATA_SOURCE_FILE               4
      DATA_FORMAT            DATA_MANIPULATION
    END_DATA_SOURCE_FILE           4
!
!   Note:  The final sizing, output address size, and data scale are shown
below.
!
    START_DATA_FRACTURE            2
      PATTERN_ADDRESS_SIZE         .05
        DATA_SCALE_FACTOR              5
    END_DATA_FRACTURE              2
!
START_DATA_FRACTURE                3
        SIZING                     .25
      SIZING_RULE              TWOSIDED
        SIZING_BORDER_RULE           PARAGON
END_DATA_FRACTURE              3
!
  END_DATA_MANIPULATION            5
!-------------------------------------------------------------------------------
---------------------------------
END_DATA_PATTERN_NAME                    METAL-1
```

RELATED INFORMATION 8
EXAMPLE OF A DATA FUNCTION

NOTICE: The information contained in this related information is not an official part of SEMI P10, and it is not intended to modify or supercede the official standard. Rather, this example is offered as an aid to visualizing possible output from software which might implement the standard.

The following is an excerpt of a P10 file which demonstrates how the <data_function> capability might be applied.

```
START_DATA_FUNCTION                CPL
  DATA_FUNCTION_PURPOSE            CPL Mask Synthesis for Poly-Gate Layer
  SOFTWARE_NAME                    MaskWeaver
    SOFTWARE_REVISION              1.2
      RUNSET_NAME                  cpl090.mw
      RUNSET_REVISION              1.4
      DATA_LOCATION                /n/raidhost/r5/mwlib/
        PARAMETER_FILE_NAME        cpl090.par
        PARAMETER_FILE_REVISION    2.2
      INPUT_FILE_NAME              qtiac90_1.5.gds
      INPUT_FILE_FORMAT            gds
        TOP_CELL                   MASTER
        DATA_LOCATION              /n/raidhost/r8/tapeouts/qtiac90_1.5/
      RESULT_FILE_NAME             qtiac90_1.5_cpl.o32
      SUMMARY_FILE_NAME            qtiac90_1.5_cpl.sum
      LOG_FILE_NAME                qtiac_90_1.5_cpl.log
END_DATA_FUNCTION                  CPL
```

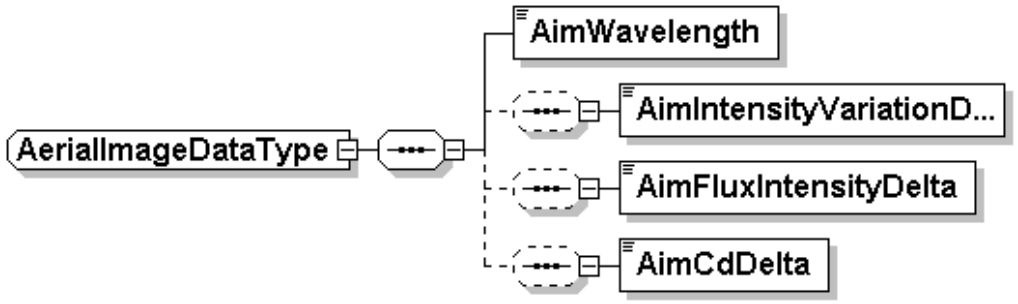
RELATED INFORMATION 9
SEMI PHOTOMASK MASK ORDER STRUCTURE TREE DIAGRAM

NOTICE: The information contained in this related information is not an official part of SEMI P10, and it is not intended to modify or supercede the official standard. Rather, this example is offered as an aid to visualizing possible output from software which might implement the <mask_order> portion of the standard in XML format.

NOTE: All portions of the tree were scaled to fit within single pages. In cases where a portion of the tree is very long, this causes the text to be very small. Such portions of the tree will be more easily read by viewing them with a text editor or text viewer and using an increased magnification.

