Job Shop Visual

User Manual

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Content

Introduction

For a basic introduction to using the program, we recommend this video:
http://www.jobshop.72.sk/?m=0EN

Job Shop is a work location in which a number of general purposes Work Place area exist and are used to perform a variety of jobs Traditional machine shop, with similar machine types located together, batch or individual production can be taken as an example.

There are 3 major constraints to be considered to schedule a job shop scheduling process.

1. No task for a job can be started until the previous task for that job is completed.
2. A machine can only work on one task at a time.
3. A task, once started, must run to completion.

Four major factors are used to describe a job shop scheduling problem.

1. Arrival Pattern
2. Number of Machines (Work Place area)
3. Work Sequence
4. Performance Evaluation Criterion

Types of Arrival Patterns

The arrival pattern of jobs to machines are of two forms, either static or dynamic.

1. Static — n jobs arrive at an idle shop and must be scheduled for work
2. Dynamic — intermittent arrival (this is often stochastic)

Number of Machines

Number of machines means the available resources of the machine shop which can be utilized to perform the arrived jobs.

Types of Work Sequence

1. Fixed, repeated sequence — flow shop
2. Random sequence — All patterns possible

Performance Evaluation Criterion on Job Scheduling

The performance criteria that most researches are based on following optimal job scheduling heuristics.

1. Make span — total time to completely process all jobs
2. Average time of jobs in shop
3. Lateness
4. Average number of jobs in shop
5. Utilization of machines

6. Utilization of workers

The Gantt chart is the most convenient way to visualize plan and optimize the job shop problems. The Job Shop visual software is a Gantt chart-based job shop scheduling software which can be used for scheduling very effectively.

In this manual the features and options of the software is described and elaborated using the extrusion die manufacturing process which comes under the Low volume high flexible job shop problem category.

Since all the input data table is prepared based on below discussed process Networks, Sequences, Operations, Operation Parameters and Work Place ,a proper understanding about the process is very important.

Example process description - Extrusion Die Manufacturing

Generally, the manufacturing processes and manufacturing times of extrusion dies are varying in a large range depending on the complexity of the profile to be manufactured using the die set. There are 2 major types of extrusion dies.

1. Solid Dies
2. Hollow Dies

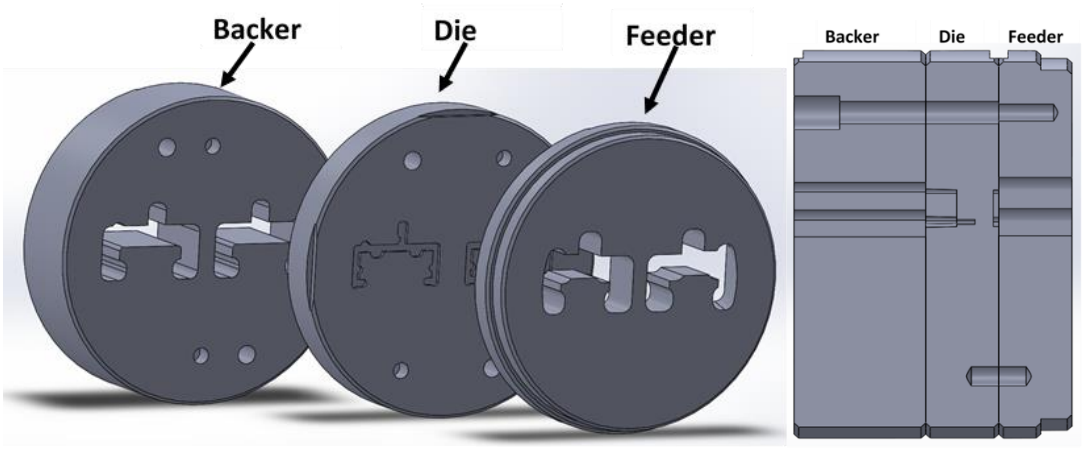
In this section a brief explanation of Extrusion Die manufacturing process for the understanding. The basic understanding of process is very crucial to understand the preparation of input data as well process optimization.

Solid Dies

A solid die set consist of 3 major parts.

1. Feeder
2. Die
3. Backer

Below sketches explain the major parts of a solid die set.



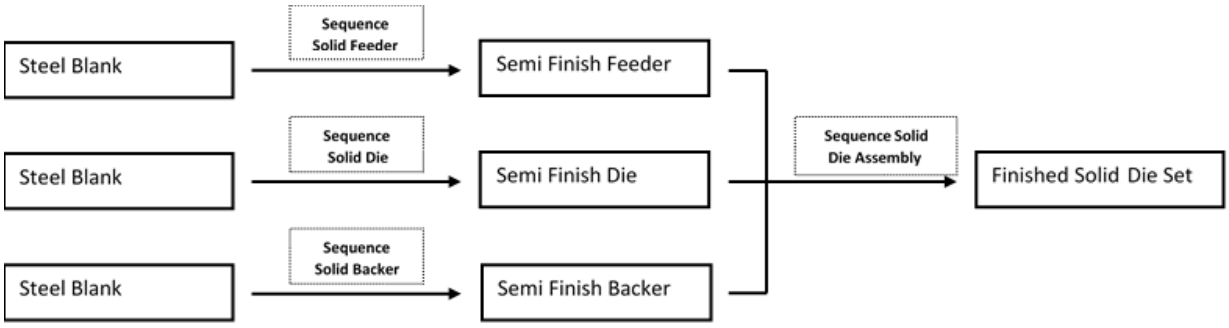
Exploded View of a Solid Die Set

Manufacturing Network of Solid Die Set

The manufacturing process network for a solid die set can be defined as below. This network has 4 process sequences.

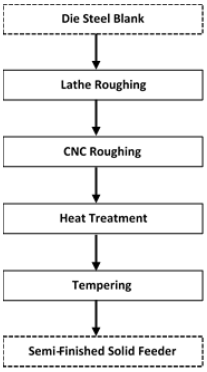
1. Sequence 1: - Manufacturing of Feeder
2. Sequence 2: - Manufacturing of solid die
3. Sequence 3: - Manufacturing of Backer
4. Sequence 4: - Assembly of previously manufactured Feeder, Solid Die and backer.

The schematic diagram of complete manufacturing network of solid die set is mentioned below.

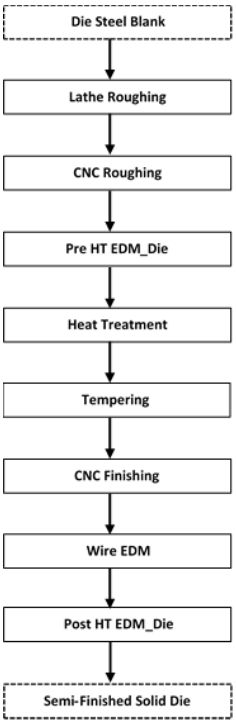


Each manufacturing Sequence is consisting of specific set of operations as below.

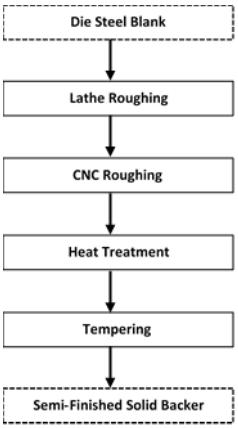
Operations of Sequence -Feeder



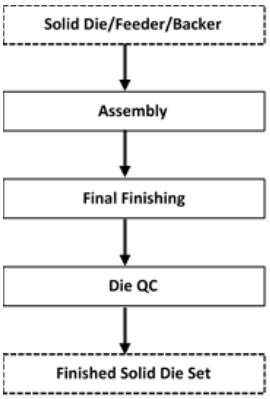
Operations of Sequence – Solid Die



Operations of Sequence - Backer



Operations of Sequence -Solid Die Assembly

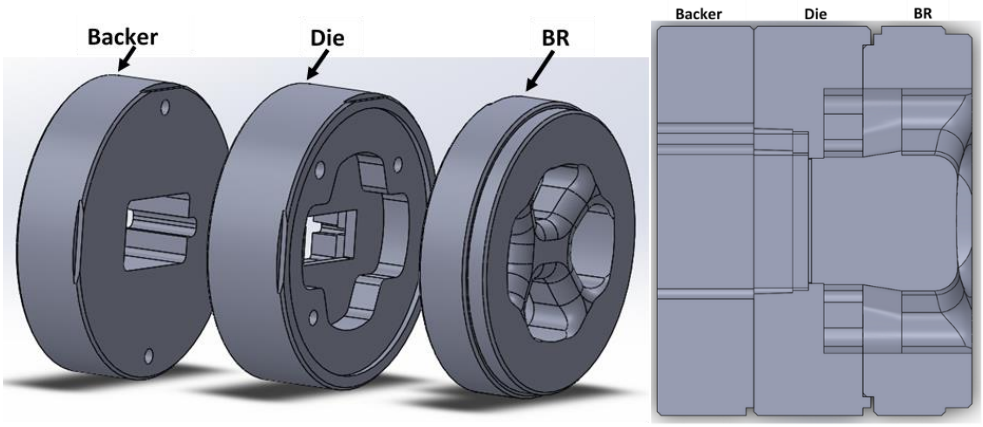


Hollow Dies

A Hollow die set consist of 3 major parts.

1. BR(Mandrel)
2. Die
3. Backer

Below sketches explain the major parts of a Hollow die set.

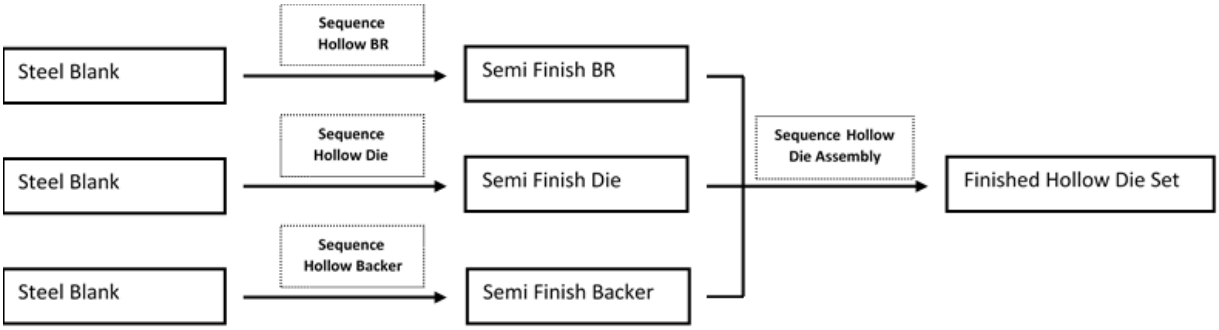


Manufacturing Network of Hollow Die Set

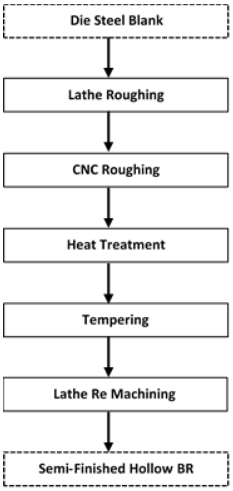
The manufacturing process network for a hollow die set can be defined as below. This network has 4 process sequences.

4. Sequence 1: - Manufacturing of BR(Mandrel)
5. Sequence 2: - Manufacturing of Hollow die
6. Sequence 3: - Manufacturing of Backer
7. Sequence 4: - Assembly of previously manufactured BR, Hollow Die and backer.

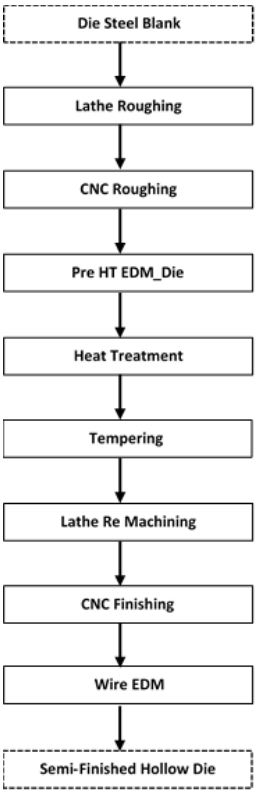
The schematic diagram of complete manufacturing network of Hollow die set is mentioned below.



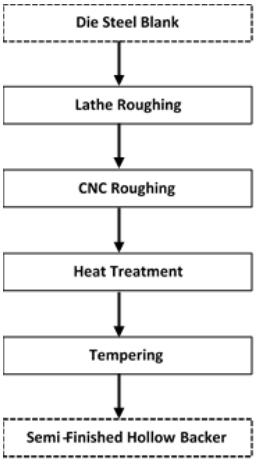
Operations of Sequence -BR (Mandrel)



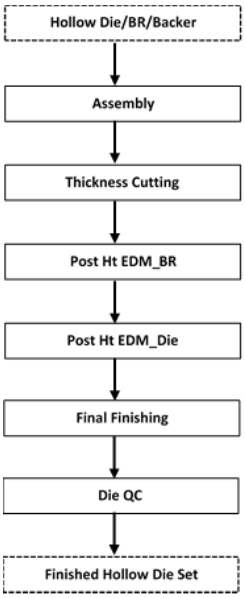
Operations of Sequence -Hollow Die



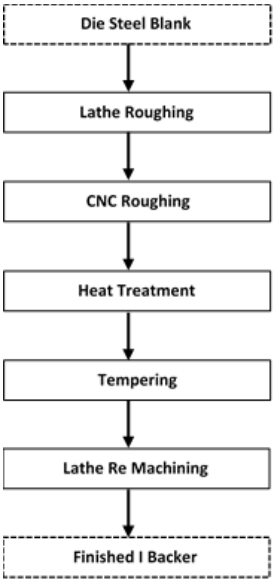
Operations of Sequence -Backer



Operations of Sequence – Hollow Die Assembly



Operations of Sequence – I Backer



In addition to the above defined dies sets, Separate plates also can be manufactured depend on the requirement.

Operation Parameters

For each operation following unique parameters can be defined as below.

1. The work place operation performed
2. The stage of the operation in the sequence
3. Duration of the operation
4. Duration of the operation with along with the operation time
5. Setting time

Work Place area, Available Machines and Operation allocation

In the machine shop following Work Place area areas and resources are available.

1. Manual Lathe
    a. 1 Manual Lathe machine (Working Time -8 Hours)
2. CNC Milling
    a. 1 CNC Milling Machine (Working Time – 24 Hours)
3. Wire EDM (EDM)
    a. 1 Wire EDM Machine (Working Time -24 Hours)
4. EDM
    a. 3 EDM Machines (Working Time – 24 Hours)
5. HT Work Place area
    a. One Heat Treatment Furnace (Working Time – 24 Hours)
    b. One Tempering Furnace (Working Time – 24 Hours)
6. Assembly
    a. One Assembly Helper (Working Time – 8 Hours)
    b. One Assembly Expert (Working Time-16 Hours)
7. Quality
    a. One QC Personal (Working time – 8 Hours)

The Operations to be performed in each Work Place area can be defined as below.

1. Manual Lathe Work Place area

Since only one machine and operator is available to perform both of below tasks, Separate time slots for each operation need to be allocated. Based on the work load For Lathe Re machining operation 8.00AM to 12.00AM and for Lathe Roughing operation 12.00AM-5.00PM time slots were allocated.

a. Lathe Roughing (Operation Time 8.00AM to 12.00PM)
b. Lathe Re machining ((Operation Time 12.00PM to 5.00PM)

2. CNC Milling Work Place area
   Since only one machine and operator is available to perform both of below tasks, Separate time slots for each operation need to be allocated. Based on the work load For CNC Finishing operation 6.00AM to 11.00AM and for CNC Roughing operation 11.00AM-6.00AM time slots were allocated.
   a. CNC Roughing (Operation Time 11.00AM-6.00AM)
   b. CNC Finishing (Operation Time 6.00AM to 11.00AM)

3. Wire EDM Work Place area
   Only the Wire EDM operation is performed in this machine and therefore the total available time can be utilized to perform the operation.
   a. Wire EDM Machining (Operation Time 6.00AM-6.00AM)

4. EDM Work Place area
   Since 3 Machines are available in the Work Place area Sperate machine for each operation can be allocated and therefore the total available time can be utilized to perform the operation.
   a. Pre HT EDM_Die (Operation Time 6.00AM-6.00AM)
   b. Post HT EDM_BR (Operation Time 6.00AM-6.00AM)
   c. Post HT EDM_Die (Operation Time 6.00AM-6.00AM)

5. Manual HT Work Place area
   a. Heat Treatment (Operation Time 6.00AM-6.00AM)
      i. Only One heat treatment furnace is available in the work shop and the time taken for one HT batch is about 8 Hours. Based on the cycle time 2 slots for 2 batches were allocated.
   b. Tempering (Operation Time 6.00AM-6.00AM)
      i. Only One tempering furnace is available in the work shop and the time taken for one Tempering batch is about 6 Hours. Based on the cycle time 3 slots for 3 batches were allocated.

6. Assembly Work Place area
   a. Die Assembly (Operation Time 8.00AM-5.00PM)
      i. One Skilled worker is allocated for this operation.

Since only skilled employee is available to perform both of below tasks, Separate time slots for each operation need to be allocated. Based on the work load For Final Finishing operation 8.00AM to 11.00AM and for Thickness Cutting operation 11.00AM-10.00PM time slots were allocated.

   b. Final Finishing (Operation Time 8.00AM to 11.00AM)
   c. Thickness Cutting (Operation Time 11.00AM-10.00PM)

The Work Place areas in the job shop, Available machines in the work shop, Operation time and operation hours can be summarized to below table.

