

Calculation of production tact time

Function Calculation of production tact time for each coater

It is necessary to calculate the production tact time from the time of evacuation, pre-treatment such as ion beam cleaning, deposition and post-treatment such as cooling. This is important for management of production. Production time depends on coater's performance, deposition material and the condition.

This macro program enables to calculate the tact time by "one click", once the coaters, materials and deposition condition (i.e. deposition rate) are registered. Furthermore, it is possible to save above data as a file, and the management and use become easy.

Preparation Copy of macro file (.BAS) and initial file (.fbi) to default directory, and configuration FILMSTAR to use this macro program

To use this macro program, it is necessary to copy following 2 files to the directory "Winfilm\Basic32" and configure FILMSTAR.

Macro file (.BAS) : T_Calc_Tact06.BAS

Initial file (.fbi) : _Ini_Calc_Tact.fbi

Step 1 Input parameters to calculate production tact time

Execute this macro program, and then "Calculate Tact Time" window is opened (fig.1). Input parameters for calculation of production tact time.

The screenshot shows the "Calculate Tact Time" window. It has several sections: "All Parameters" with "Load" and "Save as ..." buttons; "Coater Parameters" with "Load" and "Save as ..." buttons; a table for material and process parameters; and a summary section on the right. Annotations with arrows point to specific fields:

- From top left...** points to the "Coater Parameters" section, which includes:
 - Pumping**: Pumping time
 - Pre-process**: Such as ion cleaning
 - Communication(1layer)**: Communication time between each layer. Input time for one layer.
 - Post-process**: Such as cooling, bent
- From left...** points to the material table, which includes:
 - Material**: Material name
 - Sym**: Material's symbol (H, L etc.)
 - Pre-melt**: Pre-melt time
 - Tooling**: Tooling time
 - Rate**: Deposition rate

	*Material	Sym	Pre-melt[sec]	Tooling	Rate[A/s]	Thickness[nm]	Tact Time[min]
L1	SiO2	L	90	0.9	10	1829.9	
L2	TiO2	H	120	0.85	4	890.7	
L3						0.0	
L4						0.0	
L5						0.0	
Total						2720.7 nm	
						0.272 um	

Fig.1 "Calculate Tact Time" window

Step 2 Calculation of production tact time

Click “Calculate” button on the “Calculate Tact Time” window, and then total thickness and production tact time are calculated (fig.2). However, if all symbols used in design are not registered correctly, the error message like fig.3 is displayed. You should input correct parameters again.

The 'Calculate Tact Time' window displays the following data:

Load	Save as ...	*Material	Sym	Pre-melt[sec]	Tooling	Rate[A/s]	Thickness[nm]	Tact Time[min]
L1	S1	SiO2	L	90	0.9	10	1829.9	
L2	S2	TiO2	H	120	0.85	4	890.7	
L3	S3						0.0	
L4	S4						0.0	
L5	S5						0.0	

Coater Parameters:

- Pumping[min]: 70
- Communication(1layer)[min]: 1
- * Pre-process[min]: 0
- * Post-process[min]: 30

Total:

- Thickness: 2720.7 nm
- Thickness: 0.272 um
- Tact Time: 0.0 min
- Tact Time: 0.0 min

Buttons: Load, Save as ..., Calculate, OK, CSV, Report.

Fig.2 Calculation of production tact time on the “Calculate Tact Time” window

The 'Calculate Tact Time' window displays the following data:

Load	Save as ...	*Material	Sym	Pre-melt[sec]	Tooling	Rate[A/s]	Thickness[nm]	Tact Time[min]
L1	S1	SiO2	A	90	0.9	10		
L2	S2	TiO2	H	120	0.85	4		
L3	S3							
L4	S4							
L5	S5							

Coater Parameters:

- Pumping[min]: 70
- Communication(1layer)[min]: 1
- * Pre-process[min]: 0
- * Post-process[min]: 30

Total:

- Thickness: 314.6 nm
- Thickness: 0.315 um
- Tact Time: 0.0 min
- Tact Time: 0.0 min

Error Message: Symbol 'L' is not inputted.

Buttons: Load, Save as ..., Calculate, OK, CSV, Report.