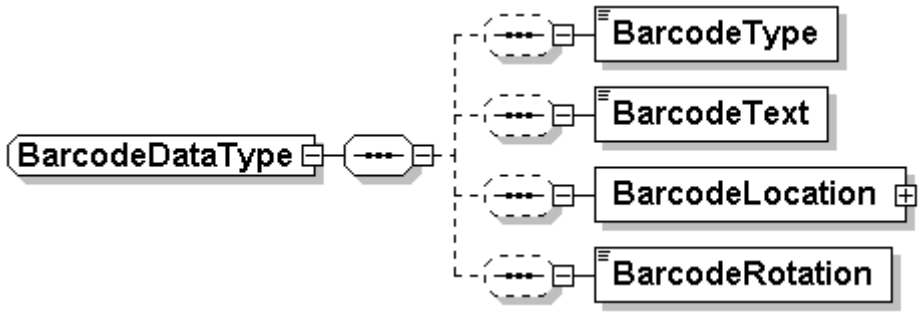
complexType **AerialImageDataType**

diagram



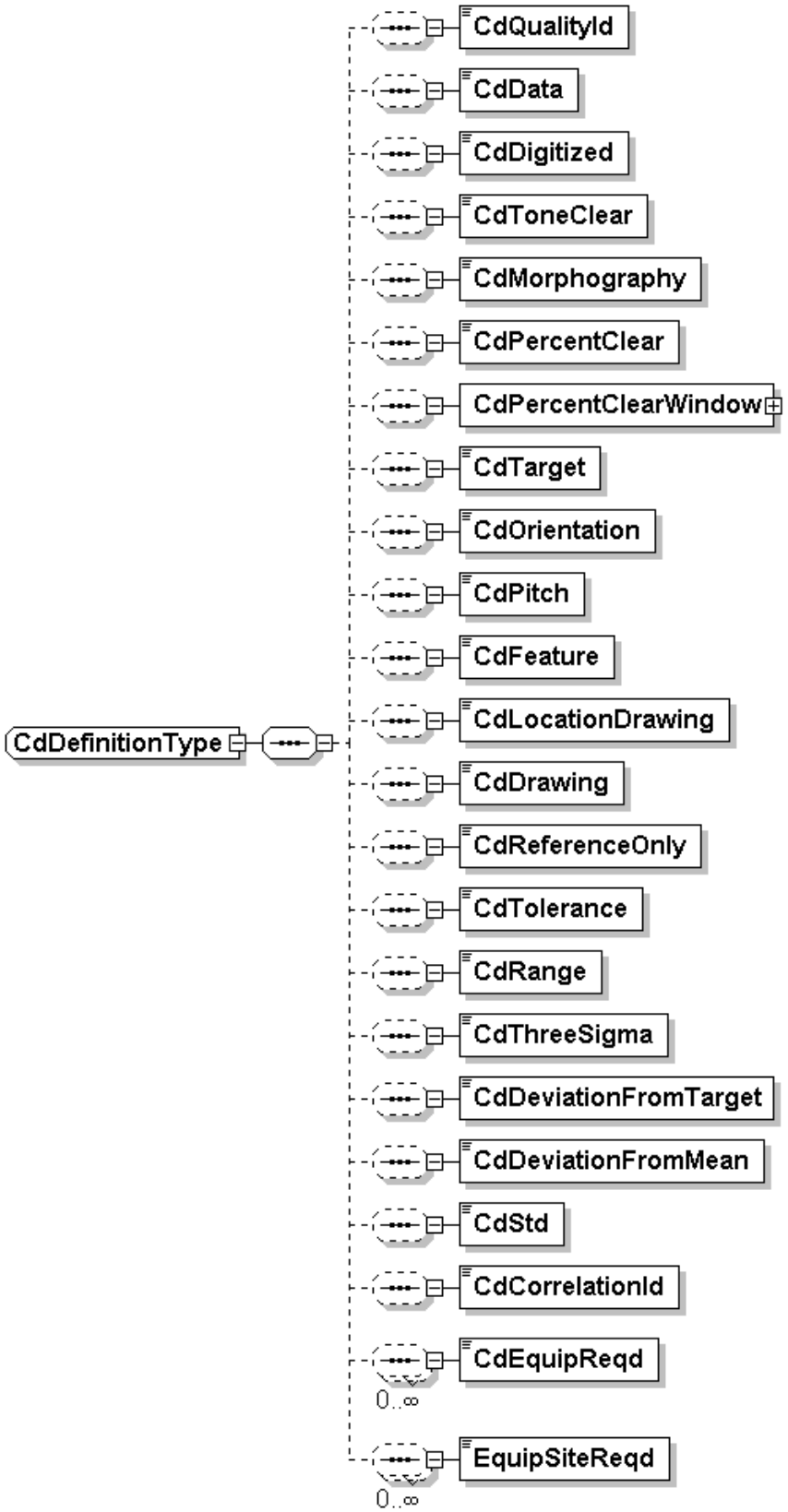
complexType **BarcodeDataType**

diagram