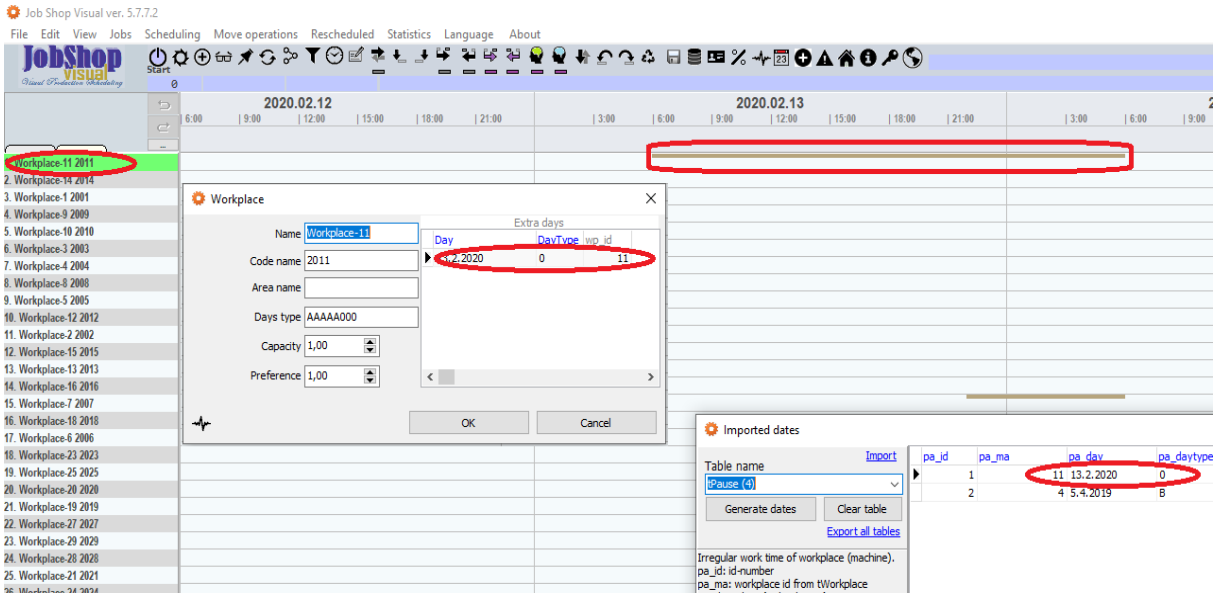
Work Place ID	Work Place Area	Work Place Name	Operation Time	Operation Hours
1	Manual Lathe	Lathe_Roughing	11:00-22:00	11 Hours
2	Manual Lathe	Lathe_Remachining	06:00-11:00	5 Hours
3	CNC Milling	CNC_Roughing	11:00-06:00	19 Hours
4	CNC Milling	CNC_Finishing	06:00-11:00	5 Hours
5	CNC WEDM	WEDM	06:00-06:00	24 Hours
6	EDM	Pre HT EDM_Die	06:00-06:00	24 Hours
7	EDM	Post HT EDM_Die	06:00-06:00	24 Hours
8	EDM	Post HT EDM_BR	06:00-06:00	24 Hours
9	Manual Milling	Milling	08:00-17:00	8 Hours
10	Manual HT	HT	06:00-12:00, 16:00-22:00	24 Hours
11	Manual HT	Tempering	06:00-10:00, 14:00-18:00, 22:00-02:00	24 Hours
12	Manual	Assembly	08:00-17:00	8 Hours
13	Manual	Thickness Cutting	11:00-22:00	11 Hours
14	Manual	Final Finishing	06:00-11:00	5 Hours
15	Die Quality	QC	08:00-17:00	8 Hours

Table Description

1. **tConfig**
   The tConfig table is not important. The program stores the data of the last runt here. Start time, calendar filter... etc.
2. **tDays**
   This table is used to define the working date pattern and input data to the software. This table express the time related details such as working hours, working time and work time intervals etc. This is initial data table. After defining the data table don't need to change the table once there is no change in the days arrangement.
   a. wd_type
      This parameter defines the type of the working day. This parameter is defined by using a Upper case char, A to Z. This parameter will link with the wkp_days of the table tWorkPlace and provide the relevant time details
   b. wd_name
      This parameter defines the name of the work day type. A string is used to provide the information and this parameter is only for the informative purpose.
   c. wd_intervals
      This parameter defines the work times and intervals of shift arrangement. A string is used as the data format and this parameter is used to get the information on basic scheduling interface. (example: 06:00-12:00, 12:30-18:00, 18:30-22:00)
3. **tHoliday**
   This table is used to give the information about standard holidays of the year. this table consist of only dates which are in **DD/MM/YY**. This table is also an initial table.

4. **tPause**
   In the tPause table, you can specify exceptions to the working hours of machines for a contrast machine and day.

The picture below shows that machine 11 is working according to the AAAAA000 work plan, but will not work on 13.4.2020.



5. tWorkPlace

This table is used to define the information of machines to the scheduling software. This is also an initial data table. If the machine set up has not changed, The data table don't need to be changed. Following information were fed in to the software using this table.

a. wkp_id –

This parameter is used to define the identity of the work place. A unique integer from 1…n is used to define this parameter. This parameter links to the *opr_wkp_id* in tOperations (Table of operation) to give the information where the operation should be performed.

b. wkp_code –

This parameter defines the short code of work place using a string of max 60 chars. This parameter is used for informative purpose.

c. wkp_name –

This parameter defines the name of the work place using a string of max 60 char. This parameter is used for informative purpose.

d. wkp_area –

This parameter defines the area or category of work place using a string of max 60 char. This is used for informative purpose.

e. wkp_prefer –

This parameter defines the order of machine list that should be shown in the Software interface or Determines the order of the machines in the representation, the machines are shown on the left. This was explained in the video. This parameter is defined using decimal numbers and the maximum is 999

f. wkp_capacity- multiplier capacity of the machine (decimal)

This parameter defines the capacity of the machine or in other word how many operations can be performed at any given time. Decimal numbers were used to define the parameter.

g. wkp_days-

This parameter defines the days types of the week and holiday by TDAYS table. As an example:'AAAAA000', which means that it works from Monday to Friday in the 'A' type schedule. Saturday, Sunday and holidays do not work.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Holiday
A	A	A	A	A	0	0	0

Above initial five table will define the work pattern and resources of the job shop. Below four tables will define the jobs related information which need to prepare the production schedule.

6. tJob (Table of Jobs)

This table is used to define the information about received jobs for scheduling. For every new schedule this table should be prepared freshly. Below information was included in the table.

a. job_id

A unique integer is used to define the job and is used as the job identification. This *job_id* makes the connection between the tNetwork (Table of Network) and tJob (Table of Jobs)

b. job_name

The job name which is related to the job_id is defined here. This will be used for ease of identification and informative purposes. The maximum length is 60 char.

c. job_start

This information defines the earliest start date of the job. This can be defined by the job shop scheduler as per the requirement of the customer as well as the current Work In Progress jobs.

d. job_stop

This information defines the deadline of the job. This can be defined by the scheduler by considering the customer requirement and the relevant factors such as Logistic issues etc.

e. job_prefer

This parameter defines the preference of the job. Here the default value is 100% and consider every job has the same preference. If you need to change the preference of the job it can be done by reducing the preference value of non-urgent jobs.

f. job deadline

This parameter defines the importance of the job dead line. Here integer 1/0 is used to provide the information.

1-The dead line is compulsory and must have to meet during the scheduling.

0 – The dead line is informative and not to be considered during the scheduling.

g. job disabled

This parameter defines whether the job is in active stage or inactive stage. If the job doesn't want to be considered for the current schedule this parameter can be used to control. Here integer 0/1 is used to provide information.

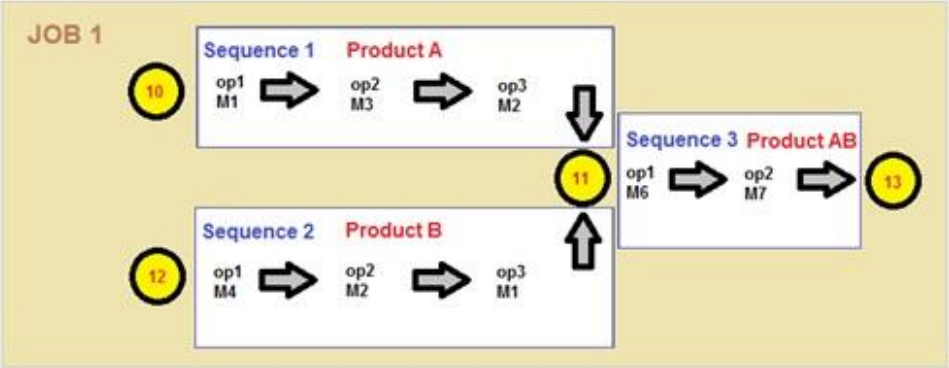
0- The job should be considered for the scheduling. (Default Value)

1- The job should not be considered for scheduling

7. tNetwork (Table of Network)

8.

The concept of network, Sequence and Operations were discussed below.



Let's take this network as an example and discuss the way of defining the network, Sequences and operation for the process.

In this job there are 3 networks and 3 sequences. (Network_1 = Seq_1, Network_2=Seq_2, Network_3=Seq_3)

Start of Network 1 is indicated by *10* and end is *11*

In Network 1 the raw material is subjected to 3 operation and the product A was produced.

Start of Network 2 is indicated by *12* and end is *11*

In Network 2 the raw material is subjected to 3 operation and the product A was produced

Start of Network 3 is indicated by *11* and end is *13*

In Network 3 the product of Seq 1 and Seq 2 is taken as the input for the process and the final product AB was produced.

(A unique integer has been used to indicate the start of the sequence. The end result of both Seq1 and Seq2 is same and therefore the same in tiger is used to indicate the end of sequence. The start of the sequence 3 is indicated by 11 and the end is 13.)

a. net_id

A unique integer is used to define the network and is used as the network identification. This net_id links the tNetwork (Table of Network) and tSequence (Table of Sequences)

b. nt_job_id

This parameter links the network and the *job_id* of tJobs.

c. net_a_id

This parameter indicates the starting node of the network. (In above example for Seq 1 the integer is 10)

d. net_b_id

This parameter indicates the end node of the network. (In above example for Seq 1 the integer is 11)

9. **tSequence (Table of Sequences)**
    a. seq_id
        This parameter is used to define the sequence. This *Seq_id* links the tSequence (Table of sequence) and tOperations (table of operation). For each and every Sequence in network, a unique integer has to be used. In above example for Seq 1, Seq 2, Seq3 unique integer 1,2,3 can be used respectively. Since the relation of rows in tNetwork and tSequence are in 1 :1, There best practice is to use same number for *Seq_id* and *net_id.*
    b. seq_net_id
        This *seq_net_id* links the tNetwork (Table of Network) and tSequence (Table of Sequences)
    c. seq_name
        This parameter is indicating the name of the production sequence and the maximum length of the name is 60 chars. This parameter is used for informative purposes.
    d. seq_product
        This parameter is indicating the product drawing or number which is used for informative purpose. The maximum length is 60 Char.

10. **tOperation (Table of Operations)**

    a. opr_id
        This parameter is indicating the operation identification. For every operation in sequence has to be defined using a unique integer. In above example, for Seq 1 there are 3 operation as Op 1, Op 2, Op 3.The integer 1,2,3 can be used as *opr_id* respectively.
    b. opr_seq_id
        This *seq_net_id* links the tNetwork (Table of Network) and tSequence (Table of Sequences) As above example for all 3 operations, the sequence ID 1 has to be used.
    c. opr_wkp_id
        This parameter indicated the workstation which perform the operation. This parameter creates the link between the tOperation(Table of operation) and tWorkplace(Table of workplace).
    d. opr_ix –
        This parameter indicates the position of operation in the sequence. To define this parameter, Sequential numbers has to be used. Below example will explain the *opr_ix* clearly. For different sequences same numbers can be used as *opr_ix*.

opr_id	opr_seq_id	opr_wkp_id	opr_ix
1	1	1	1
2	1	3	2
3	1	6	3

4	1	10	4
5	1	11	5
6	1	2	6
7	1	4	7
8	1	5	8

e. opr_td

This Parameter defines the duration time of the operation in minutes.

f. opr_tij

This parameter defines the duration of operation along with the transport time in minutes.

g. opr_ts

This parameter defines the setting time of operation in minutes.

h. opr_started

This parameter defines the status of the operation using 3 integers as below.

-1 :- Operation not realized
0 :-Operation has not started
1 :- Operation has started.

i. opr_name

This parameter defines the name of the operation and this is used for informative purposes. The maximum length of the name is 60 char.

j. opr_pc

This parameter defines the number of pieces subjected to the operation. The number of pieces should be defined using decimal numbers. This parameter is used for informative purposes.

How to create tables for specific jobs (With Example)

Let's take that the machine shop has received following 5 jobs on 2020-04-01. All these 4 jobs should be started in 2020-04-06 and the deadlines are as per the below table.

Job Description	Job_name	job_start	job_stop
Hollow Die Set	BR-001	2020/04/06	2020/04/22
Solid Die Set	SLD-001	2020/04/06	2020/04/20
Solid Die	SLD-002	2020/04/06	2020/04/13
I Backer	IBC-001	2020/04/06	2020/04/14

Based on the received date and sequence of receiving, job number were assigned to the jobs as follows.

Job Description	Job_name	Job_id
Hollow Die Set	BR-001	200401001
Solid Die Set	SLD-001	200401002
Solid Die	SLD-002	200401003
I Backer	IBC-001	200401004

Simplest way of table preparation is first prepare the basic table in one sheet and prepare the detailed tables in separate sheets.Lets analyze and define the netwotks and sequences of the process.

1. First job is a Hollow Dies Set(refer the manufacturing net work of hollow die set.)
    a. Initially the Backer, Hollow BR and Hollow die have to be manufactured separately.
    b. Then those 3 parts have to send to Assembly process and the assembly sequence have to be followed to complete the job.
    c. net_id can be defined using unique integers as below.

Job_id	net_id	Description
200201001	1001	Backer Process
	1002	Hollow Die Process
	1003	Hollow BR Process
	1004	Hollow assembly process

    d. Net work 1001,1002,1003 are starting from separate row materials and ended up with the same point. Network 1004 is started from end point of above 3 networks and ended up in a separate point.as this point *net_a_id* and *net_b_id* can be defined as follows.

Job_id	net_id	net_a_id	net_b_id
200201001	1001	1	4
	1002	2	4
	1003	3	4
	1004	4	5

    e. As above recommended the best practice is use *seq_id=net_id*. As per the recommendation Sequence number can be assigned as below. In addition to that, the process description is used as the *seq_name* for clarity of information.

Job_id	net_id	net_a_id	net_b_id	seq_id	seq_net_id	seq_name
200201001	1001	1	4	1001	1001	Backer Process
	1002	2	4	1002	1002	Hollow Die Process
	1003	3	4	1003	1003	Hollow BR Process
	1004	4	5	1004	1004	Hollow assembly process

    f. To manufacture a Backer, blank work piece has to go through 5 operations. To manufacture a Hollow Die, a blank workpiece has to go through 10 operations. Due to the size of the table only the Backer and Hollow Die is used to elaborate the table preparation part.

Job_id	net_id	net_a_id	net_b_id	seq_id	seq_net_id	seq_name	seq_product	opr_name	opr_id	opr_seq_i	opr_wkp_	opr_ix
200201001	1001	1	4	1001	1001	Backer Process	Backer	Lathe Roughing	1	1001	1	1
								CNC Roughing	2	1001	3	2
								HT	3	1001	10	3
								Tempering	4	1001	11	4
								Polishing	5	1001	9	5
	1002	2	4	1002	1002	Hollow Die Process	Hollow Die	Lathe Roughing	6	1002	1	1
								CNC Roughing	7	1002	3	2
								Pre HT EDM_Die	8	1002	6	3
								HT	9	1002	10	4
								Tempering	10	1002	11	5
								Lathe Remachining	11	1002	2	6
								CNC Finishing	12	1002	4	7
								WEDM	13	1002	5	8
	1003	3	4	1003	1003	Hollow BR Process						
	1004	4	5	1004	1004	Hollow assembly process						

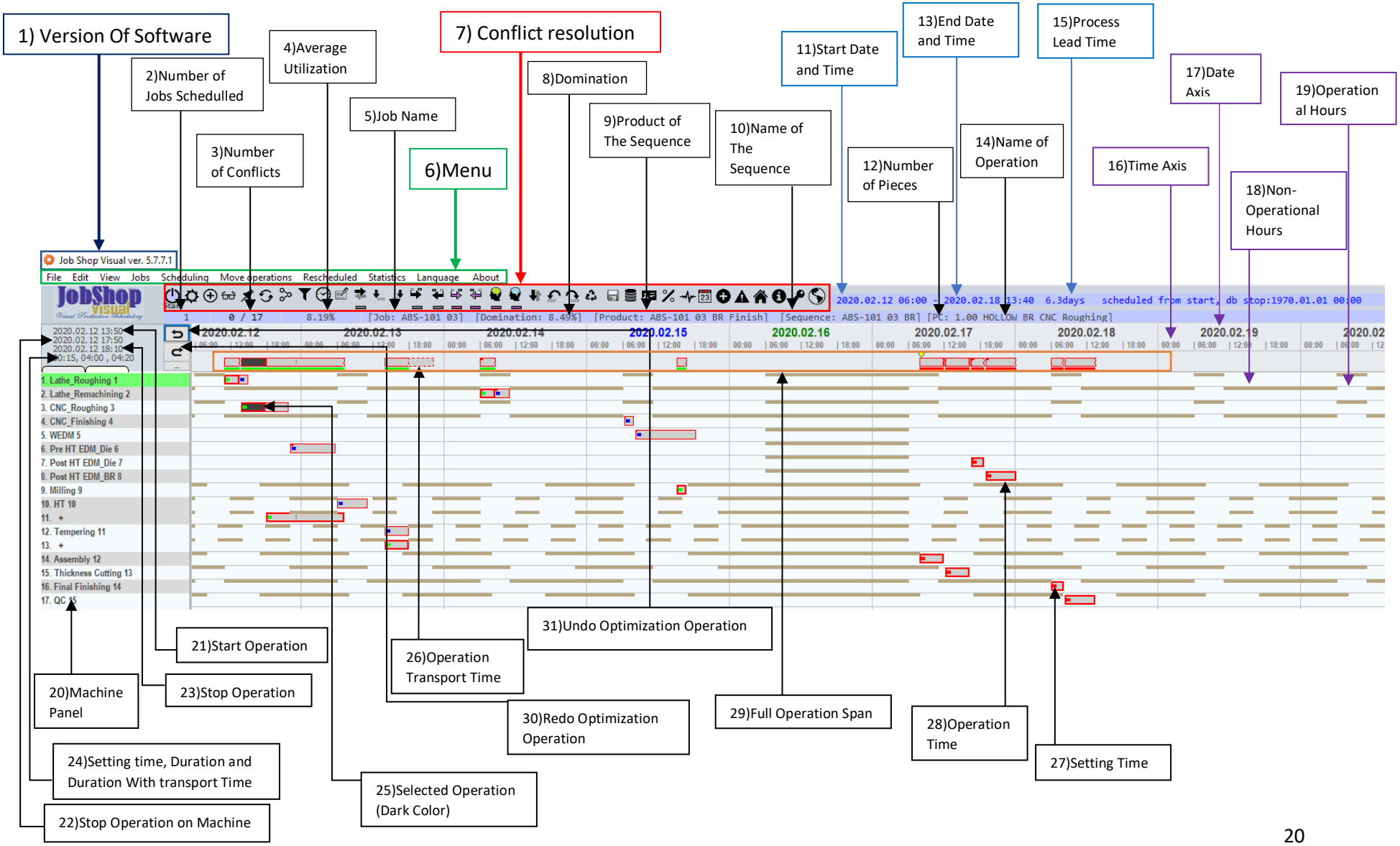
For the ease of understanding of opr_ix concept,2 different colors were used for the network 1001 and 1002.Using this basic table separate data tables with all relevant information can be prepared very easily. By following the same procedure this table can be elaborated to next 2 processes of hollow BR as well as remining manufacturing orders.

