Network Adaptive Production Scheduler

Asprova
Industry Solution

Catalogue with case study reports and samples

Automobile and Auto parts industry

Asprova Corporation
http://www.asprova.com/

Four problems of Automobile and Auto-parts industry

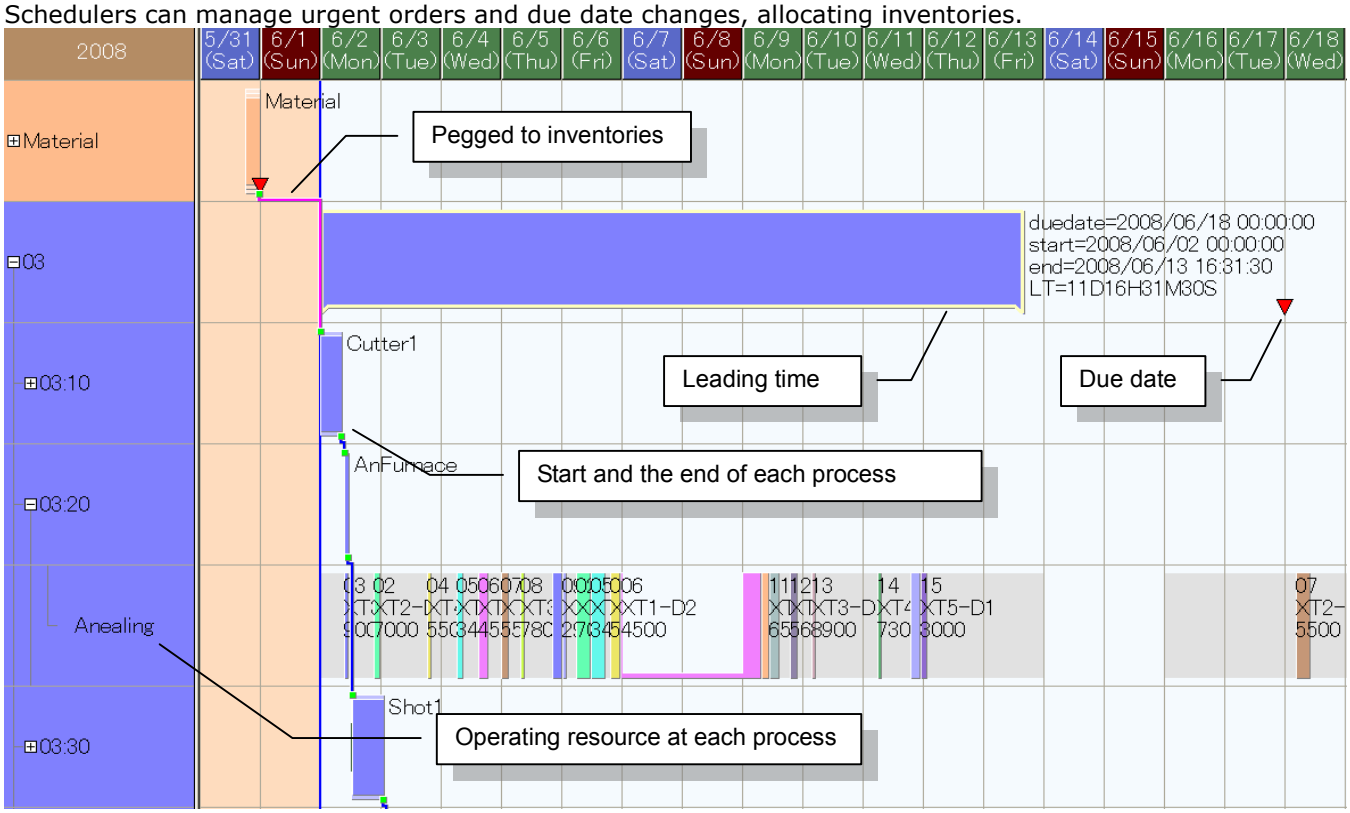
① Quality control … Operations which are not yet standardized sometimes cause defects
② Cost and Profits … Cost and profit per product should be visualized
③ Due dates … The gaps between forecasted orders and fixed orders are hard to be adjusted. Emergency orders and order changes are causes of anxiety.
④ Globalization … Close coordination with foreign factories is hard to maintain

Strict quality control, schedule management, and cost control are especially required in this industry.

Asprova's high speed production schedulers which enable "visualization" of schedules have served our clients' needs. The following is the introduction of Asprova's solution.

Finding the due date by finite capacity scheduling

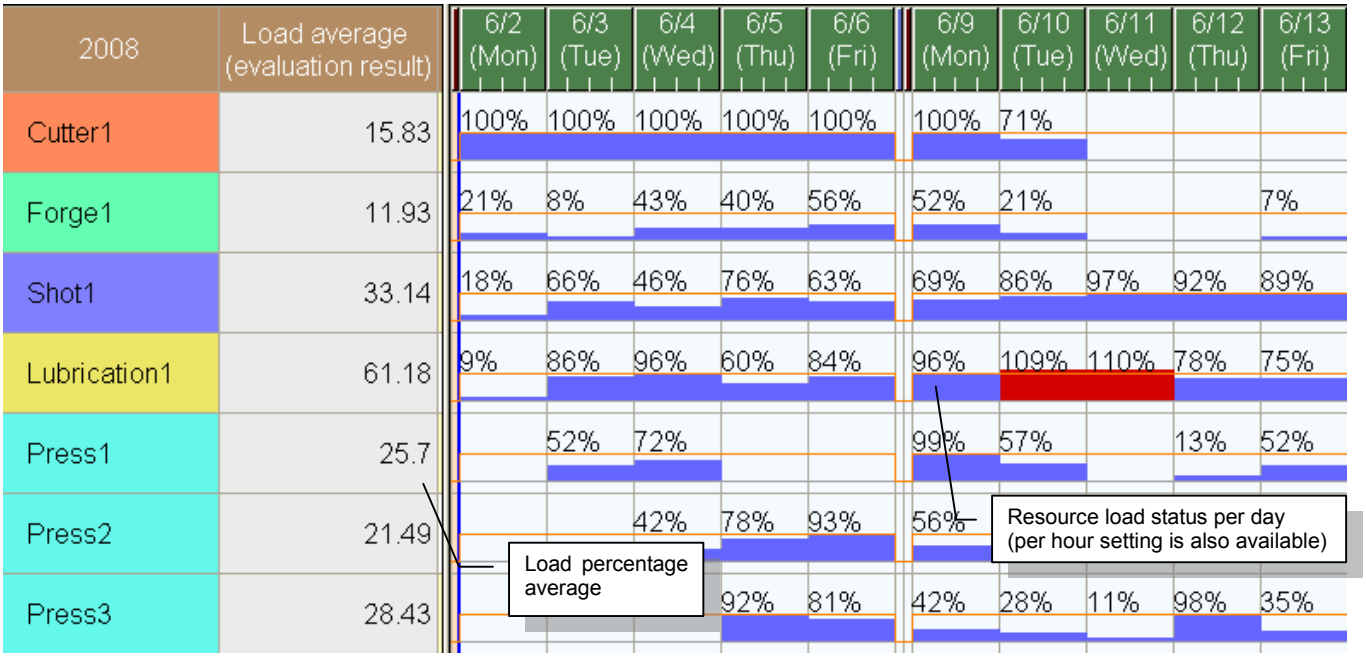
Schedulers with finite capacity make production plans which can be directly used as work instructions. Schedulers can manage urgent orders and due date changes, allocating inventories.



◆ Order Gantt Chart: enables checking of overdue orders, wait times of each process, inventory allocation. The Order Gantt Chart's standard feature includes a Resource Gantt Chart, an Instruction Gantt Chart, an item Gantt Chart, overdue flags. The Order Gantt Chart is easily operated with the mouse.

Efficient load adjustment

Asprova is capable of efficient load allocation to multiple production lines. Asprova also manages to take into account facility investment simulations and manpower employment planning. Shift changes per facility or worker are easily operated with the mouse.



◆ Load graph: current load status is recognizable in one view. Displayed periods, displayed resources, and text display are customizable at your will. In addition, inventory graphs and leading time graphs are included as a standard feature.

Skill map to manage workers capacity

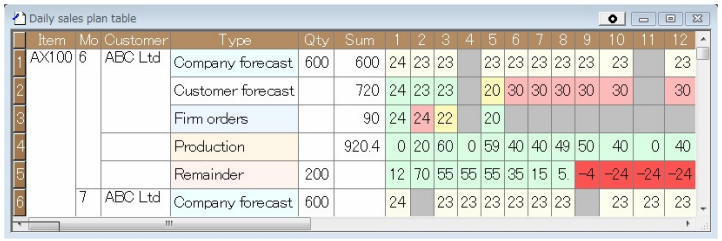
The "Skill map", a table to set up process skill of employees, is provided as a standard feature. It enables managing of employees' capacity, ability/inability and processing speed, separate to integrated master tables such as the BOM (Bill of Materials) and resource capacities.

	Resource code	Resource name	Recieve	Inspect 1	Cut 1	Treat 1	Cut 2	Forge	Die	Fix 1	Join	Fix 2	Treat 2	Adjust	Inspect 2	Deliver
1	0001489	Smith	○				○	○	○		○					
2	0001857	Johnson	○				○	○	○		○				○	
3	0001899	Williams														
4	0001945	Jones	○	○	○											○
5	0101938	Brown				○				○	○	○				
6	0101959	Davis											○	○		
7	0102848	Miller				○				○	○	○				
8	0102859	Wilson														○
9	0102933	Moore				○				○	○	○				

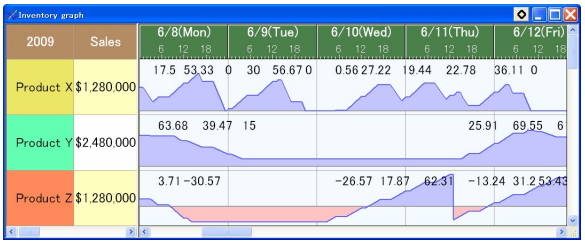
◆ Up to 999 skill types can be added. Displays and input means are also easily customized.

