Scheduling Agreements for Component Suppliers (SD-SLS-OA)

Release 4.6C

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Icons

Icon	Meaning
⚠️	Caution
🗨️	Example
💡	Note
🧭	Recommendation
SYN	Syntax

Contents

Scheduling Agreements for Component Suppliers (SD-SLS-OA)

Purpose

In the last decade, component suppliers have had to follow the example of the manufacturers they supply: to survive the changing market, they have had to reduce costs, increase quality, and increase speed of delivery.

The push to improve business processes has brought about many innovations in the industry, such as just-in-time processing. SAP has taken these innovations into account to provide component suppliers with the functions they need to better manage their business.

Integration

Electronic Data Interchange (EDI) plays an important role in scheduling agreement processing.

There are two important differences between standard scheduling agreements and scheduling agreements for component suppliers. Scheduling agreements with delivery schedules:

- Contain schedule lines in the delivery schedule, not in the actual scheduling agreement item

- Can be influenced by the customer who requests the release of a specific quantity of materials on a specific day

    In standard scheduling agreements, quantities and dates are fixed. Quantites and dates in scheduling agreements with delivery schedules are constantly changed and updated.

Features

We have added the following to standard scheduling agreements in order to accommodate the component supplier's special requirements:

- Control functions
  There are many settings for scheduling agreements, giving the component supplier the flexibility needed to create and control documents to meet a company's specific needs.

- A variety of sales functions for:
  - Engineering changes
  - Packing proposals
  - Open quantities
  - Returns

- A variety of functions in delivery schedules for:
  - Intermediate documents (IDocs)
  - Checks on incoming delivery schedules
  - Requirements planning and delivery

> ➢ Tolerance levels
>
> ➢ Analysis
>
> ➢ Year changes
>
> ➢ Cumulative quantities

- Special shipping, billing, and external agent functions

- Planning delivery schedule processing

  The planning delivery schedule, a new type of *internal* schedule, has been designed to help the component supplier realistically plan requirements.

- Delivery order processing

  The delivery order is based on the pick-up sheet used in the Material Information System (MAIS).

Constraints

Scheduling agreements with delivery schedules are not supported in assembly processing or third-party order processing.

Also, copying control for sales documents does not support copying data from a preceding document into scheduling agreements with delivery schedules. You can, however, copy data into other documents from scheduling agreements with delivery schedules using the *Create with reference to* function.

Scheduling Agreement with Delivery Schedules

Definition

An outline agreement that is created for one or more materials and outlines the overall expected quantity of the material(s) to be delivered to the customer over a specific period of time.

Use

The scheduling agreement is used as a basis for delivering a material. The customer sends in scheduling agreement releases, referred to as delivery schedules, at regular intervals to release a quantity of the material.

Structure

Header		Customer 21465	
Item		Material 122257	
Delivery schedule	Forecast delivery schedule　27 Just-in-time delivery schedule　27 Planning delivery schedule　27	History	FRC　26 JIT　26 PLN　26
Schedule lines	FRC　27　M　7/99　100 pieces JIT　27　D　7/5/99　25 pieces PLN　27　D　7/5/99　23 pieces		FRC　26　M　6/99　125 pcs JIT　26　D　6/14/99　30 pcs PLN　26　D　6/14/99　27 pcs
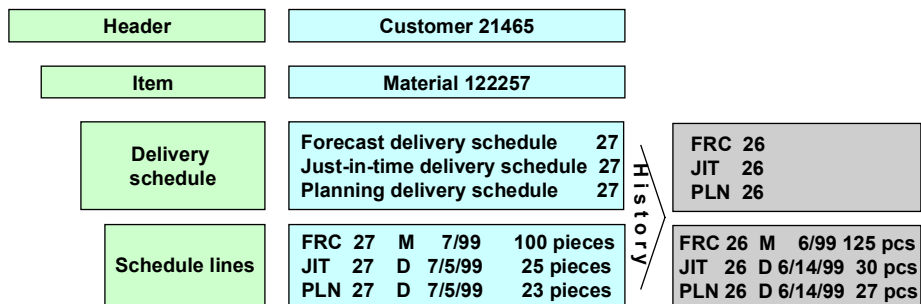
The structure of scheduling agreements with delivery schedules resemble that of other sales documents in the R/3 System, in particular the standard scheduling agreement.

Data that applies to the entire document appears in the header; data about materials appears at item level; and delivery dates and quantities appear in the schedule lines within the delivery schedule. Additionally, the system maintains a history [Page 42] that permits you to compare and contrast various generations of delivery schedules.