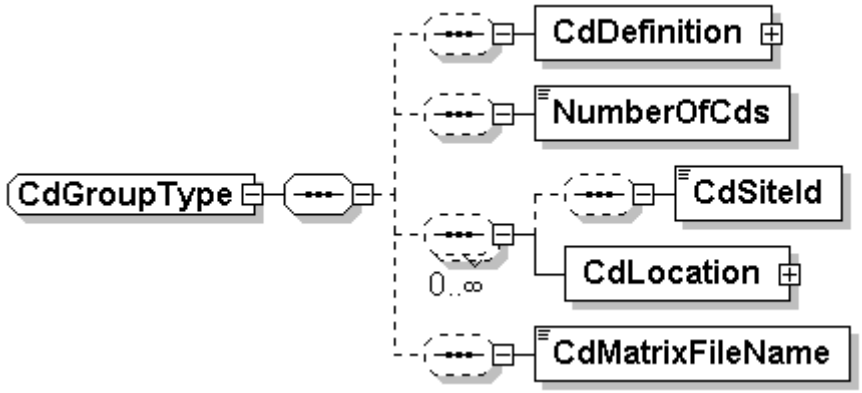
complexType **CdDefinitionType**

diagram



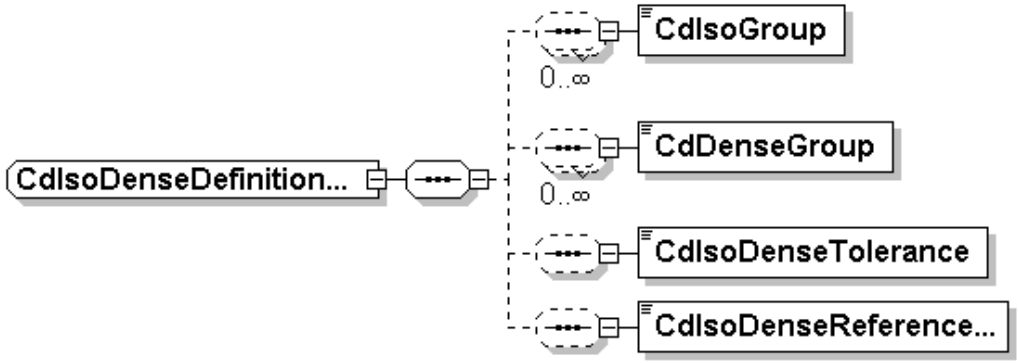
complexType **CdGroupType**

diagram



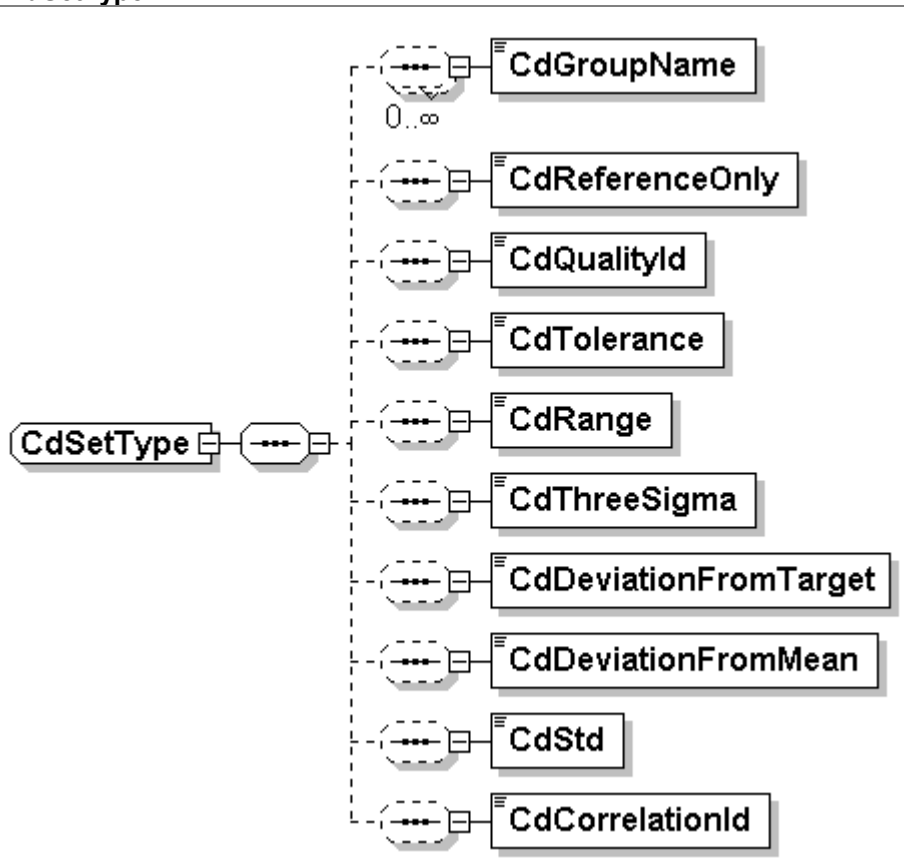