When preparing the tables, it is very important to avoid repeating numbers where the unique integer required. When assigning numbers to net_a_id field and net_b_id filed it is very crucial to avoid blending number. Because it will lead to mixing up of network and critical mistakes in scheduling process.

You can find the example data tables in download page along with the master data sheet. (opr_td, opr_tij, opr_ts values are assumed values only)

GUI of software

Basic Features of software interface.



Description of Basic features of Software interface

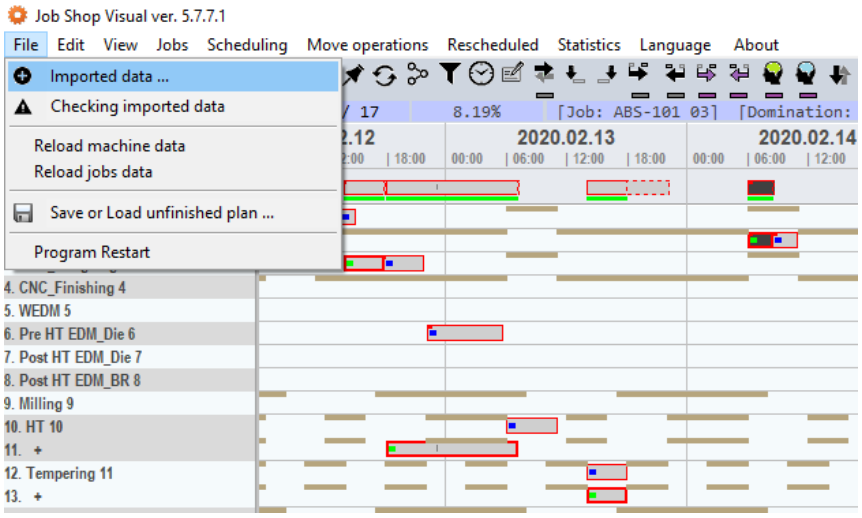
1. Version of Software
   This tab displays the version of the software.
2. Number of jobs schedulled
   This tab show the number of jobs schedulled in the program.
3. Number of conflicts
   This Tab show the number of capacity conflicts in created schedule.If there is no any conflict it will show in black color and as (00/17).The meaning of firstdigit is the number of conflits.The meaning of second digit is number of operations schedulled in the software.If there is a conflict, the number colors will be red.
4. Average Utilization
   This value shows the utilization of the machines for each day (max. 7 days).
5. Job Name
   This tab shows the name of the job.it will show the *job_name* column of the table tJobs.
6. Main Menu
   This part consist of main functions of the soft ware.these parts will be discussed in the next section seperately.
7. Shortcut Menu
   This part consist of shortcuts of main functions of softwrae.
8. Domination
   Dominance is calculated on the basis of the amount of work and employment preference. The ratio of work value and preference can be set by a coefficient. If the coefficient is 0.5, the amount of work and preferences will be taken into account: dominance 50% - 50%. Dominance determines the importance of individual jobs.
9. Product of sequence
   This tab show the final product of the sequence of current selected operation.This shows the seq_product of tSequence table.
10. Name of the sequence
    This tab show the Name of the sequence of current selected operation.This shows the seq_Name of tSequence table.
11. Start date and time
    This tab shows the start date and the time of the entire Job.
12. Number of pieces
    This tab shows the number of pieces processing in the current operation.
13. End date and time
    This tab shows the end date and the time of the entire Job.
14. Name of operation
    This tab shows the name of the operation which was mentioned in the opr_name in the tOperation table.
15. Process lead time
    This tab show the total time taken to complete the job.
16. Time Axis
    This is axis show the time of a date in the schedule.
17. Date Axis

This axis show the date of schedule.

18. Non Operationa Hours
    This area which is highlighted in grey color show the non operationl time period of relavant machine.
19. Operational Hours
    The are without highlighted strip show the operation hours of relavant machine.
20. Machine Panel
    This area shows the machines(workstations)scheduled in the process
21. Start Operation
    This tab show the start time of selected operation.
22. Stop operation on machine
    This tab show the stop time of selected operation on machine
23. Stop Operation
    This tab show the stop time of selected operation with logistic operations.
24. Setting time, Duration and Duration With transport Time
    This tab shows the time details of slected operation such as setting time,Duration and Duration with transport in hours and minutes.
25. Selected operation
    When we select an operation that operation will be shown in a dark color.
26. Operation Transport time
    The operation transport time will be shown with dashed outline.
27. Setting Time
    Setting time will be shown as a dark color line in the middle of the opration tab.
28. Operation time
    Operatione time will be shown with outline and filled with color.For different jobs the color will be changes.
29. Full Operation Span
    This ara graphically represent all the ioperation in one line.
30. Redo optimization Operation
    This tab can be used to re do an optimizing operation.
31. Undo optimization operation
    This tab can be used to Undo an optimizing operation.

Functions of Software

File Menu

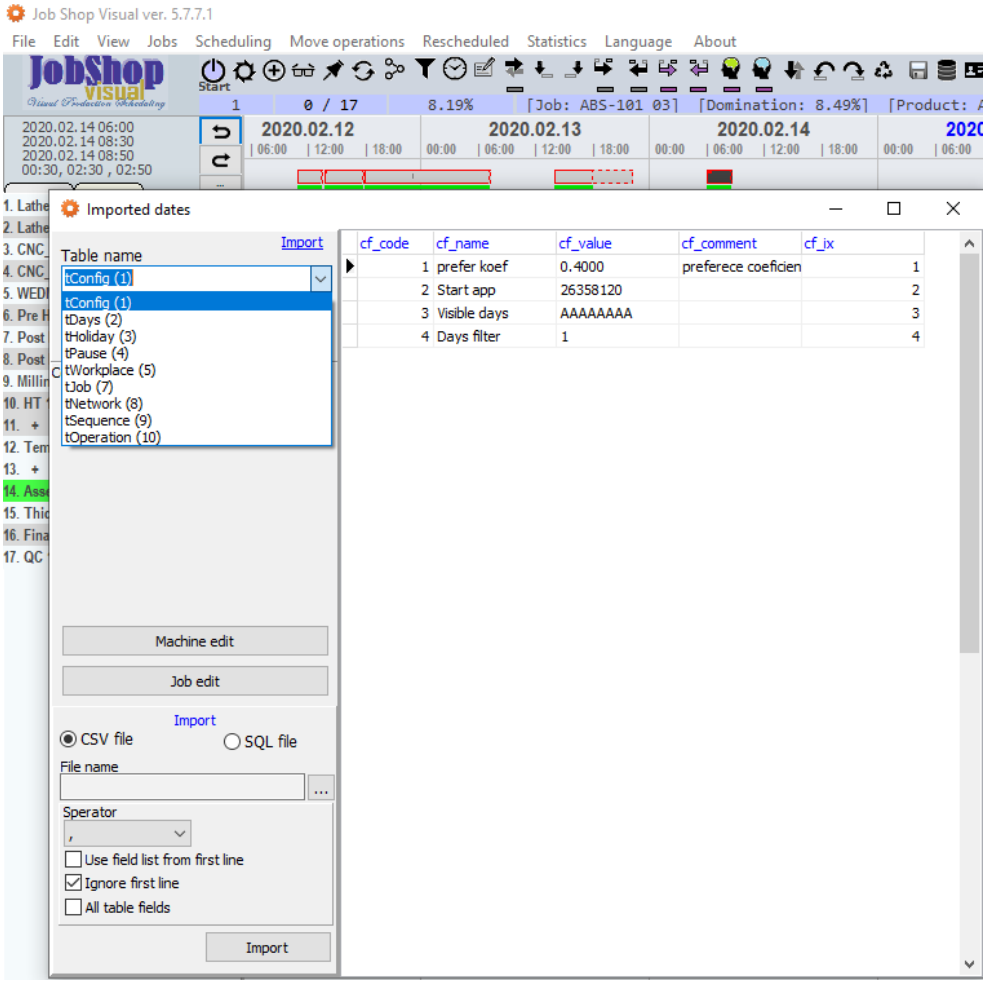


In the file menu there are 6 sub menus which are directly involved in operation.

1. Imported data
2. Checking imported data
3. Reload Machine data
4. Reload Jobs Data
5. Save or Load Unfinished Plan
6. Program Restart

The functions of each sub operation are discussed below.

Imported Data



In the top left corner drop down list of tables which will be used in scheduling calculations. Meaning content and preparation methods of these table are discussed in the part of *how to prepare data tables* part

The table can be prepared in CSV Format of as an SQL file and can be imported to job shop visual platform. To import these files first select the table type from drop down list and then Import Hyper link should be clicked.

First the file type of input file (CSV or SQL) should be selected.

Then the File name in Left down corner will be activated. the required file path can be browsed and selected.

Then there is a check list to give the import instruction of tables. The recommended practice is to prepare the tables as per the sample and import without column heading row.

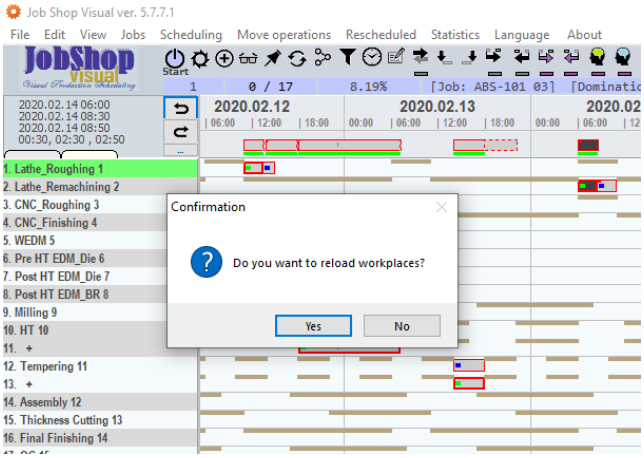
Finally, by pressing IMPORT common button the tables can be imported.

Checking Imported Data

After importing data this function can be run to identify the errors of data tables. If there is any problem in data tables such as repeated Integers or link issues in networks it will show the errors.

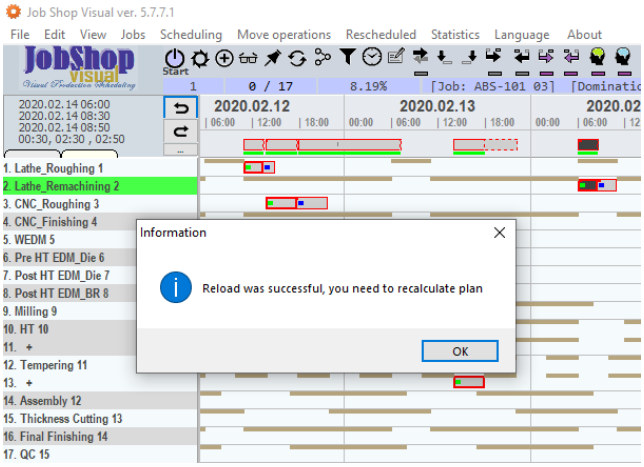
Reload Machine Data

This function is used to reload the work places. Once the Reload machine data tab is clicked, it will show below massage box.



After confirming the task by pressing “Yes” The task will execute and show the below Massage.

If you don’t want to do Reload machine data task you can abort by pressing “No”

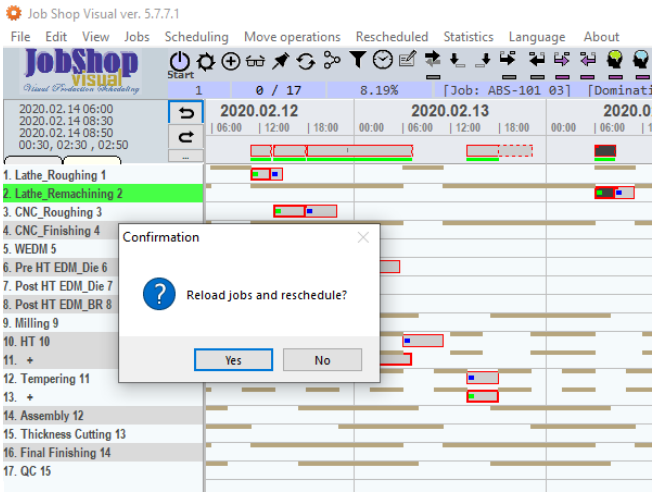


After Executing the “Reload machine data” task it will show above massage and by pressing “OK” you can abort from the task.

Important: -After Reloading machine data, the planning process should be restarted,

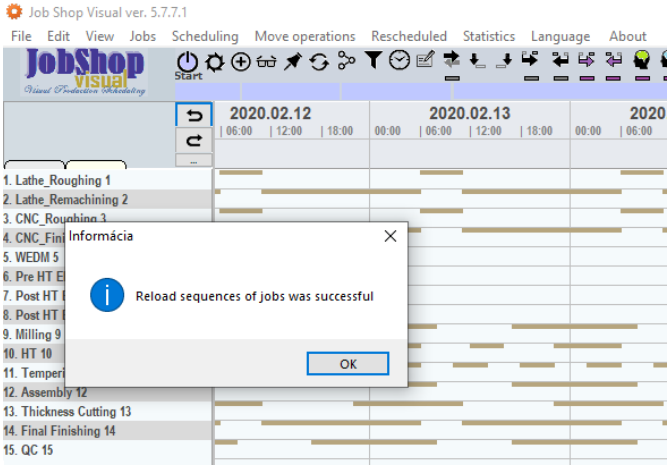
Reload Jobs Data

This function is similar to the “Reload Machine Data” and this can be used to reload the jobs.



After confirming the task by pressing “Yes” The task will execute and show the below Massage.

If you don’t want to do Reload Jobs data task you can abort by pressing “No”

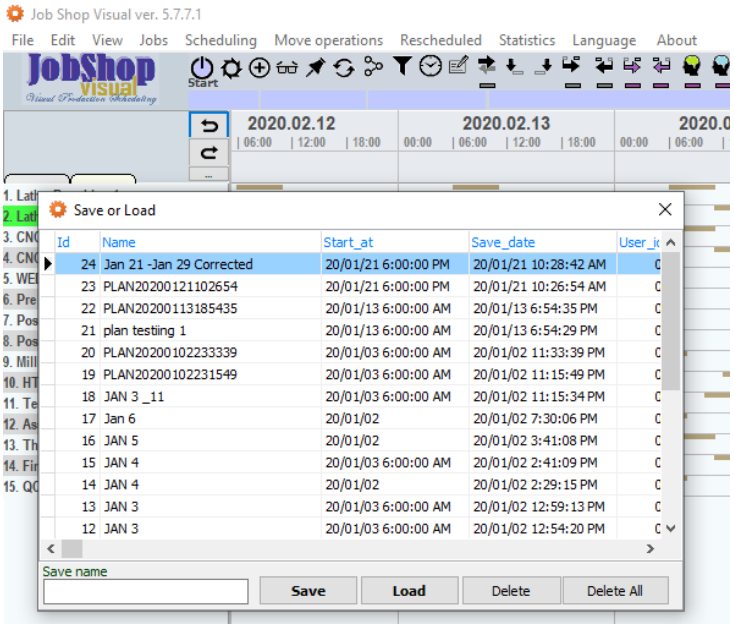


After Executing the “Reload Jobs data” task it will show above massage and by pressing “OK” you can abort from the task.

Important: -After Reloading jobs data, the planning process should be restarted,

Save or Load unfinished Plan

This function is used to save the current plan or load an old plan.



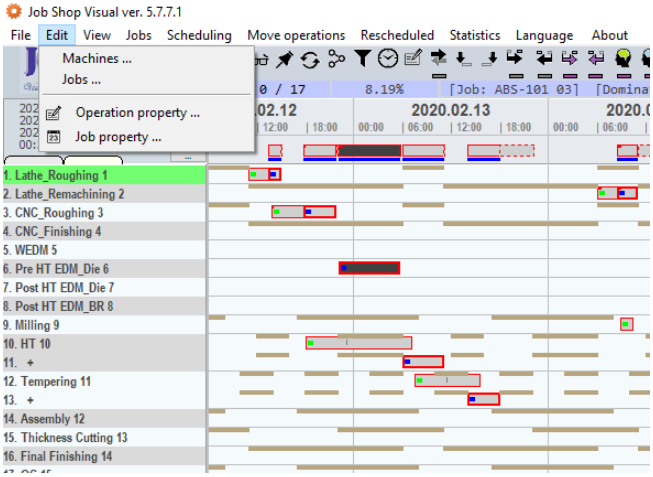
In the Save tab the Schedule name can be given and can be saved by pressing “Save” Button.

To load an old plan, you can select the plan and press the load button.

Edit Menu

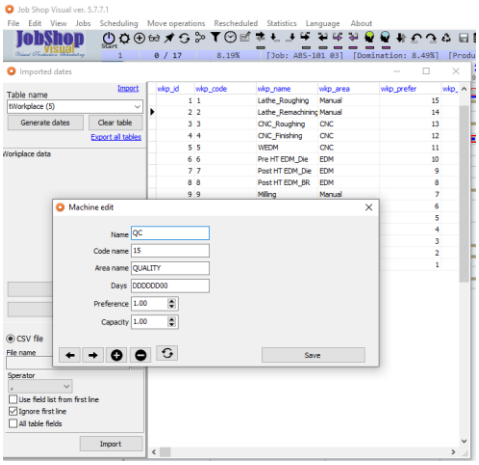
There are 4 functions under the “Edit” Menu.