Integration

Data in scheduling agreements comes from three sources:

- The customer sends in requested quantities and dates, normally by Electronic Data Interchange (EDI)

- The component supplier enters data manually

- The system automatically copies data into the scheduling agreement from master records

Controlling Scheduling Agreements

In addition to general control functions [Ext.] for sales documents, there are specific controls for scheduling agreements with delivery schedules. You configure these controls in Customizing for Sales.

Document Types

To configure document types for scheduling agreements, choose *Sales → Sales Documents → Sales Document Header → Define sales document types* in Customizing for Sales and Distribution.

In the scheduling agreement section for new entries, you can set:

- The delivery type for correction deliveries used to correct deviations in cumulative quantities

- The use indicator, such as replacement, sample, or series

- Block **07** to block deliveries when the system determines that a tolerance limit in the scheduling agreement was not reached or exceeded after comparing the old and new delivery schedules

The system automatically takes these settings into account when you create a scheduling agreement with delivery schedules.

The R/3 System contains the following document types for component suppliers:

- **LZ** - Scheduling agreement with delivery schedules (no external agents)

- **LZM** - Scheduling agreement with delivery orders [Page 76]

- **LK** - Scheduling agreement with delivery schedules (external agents)

- **ED** - Delivery by external agent (consignment issue)

- **EDKO** - External agent correction

- **RZ** - Scheduling agreement returns (no external agents)

- **KAZU** - Consignment pick-up for external agents

- **KRZU** - Consignment returns for external agents

Item Categories

To configure item categories for scheduling agreements, choose *Sales → Sales Documents → Sales Document Item → Define item categories* in Customizing for Sales and Distribution.

In the transaction flow section for new entries, you can set incompletion procedures for item categories. These specify which data must be maintained in a document in order for it to be considered complete and therefore relevant for further processing.

- Incompletion procedure 34 is for scheduling agreement items with delivery schedules (or delivery orders)

- Incompletion procedure 36 is for scheduling agreements with external agents

The system determines the following item categories for the related document types in documents containing materials with item category group **NORM**:

- Item category **LZN** for scheduling agreement type **LZ**

- Item category **LZMA** for scheduling agreement type **LZM**

- Item category **LKN** for scheduling agreement type **LK**

- Item category **KEN** for document type **ED**

- Item category **EDK** for positive corrections (or the manual alternative **EDK1** for negative corrections) for document type **EDKO**

- Item category **REN** for document type **RZ**

- Item category **KAN** for document type **KAZU**

- Item category **KRN** for document type **KRZU**

Schedule Line Categories

The schedule line category controls whether schedule lines in delivery schedules are relevant for planning and/or delivery. The system determines this category on the basis of the planning indicator [Page 38] in the forecast delivery schedule, then in the just-in-time (JIT) delivery schedule.

To configure schedule line categories for scheduling agreements, choose *Sales → Sales Documents → Schedule lines → Define* or *Assign schedule line categories* in Customizing for Sales and Distribution.

For scheduling agreements with delivery schedules, you must assign at least four schedule line categories to combinations of item category and requirement planning type:

- The basic schedule line category (field *SchLC*) is relevant for planning and delivery

- The alternative schedule line category (field 1 *MSLCa*) is relevant for planning, not delivery

- The alternative schedule line category (field 2 *MSLCa*) is relevant for delivery, but not planning

- The alternative schedule line category (field 3 *MSLCa*) is not relevant for planning or delivery

When you have made these assignments, all possible combinations are covered during automatic determination. If any are missing, the system will not be able find the appropriate schedule line category and will generate an error message.

The R/3 System contains the following schedule line categories for component suppliers:

- **L1**, **BN**, **L2**, and **CN** for item category **LZN**

- **E4**, **E0**, **E5**, and **BN** for item category **LKN**

- **L2** for item category **LZMA** (standard for delivery order processing)

> Although the availability check is switched off in the standard system for these categories, the system may carry out a transfer of requirements for some of them. Even when the availability check is switched off, you must use an **availability check group** for all materials in scheduling agreements with delivery schedules. Otherwise, the system will not transfer requirements.
>
> If the availability check is switched on and the transfer of requirements switched off for a schedule line type, the system will not take it into account!

Schedule Line Types

To configure schedule line types for scheduling agreements, choose *Sales → Sales Documents → Scheduling Agreements with Delivery Schedules → Define schedule line types* in Customizing for Sales and Distribution.

The schedule line type in the delivery schedule specifies, for example, whether an item is a backlog item, or one which is required immediately.

The R/3 System contains the following schedule line types for component suppliers:

- Fixed date

- Backlog

- Immediate requirement

- Forecast delivery schedule

- Just-in-time (JIT) delivery schedule

The schedule line type is for information purposes only and does not in any way influence processing.

