

A photograph of a modern industrial or research building at dusk. The building has a dark facade with large windows and a series of white cylindrical chimneys on the roof. The sky is a mix of purple and blue. The text is overlaid on the lower part of the image.

› **USED SAMPLES AND ANALYSIS AREA DESIRE**
D004: 2023 FPL/INK 29 | R.P. EBELING, F. MOLKENBOER

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› INTRO

- › This appendix is part of tender document 2023 FPL/INK 029
- › This is a supplement to appendix D003. D003 lists the **required** sample size that can be loaded (R-3000-005) and **required** measurement area (R-3000-015).
- › This appendix will cover
 - › Points for loading samples larger than stated in D003 (R-3000-010).
 - › Points for measuring larger surface area than stated in D003 (R-3000-020).
 - › Points for larger height which can be loaded and measured than stated in D003 (R-3000-010).
- › It is required that on the measurable surface area the following research can be performed:
 - › By means of SEM imaging, obtain information on:
 - › Material topography
 - › Material morphology
 - › Material contrasts
 - › Using EDX, perform analysis of materials

› AWARDING OF POINTS - LOADING

- › D003 states that the baseline is loading at least a full size reticle:
 - › Length x width: 6" x 6" → 152.4 mm x 152.4 mm.
 - › Height: ¼" → 6.35 mm.
 - › Top surface area: $152.4 \times 152.4 = 23226 \text{ mm}^2$. Call this surface area 'A'.
- › Points will be awarded for samples which can be loaded in the system which have a surface area larger than a full size reticle, assuming the same sample height of 6.35 mm. The shape of such a sample can be round, rectangular or square.
 - › Points awarding procedure:
 - › Load an as large as possible sample in the system, with a thickness of 6.35 mm.
 - › Calculate the top surface area of this sample, express in mm^2 . Call this surface area 'B'.
 - › Subtract ($B - A$) to obtain the extra loadable surface area w.r.t. a full size reticle.
 - › Multiply this surface area ($B - A$) with the *points per extra mm^2 loadable* to obtain points for loading:
 - › ***Points for loading = $(B - A) * 0.02$***
 - › ***Maximum points awarded for loading: 400***

› AWARDING OF POINTS - MEASURING

- › D003 states that the baseline for measuring is to measure at least the total surface area of a 4" wafer:
 - › Diameter: 4" → 101.6 mm
 - › Top surface area: $\pi \times (101.6 / 2)^2 = 8107 \text{ mm}^2$. Call this surface area 'D'.
- › Points will be awarded for a measurable surface area larger than a 4" wafer.
 - › Points awarding procedure:
 - › Load an as large as possible sample in the system, with a thickness of 6.35 mm.
 - › Determine the surface area of this sample which can be measured. It is allowed to rotate the stage to increase the measurable surface area. Express the measurable surface area in mm^2 . Call this surface area 'E'.
 - › Subtract ($E - D$) to obtain the extra measurable surface area w.r.t. a 4" wafer.
 - › Multiply this surface area ($E - D$) with the *points per extra mm^2 measurable* to obtain points for measuring:
 - › ***Points for measuring = $(E - D) * 0.02$***
 - › ***Maximum points awarded for measuring: 400***

› AWARDING OF POINTS - HEIGHT

- › D003 states that the baseline for minimum sample height is:
 - › 30 mm, assuming a round flat sample with a diameter of 4".
- › Points will be awarded for a sample with a larger height which can both be loaded *and* the top surface be fully measured.
 - › Points awarding procedure:
 - › Determine maximum sample height for a round flat sample with diameter 4" which can be loaded and the top surface be fully measured. Call this height 'h'.
 - › Subtract 30 from 'h' and multiply with *points per added mm height* to obtain points for height:
 - › ***Points for height = (h - 30) x 2***
 - › ***Maximum points awarded for height: 100***

› TOTAL POINTS D004 – LOADING, MEASURING, HEIGHT

- › Total points for D004 consist of the following:
 - › Points for loading
 - › Points for measuring
 - › Points for height
- › *Points D004 = Points for loading + Points for measuring + Points for height*

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