1. Machine
2. Jobs
3. Operation Property
4. Job Property



Machines

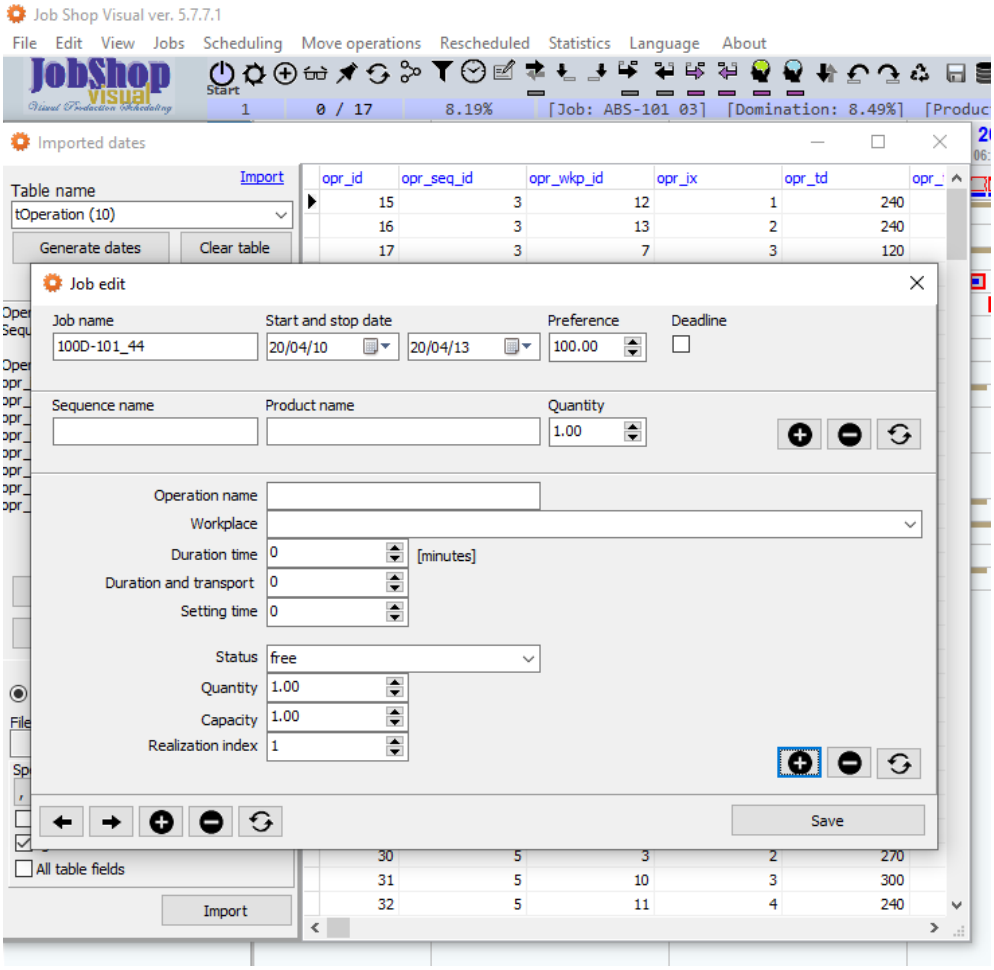
This function is used to edit the machine data of tWorkplace table.



Arrow keys can be used to toggle between the work places. + and – marks can be used to increase decrease values. The refresh key is used to refresh and go back to initial value.

The save button can be used to save the changes made.

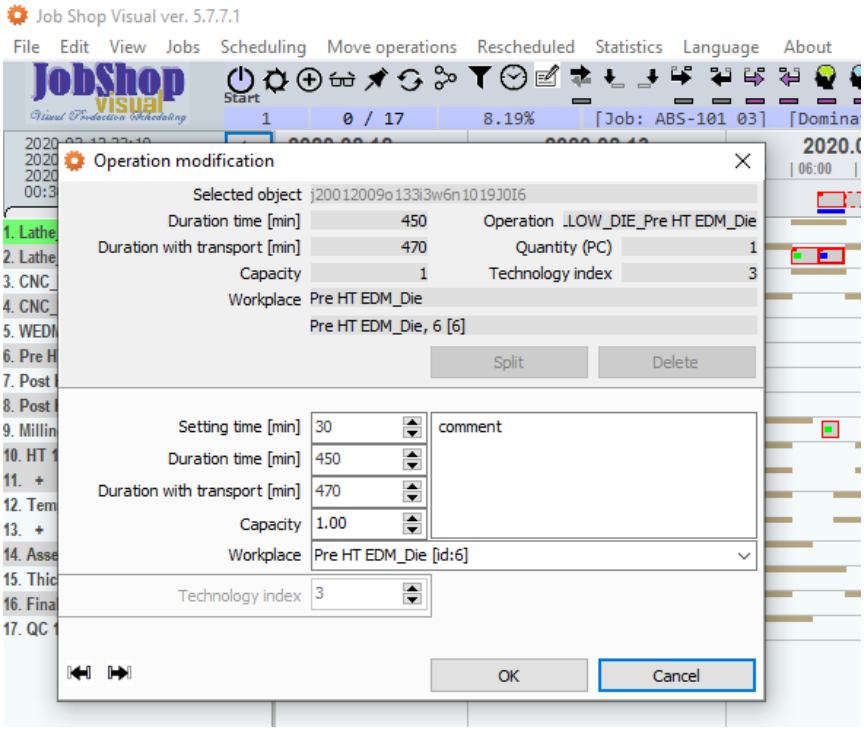
Jobs



Arrow keys can be used to toggle between the work places. + and – marks can be used to increase decrease values. The refresh key is used to refresh and go back to initial value.

The save button can be used to save the changes made.

Operation Property

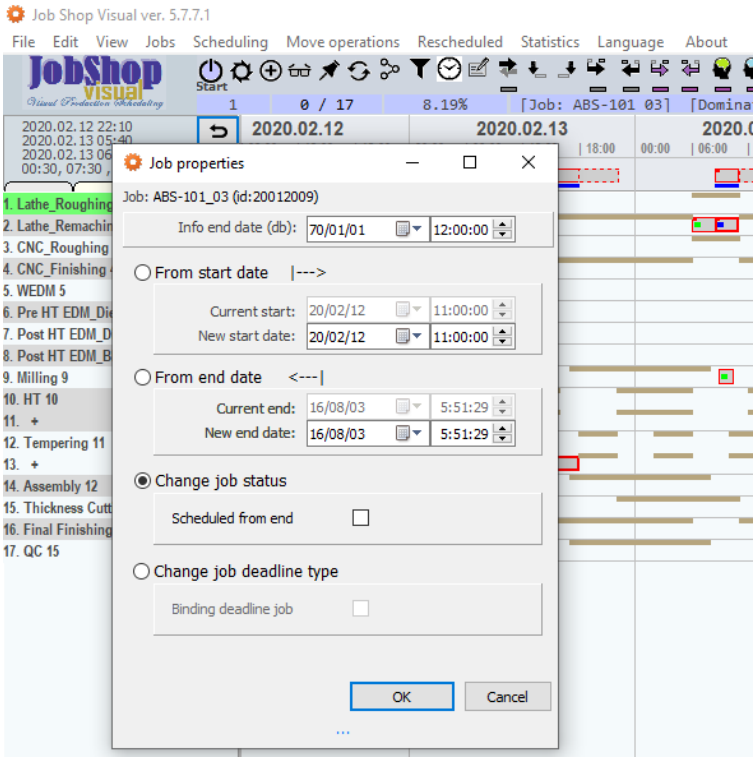


Arrow keys can be used to toggle between the work places. + and – marks can be used to increase decrease values. The refresh key is used to refresh and go back to initial value.

The save button can be used to save the changes made.

Job property

This Function is used to change the properties of the job.

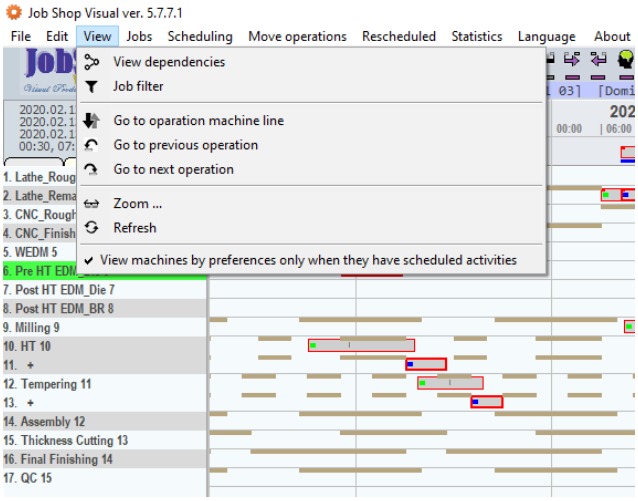


The job start date, Job End date, job scheduling technique and the job dead line type can be modified using this option.

View Menu

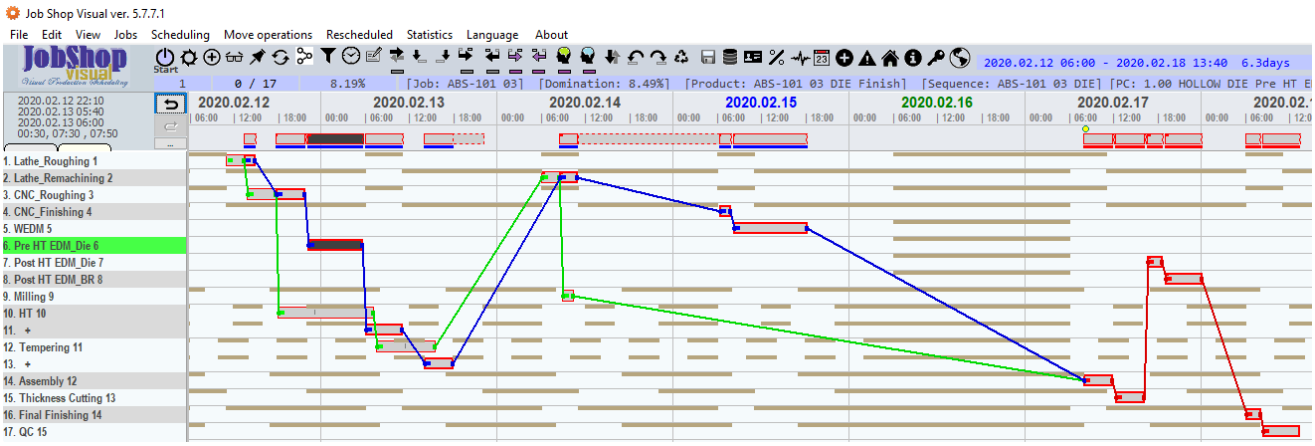
There are 8 functions coming under the view menu.

1. View Dependencies
2. Job Filter
3. Go to operation machine line
4. Go to previous operation
5. Go to next operation
6. Zoom
7. Refresh
8. View machine by preference only when they have scheduled activities.



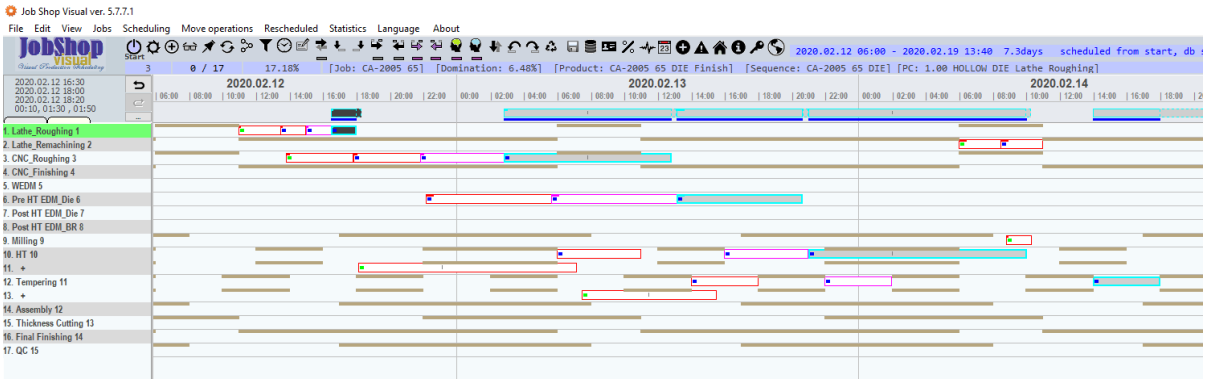
View Dependencies

Using this function, the relationships between operation and networks can be identify. Once this function is activated, the software will show the relationships of selected operation. For different networks it use different colors.as an example in below image there are 3 networks.ABS-101 die network is shown in blue color and ABS-101 BR operation is shown in green color. The assembly operation of DIE and BR is shown in Red color.

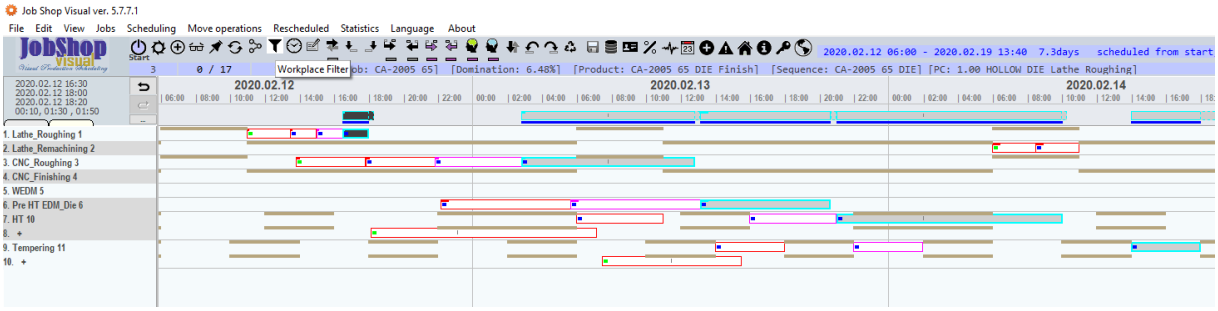


Job Filter

This option can be used to filter workstation selected for each job.



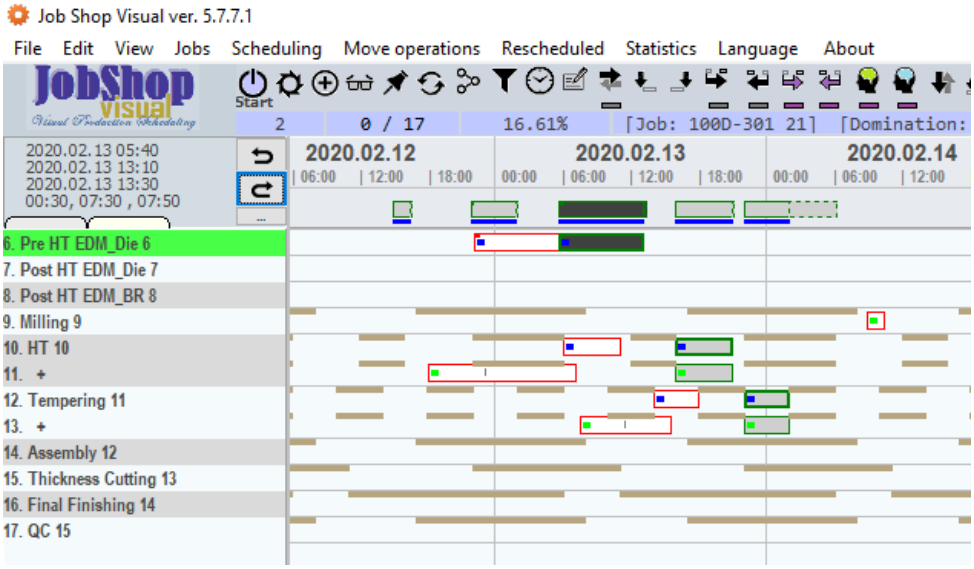
Without activating job filter option all the 17 workstations available in the work shop were shown in the above screen.



After activation of job filter option only 8 work stations which has to be perform an operation related to the selected job is shown in the display.

Go to operation Machine line

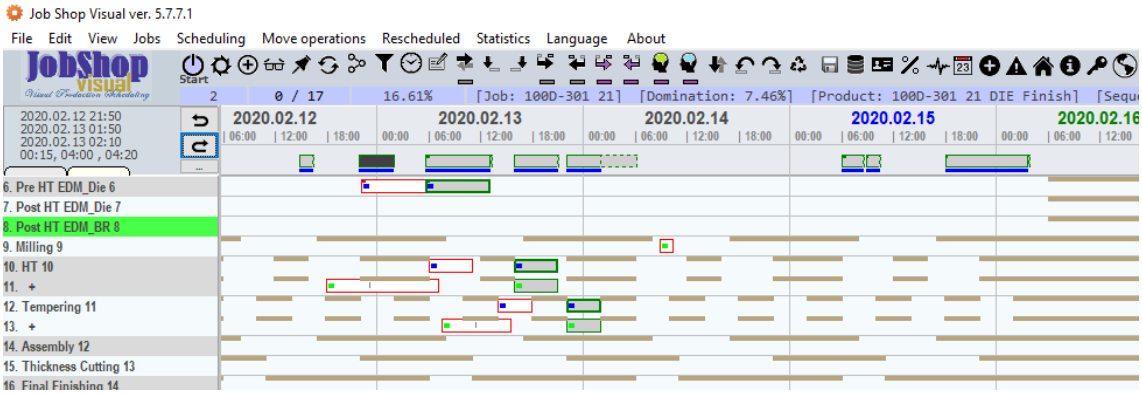
To get the selected machine lines to top row, this option can be used.



When this option is activated, selected option will be scrolled up to top row. This option will be very helpful when analyzing a selected work station.

Go to previous operation

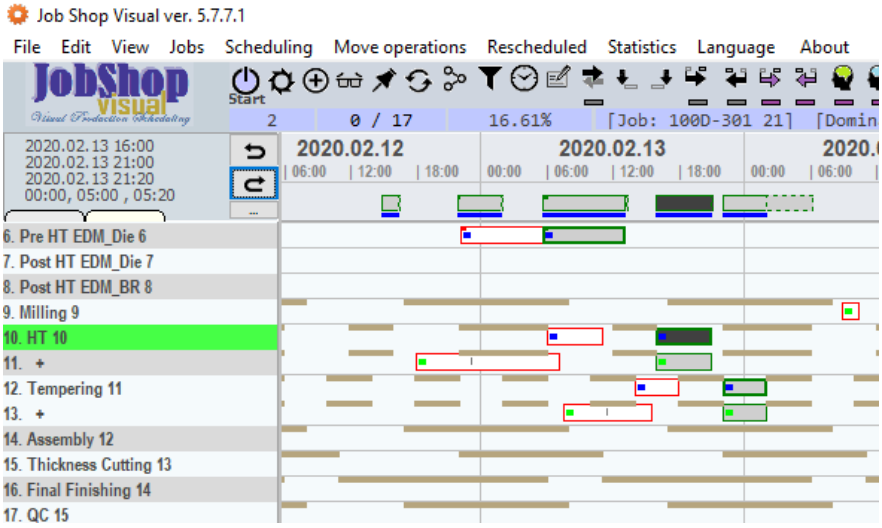
This feature can be used to toggle to the previous operation.