Controlling Inbound EDI

Output control integrates all required output types such as goods issue/receipt slips, delivery notes, credit and debit memo requests, invoices, and many more. Because customers who send you these documents by Electronic Data Interchange (EDI) may have special requirements, the R/3 System allows you to carry out checks specific to the customer and process inbound messages accordingly.

You configure inbound EDI delivery schedules in Customizing for Sales. Choose *Sales Documents → Scheduling Agreements with Delivery Schedules → Control EDI Inbound Processing*. The following subtopics are set up just as you find them in Customizing.

Additional Information

For more information on EDI in general, see IDoc Interface / Electronic Data Interchange [Ext.] under *Basis Components → Basic Services / Communication Interfaces (BC-SRV)*.

For information on EDI specific to Sales and Distribution, see Electronic Data Interchange / IDoc Interface (SD) [Ext.].

For related information, see the intermediate document [Page 30] (IDoc) process flow.

Assigning a Sold-to Party

Customers do not generally send their customer number along with delivery schedules. For this reason, you must set the system to determine a sold-to party number based on other data sent in by the customer, such as the vendor number, partner description, and unloading point.

Note the following when making these settings:

- The vendor number you enter here must have ten digits. If the number from the master record does not have this many, you must enter as many zeros before the number as necessary.

- The system uses the partner field (PARTN) from segment E1EDKA1 as the customer plant. In this case, the field PARVW must be "WK". At item level, the system uses the field for the customer plant (KWERK) from segment (E1EDP10). Make sure you enter the sold-to party plant as partner description for the ship-to party.

- You can leave the unloading point blank if the customer does not usually send this information in the delivery schedule.

- The sold-to party number is *your* number for the customer.

Special Features for Delivery Schedules

Special features for delivery schedules allow you to define for each sold-to party or combination of sold-to party/unloading point how delivery schedules are to be processed. The system checks this record in Customizing for every incoming delivery schedule. If it cannot find a record for the particular sold-to party, it issues an error message and ends processing of the IDoc.

There are several optional features that you can set in this record. You can:

- Enter a message version

  Using a version, you can designate how the system should react to errors during checks on the incoming delivery schedules of a particular sold-to party. You can set the system to issue a warning message, an error message, or no message at all. You can also, for example, set all the messages to be issued as errors. Note that in the standard system, all variable messages are issued as warnings.

  There are no preset version numbers in the standard system. You can maintain new ones by choosing *Sales → Sales Documents → Define variable messages.* Here, you can assign message types different from those in the standard system to individual messages.

  Opel: Version 01　→ Message 071 (message type: error)

  Autos Inc.: Version 02 →　Message 071 (message type: none)

  In this example, version 01 has been defined for Opel and contains message 071: "Check item X, quantity change exceeds the change tolerance". This message has been designated as an error message.

  Version 02 has been defined for Autos Inc. Since the customer does not attach much importance to tolerance levels, no message category has been assigned to message 071. If the system determines that a tolerance level has been exceeded, no message will be issued.

- Activate a **special rule** for an automobile manufacturer

  You can use this field to refer to any of the various user exits that you program for EDI processing. The system will then take the user exits into account when processing delivery schedules for the automobile manufacturer that you designate.

  An automobile manufacturer sends material numbers in just-in-time (JIT) delivery schedules in a different format than in forecast delivery schedules. You program a user exit to convert the format of material numbers sent in JIT delivery schedules to match that in forecast delivery schedules.

- Enter a **delivery prefix** for the customer delivery number

  Customers often use only a portion of your internal delivery number for their records, usually the last few digits. When they send this number in a delivery schedule, the system adds to it the prefix that you have entered here to find the internal delivery number. The system uses the last internal delivery to check self-billing documents [Page

56]. Or you can manually call up the last delivery to check or recalculate cumulative quantities.

- Specify whether the system should use the customer **purchase order number** or **unloading point** sent in the delivery schedule to find the related scheduling agreement

- Specify how data on **packaging material** sent in a delivery schedule should be handled

  You can set the system to:

  - Automatically send a mail informing the employee responsible that packaging data is available for processing

  - Send a mail, and copy the data as text into the scheduling agreement

  - Ignore packaging data altogether

  - Copy data into the scheduling agreement with no mail

- Specify whether an employee should be notified if **general texts** are sent in a delivery schedule

- Activate **test runs** for delivery schedules

  When you set this indicator, the system **does not** automatically process an incoming delivery schedule. It sends the employee responsible a mail and the IDoc must then be processed manually.

