Introduction

MOS4YOU is Philips’ latest IC production facility. The ICs are fabricated on silicon wafers. The Philips MOS4YOU fab in Nijmegen is in a ramp up phase. Because of this ramp up, the furnace area of the fab has to be extended with new furnaces. The furnaces which are present in the current fab are TEL Alpha furnaces.

Objective

An alternative furnace manufacturer can also deliver furnaces for the furnace area of MOS4YOU. The cycle time of the furnace area must be minimised with the ramp up. A model of MOS4YOU is built to test the performance of the two furnace systems. The model is built using the specification language $\chi$ [1].

Production characteristics

- 10 furnace families in furnace area with a total of 26 furnaces
- furnaces are batch processing equipment
- 34 different furnace recipes
- normal lots and priority lots
- re-entrant flow shop

Alternative furnace system

System behaviour

The decrease in maximum throughput as a result of the smaller maximum load size is compensated by a double boat. This double boat results in a higher reactor utilisation and an increase in maximum throughput.

Simulation model

Process $G$ generates 5 different lot types. System $Fur$ represents the furnace area of MOS4YOU with 26 vertical batch furnaces. Process $C$ represents the rest of the fab and lots leave the system via process $E$.

Results

Lot cycle times in furnace area

Conclusion

Applying alternative furnace systems for the ramp up of the furnace area of MOS4YOU results in minimum lot cycle times. Lots are processed earlier due to the dual boat principle of the alternative furnace system which results in smaller lot waiting times. These smaller lot waiting times result in smaller cycle times.

References