Production Scheduling pegged to inventories and order information

Registering orders not only per production unit/lot but also per sales order unit/lot is possible. Production schedules can be made to eliminate unnecessary inventory, while taking into account safety inventories.



◆ Sales plan table: The information on orders for a certain period can be registered with the accuracy of company forecast, sales forecast, customer forecast, and confirmed orders.
∗Sales order option is required.

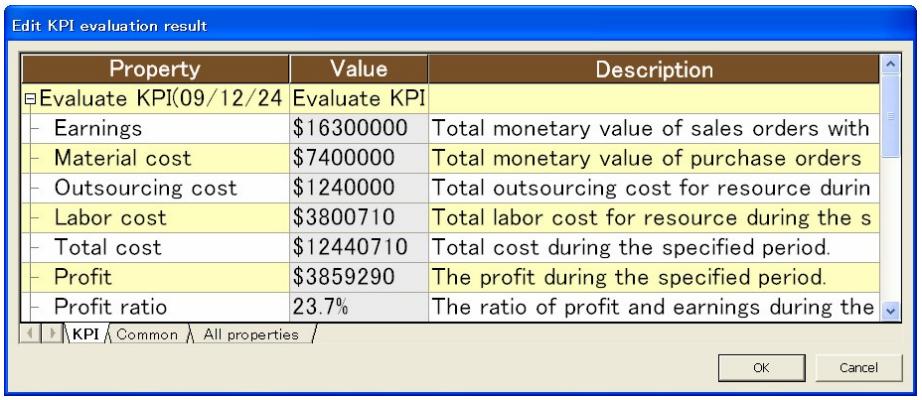


◆ Inventory graph: inventory changes and material requirement can be calculated at one view. In addition, production graphs and consumption graphs are available. Calculation functionality for each term is also included.

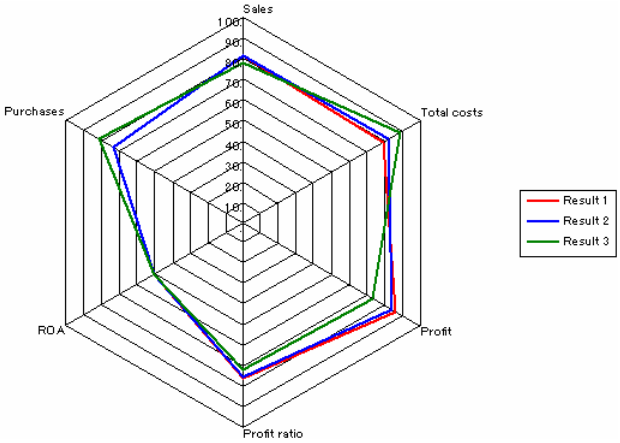
Evaluation of the result of scheduling and simulation by KPI

Key Performance Index ("KPI") including sales, profit, profit ratio and material cost can be calculated by cost per item and working cost per resource. Calculation formulae can be freely customized. Also, a standard cost breakdown can be calculated. It can be used to verify the result of facility investment simulations as well.

∗ KPI option is required



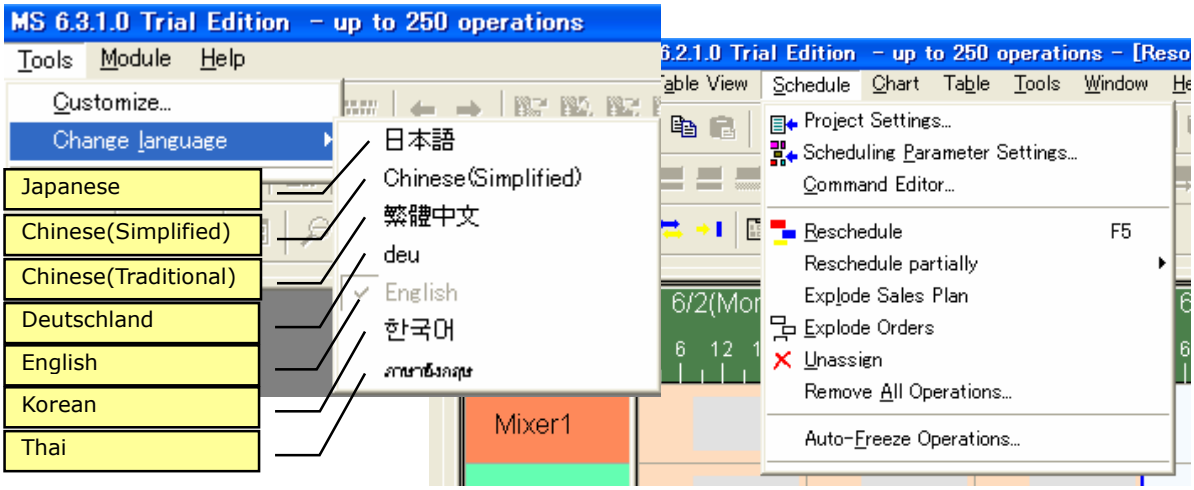
◆ KPI (Key Performance Index): KPI can evaluate the schedule result and keep records.



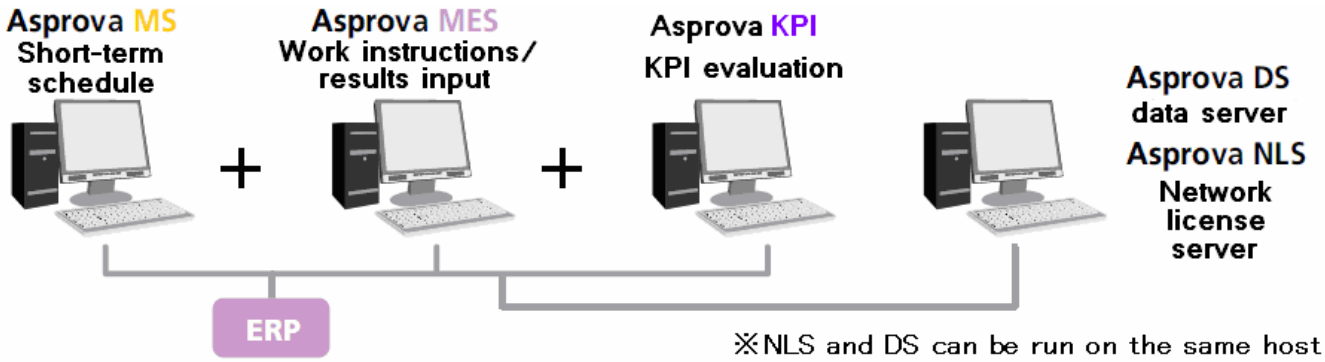
◆ KPI radar chart: KPI radar chart enables comparison of the simulation result by radar chart. (with HTML View)

Adaptable to global networks

Asprova is available in Japanese, English, Chinese (Simplified Chinese and Traditional Chinese), Korean, German, Spanish, Portuguese, and Thai. Using the same package enables very close co-operation and understanding between different plants.



◆ Adaptable to Multi-languages: Displayed languages can be changed during running.



◆ Adaptable to Network: production scheduling is shared through the network.

Introduction to the case studies

To read our latest case study, please go to

http://www.asprova.com/em/case/index.html

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Case Study 1

Kihara Manufacturing Company, Ltd.

Pipe Manufacturer Chooses Asprova for Scheduling Speed Achieves Load Leveling and Major Inventory Reduction

The Ibaraki factory of Kihara Manufacturing Company specializes in production of piping and tubing, including truck exhaust pipes, engine pipes, and hydraulic pipes for construction equipment. Production scheduling is performed twice each morning, first for products and then again for parts. Weighed down by the complexity of handling a large number of customers and product varieties and the resulting large number of order changes, they were drawn to Asprova's ability to maintain fast scheduling speed in the face of overwhelming data size. Due to the flexibility of the Asprova program, they were able to deal with the large number of customers and products while keeping customization to a minimum.

Problems Prior to Introduction

- MOUNTAINS of paperwork due to complicated scheduling procedures
- CONFUSION on assembly line due to contradictory instructions from different process managers
- PROCESS managers hoarding inventory to avoid missed deadlines

Reason for Introducing Asprova

- ASPROVA's scheduling speed
- MINIMAL need for customization
- QUALITY of response from Scheduling System Laboratory

Benefits of Introduction

- ASPROVA's load calculations enabled scheduling to be performed centrally every morning without exchange of paperwork.
- CONTROL of factory floor through reliable schedules led to inventory reduction of more than 200 million yen.
- CLARITY of priorities and accuracy of load calculations in Asprova's manufacturing instructions eliminated need for corrections by process managers.

Production Scheduling in State of Confusion

Up till now in the Ibaraki factory of Kihara Manufacturing Company, process managers for each customer carried out instruction-based production which depended on the exchange of considerable paperwork in the form of production plans, work charts, missing item lists, and instruction supplements. Since it was not feasible for detailed factory-wide production schedules to be drawn up centrally on a daily basis, much of the burden of scheduling was placed on the shoulders of the process managers themselves, who were often unable to set appropriate priorities to the requests for needed parts coming in simultaneously from numerous other managers. As the factory floor and production management office became increasingly swamped in paperwork, the problem was worsened by managers making unnecessarily large request for parts or hiding inventory stock for fear of missing deadlines. Although a production management system had been installed on the factory mainframe for more than 20 years, the reality of the factory's production scheduling was that it was in a state of confusion.