Delivery Intervals

Some customers send delivery schedules in weekly quantities to their component suppliers along with additional indicators that specify that these quantities are to be split up and delivered on certain days of the week. You define delivery intervals by assigning a key to the customer and marking the required delivery days for the key. When the system receives an incoming delivery schedule, it automatically divides up the weekly quantities into daily quantities and assigns them to the days that you have designated in the key.

You can also split **monthly** delivery quantities by selecting the *Month* field in the delivery interval key.

> The delivery interval function is in no way associated with the splitting function [Page 102] in planning delivery schedule processing.

Example

You assign an automobile manufacturer delivery interval key 01. They have asked that you deliver materials only on Mondays, Tuesdays, and Wednesdays. You mark these days in the key.

Soon after, you receive a delivery schedule with a weekly schedule line for 60 pieces. The system automatically divides the quantity and assigns them to the three days according to key 01.

Result: The automobile manufacturer receives 20 pieces each on Monday, Tuesday, and Wednesday.

Special Features for External Agents

External agents [Page 66] report back to you in the form of delivery notes, deliveries made to the customer on your behalf. You may want to run specific checks on external agent delivery documents sent to you by EDI by a particular external service agent.

Special features for external agents are similar to those for standard delivery schedules. They allow you to define how delivery notes from the external agent are to be processed for each sold-to party, supplied by the external agent, or combination of sold-to party/unloading point. You can:

- Activate **test runs** for incoming EDI external agent delivery notes

- Specify how data on **packaging material** sent in an external agent delivery note should be handled

  You can set the system to:

  − Automatically send a mail informing the employee responsible that packaging data is available for processing

  − Send a mail, and copy the data as text into the scheduling agreement

  − Ignore packaging data altogether

  − Copy data into the scheduling agreement with no mail

- Specify whether an employee should be notified if **general texts** are sent in an external agent delivery note

- Specify the sales document type with which you create delivery by external agent [Page 69]documents

  This is sales document type **ED**, delivery by external agent (consignment issue), in the standard system.

Special Features for Self-Billing

There is a variety of billing methods which your customer can use to settle business transactions. With the special self-billing features, you can make settings to run specific checks on incoming self-billing documents [Page 54] sent to you by EDI by a particular customer.

These billing features are similar to those for standard delivery schedules. They allow you to define how self-billing documents are to be processed for each sold-to party or combination of sold-to party/unloading point. You can:

- Activate **test runs** for incoming EDI self-billing documents

- Make settings for self-billing [Page 56]

  This includes:

  - Defining sales document types for credit and debit memo requests that the system creates when it receives a self-billing document from the customer requiring a credit or debit to the customer's account.

    In the standard system, sales document type **G2** is for credit memo requests and **L2** for debit memo requests.

  - Activating a **special rule** for an automobile manufacturer

    You can use this field to refer to any of the various user exits that you program for EDI processing. The system will then take the user exits into account when processing billing documents for the automobile manufacturer that you designate.

  - Specifying whether an employee should be notified if **general texts** are sent in a billing document

- Make settings for self-billing with invoice creation [Page 62]

  This includes:

  - Defining billing document types for invoices, and credit memos sent in by the customer to correct quantity differences

  - Defining retro-billing document types for credit and debit memos sent in by the customer to correct prices

  - Specifying whether an invoice is to be created for every external invoice sent in by the customer

    The system normally creates an invoice in the R/3 System exactly as it is received from the customer. This may not always be possible, for example when there are items not relevant for billing, or when the document requires an invoice split. In these cases, the system **does not** create an invoice.

    By setting this indicator, you can create invoices for **testing** purposes even in those circumstances when the system normally would not.

  - Specifying the default values of an invoice in case the system cannot determine this information from the delivery, or other internal referenced document, referred to in the intermediate document (IDoc)

- Assign external conditions to internal conditions

For only those conditions that you enter here, the system compares the value of the internal condition with that of the external condition sent in the external invoice.

You can specify that the system should take these differences into account by setting the related indicator. If there are differences in these values, the system updates the IDoc status records and sends a mail to inform you. It continues processing the IDoc and, if no serious errors occur, creates the invoice anyway. This function is only available for the self-billing procedure with invoice creation.

With user exit EXIT_SAPLVED5_003 [Page 65], you can design your own tolerance checks.

- Define tolerance levels [Page 59] for differences between external and internal conditions

In the standard self-billing procedure, the system compares the values in the credit advice with those in the existing internal invoice. If the system finds any differences in these values, it terminates processing.

With this function you can define differences that the system tolerates. In this case, even if the system determines differences in the external and internal condition values, it ignores them and continues processing the IDoc.