When this feature is activated, the selection will be moved to previous operation from current selected operation.

Go to next Operation

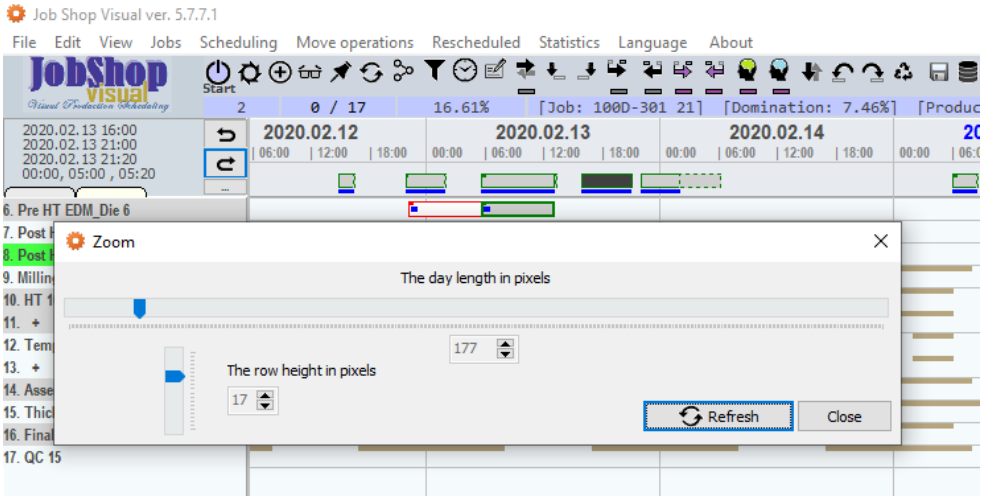
This feature can be used to toggle to the next operation.



When this feature is activated, the selection will be moved to next operation from current selected operation.

Zoom

This feature is used to change the size of the day length and row heights.



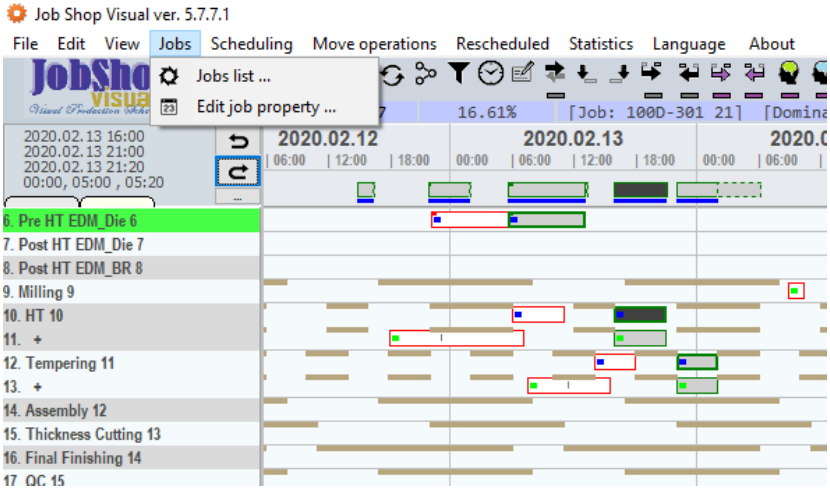
The length of the day can be adjusted by changing the cursor of the horizontal adjuster or by entering the numerical value. After changing the size click refresh button to confirm the change. Then the size of the day length will be changed accordingly.

The height of the row can be adjusted by changing the cursor of the vertical adjuster or by entering the numerical value. After changing the size click refresh button to confirm the change. Then the size of the day length will be changed accordingly.

Jobs Menu

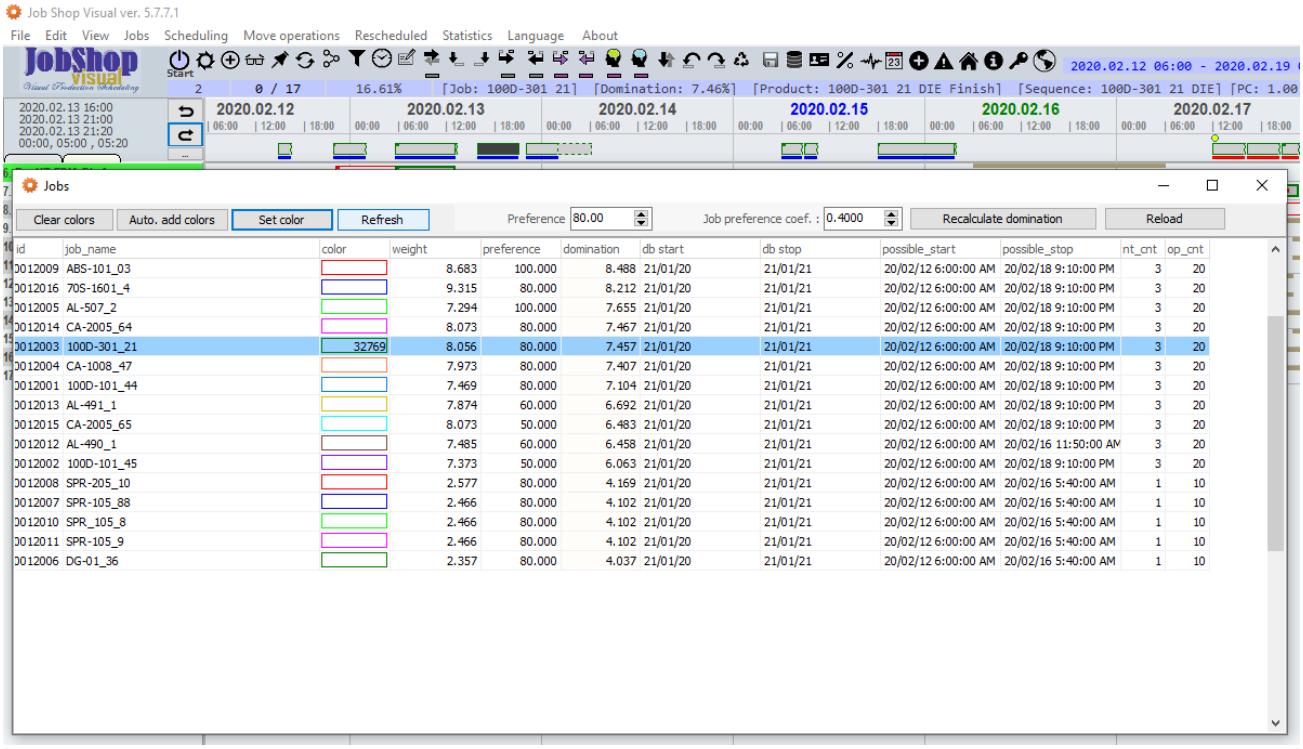
There are 2 options which are related to the job-related functions are coming under this menu.

1. Jobs List
2. Edit Job Property



Jobs List

This option can be used to get a list of added job.



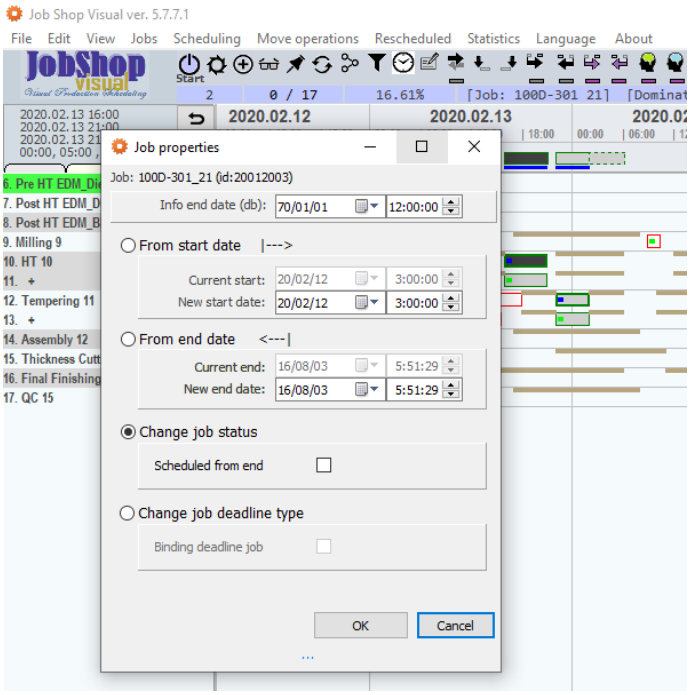
id	job_name	color	weight	preference	domination	db start	db stop	possible_start	possible_stop	nt_cnt	op_cnt
2012009	ABS-101_03		8.683	100.000	8.488	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/18 9:10:00 PM	3	20
2012016	70S-1601_4		9.315	80.000	8.212	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/18 9:10:00 PM	3	20
2012005	AL-507_2		7.294	100.000	7.655	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/18 9:10:00 PM	3	20
2012014	CA-2005_64		8.073	80.000	7.467	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/18 9:10:00 PM	3	20
2012003	100D-301_21	32769	8.056	80.000	7.457	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/18 9:10:00 PM	3	20
2012004	CA-1008_47		7.973	80.000	7.407	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/18 9:10:00 PM	3	20
2012001	100D-101_44		7.469	80.000	7.104	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/18 9:10:00 PM	3	20
2012013	AL-491_1		7.874	60.000	6.692	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/18 9:10:00 PM	3	20
2012015	CA-2005_65		8.073	50.000	6.483	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/18 9:10:00 PM	3	20
2012012	AL-490_1		7.485	60.000	6.458	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/16 11:50:00 AM	3	20
2012002	100D-101_45		7.373	50.000	6.063	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/18 9:10:00 PM	3	20
2012008	SPR-205_10		2.577	80.000	4.169	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/16 5:40:00 AM	1	10
2012007	SPR-105_88		2.466	80.000	4.102	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/16 5:40:00 AM	1	10
2012010	SPR_105_8		2.466	80.000	4.102	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/16 5:40:00 AM	1	10
2012011	SPR-105_9		2.466	80.000	4.102	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/16 5:40:00 AM	1	10
2012006	DG-01_36		2.357	80.000	4.037	21/01/20	21/01/21	20/02/12 6:00:00 AM	20/02/16 5:40:00 AM	1	10

In the job list Summery of following details can be seen.

1. Job id
2. Job name
3. Color assigned to the job.
   This color can be changed according to the personal preference by using set color option.
   Generally, a unique color will be assigned to each job automatically.
4. Weight of the job
   It representable job demanding
5. Preference
   Preference given in the tJobs table is displayed here.
6. Domination -Need to explain this
7. Db start date
   Scheduling started date will be displayed here.
8. Db stop date
   The stop date of database is displayed here. This date set by default one year from db start date.
9. Possible start date
   The earliest possible start date according to the data table is displayed here.
10. Possible stop date
    The latest possible end date according to the data table is displayed here.
11. nt-cnt
    Count of networks related to the job is displayed here.
12. op_cnt
    Count of operations related to the job is displayed here.

Edit Job Property

This Function is used to change the properties of the job. This function is same as the “job property” function in “Edit” menu.



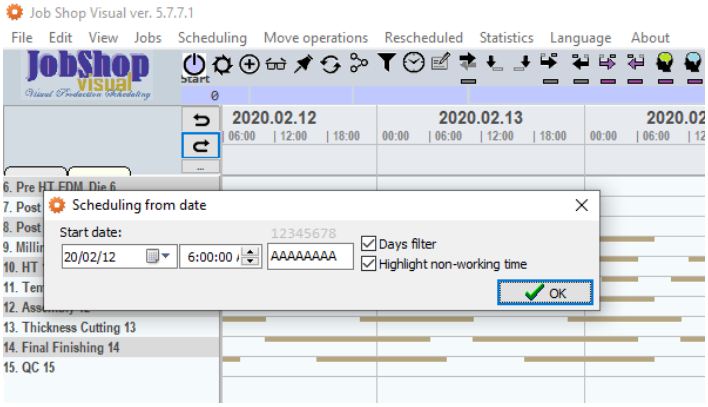
Scheduling Menu

There are 4 major functions which are related to the scheduling process is coming under this menu.

1. Start
2. Scheduling Sequences
3. Save completed plan
4. Plan operation list

Start

To start the scheduling process this function, need to be activated.



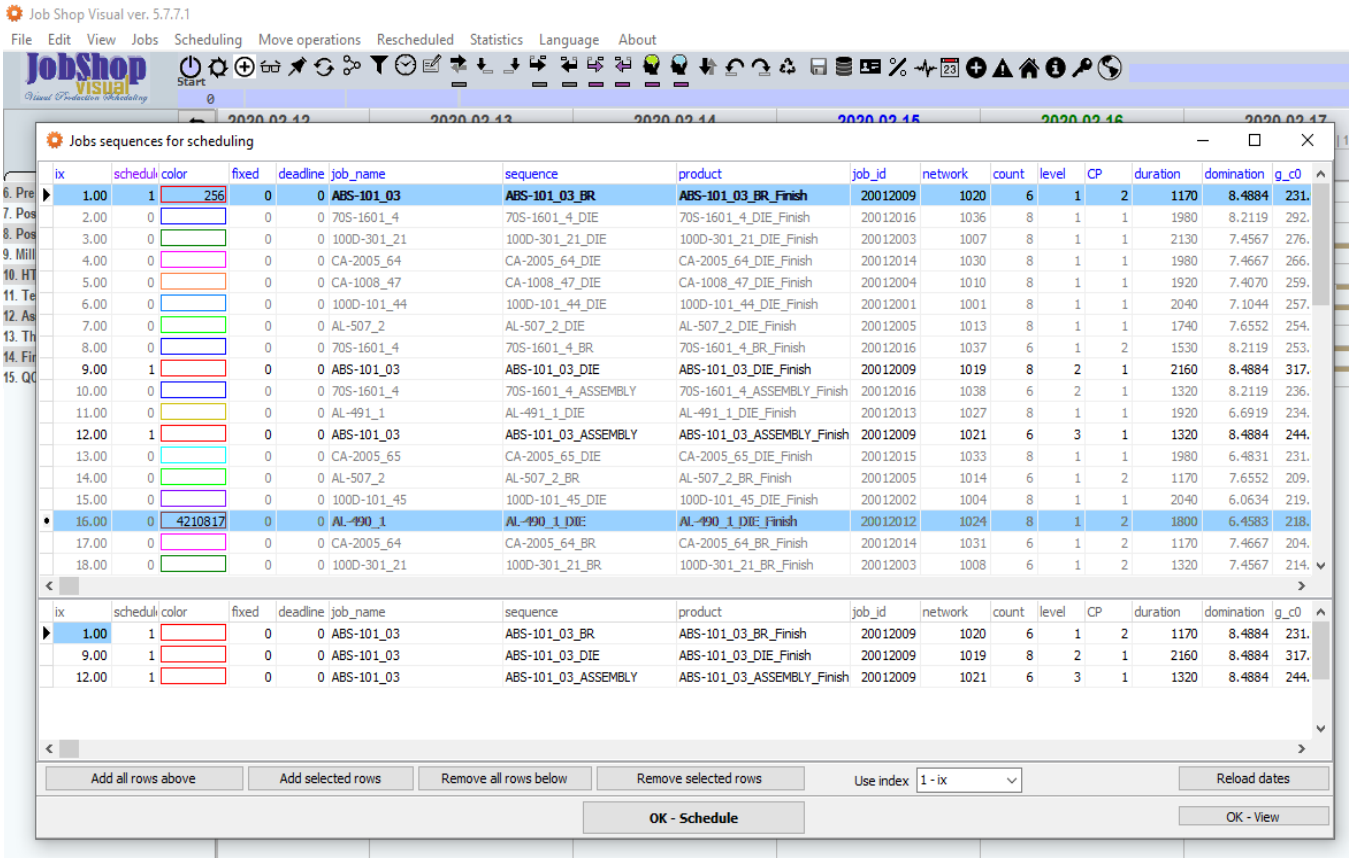
After clicking the function, above dialog box can be seen.

In this dialog box, the start date and start time and the working pattern can be given. In addition to that, There are 2 check boxes.

1. Days filter
   If this check box is un ticked the non-working days will be displayed in the schedule. If this check box was ticked the non-working days will be removed from the schedule display.
2. Highlight non-working time
   When this tick box is tike, non-working times will be shown as described in the no 18 in display introduction page.

Scheduling Sequences

Basic scheduling operation will be done using this feature. When this feature is clicked, below dialog box will be activated.



In the upper part of the dialog box all the networks related to give job will be displayed.

In the lower part networks, which are selected for the scheduling will be displayed.

There are 2 major types of scheduling process.

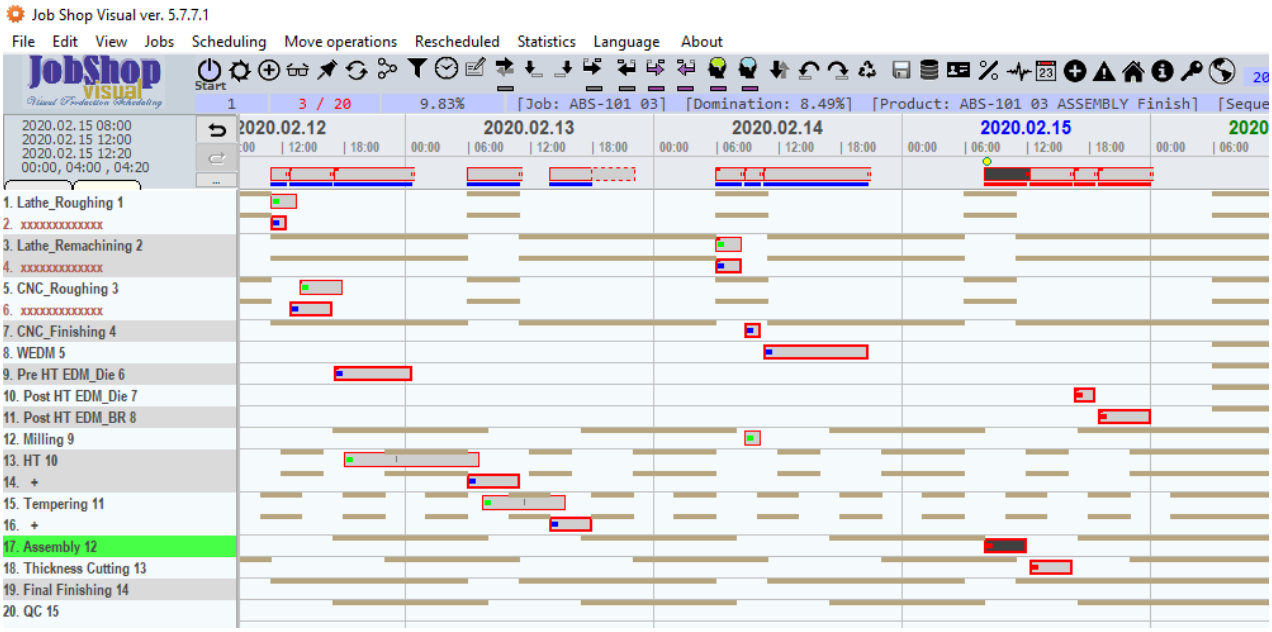
1. Job by Job Scheduling.
   In this technique you can select the relevant networks for a specific job and then schedule. This can be done for every job in step by step process.
   For scheduling using this technique relevant networks should be added to the lower part. For that the relevant networks can be selected from the upper part using Ctrl + Left mouse click und can be added to lower part using the “ADD Selected Rows “command.