"For more than 10 years," explains Masami Satoh, Chief of Production Management, "we had been looking into introducing a scheduling management system, and in fact we tried several different ones, but none of them reached the stage of actual installation." The main reason, he says, was that most of the systems were unable to handle the large number of customers and product varieties. They decided on Asprova because of the high speed of its scheduling computation, and because they valued Scheduling System Laboratory's quick response to all of their needs. Concerning the speed of computation, Satoh says, "We saw the demo and were amazed."

Data Volume

Finished products	3,400
Total items	10,000
Resources	100
Processes	3
Scheduling period	58 days
Scheduling cycle	once / day
Lots in scheduling period	6,000
Jobs in scheduling period	15,000

Kihara Manufacturing Company, Ltd.

Main office: 6-14-9 Soto-kanda, Chiyoda-ku, Tokyo 101-0021 Japan
Ibaraki factory: 5166 Uchimoriya-cho, Mizukaido-shi, Ibaraki-ken 303-0042 Japan
Company established: February 1943, Factory established: July 1954
Representative director: President Tsuneo Kihara
Capital: 107 million yen, Employees: 270 (as of June 1998)
Annual sales: 5 billion yen (in 1997)

Since its establishment, Kihara Manufacturing Company has specialized in producing a diverse range of low-pressure to high-pressure pipes for use in motors, industrial machinery, ships, and other machinery.

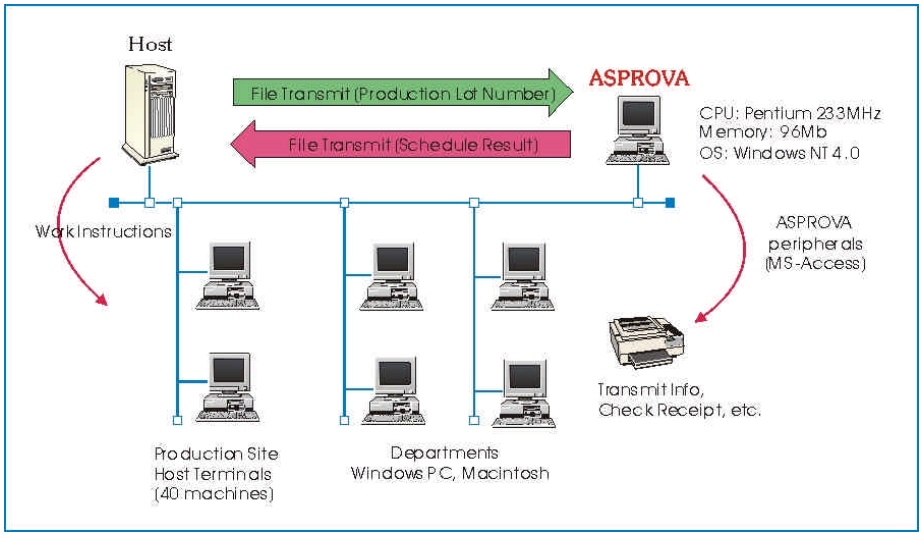

Figure 1: System structure
Data is transferred with the office mainframe twice daily in order to carry out scheduling, first for the customer-side plans, and then for the factory's internal requirements. The mainframe explodes requirements for parts, determines due dates, and outputs manufacturing instructions.

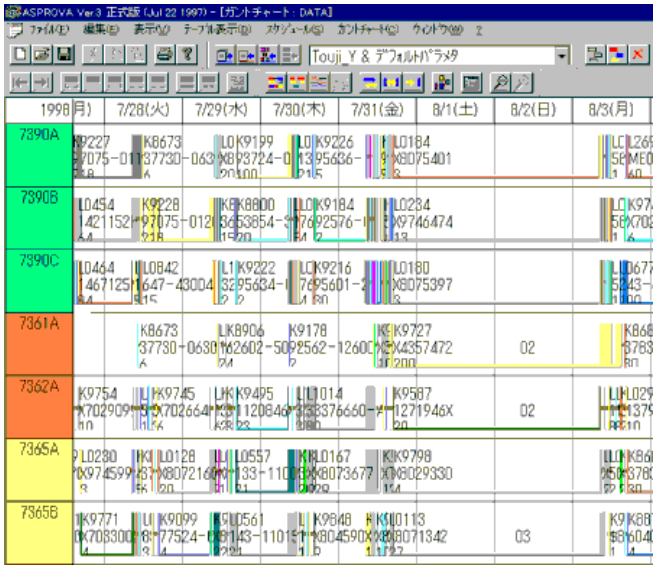

Figure 2: Gantt chart showing results of scheduling with Asprova.

Figure 3: Main menu from Asprova peripheral utility, developed by Kihara Manufacturing Company in response to various needs from the customer relations department.

Satoh says their appreciation was further increased upon finding that Asprova's standard version was able to deal with the continual thorn in their side -- the huge number of product varieties -- with a minimum of customization.

Can't Operate Without Asprova

Now scheduling is performed twice a day, first to schedule the final products, and then again to schedule the component parts based on those results. Although performing daily scheduling on a scale as large as the Ibaraki factory's means some daunting demands on the scheduler for computational speed, Asprova easily met the challenge by generating a schedule in only 10 minutes.

At the same factory, during the investigatory stages of the scheduler introduction, managers had described their hopes for the role of the scheduler in a list including such tasks as integrating customer-specific manufacturing instructions, generating reasonable instructions based on resource load planning, guaranteeing that following the schedule will finish lots on time, producing only the required items, facilitating frequent re-scheduling, and ensuring timely completion of job preparations. Asprova, they say, has fulfilled nearly 100 percent of their hopes.

Not only that, but Asprova has also allowed them to effect a drastic reduction in inventory. "Up till now," explains Satoh, "process managers were only managing to stay on top of demand by producing hundreds of pipes at a time. Now that we have scheduling under control, we've started producing smaller lots to cut down on inventory." On a price base, he says, this inventory reduction has totaled about 30 percent.

With this growing list of achievements, Asprova is rapidly becoming an indispensable element of the Ibaraki factory. As Sumio Sakamaki, Chief of Systems Development in the Production Division, says, "Asprova has become so much of part of our production management system, I don't think work in this factory could even go on without it."

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Case Study 4

F-tech, Inc.

Auto Parts Manufacturer Chooses Asprova For Scheduling Speed Reduces Setup Time and Inventory in Two Months

F-Tech Inc. primarily manufactures suspensions and rear axle beams for automobiles. Before introducing Asprova, they made schedules relying on their intuition and experience based on required quantities calculated by the mainframe computer. Frequent changes in orders, however, put a heavy load on scheduling managers and caused inconsistency between material ordering and scheduling. To resolve this situation, they have introduced Asprova, a popular high-speed scheduling system, and DISP, a production management module. The introduction of these systems has reduced not only the load on scheduling managers but also inventory in a short period of two months after actual operation began.

Problems Prior to Introduction

- HEAVY workload for scheduling managers trying to keep up with frequent order changes through manual scheduling methods
- EXCESSIVE inventory hoarded to avoid late delivery and confused production in the face of frequent schedule changes
- EXCESSIVE raw material inventory and hand-writing of material orders due to inconsistency between material ordering and scheduling

Reason for Introducing Asprova

- ASPROVA's diverse standard features
- ASPROVA's fast scheduling speed

Benefits of Introduction

- CUT time required to make a schedule down to a couple of hours, reducing the workload of the scheduling managers.
- IMPROVED accuracy of scheduling, reducing setup time, lead time, and inventory.
- ENABLED source data for material orders to be sent automatically to the mainframe computer, preventing material shortages.

Heavy Load on Scheduling Managers

The mainframe computer in F-Tech receives order data once a month covering a period of three months and receives data on order changes daily. Before introducing Asprova, however, material requirements were generated only once a week on the mainframe because it took too much time and they had no way to take into account the load on the line. As a result, scheduling managers had to make daily schedules based on their own intuition and experience, manually transcribing order changes and taking into account the inventory and load on the line. Despite their effort, it was very difficult to handle the great number of order changes, and careless mistakes would inevitably occur. Since accurate scheduling was quite difficult, they were forced to change schedules frequently, taking on an excessive workload. As Katsumi Arima of the Production Management Department of the Production Division says, "The whole day would be taken up just adjusting the schedule." These frequent changes in the schedule would in turn force the factory floor to keep extra inventory of intermediate parts to prevent late delivery and confusion in production. Also, the manually-drafted production plans and material orders did not match because materials were ordered based on the data in the mainframe, which did not reflect the manual changes. Again, they were forced to order materials manually to keep extra inventory so that the production line could go on running.

"The first thing we needed," said Toru Okutomi, Manager of the Production Management Department, Production Division, "was to reduce the man-hours required for scheduling."

Data Volume

Finished products	600
Total items	5,150
Resources	58
Processes	5
Scheduling period	3 months
Scheduling cycle	Constantly
Lots in scheduling period	about 45,000
Jobs in scheduling period	about 150,000

F-Tech Inc.

Main office (Kuki office): 19 Showa-numa, Shobu-cho,
Minamisaitama-gun, Saitama-ken 346-0194, Japan
Company established: July 1947
Representative director: Akihide Fukuda
Capital: 1778.9 million yen
Employees: 980

Since its establishment, F-Tech Inc. has manufactured auto parts such as suspension assemblies, sub frame comp., and rear axle beams. The company has numerous patents and utility model rights regarding auto parts such as a pedal leg-power reducer and a foot-operated parking brake.