Fig.3 Error message

Step3 Load and save of all parameters

It is possible to load all parameters that are inputted as a file in step 1. Click “All parameters – Load / Save as ...” button on “Calculate Tact Time” window (fig.4), and then the file dialog is opened (fig.5). Input a file name and save or load a file.

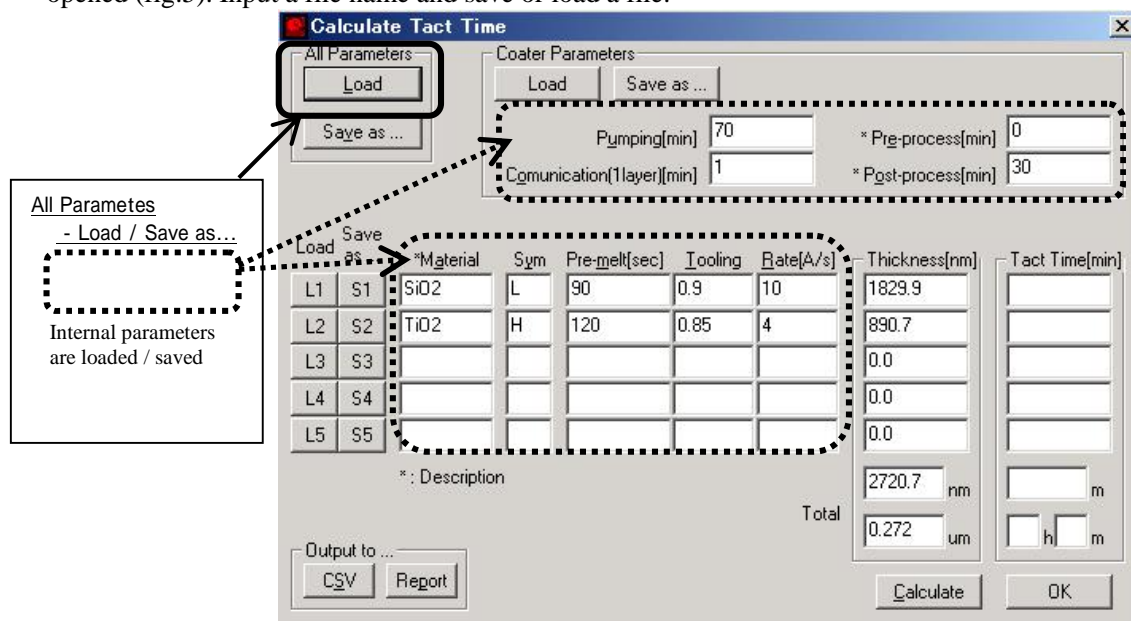


Fig.4 Save and load of all parameters

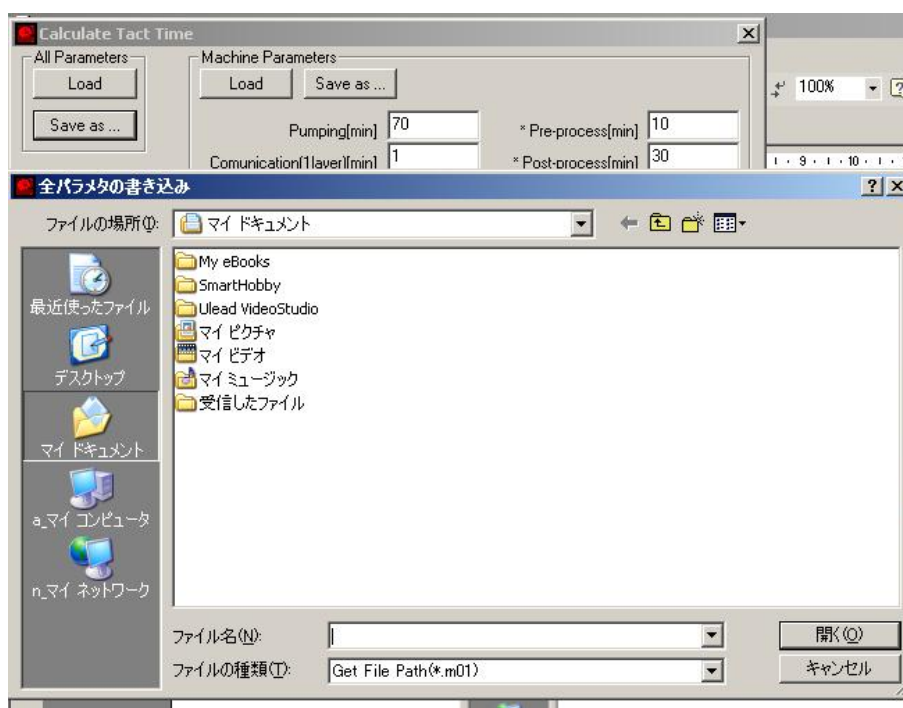


Fig.5 File dialog that selects a saved file of all parameters

Step4 Save and load of coater parameters

It is possible to load coater parameters that are inputted as a file in step 1. Click “Coater parameters – Load / Save as ...” button on “Calculate Tact Time” window (fig.6), and then the file dialog is opened (fig.7). Input a file name and save or load a file.