complexType **CdIsoDenseDefinitionType**

diagram



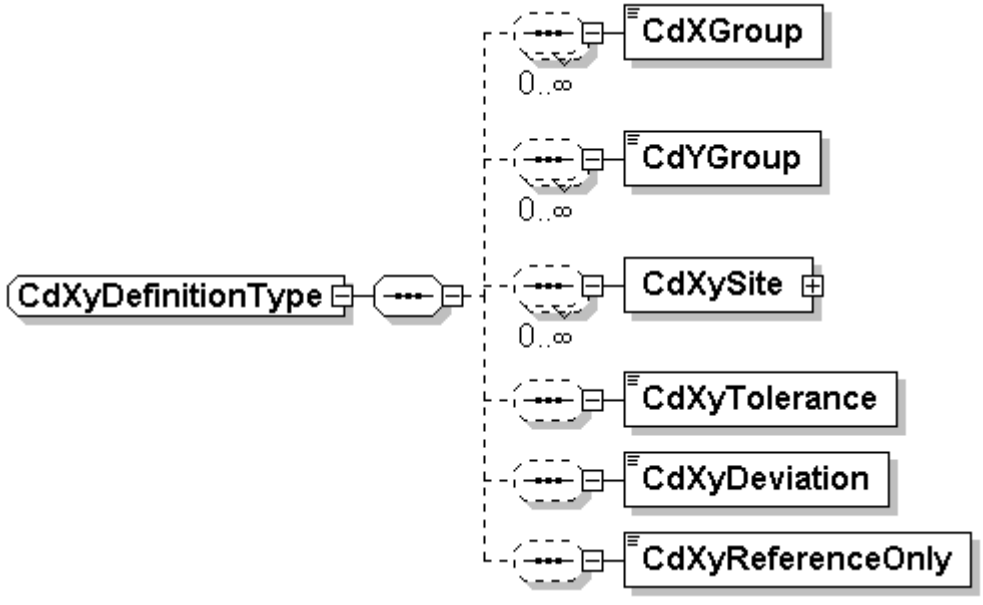
complexType **CdSetType**

diagram



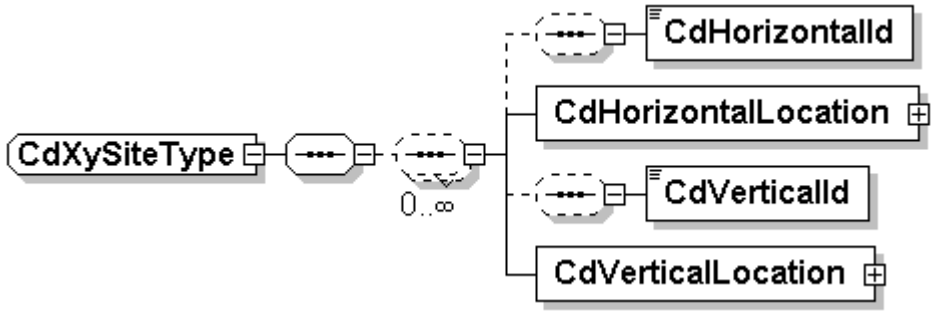