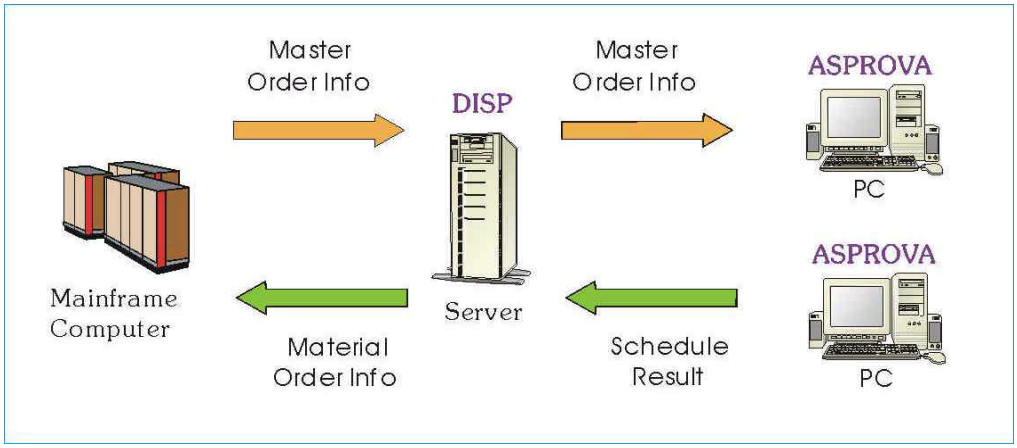

Figure 1: System Configuration
Master order information is sent from the mainframe, and scheduling is performed by two Asprovas linked with DISP. The resulting schedule is then used for generating work instructions, and part of the data is returned to the mainframe to be used for issuing material orders.

Thus, among various objectives, they recognized the most important one to be the reduction in the load on scheduling managers. After comparing several modules, they were most impressed with the high-speed scheduling and the standard features of Asprova. In terms of scheduling speed, in particular, Arima said that Asprova was by far the fastest.

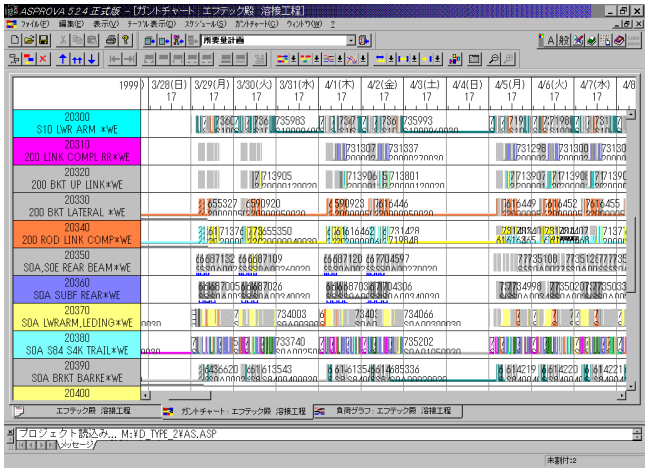

Figure 2: Gantt chart created through scheduling with Asprova. Changes and additions are identified by color or by fixing the associated jobs in place.

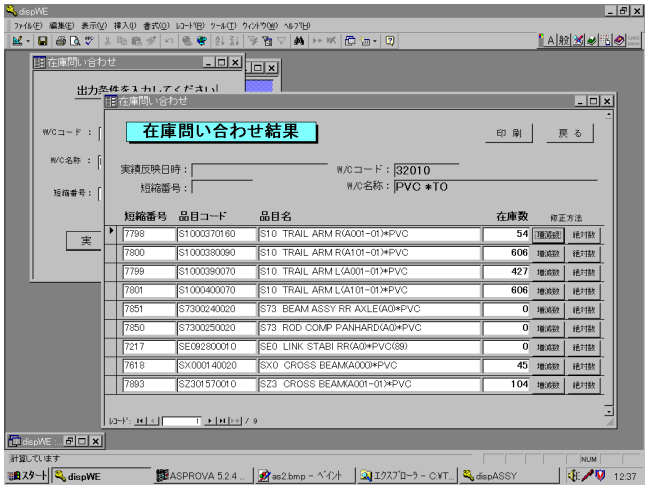

Figure 3: One of the screens from DISP. These screens are customized to the user's needs.

Since, however, as Okutomi explains, "we needed capabilities that would enable peripheral connections besides scheduling," they decided to introduce Asprova together with DISP, a production management module from NEC Techno-Service, an Asprova distributor.

Results Within Two Months of Operation

When it came time to install Asprova and DISP, F-Tech took charge of preparing the necessary data and determining the system specifications, while NEC Techno-Service took charge of most of the system development. "Determining the specs was not an easy job," Arima said. "Also, we got a lot of errors because the mainframe's configuration charts didn't include the process codes, and correcting these errors took a lot of time." Since he had to do regular work as well, he says, it took time to get ready for the test run.

Now, after the installation of Asprova, the schedule can be created in a couple of hours, reducing the load on the scheduling manager, which was the initial objective. Asprova has also enabled accurate scheduling making full use of the precise data prepared at installation. As a result, the factory not only produces items as scheduled but has also been able to reduce setup time, lead time, and inventory. They can now order materials by sending source data directly to the mainframe so that sufficient materials can be kept all the time. Although only two months have passed since they started operating Asprova, they are already enjoying various benefits. "I think we will have further good effects as time passes," says Arima.

In the future, F-Tech is planning to deploy PC terminals at each process to enter the results data that is now written on daily reports, and to create a system to confirm schedules using the Asprova Scheduling Monitor, thus more efficiently utilizing Asprova and DISP.

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Case Study 3

Shonan Unitec Corporation

Auto Parts Manufacturer Reduces Inventory and Achieves Consistency Among Process Plans

"Asprova" a Byword For Production Planning Throughout the Factory

Shonan Unitec Corporation specializes in production of auto parts such as pedal assemblies, pulleys, press parts for cabs, as well as various other products such as sound barriers, pedestals, etc. Before the introduction of Asprova, schedules were prepared separately for each process based on documents generated by the mainframe computer. This caused mismatches between processes and excess inventory for each process, resulting in long overtime work. Now, after introducing Asprova, they are able to make consistent schedules by visually checking how much load is applied or required, enjoying various benefits such as reduction of inventory and workload. When it comes to production planning, everyone in the factory thinks of Asprova.

Problems Prior to Introduction

- INCONSISTENCY between processes and excess inventory from having different staff members prepare schedules for each process based on documents generated by the mainframe computer
- LONG overtime work required to complete items by their due dates, putting heavy load on the workers
- DAILY overtime work for the person in charge of planning to adjust the schedule

Reason for Introducing Asprova

- ASPROVA's ease of installation
- ASPROVA's diverse standard features
- ASPROVA's bulk production capability

Benefits of Introduction

- ACHIEVED consistency between processes, enabling smaller lot sizes and reduction of excess inventory, which could now be managed visually.
- IMPROVED the accuracy of the master data and the schedule, enabling reduction of the load on workers.
- ALLOWED the schedule to be created by one employee alone, rather than by two or more employees working overtime.
- MADE it easy for the factory to increase the number of manufactured item types.

Inconsistent Scheduling Among Processes

Shonan Unitec Corporation used to output documents to each process once a week, generated based on orders from customers using a standard lead time. These were calculated by a mainframe computer without checking the load on the equipment. Although each process was managed by scheduling specialists who worked out weekly schedules relying on their intuition and experience, processes were inconsistent because they were scheduled independently of other processes. This led to awkward situations in which produced parts were not used for a long time or production stopped for lack of necessary parts. Each process center would have to hoard inventory for fear of item shortages. If there was a sudden change in schedule or inconsistency between processes, they had to work overtime to finish the lot in time for the customer's due date. Scheduling managers also worked overtime everyday adjusting the schedule to flatten the workload of the factory floor.

To resolve these problems, they looked into introducing a scheduling package that would enable "scheduling that takes into account the load on facilities for all the processes." The factory wanted to select a package that was easy to install, capable of leveraging the data and capabilities of the existing system, and equipped with all required capabilities. In addition to load leveling throughout the processes, they needed the capability to assign lots for the press process combining multiple customer orders. According to Kenji Saito of the System Group, when they evaluated Asprova, they saw no problem regarding ease of installation,

Data Volume

Finished products	10,000
Total items	20,000
Resources	150
Processes	Avg. 3
Scheduling period	3 weeks
Scheduling cycle	daily
Lots in scheduling period	1,200; 6,200
Jobs in scheduling period	10,000; 60;000

Shonan Unite Corporation.
Main factory: 1919 Kurami, Samukawa-cho, Takaza-gun, Kanagawa
Fujisawa factory: 50 Shobuzawa, Fujisawa-shi, Kanagawa
Iwafune factory: Oaza Kyokugashima, Iwafune-cho, Shimotuga-gun, Tochigi
Fukushima factory: 20 Fukasaku, Miharu-cho, Tamura-gun, Fukushima
Representative director: Hiroo Ito
Company established: October 1992 (Merger)
Employees: 600
Annual sales: 14.7 billion yen (in 1997)

Since its establishment, Shonan Unitec Corporation has manufactured auto parts such as pedal assemblies (accelerator, brake, and clutch), pulleys, press parts for small-sized, medium-sized, and large-sized cabs, as well as various other products such as sound barriers, pedestals (base parts for construction), etc.