Initial Data Transfer - Scheduling Agreements

Use

You can transfer scheduling agreements for component suppliers from a legacy system to the R/3 System using the Sales and Distribution (SD) Data Transfer Workbench [Ext.]. The system uses this standard program to transfer header and item data.

Features

Two fields, designed specifically for scheduling agreements, have been added to communication structures VBAPKOM and BVBAPKOM to allow you to transfer an external cumulative quantity and date. The system uses this data to create a correction delivery [Page 45] and set up a *beginning cumulative quantity* in the new scheduling agreement.

Constraints

This function does not include the transfer of schedule lines in delivery schedules.

Activities

Use data transfer object **90** (sales documents) for scheduling agreements for component suppliers.

Creating Scheduling Agreements

To create a scheduling agreement with delivery schedules:

1. In the Sales menu [Ext.] choose *Scheduling agreement* → *Create*.

2. Enter scheduling agreement type **LK** (standard) or **LZ** (external agents) and the relevant organizational data.

3. Choose ENTER.

4. Enter the following data:

   – Sold-to or ship-to party number

   – Purchase order or closing number

   – Material or customer material number

   You can use the *Description* field to identify the scheduling agreement. For example, you could enter the model year for a particular production series.

   The system allows up to **35 digits** for a customer material number.

   – Rounding quantity [Page 26]

   – Usage

   Choose *Goto* → *Header* → *Sales* to enter the usage at header level, or *Goto* → *Item* → *Sales A* to enter it at item level. The system proposes usage **S**, for series, as default in both cases.

   – Planning indicator [Page 38]

   Choose *Goto* → *H*eader → *Sales*.

   – Target quantity

   Mark an item and choose *Goto* → *Item* → *Sales A*

   – Partners

   For scheduling agreements with external agents [Page 69], choose *Goto* → *Header* → *Partners* to enter the external agent as forwarding agent and special stock partner on the partner function screen.

5. Create a delivery schedule [Page 34].

   Mark an item in the scheduling agreement and choose *Goto* → *Item* → *<Delivery schedule>*. Enter:

   – A delivery schedule number and date

   – The cumulative quantity received by the customer

   – The last delivery confirmed by the customer

   – A schedule line with date, time, and quantity

   To enter additional data in the delivery schedule, choose *DlvSch.Hdr* (delivery schedule header).

Creating Scheduling Agreements

6. Save the scheduling agreement.

Changing Scheduling Agreements

To change a scheduling agreement with delivery schedules:

1. From the <u>Sales menu [Ext.]</u> choose *Outline agreement* → *Change.*.

2. Enter a scheduling agreement number or use the matchcode to find one.

   Besides the standard matchcode, you can use the fields in the *Further search criteria* section to find a scheduling agreement.

3. Choose `ENTER`.

   The system may issue a message reminding you that there are subsequent documents to be considered. To display these, choose *Environment* → *Display document flow*.

4. Make your changes to the scheduling agreement. To change a delivery schedule, mark an item and choose *Goto* → *Item* → ‹Delivery schedule›.

   You can change the delivery schedule or create a new one by choosing *New dlv sched* with or without proposal.

   When you create a delivery schedule **with proposal**, the system copies schedule lines from the previous delivery schedule into the new delivery schedule. You can then modify schedule lines that have changed or add new ones.

   When you create a delivery schedule **without proposal**, the system generates a delivery schedule with empty schedule lines which you then maintain manually.

5. Save the scheduling agreement.

Entering Packing Proposals

In the component supplier industry, there are normally regulations on how and in what quantity a material is to be packed. The packing proposal function allows you to quickly and flexibly pack materials for delivery.

If a packing proposal is not sent by the customer in the intermediate document (IDoc), you can enter the proposal manually in the scheduling agreement:

1. In the *Rounding quantity* field in the item overview screen, specify how much of an item is to be packed in one shipping unit.

   The system will then round quantities so that only complete shipping units are delivered. If you do not want to round up to complete shipping units, set this quantity to zero.

2. Choose *Extras → Packing proposal.*

   If you have entered a value in the *Rounding quantity* field, the system copies it to the *Pack items* screen.

Standard packing functions [Ext.] are also available for scheduling agreements with delivery schedules.

Engineering Changes

Use

Engineering changes (ECNs) to individual materials in a production series are common in the component supplier industry. The customer requests a change by sending in the same material number as before with a supplementary, engineering change number. This engineering change status is linked to the serial number in the R/3 System, allowing you to take the change into account for future deliveries.