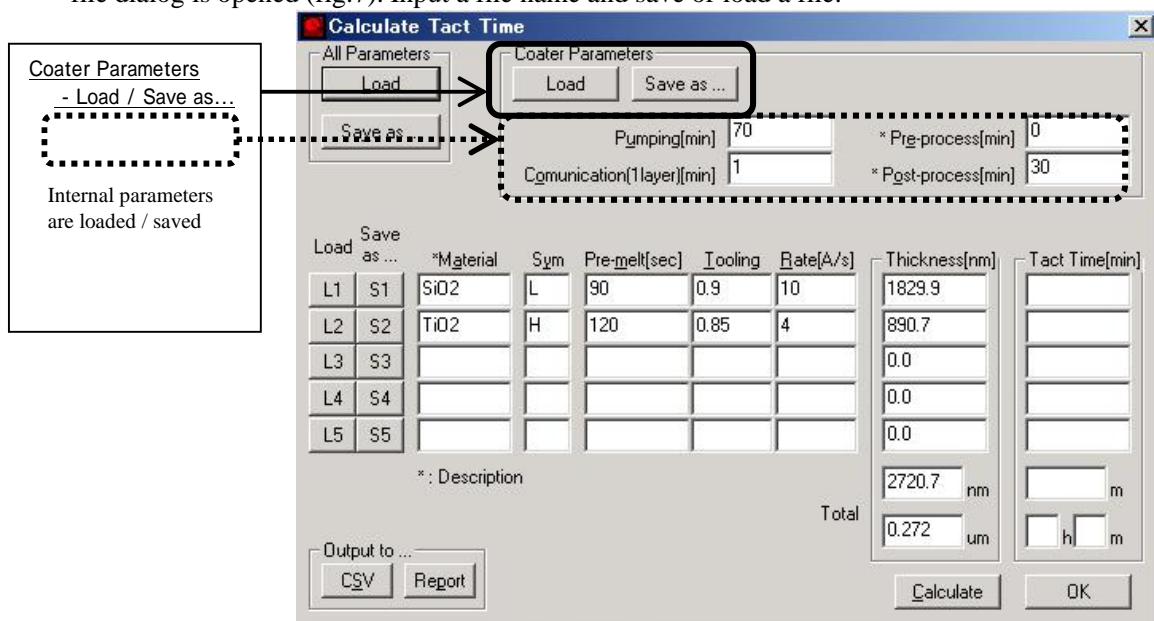


Fig.6 Save and load coater parameters

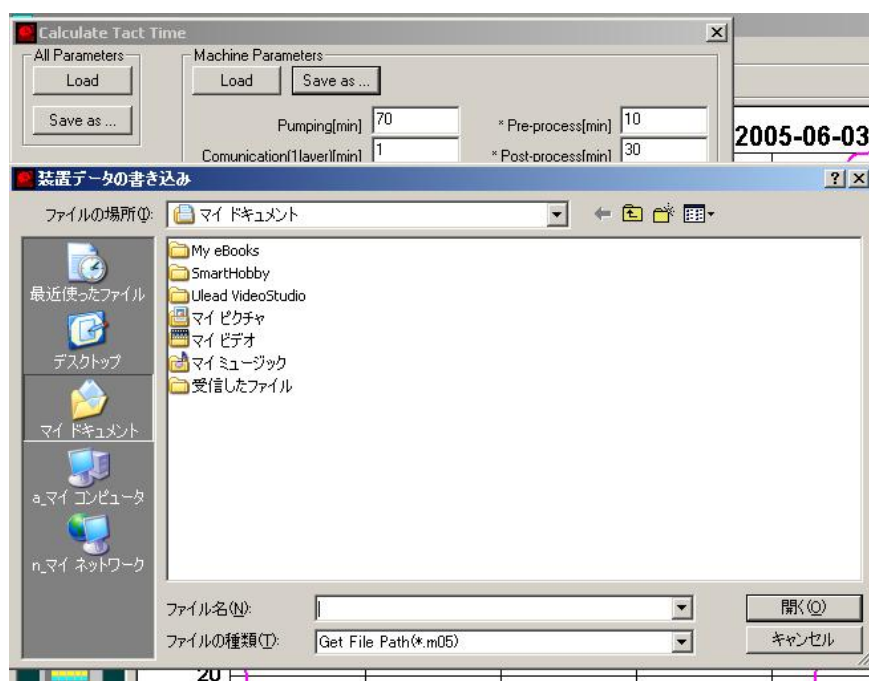


Fig.7 File dialog that selects a saved file of coater parameters

Step 5 Save and load of material parameters

It is possible to load coater parameters that are inputted as a file in step 1. Click “Load / Save as ...” button on “Calculate Tact Time” window (fig.8), and then the file dialog is opened (fig.9). Input a file name and save or load a file.