complexType **CdXyDefinitionType**

diagram



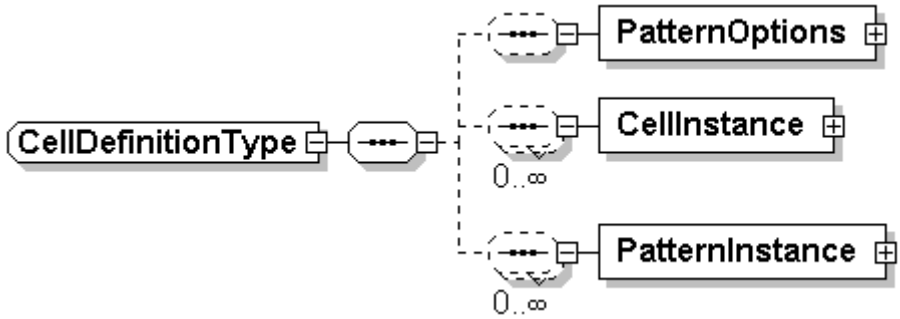
complexType **CdXySiteType**

diagram



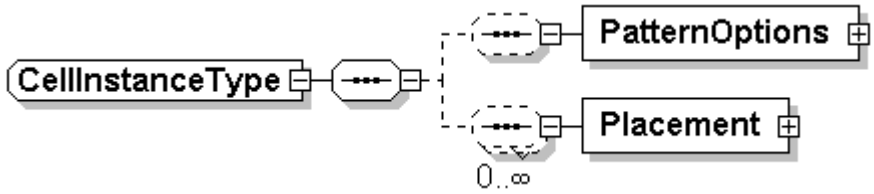