2. Batch scheduling.
   In this techniques you can select all the networks in one time and schedule as a batch very easily.to add all the operations to schedule area you can scroll down to the last raw of upper part and select it an then click the “add all rows above” command.

“Remove all rows above” and “Remove all selected rows” operations can be used to remove necessary operations when scheduling.

“OK-View “ command can be used to view selected operations under relevant workstations as below.

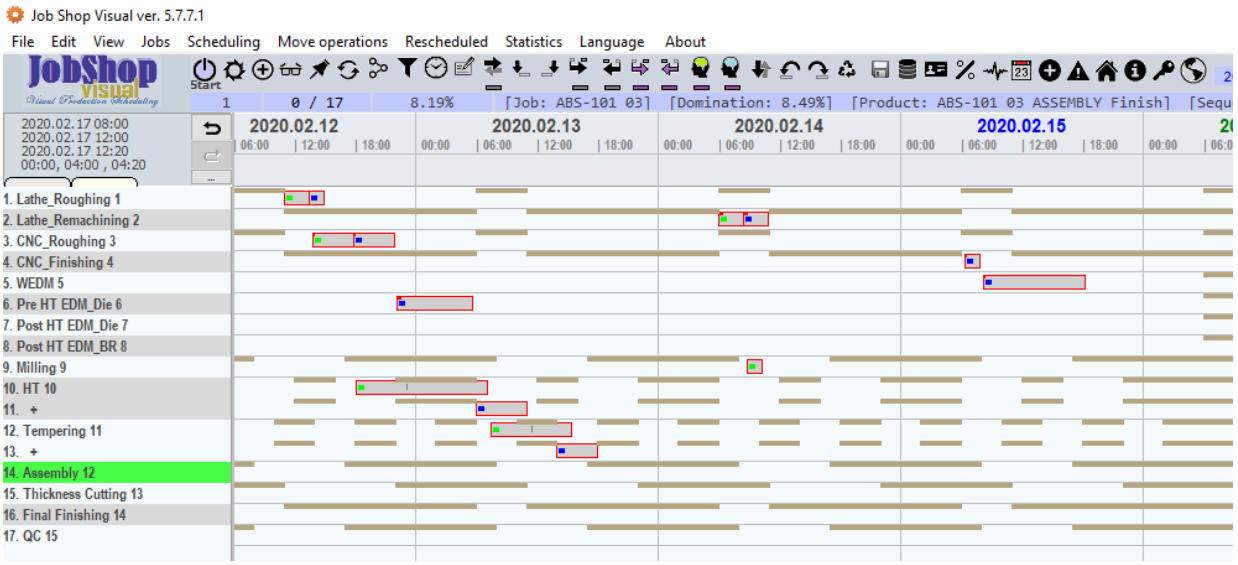
In the view



process capacity constraints will not be considered.

“OK-Schedule” command can be used to schedule selected operation. During the scheduling capacity constrains will be considered as will be resolved as much as possible. See the difference of above result od view command and below result of schedule command for same operation.

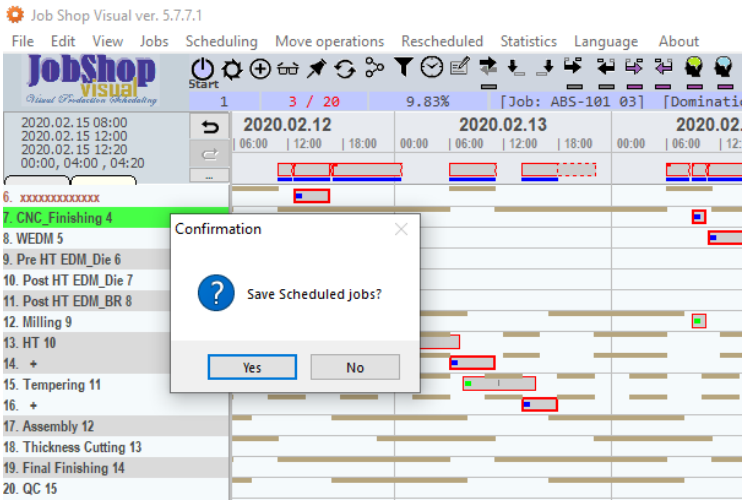
**For more details on Utilization of these options please see the video of https://youtu.be/R31MIGTRniU



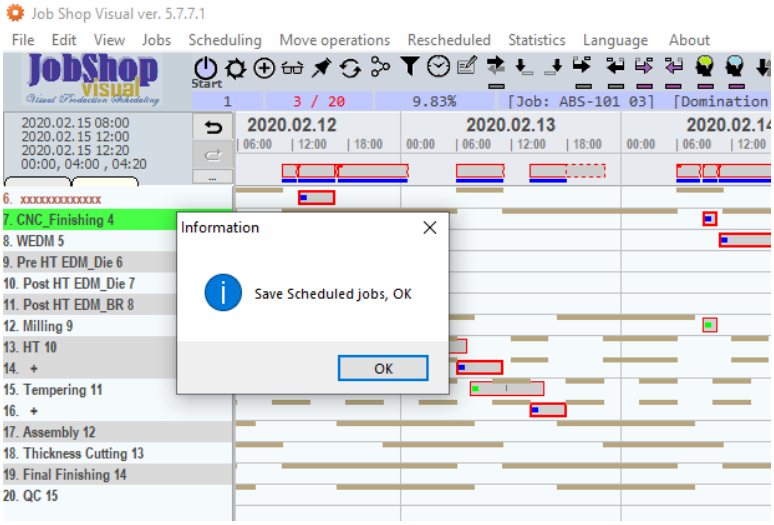
Save Completed Plan

This function is used to save the schedule. After scheduling always, it is recommended to save the schedule.

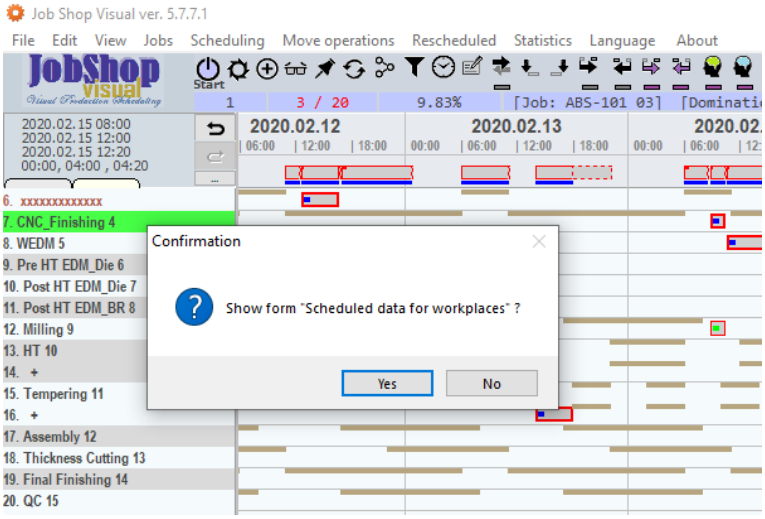
When clicking this operation below dialog box will be displayed.



By clicking the “yes” command d in dialog box the schedule can be saved.

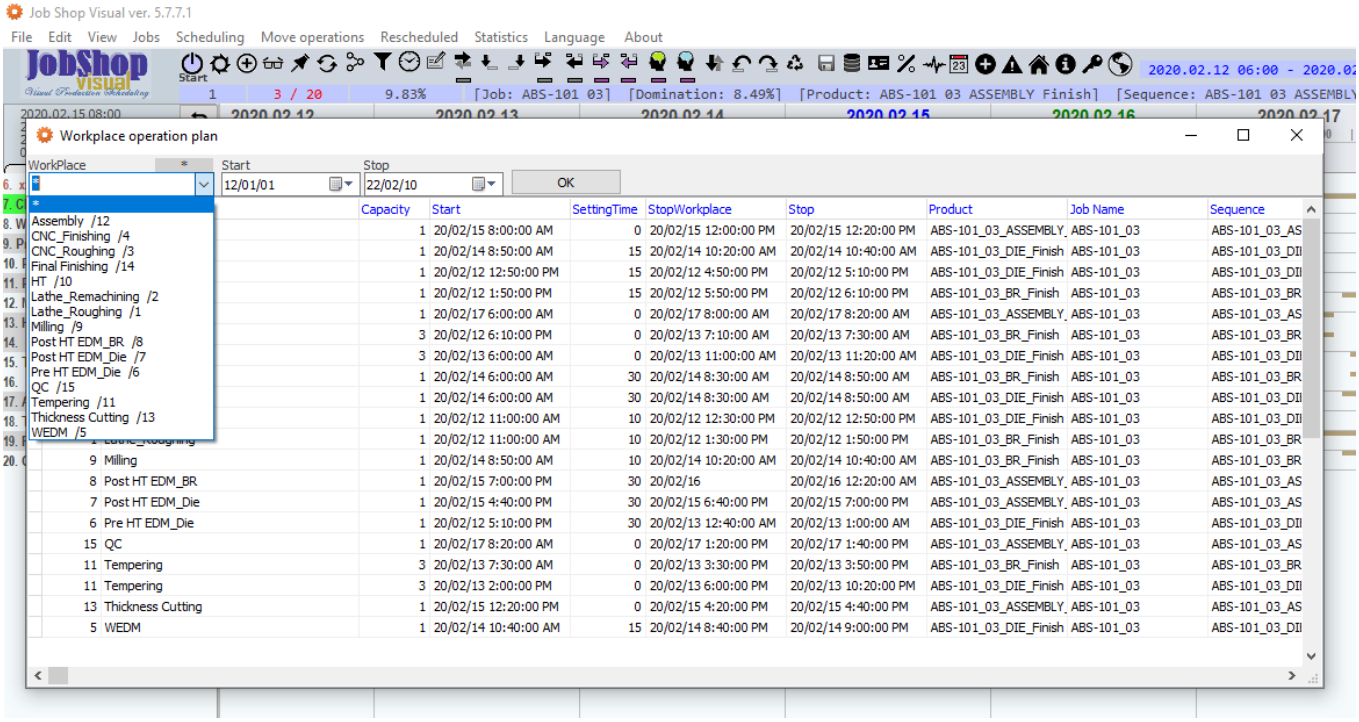


After clicking “OK” Command you can get the below dialog box.



If “yes” command box is selected, the workplace operation plan will be displayed.

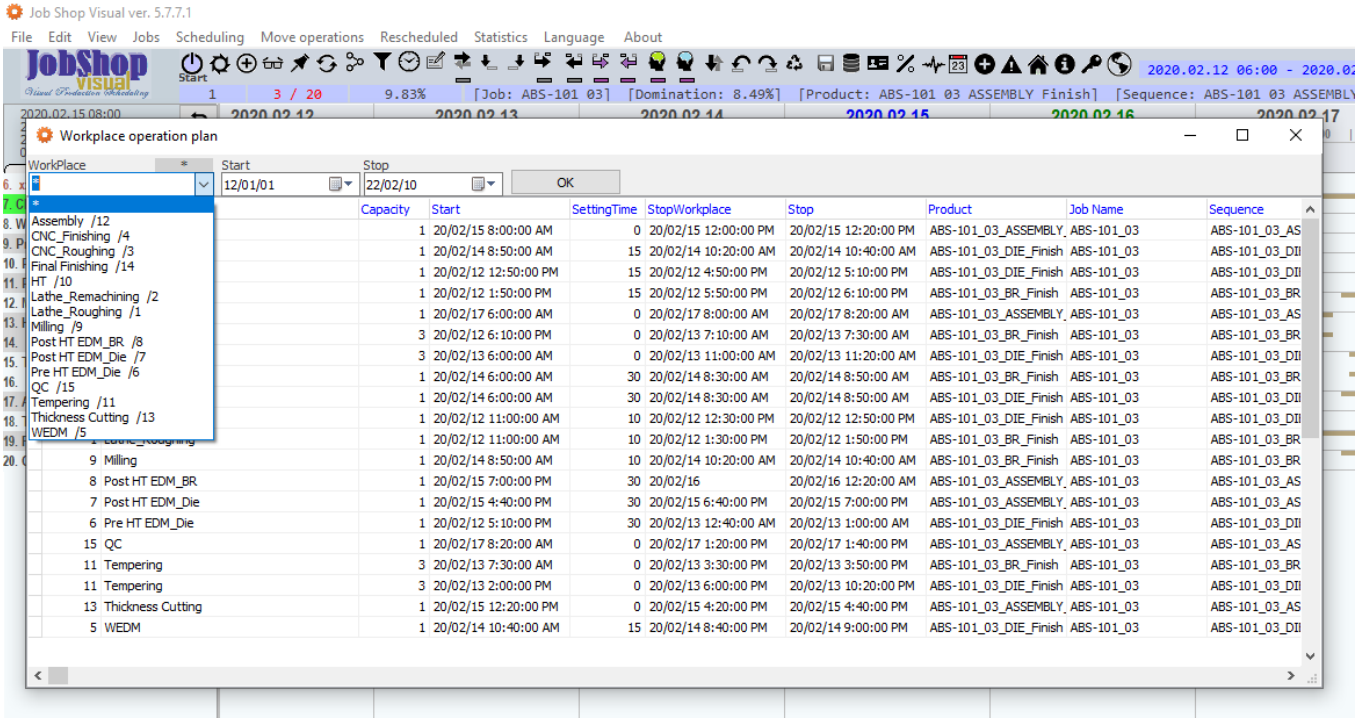
Saved plan operation list



	Capacity	Start	SettingTime	StopWorkplace	Stop	Product	Job Name	Sequence
	1	20/02/15 8:00:00 AM	0	20/02/15 12:00:00 PM	20/02/15 12:20:00 PM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
	1	20/02/14 8:50:00 AM	15	20/02/14 10:20:00 AM	20/02/14 10:40:00 AM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DII
	1	20/02/12 12:50:00 PM	15	20/02/12 4:50:00 PM	20/02/12 5:10:00 PM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DII
	1	20/02/12 1:50:00 PM	15	20/02/12 5:50:00 PM	20/02/12 6:10:00 PM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
	1	20/02/17 6:00:00 AM	0	20/02/17 8:00:00 AM	20/02/17 8:20:00 AM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
	3	20/02/12 6:10:00 PM	0	20/02/13 7:10:00 AM	20/02/13 7:30:00 AM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
	3	20/02/13 6:00:00 AM	0	20/02/13 11:00:00 AM	20/02/13 11:20:00 AM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DII
	1	20/02/14 6:00:00 AM	30	20/02/14 8:30:00 AM	20/02/14 8:50:00 AM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
	1	20/02/14 6:00:00 AM	30	20/02/14 8:30:00 AM	20/02/14 8:50:00 AM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DII
	1	20/02/12 11:00:00 AM	10	20/02/12 12:30:00 PM	20/02/12 12:50:00 PM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DII
	1	20/02/12 11:00:00 AM	10	20/02/12 1:30:00 PM	20/02/12 1:50:00 PM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
9	Milling	1	20/02/14 8:50:00 AM	10	20/02/14 10:20:00 AM	20/02/14 10:40:00 AM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
8	Post HT EDM_BR	1	20/02/15 7:00:00 PM	30	20/02/16	20/02/16 12:20:00 AM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
7	Post HT EDM_Die	1	20/02/15 4:40:00 PM	30	20/02/15 6:40:00 PM	20/02/15 7:00:00 PM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
6	Pre HT EDM_Die	1	20/02/12 5:10:00 PM	30	20/02/13 12:40:00 AM	20/02/13 1:00:00 AM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DII
15	QC	1	20/02/17 8:20:00 AM	0	20/02/17 1:20:00 PM	20/02/17 1:40:00 PM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
11	Tempering	3	20/02/13 7:30:00 AM	0	20/02/13 3:30:00 PM	20/02/13 3:50:00 PM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
11	Tempering	3	20/02/13 2:00:00 PM	0	20/02/13 6:00:00 PM	20/02/13 10:20:00 PM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DII
13	Thickness Cutting	1	20/02/15 12:20:00 PM	0	20/02/15 4:20:00 PM	20/02/15 4:40:00 PM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
5	WEDM	1	20/02/14 10:40:00 AM	15	20/02/14 8:40:00 PM	20/02/14 9:00:00 PM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DII

In this operation plan filters can be applied according to the operation and get the start times and end times as well as other information of relevant operations.

This function is similar to the function discussed in above. To get the saved operation plan in one time this operation can be used.

