

## Flow-shop problems with transportation delays

- **maximal polynomially solvable:**

$F2 p_{ij} = 1; t_i \in \{T_1, T_2\} C_{max}$	Yu (1996) [5]
$F2 t_{ik} = T C_{max}$	Johnson (1954) [3]
$F p_{ij} = 1; t_i \sum C_i$	Brucker et al. (2004) [1]
$F p_{ij} = 1; t_k; r_i \sum w_i U_i$	Single-machine problem
$F p_{ij} = 1; t_k; r_i \sum w_i T_i$	Single-machine problem

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- **minimal NP-hard:**

* $F2 p_{ij} = 1; t_i C_{max}$	Yu (1996) [5], Yu et al. (2004) [6]
* $F2 r_i C_{max}$	Lenstra et al. (1977) [4]
* $F2 t_i \in \{T_1, T_2\} C_{max}$	Yu (1996) [5]
* $F3 C_{max}$	Garey et al. (1976) [2]
* $F2 L_{max}$	Lenstra et al. (1977) [4]
* $F2 \sum C_i$	Garey et al. (1976) [2]
* $F2 p_{ij} = 1; t_i; r_i \sum C_i$	Brucker et al. (2004) [1]
* $F2 p_{ij} = 1; t_i \sum w_i C_i$	Brucker et al. (2004) [1]

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- **minimal open:**

$F2 p_{ij} = 1; t_i \in \{T_1, T_2\}; r_i C_{max}$	$F2 p_{ij} = 1; t_i \in \{T_1, T_2\}; r_i \sum C_i$	$F2 p_{ij} = 1; t_i \in \{T_1, T_2\} \sum w_i C_i$
$F3 p_{ij} = 1; t_i \in \{T_1, T_2\} C_{max}$	$F3 p_{ij} = 1; t_i \in \{T_1, T_2\}; r_i \sum C_i$	$F3 p_{ij} = 1; t_i \in \{T_1, T_2\} \sum w_i C_i$
$F2 p_{ij} = 1; t_i \in \{T_1, T_2\} L_{max}$	$F3 p_{ij} = 1; t_{ik} \sum C_i$	

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- **maximal open:**

$F p_{ij} = 1; t_{ik} \sum C_i$	$F p_{ij} = 1; t_i \in \{T_1, T_2\}; r_i \sum w_i U_i, \sum w_i T_i$	$F3 p_{ij} = 1; t_{ik}; r_i \sum w_i U_i, \sum w_i T_i$
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## References

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