complexType **CellDefinitionType**

diagram



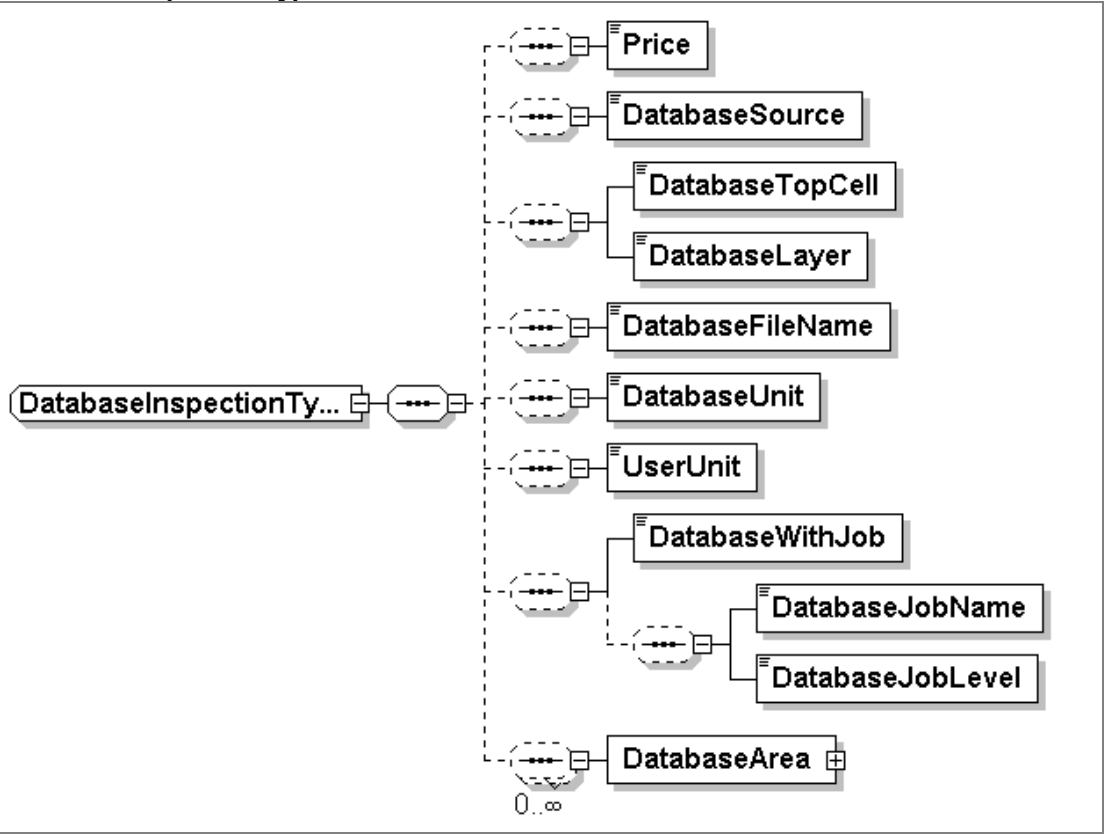
complexType **CellInstanceType**

diagram



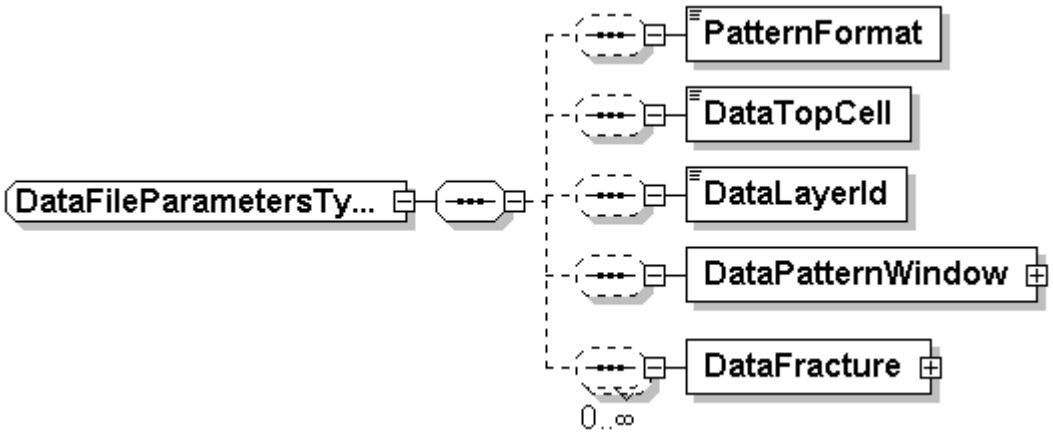
complexType **DatabaseInspectionType**