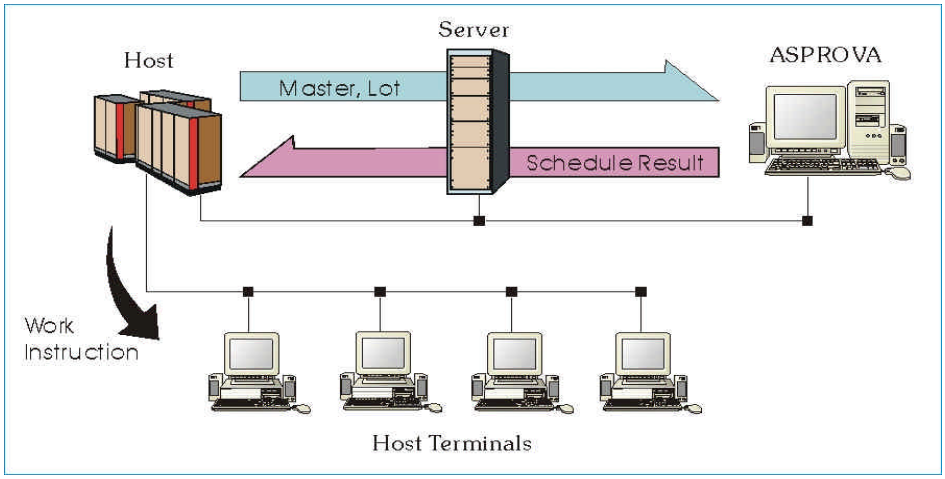

Figure 1: System Configuration
The mainframe sends data to Asprova via a server and Asprova returns the result of scheduling. The mainframe then sends production instructions to terminals at each process.

and concerning functionality, "when we had looked into Version 3, it had still been lacking in features, but when we heard that Version 4 had a bulk production feature we were impressed." Following this evaluation, they decided to introduce Asprova.

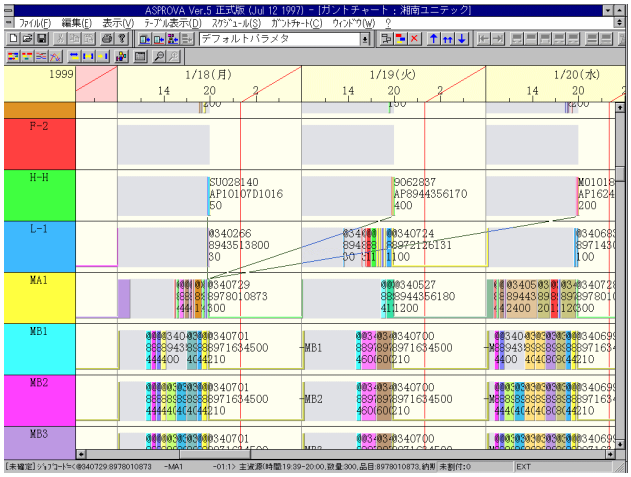

Figure 2: Gantt chart showing the result of assignment using the bulk production capability

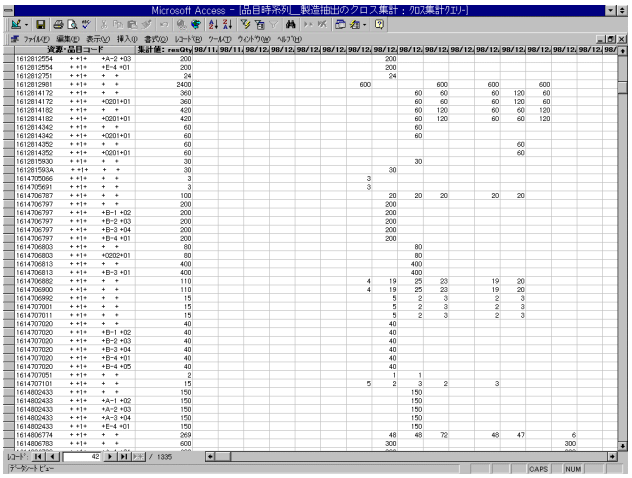

Figure 3: Aggregated list taken from Asprova's time series data using an Microsoft Access query

'Asprova' a Byword For Production Planning

The factory's System Group and the Factory Works Group played the central role in introducing Asprova. International Laboratory Corporation (ILC), an Asprova distributor, helped with the installation work several times a week. "Although it was hard to create new data that we hadn't used before," says Haruo Kasama, Factory Works Group, "we were able to start actual operation in a relatively short period of four months." During the early stage of actual operation, data was not very accurate. "We received a lot of complaints if there were problems with a schedule," says Saito. "But now," Kasama explains, "the situation is completely different from how it was in the early stage of introduction." The accuracy of the master and scheduling has been improved a great deal because they corrected data every time they received complaints.

As a result of introducing Asprova, they have been able to achieve consistency between processes, which was one of their initial objectives. This improved the operation of the factory floor, enabling a reduction in the size of production lots. "Inventory quantity has reduced significantly and housekeeping is now properly performed," Saito says. Scheduling used to be performed by several people but now can be done by one person alone, resulting in substantial savings in man-days. The load on the factory floor has also been considerably reduced because the accuracy of scheduling has been improved to balance the amount of work for each day. Recently, items which were previously manufactured in other factories are being moved over to the main factory, but they have had no trouble in managing the increased production.

Now, says Saito, everyone in the factory thinks of Asprova when it comes to production planning. The factory floor counts on Asprova and makes numerous requests. These requests are being met one by one with the cooperation of ILC Corporation. In the future, Shonan Unitec plans to improve the mainframe as well as upgrade Asprova to better meet requests from the factory floor.

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ASPROVA

Case Study 5

Auto Parts Manufacturer

Auto Parts Manufacturer Chooses Asprova For Its Good User Interface

Reduces Labor of Adjusting The Schedule

An auto parts manufacturer had been using a custom-made scheduler running on DOS before switching to Asprova. As the number of products and the required number of production lots in their factory increased, they eventually exceeded the capability of the scheduler, and were forced to limit the number of products and to break orders into several groups to be scheduled in separate scheduling runs. Other problems, such as the inability to restrict color for each facility, worsened this scheduler's usability. After introducing Asprova, they became able not only to schedule all of the products simultaneously, but also to automatically assign jobs, taking into account the color restriction of each facility. These improvements, along with the ease of rescheduling using the Gantt chart, have considerably reduced the labor of adjusting the automatically generated schedules.

Problems Prior to Introduction

- INADEQUATE data processing capability of the existing custom made scheduler, leading to impracticalities such as having to limit the number of products and divide orders into several scheduling runs
- NUMEROUS typing misses when manually scheduling products that were left out of the schedule
- INABILITY to restrict colors in each facility, leading to inevitable manual schedule modification by an experienced schedule manager

Reason for Introducing Asprova

- EASE of understanding the schedule in Gantt chart form
- EASE of modifying the schedule by drag-and-drop on the Gantt chart
- ABILITY to restrict colors in each facility

Benefits of Introduction

- ENABLED all products to be scheduled simultaneously.
- ENABLED scheduling of many times the original data size in the same amount of time.
- REDUCED schedule adjustment work due to the ability to restrict colors in each facility.
- STANDARDIZED most of the scheduling work, by codifying schedule managers' know-how in the form of master data set into Asprova.

Data Volume

Finished products	60
Total items	60
Resources	46
Processes	1
Scheduling period	3 days
Scheduling cycle	Daily
Lots in scheduling period	about 3,000
Jobs in scheduling period	about 3,000

A System That Became Practically Useless

Before introducing Asprova, the auto parts manufacturer had been using a custom-made scheduler running on DOS. But because the processable number of lots was inadequate, their increasing number of finished products and their increasing number of production lots eventually exceeded this scheduler's data processing capability. Consequently, the factory had to artificially limit number of finished products, and divide the orders into groups that they scheduled in separate scheduling runs. This became quite a burden. Products that were left out at the schedule would be handled manually, but, as one manager said, "Manual scheduling was prone to typing errors and many other problems." Furthermore, diversification in the color of the products made it crucial to have a color restriction function in the schedule. But since the custom-made scheduler did not have that function, an experienced schedule manager would inevitably have to modify the schedule manually. Considering these problems, the manager says that the custom-made scheduler had become "practically useless."

They did think about ways to improve the existing custom-made scheduler, but as one of the managers said, "With the year 2000 at hand, introducing a scheduling package was much better than going through the hassle of improving the system."

After initially fruitless efforts in finding a package that would match their needs, they then found out about Asprova, and immediately requested a demonstration. Besides having the ability to restrict colors for each facility, "[Asprova's] GUI is incredibly easy to understand visually, and the ability to correct schedule using a mouse is just amazing," said one astonished manager. After learning more about Asprova's functions by using a trial version of Asprova and attending a training seminar, they decided to introduce Asprova.

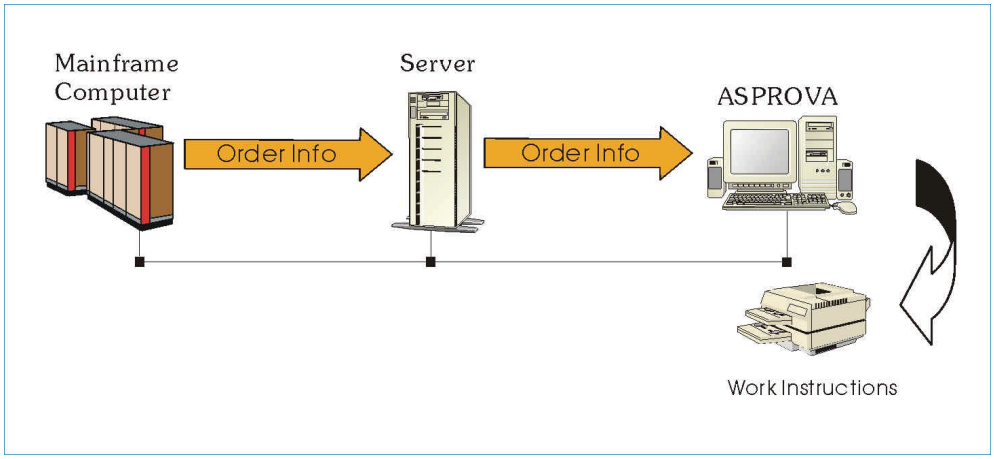

Figure 1: System Configuration
Scheduling is performed based on order data from the mainframe computer. Asprova's master data is entirely created on the PC. A daily report is generated after scheduling.

