Introduction

ASML produces LithoCells for the semiconductor industry, referred to as multiple lot machines (MLM). Unfortunately, during operation of a LithoCell, track and scanner failures are unavoidable. As a result, capacity is lost to repair the track or scanner. Subsequently, all lots in process are aborted (all time spend processing these lots is lost) and need to be reworked. Finally, not all effective capacity is used in order to compensate the resulting variability effects and to prevent the flow time from violating the objective flow time.

Case

A case is performed to evaluate the effect of mean time between failure $t_f$ and mean time to repair $t_r$ on effective capacity $(1 / t_e)$ and flow time $\phi$:

Conclusions

When track and scanner parameters are known, ASML can use the defined relations to quantify the influence of failures on effective capacity and flow time. Concluding, ASML has to reduce $t_r$ and to increase $t_f$ within technical and economical constraints.

References