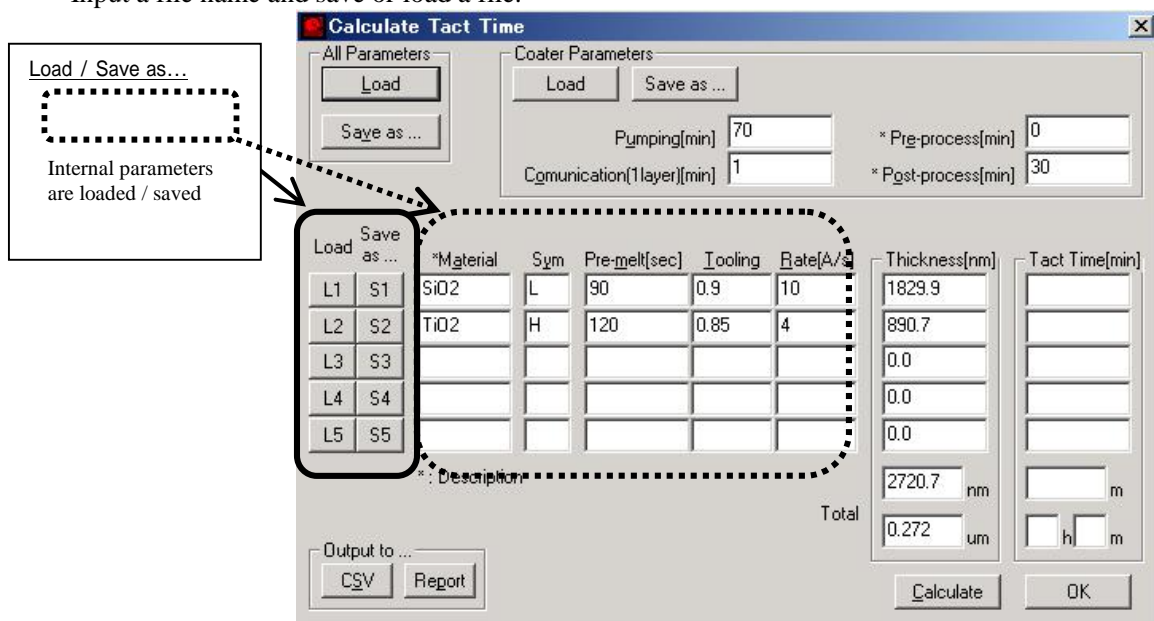


Fig.8 Save and load material parameters

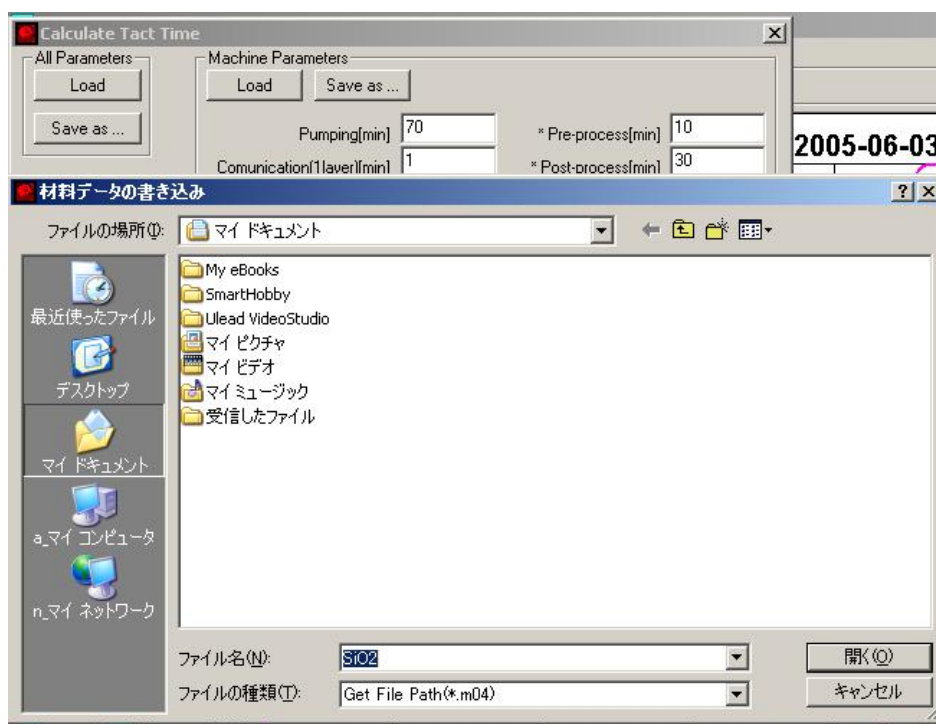


Fig.9 File dialog that selects a saved file of material parameters

Step6 Save of the result as CSV file

It is possible to save the result of production tact time calculated in step 2 as a CSV file. Click “Output to ... - CSV” button on “Calculate Tact Time” window (fig.10), and then the file dialog is opened (fig.11). Input a file name and save a file, then it is saved as CSV file like fig.12.