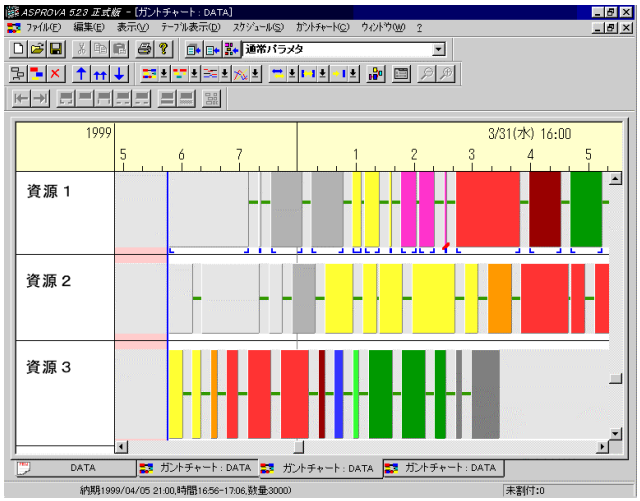

Figure 2: Gantt chart created from scheduling with Asprova. Product specifications are made easy to understand by intelligent use of colors.

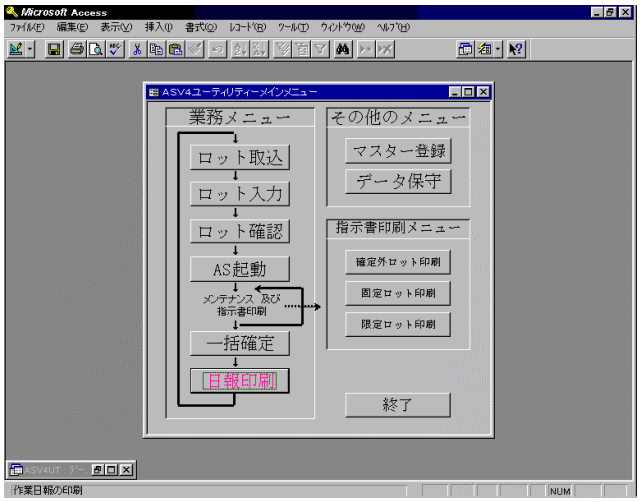

Figure 3: Customized screen of Asprova Utility. A variety of needs from the production site are reflected.

Reduces Labor of Adjusting The Schedule

It was recommended that initial implementation work, such as workers' education, creation of the master data based on schedule managers' knowledge, and development of peripheral functions, were to be done mainly by the company itself, with the support of the distributor International Laboratory Corporation. Development of peripheral functions was done in parallel with the test run. However, as one manager noted, designing and altering the functions to meet the demands from the production site was not easy.

Since the installation of Asprova, they have not only become able to schedule all of the products simultaneously, but they can now create this complete schedule in the same amount of time it took to create one of the partial schedule before, which had only included a fraction of the total data set. Regarding the time required to make a working schedule, one manager explains, "Since Asprova automatically creates a schedule that takes into account the color restriction of each facility, we don't need to do nearly as much adjusting work." What's more, they have been able to standardize most of the scheduling work by codifying schedule managers' know-how in the form of master data that was set into Asprova at the initial installation. In addition, while it has previously been difficult to explain the procedure for scheduling to new employees, this has became much easier because of how simple it is to verify and modify the schedule using Asprova's Gantt chart..

In the future, the company intends to transmit the schedule directly to facilities, to expand the number of processes in the schedule, and to meet various needs of the production site by more effectively using Asprova and by developing peripheral functions. Additionally, in developing the peripheral functions, the company plans to built an even easier-to-use system by reconstructing the utility in Microsoft Access and using Asprova plugin architecture.

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Introduction to the sample data

The sample data, the case studies of our clients who installed Asprova, is introduced here. If Industry sample data is needed, please sign up at the membership registration page of our website or at

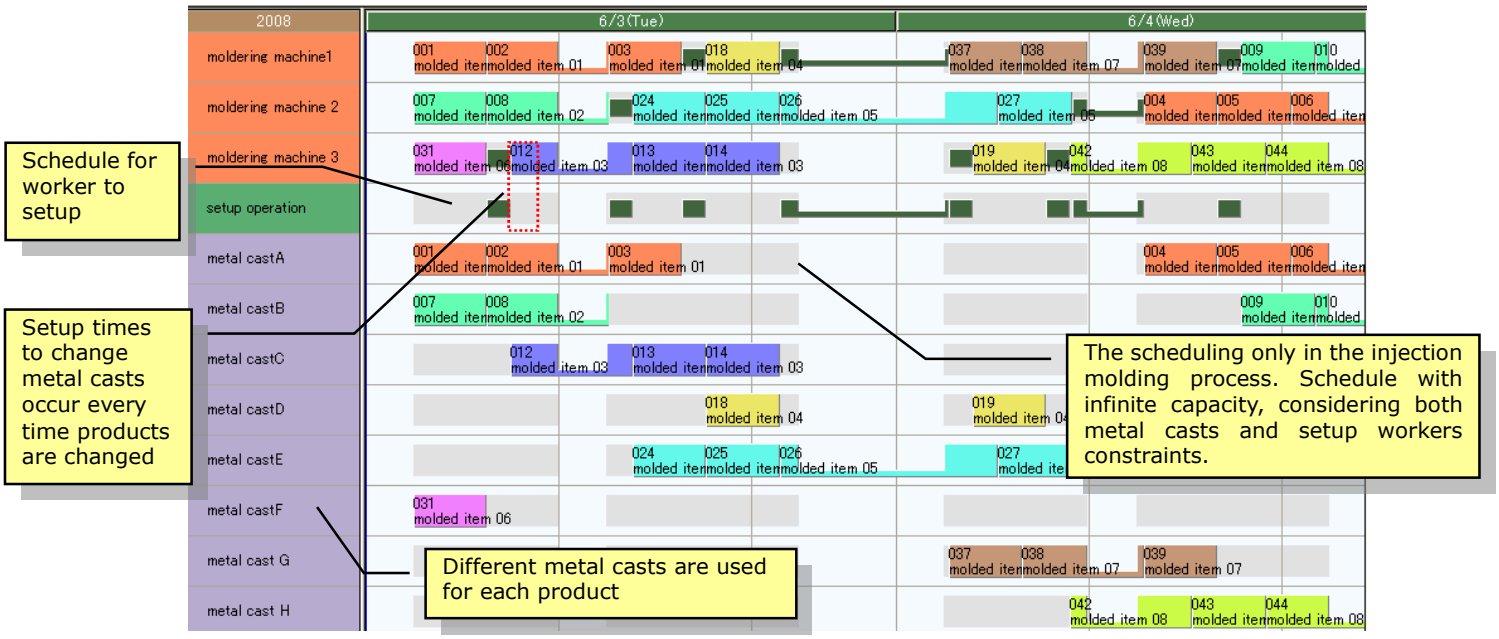
http://www.asprova.com/en/asprova/document_library.html

Industry Sample Data No.2

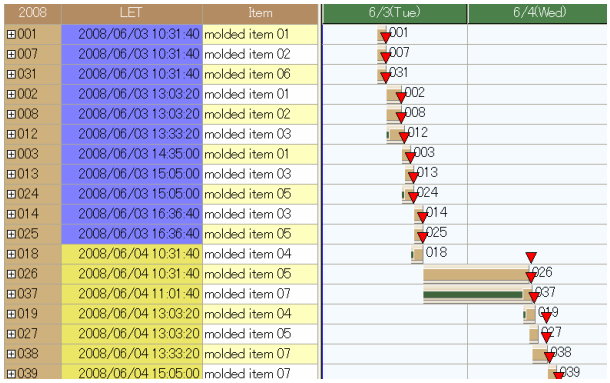
Automobile Bumper (injection molding)

Asprova MS+Option not in use

Schedule



Order Gantt Chart



Integrated Master Editor

	Item	Process code	TI	Instruction type	Instruction code	Resource/Item	F	Setup	Production	Teardown
1	molded item 01	molding		Use instruction	M	moldering mac		0	110sp	
2				Use instruction	S0	metal castA			0	
3				Use instruction	S1	setup operatio		0		
4	molded item 02	molding		Use instruction	M	moldering mac		0	110sp	
5				Use instruction	S0	metal castB			0	
6				Use instruction	S1	setup operatio		0		
7	molded item 03	molding		Use instruction	M	moldering mac		0	110sp	
8				Use instruction	S0	metal castC			0	
9				Use instruction	S1	setup operatio		0		
10	molded item 04	molding		Use instruction	M	moldering mac		0	110sp	
11				Use instruction	S0	metal castD			0	
12				Use instruction	S1	setup operatio		0		

Set up table (Item)

	Resource	Item L	Item R	Setup time	Sort order
1	moldering machine	*	*	30M	1
2	moldering machine	=	=	0S	10