Activities

To process a material with engineering changes, select a scheduling agreement item and choose *Goto → Item → Eng.change statuses*.

If no engineering change status exists for the item, the system displays a dialog box. Here, you can choose whether you want to process change statuses on the basis of the delivery date or the cumulative delivered quantity. You can only choose one type of processing per item:

- If you choose *Date-related*, the system displays a screen where you enter the specific delivery date as of which the engineering change should take effect.

- If you choose *Cum.qty-related*, the system displays a screen where you enter the specific level of cumulative delivered quantity, and fiscal year, as of which the change should take effect.

In addition to these basic settings, you enter the customer's engineering change statis and assign it to the relevant serial number in your system. With the active indicator, you can specify whether the change status is relevant for requirements planning and delivery, or whether it is only for information purposes. Whether active or inactive, the engineering change with its related serial number is copied into the delivery [Page 51].

⚠️

> Make sure that you transfer only **individual requirements** for materials with engineering changes. This is because change statuses can be different for each item. If you transfer total requirements in this case, serial numbers will not be forwarded to production.

Integration

The engineering change function is not only available in scheduling agreements. It is also possible to include engineering changes in **sales orders**, where you can assign an engineering change status to a serial number at item level (choose *Goto → Item → Sales A*).

This function in sales orders allows you to:

- Print engineering changes in material tags from the delivery (VDA 4902)

- Process special transactions that occur outside of the scheduling agreement

- Process components that have been damaged by the customer, repaired by you and sent back to them

- Process deliveries made to the customer by an external agent

Engineering Changes

There are two constraints, however: you cannot work with engineering changes based on cumulative quantity levels, and, just as in scheduling agreements, you cannot manage stock according to engineering changes.

Returns for Scheduling Agreements

Use

With this function, you create a return for scheduling agreement items.

Features

When processing returns for scheduling agreements with delivery schedules, note the following:

- Use document type **RZ** for returns
  To ensure immediate pick-up, the system automatically creates an immediate delivery when you save a return with this document type. If you do not want this, create a new sales document type in Customizing and switch off the immediate delivery indicator. You can then create and process returns from a work list.

- Use document type **KRZU** (consignment returns) or **KAZU** (consignment pick-up) for returns involving external agents [Page 69]. Create returns with reference to the relevant scheduling agreement.

- When the customer posts goods receipt, their system automatically updates the cumulative quantites. For this reason, you may want to correct your cumulative quantities only when the customer sends the items back without having posted goods receipt.

- Cumulative quantities are **not** updated automatically. You must correct [Page 45] them manually.

- Choose *Goods issue* to book goods receipt.

Additional Information

For general information on returns, see Complaints [Ext.].

Intermediate Documents for Scheduling Agreements

Purpose

When a customer sends in a document by Electronic Data Interchange (EDI), it is converted into an intermediate document with SAP format before being introduced into the R/3 System.

Process Flow

Note that this process flow uses delivery schedules as an example. External agent [Page 69] documents and self-billing [Page 54] documents sent by EDI are processed in much the same way.

```
                    ┌─────────────────────┐
                    │      Customer       │
                    └─────────────────────┘
                         ┌────────┐
                         │ IDoc   │
                         │ mat 1  │
                         │ mat 2  │
                         │ mat 3  │
                         └────────┘
                             │
          ┌──────────────────────────────────────────────── R/3
          │          ┌─────────────────────┐
          │          │    EDI subsystem    │
          │          └─────────────────────┘
          │     ┌────────┐ ┌────────┐ ┌────────┐
          │     │ IDoc   │ │ IDoc   │ │ IDoc   │
          │     │ mat 1  │ │ mat 2  │ │ mat 3  │
          │     └────────┘ └────────┘ └────────┘
          │           │        │        │
          │   Warning ┌─────────────────────┐  Error
          │           │ Sales and Distribution│
          │           └─────────────────────┘
          │                    │ OK
          │  ┌──────┐          │         ┌──────┐
          │  │ Mail │          │         │ Mail │
          │  └──────┘   ┌────────────┐   └──────┘
          │  ┌────────┐ │ Scheduling │   ┌─────────┐
          │  │Display │ │ agreement  │   │ Process │
          │  │warning │ │┌──────────┐│   │ online  │
          │  └────────┘ ││ Delivery ││   └─────────┘
          │             ││ schedule ││
          │             │└──────────┘│
          │             └────────────┘
          └───────────────────────────────────────────────
```
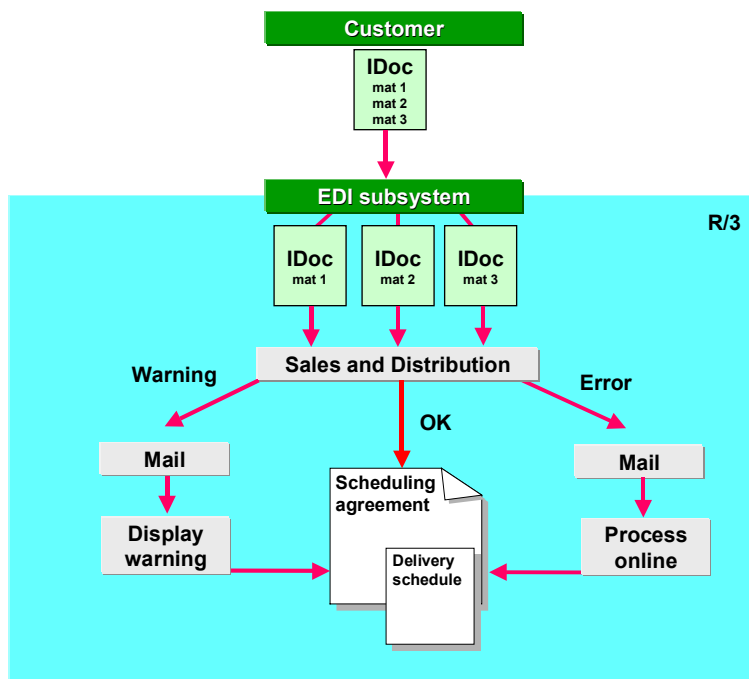
1. The customer normally sends several material numbers, and their corresponding schedule lines, in one delivery schedule.