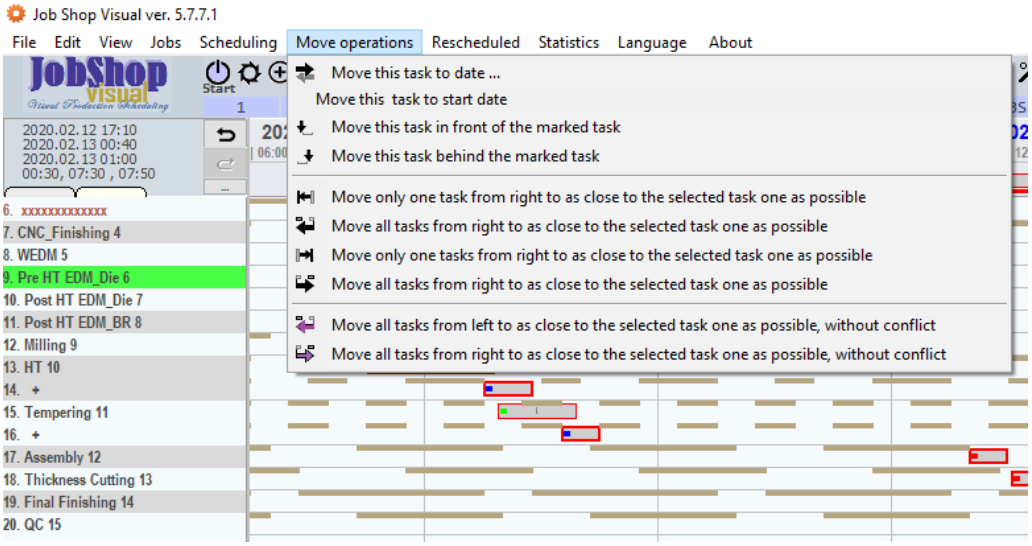


		Capacity	Start	SettingTime	StopWorkplace	Stop	Product	Job Name	Sequence
		1	20/02/15 8:00:00 AM	0	20/02/15 12:00:00 PM	20/02/15 12:20:00 PM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
		1	20/02/14 8:50:00 AM	15	20/02/14 10:20:00 AM	20/02/14 10:40:00 AM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DI
		1	20/02/12 12:50:00 PM	15	20/02/12 4:50:00 PM	20/02/12 5:10:00 PM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DI
		1	20/02/12 1:50:00 PM	15	20/02/12 5:50:00 PM	20/02/12 6:10:00 PM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
		1	20/02/17 6:00:00 AM	0	20/02/17 8:00:00 AM	20/02/17 8:20:00 AM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
		3	20/02/12 6:10:00 PM	0	20/02/13 7:10:00 AM	20/02/13 7:30:00 AM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
		3	20/02/13 6:00:00 AM	0	20/02/13 11:00:00 AM	20/02/13 11:20:00 AM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DI
		1	20/02/14 6:00:00 AM	30	20/02/14 8:30:00 AM	20/02/14 8:50:00 AM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
		1	20/02/14 6:00:00 AM	30	20/02/14 8:30:00 AM	20/02/14 8:50:00 AM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DI
		1	20/02/12 11:00:00 AM	10	20/02/12 12:30:00 PM	20/02/12 12:50:00 PM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DI
		1	20/02/12 11:00:00 AM	10	20/02/12 1:30:00 PM	20/02/12 1:50:00 PM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
9	Milling	1	20/02/14 8:50:00 AM	10	20/02/14 10:20:00 AM	20/02/14 10:40:00 AM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
8	Post HT EDM_BR	1	20/02/15 7:00:00 PM	30	20/02/16	20/02/16 12:20:00 AM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
7	Post HT EDM_Die	1	20/02/15 4:40:00 PM	30	20/02/15 6:40:00 PM	20/02/15 7:00:00 PM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
6	Pre HT EDM_Die	1	20/02/12 5:10:00 PM	30	20/02/13 12:40:00 AM	20/02/13 1:00:00 AM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DI
15	QC	1	20/02/17 8:20:00 AM	0	20/02/17 1:20:00 PM	20/02/17 1:40:00 PM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
11	Tempering	3	20/02/13 7:30:00 AM	0	20/02/13 3:30:00 PM	20/02/13 3:50:00 PM	ABS-101_03_BR_Finish	ABS-101_03	ABS-101_03_BR
11	Tempering	3	20/02/13 2:00:00 PM	0	20/02/13 6:00:00 PM	20/02/13 10:20:00 PM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DI
13	Thickness Cutting	1	20/02/15 12:20:00 PM	0	20/02/15 4:20:00 PM	20/02/15 4:40:00 PM	ABS-101_03_ASSEMBLY	ABS-101_03	ABS-101_03_AS
5	WEDM	1	20/02/14 10:40:00 AM	15	20/02/14 8:40:00 PM	20/02/14 9:00:00 PM	ABS-101_03_DIE_Finish	ABS-101_03	ABS-101_03_DI

Move Operation Menu

There are 8 operations coming under this operation. these “move operation” options are very important for the schedule optimization.

1. Move this task to date
2. Move this task to start date
3. Move this task in front of marked task
4. Move this task behind the marked task
5. Move only one task from right to as close to the selected task one as possible
6. Move all tasks from right to as close to the selected task one as possible
7. Move only one task from right to as close to the selected task one as possible
8. Move all tasks from right to as close to the selected task one as possible



Move this task to date

This function can be used to move a certain operation to certain date.

Move this task to start date

This function can be used to move a certain operation to a certain date.

Move this task in front of marked task

This option can be used to move a selected task to Infront of a marked task.

Move this task behind the marked task

This option can be used to move a selected task to Infront of a marked task

Move only one task from right to as close to the selected task one as possible

This option can be used to move a selected task from right to as close to the selected task one as possible

Move all tasks from left to as close to the selected task one as possible

This option can be used to move all tasks in relevant workstation from left to as close to the selected task one as possible

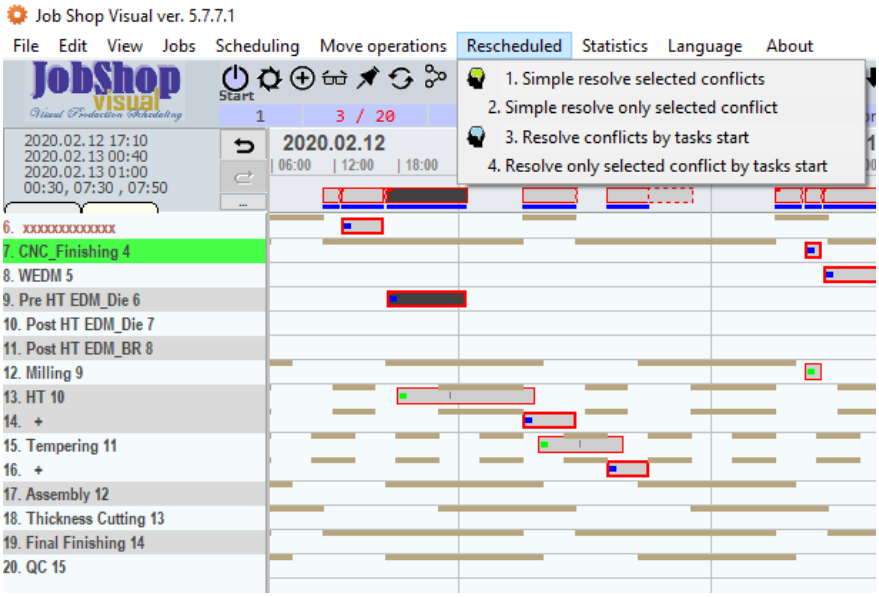
Move only one task from right to as close to the selected task one as possible

This option can be used to move a selected task from right to as close to the selected task one as possible

Move all tasks from right to as close to the selected task one as possible

This option can be used to move all tasks in relevant workstation from left to as close to the selected task one as possible

Rescheduled Menu



Simple resolve selected conflict

If there are some conflicts in the schedule, those conflicts can be resolved using this function easily. For the simple schedules with small networks this function is very effective.

Simple resolve only selected conflict

To resolve a selected conflict, this function can be used. To resolve the conflicts of complex schedules with large networks this feature is recommended.

Resolve conflicts by task start

This function will resolve conflicts by changing the task start. This feature will try to resolve all the conflicts.

Resolve only selected conflict by tasks start

This function will resolve only the selected conflicts by changing the task start.

**For more details on Utilization of these options please see the video of http://www.jobshop.72.sk/?m=0EN

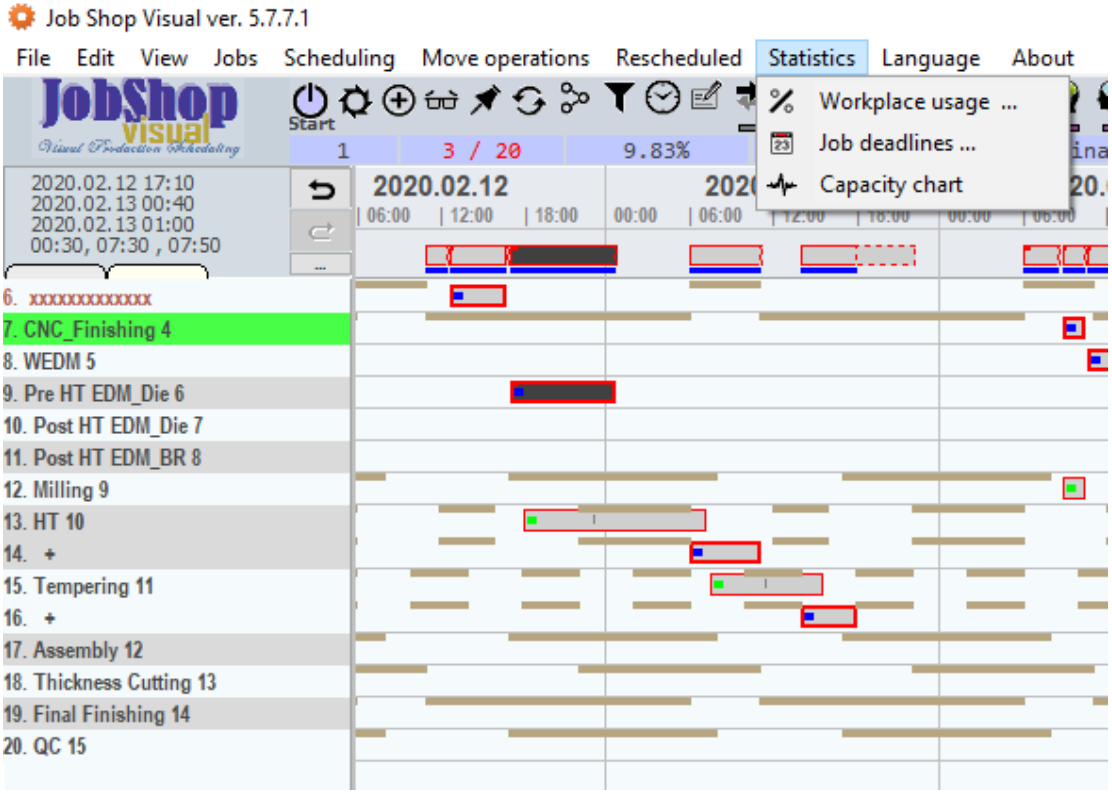
Statistics

There are 3 sub menus are coming under this main menu. The results of scheduling and optimizing process can be obtained using the sub menus coming under this main menu.

1.Work Place Usage

2. Job Dead Line

3. Capacity Chart



Workplace Usage

The Utilization of work place in terms of Dates and In terms of work places were analyzed in this sub menu. On the top left corner there are 3 tabs.

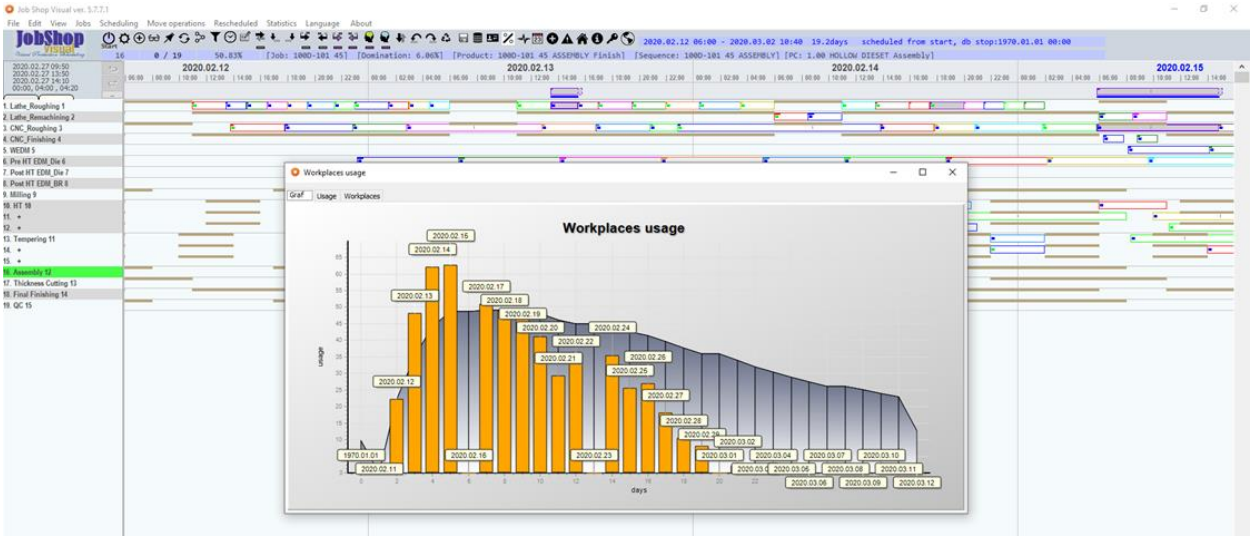
1.Graph

2.Usage Table

3.Workplace utilization table.

Graph

This is the graphical representation of Work place utilization. Yellow columns show the actual utilization and the gray char is showing the Hypothetical utilization of machines.



Usage

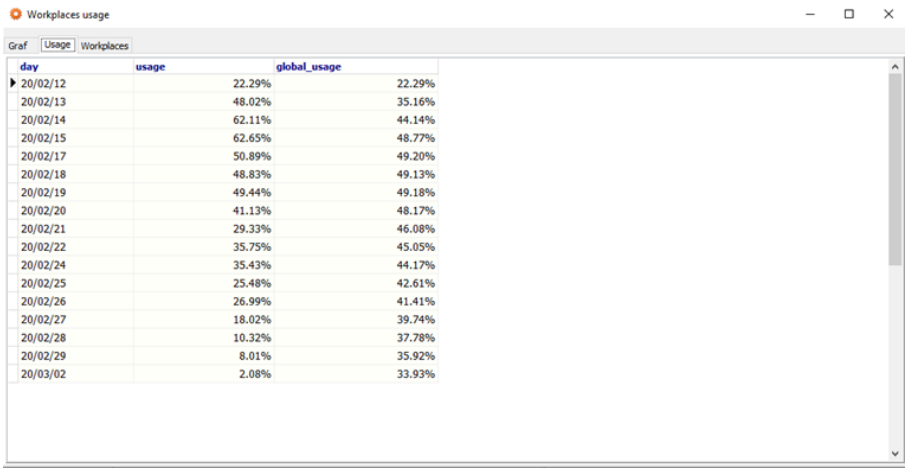
This is the data table representation of utilization of machines.

There are 3 columns in the data table.

1.Days - Planned dates

2.Utilization -Actual Utilization of total machines (Yellow columns in the graph)

3.Global Utilization - Hypothetical utilization (Grey area of the graph)



day	usage	global_usage
20/02/12	22.29%	22.29%
20/02/13	48.02%	35.16%
20/02/14	62.11%	44.14%
20/02/15	62.65%	48.77%
20/02/17	50.89%	49.20%
20/02/18	48.83%	49.13%
20/02/19	49.44%	49.18%
20/02/20	41.13%	48.17%
20/02/21	29.33%	46.08%
20/02/22	35.75%	45.05%
20/02/24	35.43%	44.17%
20/02/25	25.48%	42.61%
20/02/26	26.99%	41.41%
20/02/27	18.02%	39.74%
20/02/28	10.32%	37.78%
20/02/29	8.01%	35.92%
20/03/02	2.08%	33.93%

Work Places Utilization

In this table the workplace utilization and global work place utilization is analysed under vast range of fileds.There are 11 columns coming under this table.

1. Work Place -The Work Place in the machine shop which need to be analyzed.

2. Code – The code given to machine shop

3. Area – The area where the work place belongs to

4. Capacity – The capacity of work station.

5. Preference – The preference given for the work station

6. Day – Days in the schedule

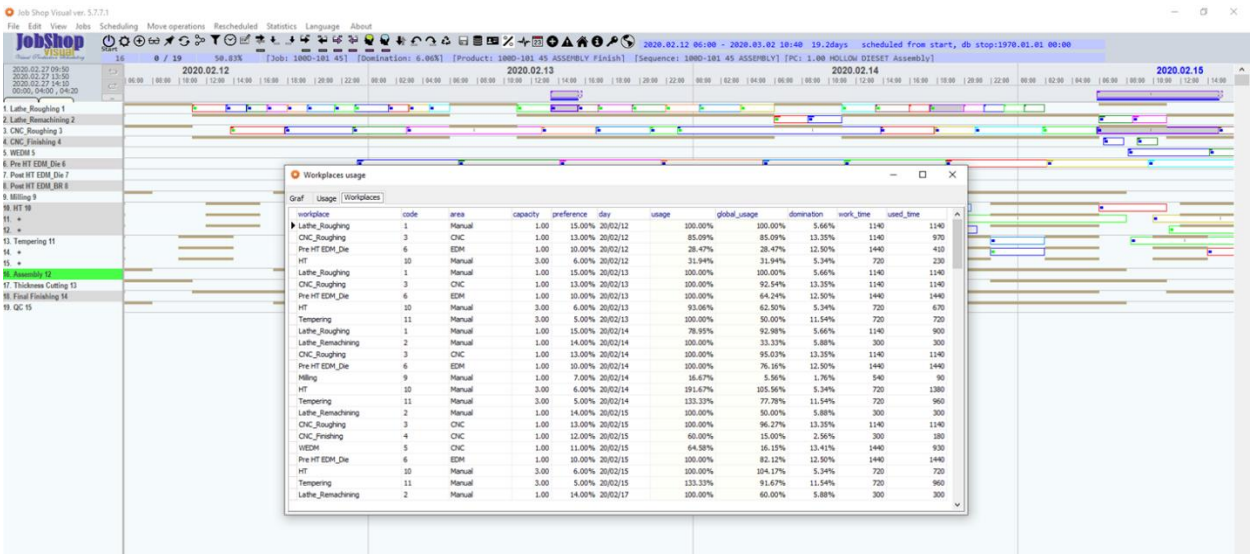
7. Usage – Usage as a percentage of work time

8. Globle usage – Hypothetical Usage

9. Domination of job

10. Work Time – Total Available time of work station

11. Used Time – Utilized time for operation.

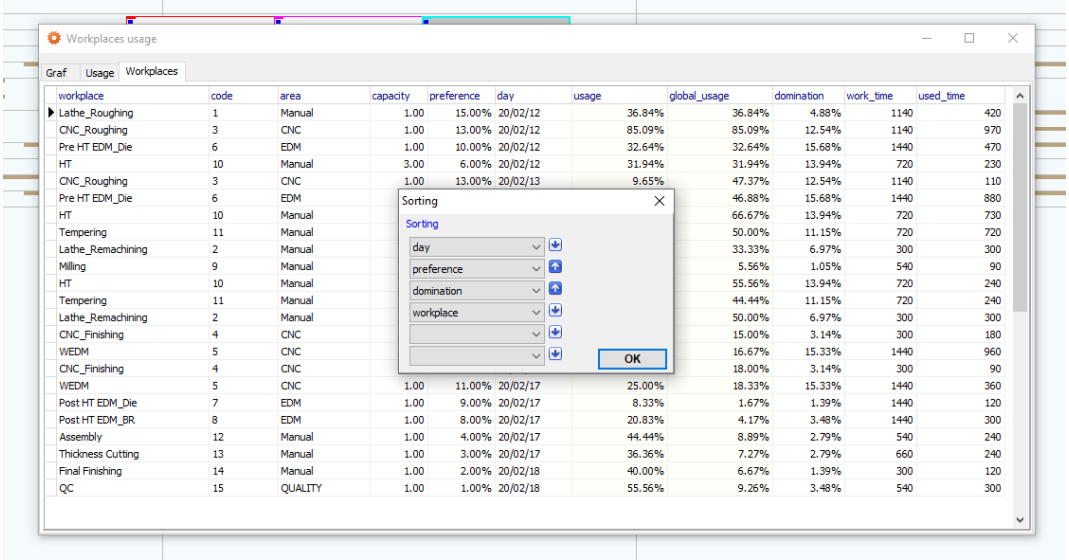


Above table can be exported to an Excel file and this can be used for further analysis. Most important feature in this table is sorting menu. When left click the Heading row, it will give the sorting menu.