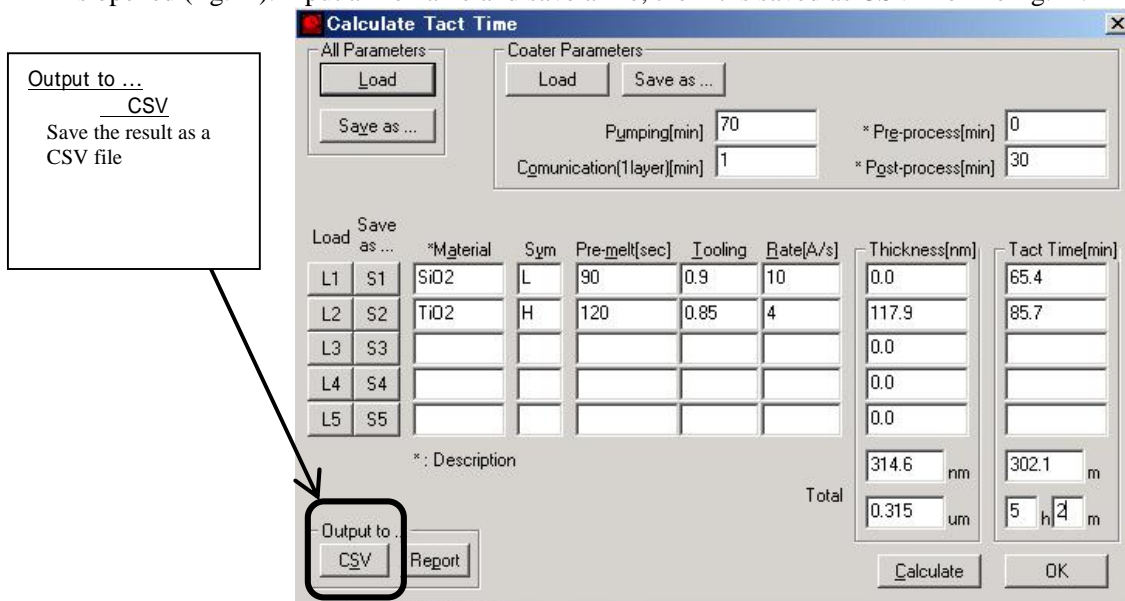


Fig.10 Save as a CSV file

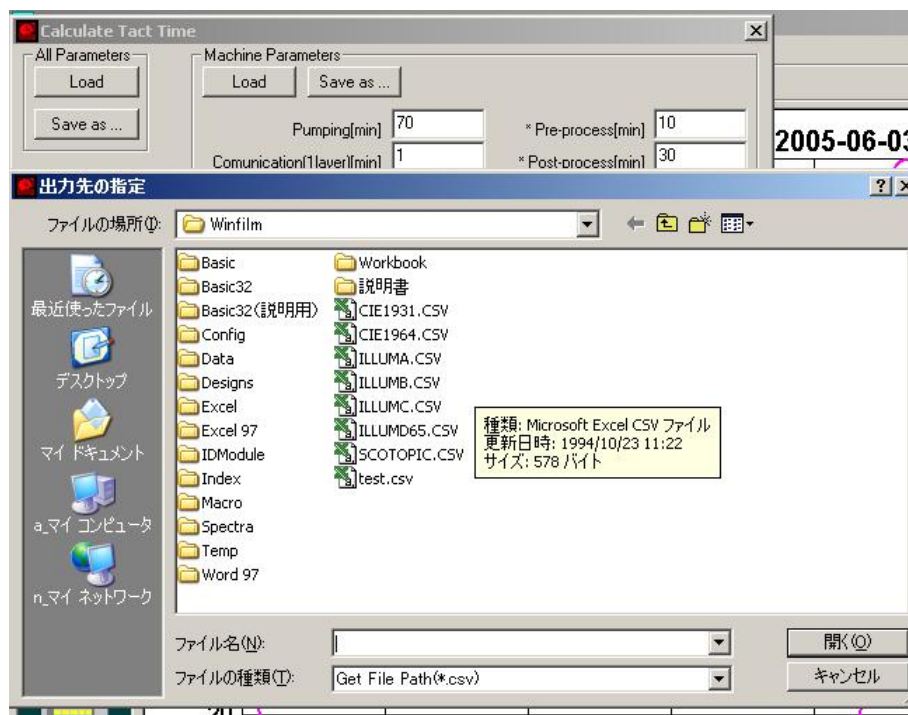


Fig.11 File dialog that selects a saved CSV file

Microsoft Excel - test.csv

ファイル(F) 編集(E) 表示(V) 挿入(I) 書式(O) ツール(T) データ(D) ウィンドウ(W) ヘルプ(H)

100%

Arial 10 B I U

	A	B	C	D	E	F	G	H
1	General							
2	Punping[min]	70						
3	Pre-processing[min]	10						
4	Comunication[min]	1						
5	Post-processing[min]	30						
6								
7	Material							
8		Symbol	Material	Rate[A/s]	Tooling	Thickness[nm]	Tact time[min]	
9	1	L	SiO2	10	0.9	1829.92	65.38741	
10	2	H	TiO2	4	0.85	890.7499	85.66422	
11	3			-1	-1	0	0	
12	4			-1	-1	0	0	
13	5			-1	-1	0	0	
14								
15	Total							
16	Thickness[nm]	2720.67						
17	Tact time[min]	302.0516						
18								

Fig.12 Saved CSV file

Step 7 Output to report

It is possible to insert the result into the report. Click “Output to ... - Report” button on “Calculate Tact Time” window (fig.13). Then click “File Report Generator” on menu bar on FILMSTAR main window, you can see the total thickness and the production tact time are inserted to the report (fig.14).