2. The EDI subsystem attached to the R/3 System converts the delivery schedule to SAP format and divides the delivery schedule up to create one IDoc per material number.

3. EDI Basis reviews the control record in the IDoc. According to these records, and your settings in Customizing for EDI, each IDoc is transferred by workflow to a function module in Sales and Distribution, such as IDOC_INPUT_DELINS.

4. The system processes each IDoc in the background, taking into account any special features that you have specified in Customizing [Page 16]. It uses criteria in the IDoc to determine the sold-to party [Page 15] and the related scheduling agreement.

   To find the scheduling agreement, the system checks:

   • Customer/Material number

   • Customer number

- Customer plant

- Purchase order number or unloading point, if you have activated the check in Customizing [Page 16]

- Usage indicator [Page 23], if you have entered one in the scheduling agreement header

- General text (field KTEXT)

Note that the system checks only items that have not been rejected. If this search is unsuccessful, the system also checks on the basis of the customer/material number only.

Result

If processing is successful, the system creates or updates the delivery schedule in the scheduling agreement. The IDoc is sent back to EDI-Basis which updates the status records.

If it cannot find the scheduling agreement, or if an error occurs in processing, the system determines [Page 32] the employee responsible and sends an electronic mail. This person can then:

- Switch to the scheduling agreement change mode (transaction VA32) and find the scheduling agreement manually by entering the criteria in the "further search criteria" section of the change screen. If necessary, change the scheduling agreement to correspond to the IDoc.

- Process the IDoc manually in order to review all of the data in the different steps of the IDoc and correct it if necessary.

- Create a new scheduling agreement if the IDoc is correct, and there is no existing scheduling agreement

To display the IDoc for the current delivery schedule, choose *DlvSch.Hdr* on the delivery schedule tabstrip. Then choose *Edit → Curr. IDoc for dlv.sched*.

Additional Information

For information on Customizing settings for incoming IDocs for component suppliers, see Controlling Incoming EDI [Page 14].

For more information on EDI in general, see IDoc Interface / Electronic Data Interchange [Ext.] under *Basis Components → Basic Services / Communication Interfaces (BC-SRV)*.

For information on EDI specific to Sales and Distribution, see Electronic Data Interchange / IDoc Interface (SD) [Ext.].

For related information, see the intermediate document [Page 30] (IDoc) process flow.

Determining Notification Recipients

Use

If a warning or error occurs during processing of an incoming document by Electronic Data Interchange (EDI), the system determines the employee responsible, or agent, and sends a workitem [Ext.] by electronic mail.

The system first tries to determine a notification recipient at the **sales document level**. Because sales documents in scheduling agreement processing normally contain only one material, you can also consider this a search at the material level. If the system fails to determine a recipient this way, it carries out a more general search at the **customer level**.

Features

When you receive an incoming EDI document, the system searches for the reference sales document. If it finds one, it looks for partner function **ED** in the document header. This is a special partner function that has been specifically developed for notification recipients in incoming EDI processing for component suppliers. You can enter it manually in documents in the *Partner* screen, or the system copies it to sales and shipping documents from the sold-to party master record.