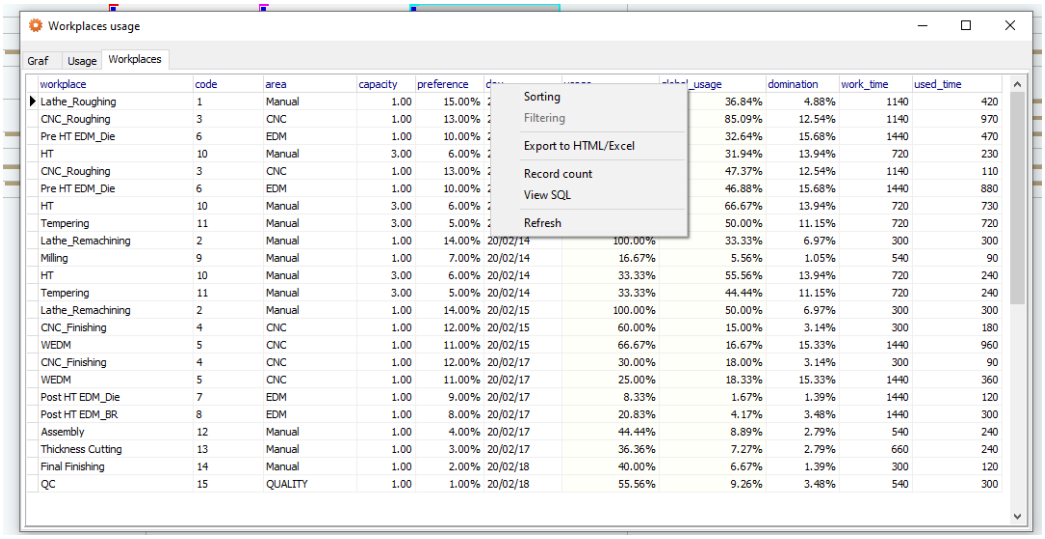
In the left side of sorting menu sorting fields can be found. In a sorting fields, sorting requirement can be selected using a drop-down menu. In the drop-down menu, all the columns are available.

In the right side there is a blue arrow. By using this arrow, the ascending or descending nature of selected field can be changed.

The sorting menu feature can be seen in below image.



By right clicking the mouse you can go to the sub menu mentioned below.



In this sub menu, there are 5 tasks displayed.

1.Sorting function -The function explains in above paragraph.

2.Export to HTML/Excel -By clicking this sub menu the data table will be saved to an excel fine in the location where the software is installed. the excel file name is “table-html.xls”

3.Record count -The number of records in the data table can be count using this operation.

4.View SQL -This operation will show the SQL code for this table.

5.Refresh -the data table can be refreshed using this function.

Job Dead Lines

This function will give the table of job dead lines,There are 12 columns in this table.

1. Job -The Job number is represented in this column.

2. Dead line - This parameter defines the importance of the job dead line. Here integer 1/0 is used to provide the information.

3. Reserve Days – This column indicates the additional dates taken for the completion of job.

4. Preference - This parameter defines the preference of the job. Here the default value is 100% and consider every job has the same preference. If you need to change the preference of the job it can be done by reducing the preference value of non-urgent jobs.

5. Domination -

6. Scheduled - This parameter defines whether the job is in active stage or inactive stage.

7. Start – This column shows the start date of the job.

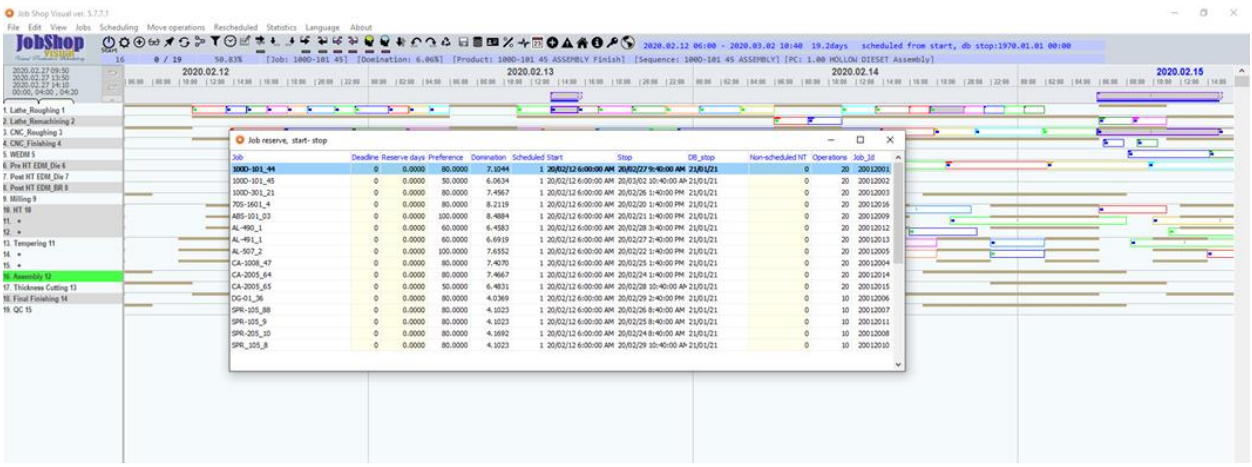
8. Stop -This column shows the completion date of the job.

9. DB Stop -This column shows the stop date of the data base.

10. Non-Scheduled NT -This column shows whether there are any operations not scheduled to the current scheduled or not.

11. Operations -This column shows the number of operations attached to the relevant job.

12. Job ID -This column shows the job id which is used in job_id used in tJobs table.



In the left side of sorting menu sorting fields can be found. In a sorting fields, sorting requirement can be selected using a drop-down menu. In the drop-down menu, all the columns are available.

In the right side there is a blue arrow. By using this arrow, the ascending or descending nature of selected field can be changed.

By right clicking the on the table next sub menu can be obtained, there are 5 tasks displayed in this sub menu.

1. Sorting function -The function explains in above paragraph.

2. Export to HTML/Excel -By clicking this sub menu the data table will be saved to an excel fine in the location where the software is installed. the excel file name is “table-html.xls”

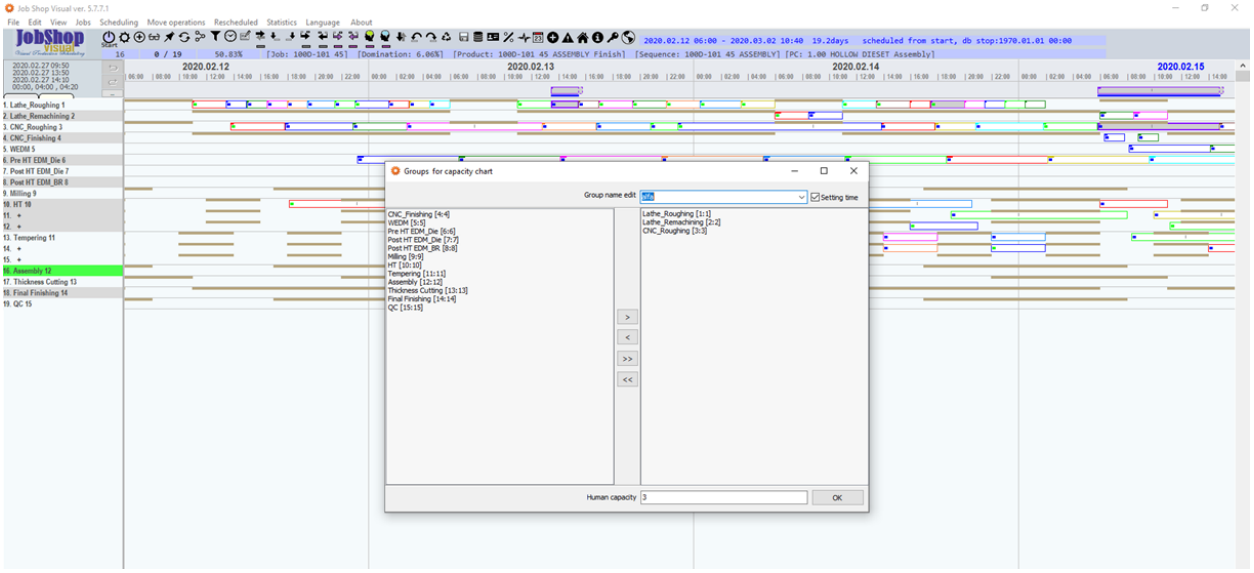
3. Record count -The number of records in the data table can be count using this operation.

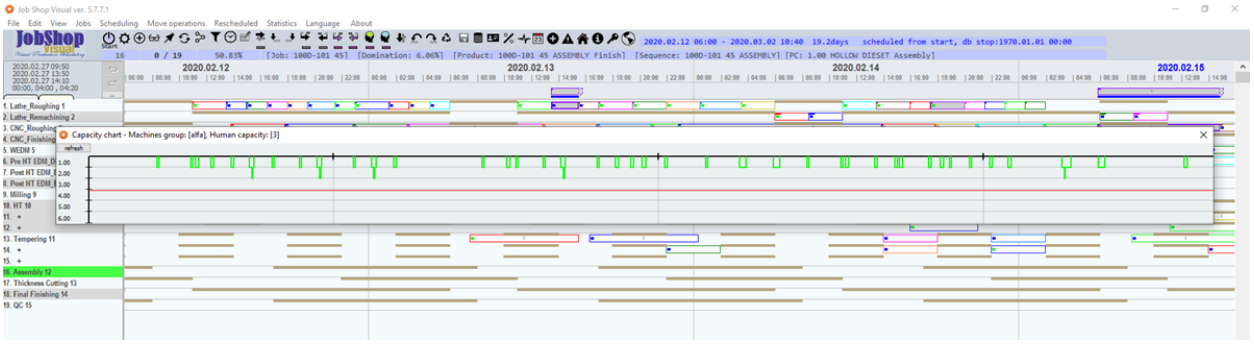
4. View SQL -This operation will show the SQL code for this table.

5. Refresh -the data table can be refreshed using this function

Machine groups for human capacity

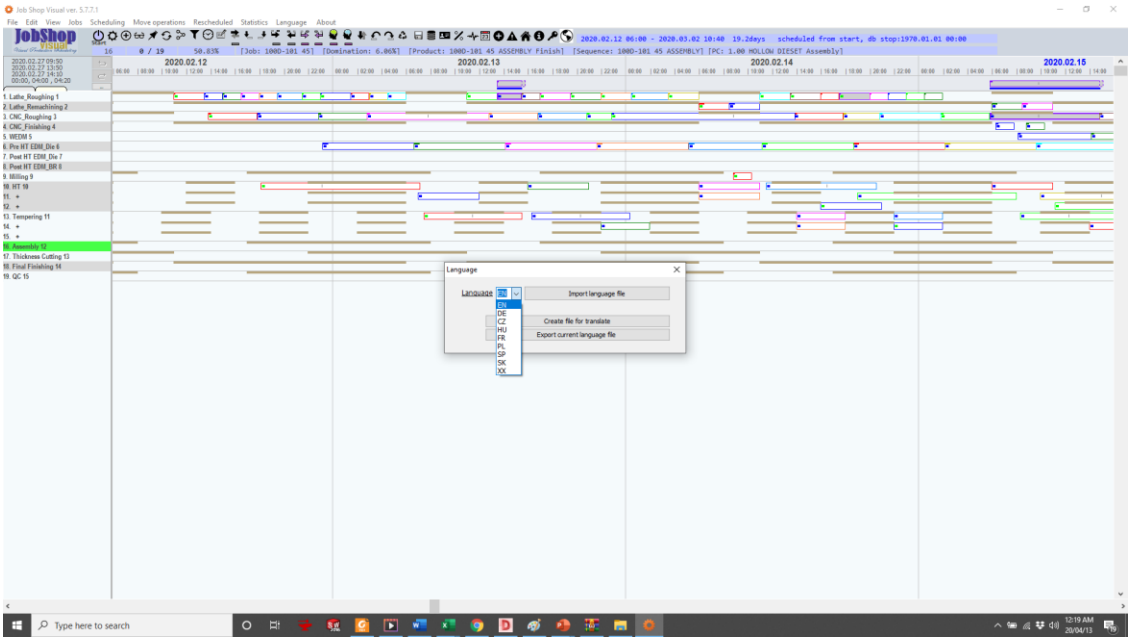
Here you can enter human resources. Usually, some machines can only be set up by a few people.





Language Menu

The language setting can only be used if the language files are attached to the program.



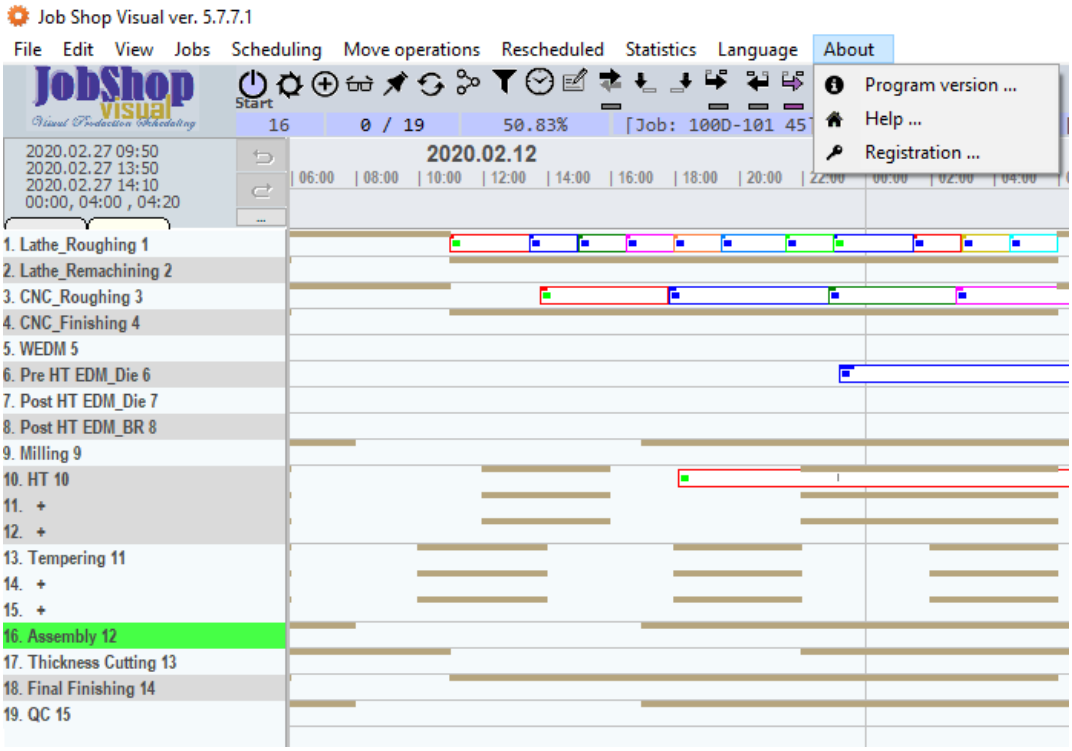
About Menu

There are 3 sub menus are coming under the About menu.

1. Program Version -This will show the program version of the soft ware

2. Help Menu

3. Registration



Registration

In registration menu, there are 3 labels to be filled as below.

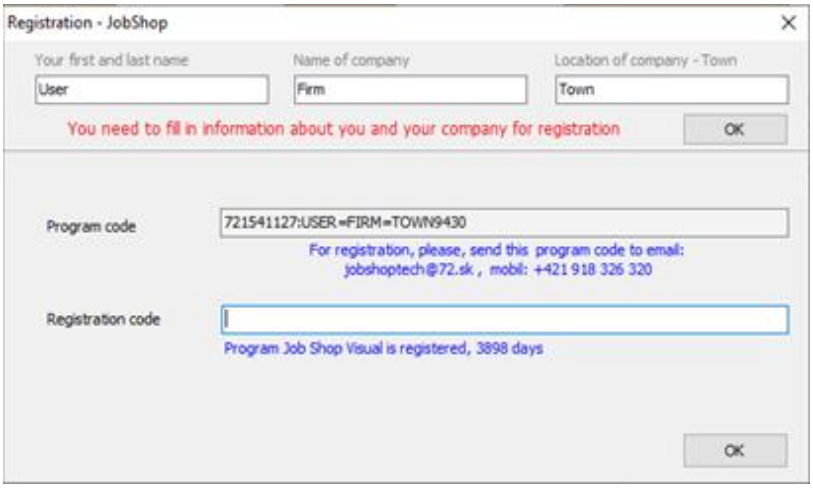
1. Name
2. Name of company
3. Town

After completion of this form there is a “OK” Command button to press.

After pressing “OK” Button, A program code will be generated. You need to send this code to software developer and then the developer will send the Registration code.

To register the software, the registration code needs to be passed and press the Second “OK” Command button.

After completion of registration, below registration tab it will show the license remaining dates for the software.



Help

When You click the Help Tab you will be redirected to the web site: http://www.jobshop.72.sk/?m=2EN.

Prepared By

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