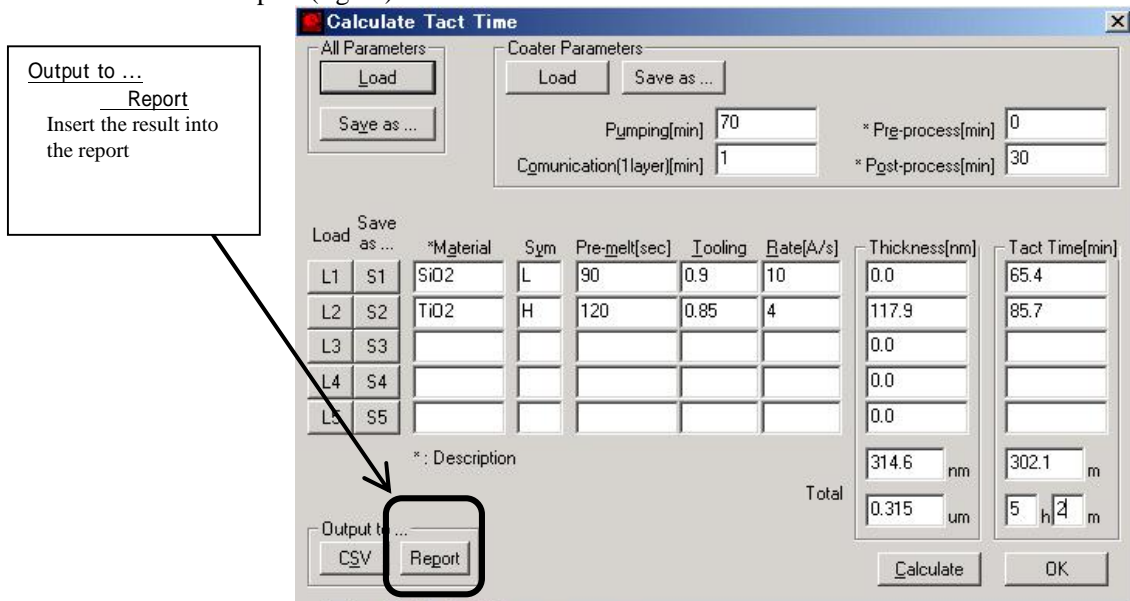


Fig.13 Insert to report

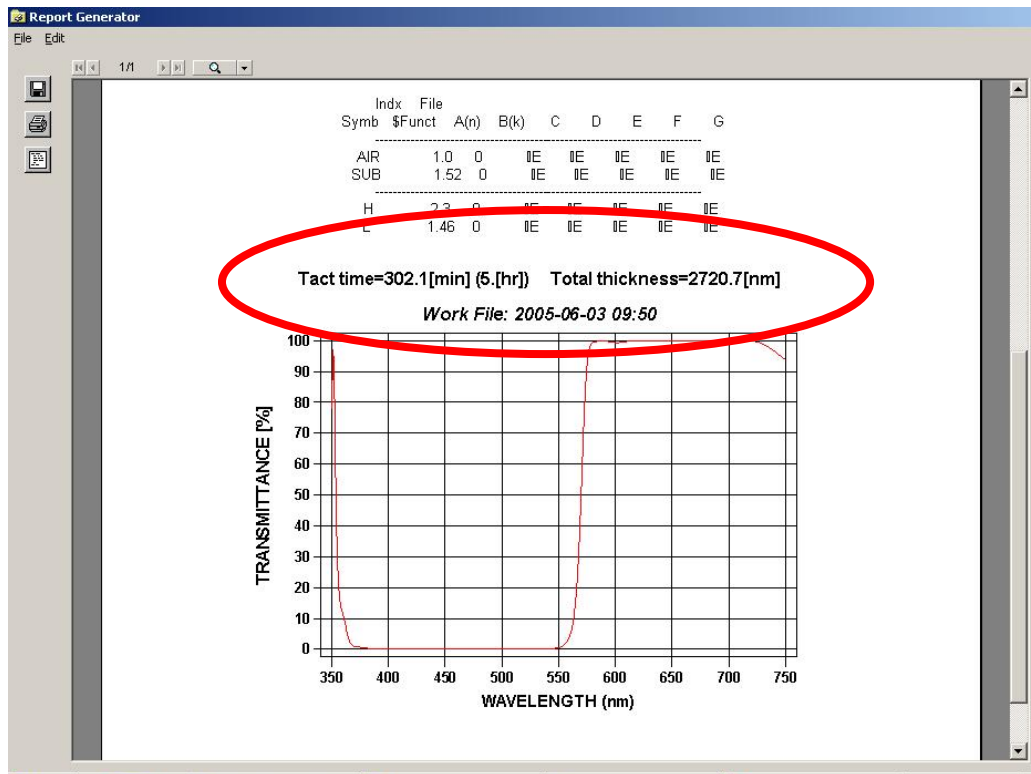


Fig.14 Total thickness and production tact time inserted the report