Defining setup times which occur every time items are changed

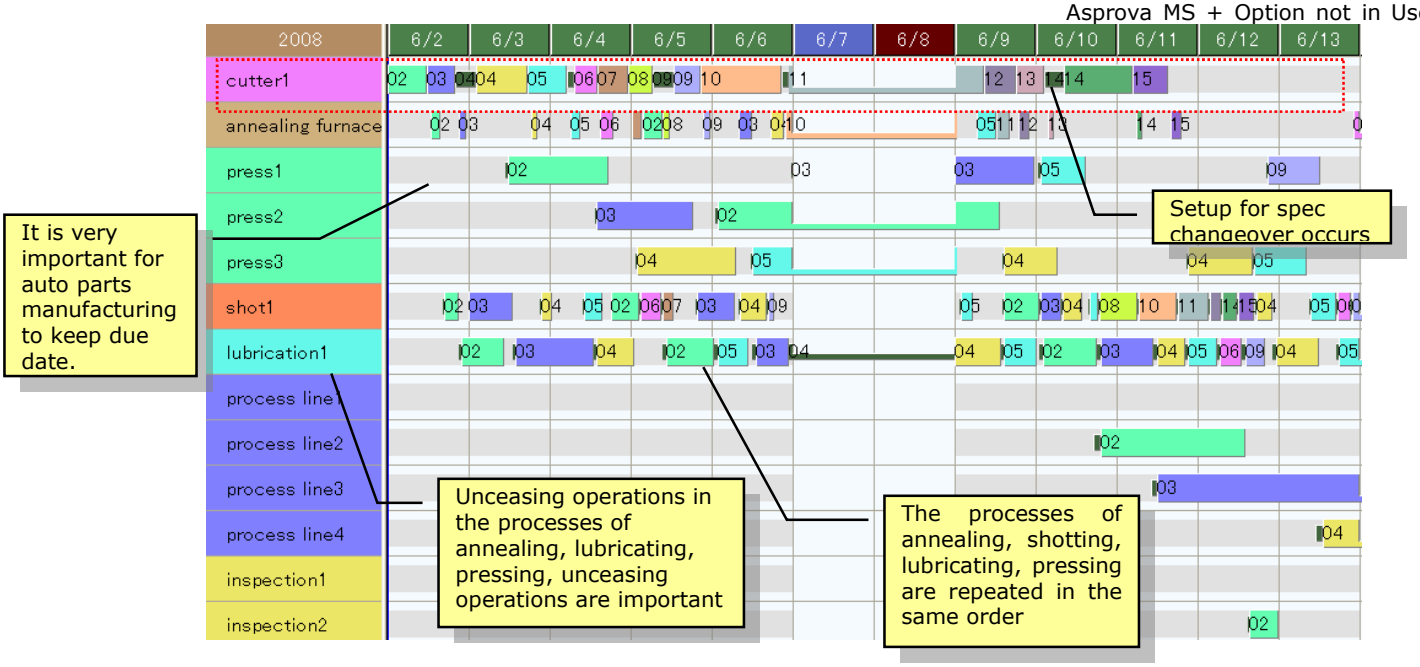
Data

Automobile bumper(injection molding).ar4

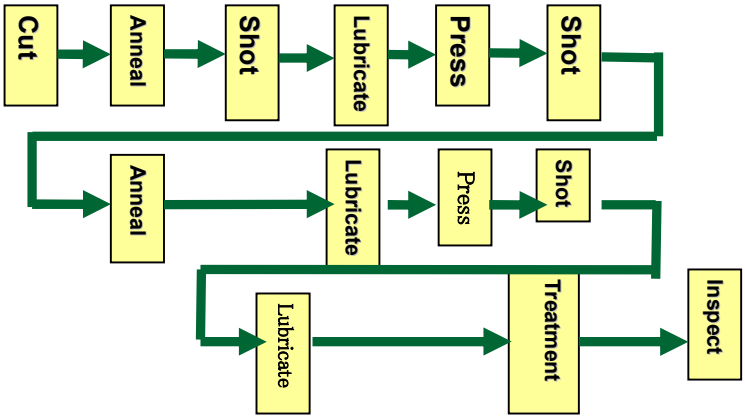
Industry Sample Data No.4

Metal Plate/Auto body (repeated process)

Asprova MS + Option not in Use



Flow Chart



To elevate the strength of the metal plates, the processes of annealing, shotting, lubricating, and pressing are repeated.

spec for each item and the setting of its changeover setup

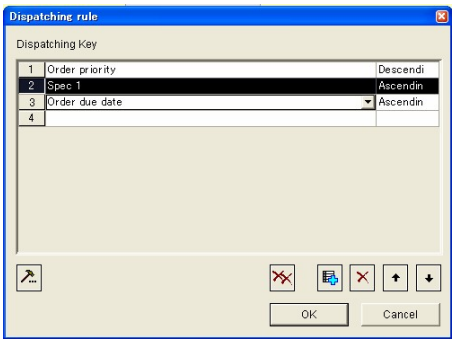
	Resource	Previous spec	Next spec	Setup time
1	cutter1	A	B	360M
2	cutter1	B	A	120M

	Item code	spec1
1	XT1-C	A
2	XT2-C	A
3	XT3-C	A
4	XT4-C	B
5	XT5-C	B

In the cutting process, setup for spec changeover occurs every time items' designated specs(A/B) are changed

Other factors

Other factor is to reduce the setups for spec changeover in cutting process. Scheduling parameter can reduce the number of the setup for spec changes occurring.



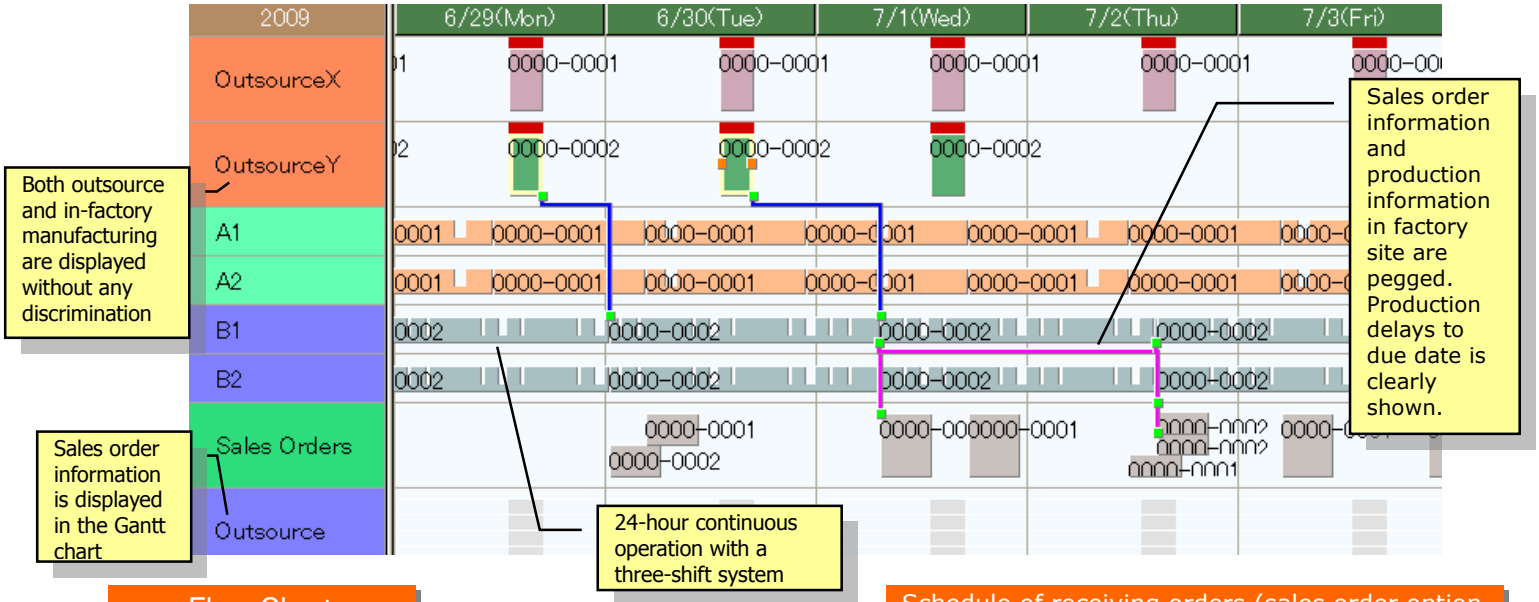
Data

This data is the sample 3 which is installed from Asprova's trial version.

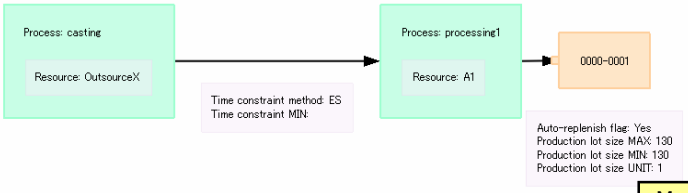
ASPROVA
Industry Sample Data No.5

Auto parts (Make to stock manufacturing)

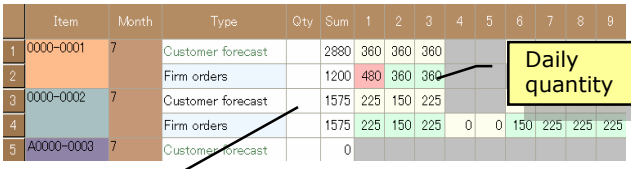
Asprova MS+ Sales Order OP
This data contains much data so that reschedule function does not work on trial version.



Flow Chart



Schedule of receiving orders (sales order option is required)



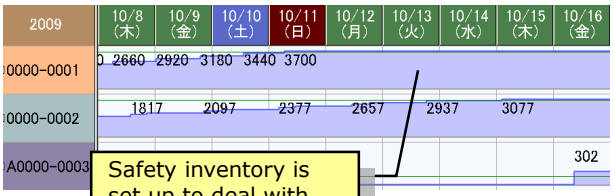
Make to stock manufacture is carried out with monthly temporary orders and weekly confirmed orders from clients.

Setting up auto-replenish production and safety inventory (Item table)

	Item code	Auto-replenish flag	Production lot size MAX	Production lot size MIN	Production lot size UNIT
1	⊞0000-0001	Yes	130	130	1
2	⊞0000-0002	Yes	140	140	1
3	⊞A0000-0003	Yes	288	288	1

Auto-replenish production function is used for production orders which are automatically made upon receiving temporary sales orders.

Inventory Graph (green line shows safety inventory)



Other Factors

Although backward scheduling is basically adopted, forward scheduling for continuous manufacturing is used when the total number of orders is large.