diagram



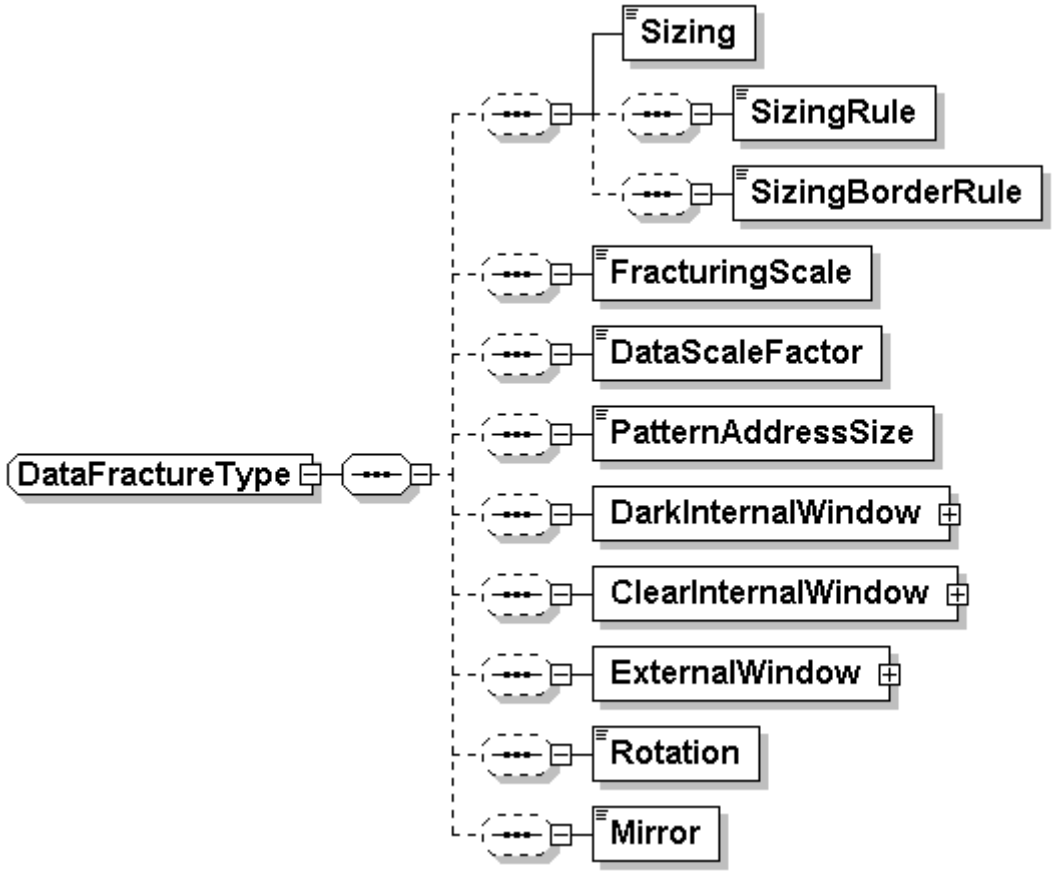
complexType **DataFileParametersType**

diagram



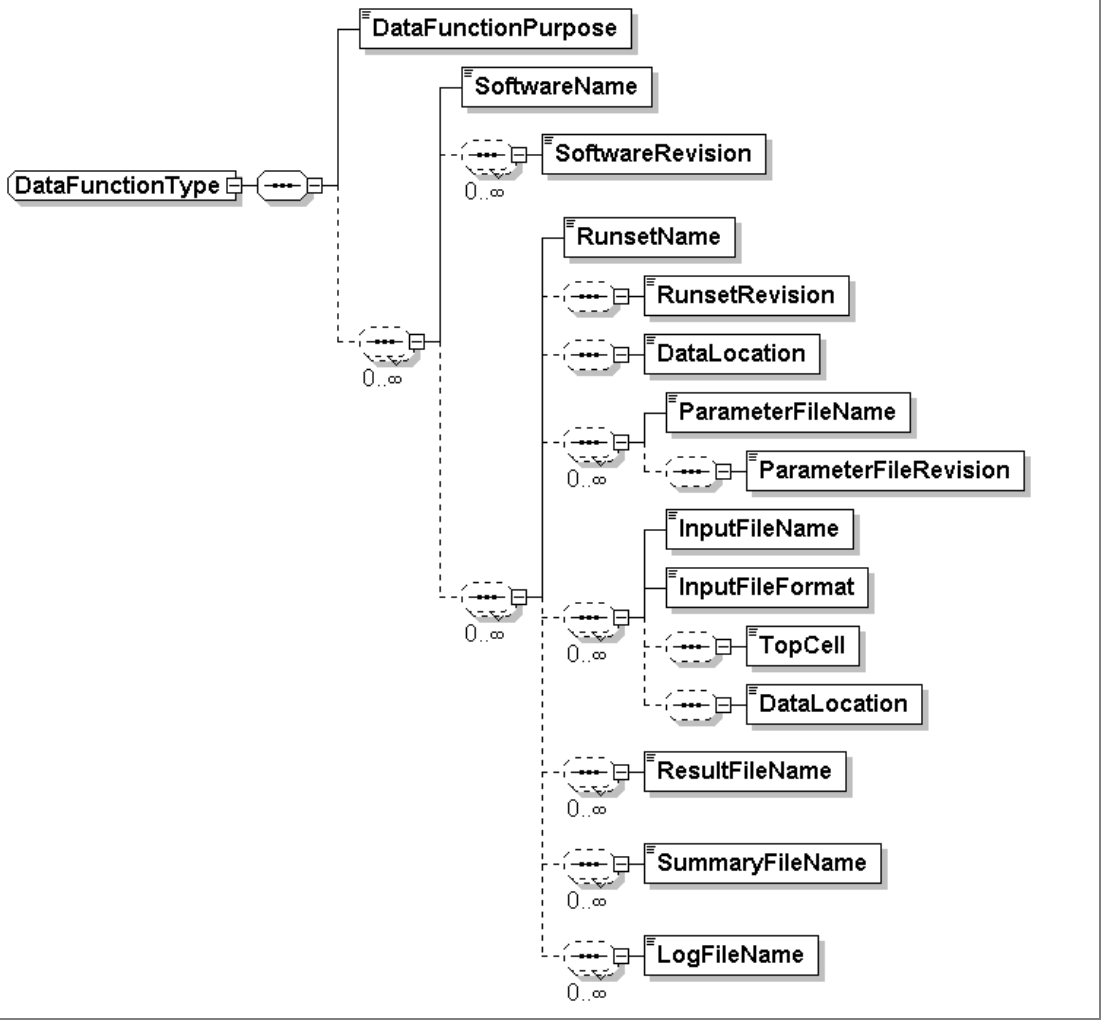
complexType **DataFractureType**

diagram



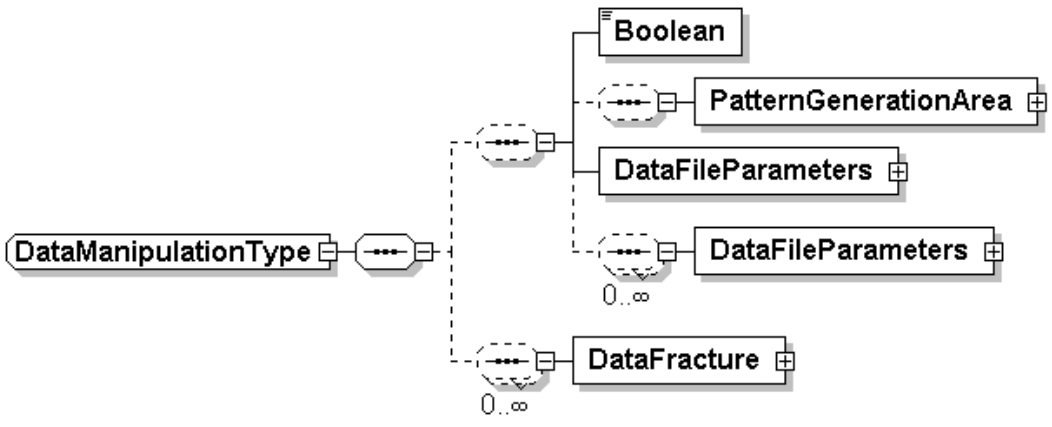
complexType **DataFunctionType**

diagram



complexType **DataManipulationType**

diagram



complexType **DataType**

diagram