Data

Auto Parts(Make to stock manufacturing).ar4

Key points of Make-to stock Manufacturing

1. Master data is used repeatedly
2. Production plans are accompanied with accuracy including temporary and confirm orders and have safety inventories in order to deal with changes of sales orders
3. Accurate estimation of production plans is important to avoid parts shortage
4. Making middle or long-period plans to make purchase plans of material and parts which require long term from purchase date to delivery date
5. Mid and long-term plans are often made with MRPs before short-term plans which are made by production schedulers
6. Inputting timing of prototypes and small-number orders into the production lines which continuously manufacture same items is very important because setup times etc are related
7. Simulation for facility investment can be carried out with KPI functionality

Related features

Sales order option, Purchase option, Sales order schedule, Auto-replenish production, Safety stock, Material constraints, Assigning workers, Skill map, Inventory graphs, Load graphs, Production/purchase schedule, Sequence control option, evaluate schedule, Operation split, KPI option

APS Practical Training Seminar (held regularly at Asprova Distributors)
http://www.asprova.jp/seminar/file/seminar_expl2aps.html

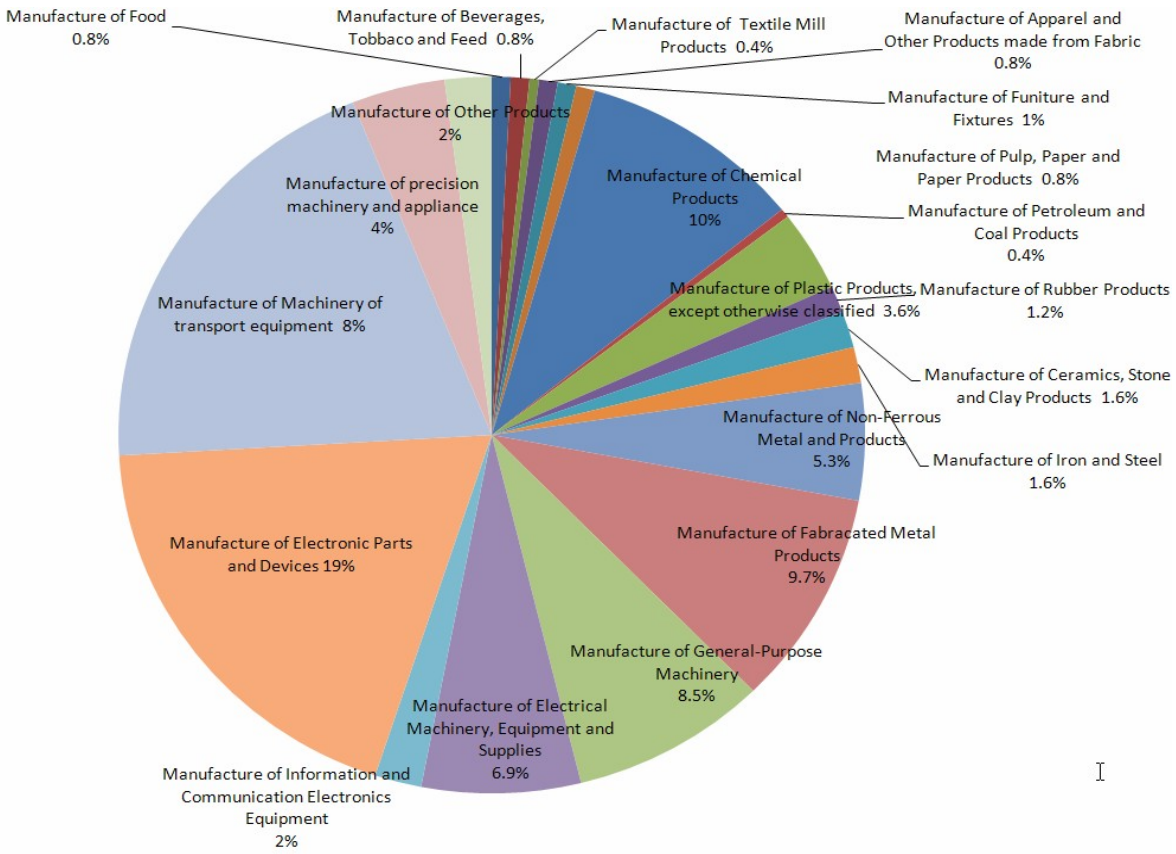
Key points of Make-to order Manufacturing

1. Registering new master data can be done efficiently in short hours. Or plans can made without master data registration.
2. Changing plans such as changing designs, time, resources, and workers after plans are made can be easily carried out
3. Confirming inventories immediately
4. Start orders should be made up in order to reduce setup times efficiently
5. Producing common parts together
6. Utilizing resources efficiently
7. You sometimes have safety inventories which are in-progress inventories of semi-finished products

Related features

Graphical BOM window, Parametric BOM, Auto-replenish production, Safety stock, Material constraints, Assigning workers, Skill map, Inventory graphs, Load graphs, Production/purchase plans, Sequence control option, Evaluate schedule, Operation split

The fields of Asprova users



Electric Electronics	LEDs, connectors, solderless terminals, microprocessors, printed circuit boards, silicon wafers, air conditioner cases (plastic molding), speakers, ceramics, watches, semiconductors, lead frames, CD-ROMs, CD-R / DVD / CD-ROM drives, electric wire, LCDs, stereos, photo masks, WF cables, sockets, mobile phones, connectors for mobile-phones, IC packages, aluminum electrolytic capacitors, photoresist, TFT modules, piston rings, needles, piano wire, printer pins, automotive meters, photoelectric board, digital cameras, car navigation systems, refrigerators, light fixtures, sensors, signal controllers, solar-powered battery modules, vacuum fluorescent displays, batteries, multipolar connectors, power cables, mainframe computers, projection equipment, quartz transmission equipment, desktop PCs, carbon electrodes, projectors, printers, power boards. heating equipment controllers, solar cell wafers, medical electrical equipment, SD cards, portal media players, connectors, bar code readers…
Automotive	Engine parts, doors, chassis, interior (plastic molding), metal molds, shock absorbers, vehicle inspections, pipes, tubes, engines, cranes, rubber, aircraft parts, test bodies, brake parts, high-pressure hose, seat fabrics, wire rope, transmissions, camshafts, crankshafts, cases, wire harnesses, motorcycles, bicycles, railway carriages, external parts for ships, anti-vibration equipment for vehicles, tires, movable cranes…
Machinery	Looms, kitchen appliances, machine tools, agricultural machinery, industrial machinery, optical instruments, light fixtures, air conditioners, heating appliances, plastic parts for office equipment, control computers, material handling equipment, power transmission equipment, power-driven hand tools, internal combustion engines, in-line instrumentation systems, wafer visual inspection equipment, centrifuges, sewing machines, heat treatment equipment, tanks, water tanks, turbines, condensers, model engines, vacuum pumps, wafer precision equipment, food products machinery, electric facilities, gas and water-related tools, water supply-related instruments, electric welders, stage lighting fixtures, sewing machine parts, pumps, ultrasonic diagnosis equipment, CNC, robot transfer machines, nuclear equipment, crystal units, rubber hose. Fire alarm equipment…
Metal	Drills, screws, cannons, wire, plumbing fixtures, guard rails, pipes, magnet wire, steel, sheet metal parts, fences, metal bridge parts, blades, connecting rods, nuts, industrial precious metal products, drawing alloys, aluminum for beverage cans, blades for cutting machines, gears, metal springs, timer parts, precision gears, aluminum foil, sheet copper, ship plates, drawn copper products, specialty steel products, cutting tool tips, lubricating oil packaging, beverage cans, magnets, seamless pipes, large scale pumps, process pump, coupling, clad steel sheet, transmission gear…
Non-metal	Corks, packaging, textiles, paper, shipping blocks, camera films, rubber products, ABS resin, synthetic resin, UV ink, gravure ink, printing of packing materials, coated abrasives, resin hose, coating materials, dental materials, film sheets, ceramic base for electronic parts, tiles, firebricks, new ceramics, catalysts, paper clay, fasteners, glass for LCD displays, adhesives, packing tape, stencil paper for wigs, sensitized resin, natural resin, cosmetics materials, inorganic pigments, lenses for microscopes, nonwoven fabric, aluminum foil, man-made leather, aluminum cans, resin mold, silicon wafer…
Consumer goods	Fermented soybeans, detergent, flour, plastic bags, plastic food containers, plastic models, office goods, fishing reels, microwave dinners, wood processing, socks, cans, cosmetics, rubber stamps, ballpoint pens, shampoo, shopping bags, cardboard, home exterior products, drinking water, entranceways, underfloor storage units, fixture components, shoes, toy parts, necklaces, stockings, office furniture & fixtures, coffee beans. Labels, envelopes, stationery, candy, gummy, seasoning, steel furniture, toner cartridge, curtains, food trays…
Medical	Medical products, test drugs, medical equipment, laboratory testing reagents, granulated powder, pills, endoscope, dental materials, clinical test medicine, chemicals…
Chemical	Adhesives, plastic, asphalt, silicon, motor oil, polyethylene, polypropylene, molding materials, rubber, fluorine chemical products, polyvinyl chloride, polyvinyl chloride paste, plastic paint products, make up products, chemical substances…

System requirements

Item	Requirement	
Memory	At least 1GB	
Hard Disk space	At least 300MB hard disk space	
CPU	Faster than 1GHz(If 64bit, it's compatible to x64)	
OS	Windows Server 2003 Windows 2000 Server	Windows Vista Windows XP Professional Windows 2000
Other	If using 64bit-CPU, compatible to x64	

※The requirement of Memory, hard disk space, and CPU depends on its usage and the amount of data dealt with.

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※Product specs are sometimes changed upon version-ups.

2009.9