If the system finds this partner function, it sends an electronic mail to the partner using the personnel number that you have assigned.

> In sales documents, you cannot process recipients according to work center, job, organizational unit, position, or user. You can only work with personnel numbers, partner type **PE**. The system only allows one personnel number each in the sales document and customer master.

If an error occurs in processing before the system has found a sales document, or the initial search is unsuccessful, for example because the partner does not have the required partner function, the system uses the standard method of finding a recipient with the customer number defined in the partner profile [Ext.].

There is another method, different from the above standard, to specify a notification recipient for an incoming document that you have just processed. With user exit EXIT_SAPLVED4_004, you can use the IDoc message type as import parameter, or the IDoc control record and data record as table parameters.

Transmit a user type in export variable E_USRTYP and a user name, or number, in export variable E_USRKEY. If you do not maintain both export parameters, the system does not take the user exit results into account.

Integration

This function is available for all documents associated with scheduling agreements:

- Delivery schedules (function module IDOC_INPUT_DELINS)
- Delivery orders (function module IDOC_INPUT_ORDERS)

- External agent delivery notes (function module IDOC_INPUT_EDLNOT)

- Self-billing documents (function module IDOC_INPUT_GSVERF)

   For self-billing documents, the system takes the personnel number from the delivery header instead of the sales document header.

   The recipient determination function is not available for self-billing with invoice creation. This is because the customer can send several deliveries in one EDI document, resulting in some cases in the system determining *several* personnel numbers for one item. Workflow, however, only allows you to send a notification to *one* person.

Delivery Schedule

Definition

Document sent by Electronic Data Interchange (EDI) or fax to the component supplier to release a quantity of the material or materials outlined in the scheduling agreement.

The delivery schedule contains information on delivery quantities and dates. A new delivery schedule replaces, in part or completely, the previous delivery schedule with regard to date and quantity.

In the more general context of outline agreements, delivery schedules may be referred to as scheduling agreement releases.

Integration

The various types of delivery schedules, their structure and usage, are defined by the VDA (German Automobile Suppliers Association), the AIAG (Automotive Industry Action Group), and Odette guidelines.

There are three types of delivery schedules available in the R/3 System:

- Forecast delivery schedules (FRC)

  The VDA recommends that short, medium, and long-term requirements concerning delivery quantities and dates be sent to you in a forecast delivery schedule.

  The customer normally enters weekly, or monthly schedule lines in this type of delivery schedule. However, the customer may decide to enter daily schedule lines here instead of using a JIT delivery schedule.

  You can use the forecast delivery schedule as a basis for planning production and sales, and for controlling shipping. The forecast delivery schedule can refer to a scheduling agreement or purchase order.

- Just-in-time delivery schedules (JIT)

  The JIT delivery schedule is much like the forecast delivery schedule except that it is more suitable for short-term requirements (exact-to-the-minute, in some cases).

  You can use it for fine-tuning production and shipping.

- Planning delivery schedules (PLN)

  The planning delivery schedule [Page 91] is an *internal* schedule based on the forecast delivery schedule. It is used to fine-tune requirements planning by:

Limiting the planning period of schedule lines in forecast delivery schedules

Breaking down the weekly or monthly schedule lines sent in by the customer into daily requirements

For information on how these delivery schedules work together in the scheduling agreement, see Combining Delivery Schedules [Page 37] and Setting Requirements and Delivery Relevance [Page 38].

There is another type of document that resembles a delivery schedule. Delivery orders [Page 82], which are based on the Material Information System, are not delivery schedules per se. They are used in a similar way to JIT delivery schedules, however.

Structure

To access a delivery schedule, mark a scheduling agreement item and choose *Goto* → *Item* → *<Delivery schedule>*.

The following data is displayed in the **delivery schedule tabstrip**:

- Delivery schedule number and date

- A wide range of standard cumulative quantities [Page 43]

- Delivery information

    To display deliveries for the delivery schedule, choose *Deliveries* on the delivery schedule tabstrip.

    In scheduling agreements involving external agents, the system displays deliveries made to the customer by external agents as consignment issues.

- Correction delivery [Page 45] information

    To display or create correction deliveries, choose *Corr. delivery* on the delivery schedule tabstrip.

- An analysis function [Page 42]

- Information at a glance

    To display a summary of delivery schedule data, choose *Short disp.* on the delivery schedule tabstrip.

- Schedule lines

    Choose *DlvSch.Hdr* on the delivery schedule tabstrip to access the delivery schedule **header**. The following data is displayed here:

- Information on quantities received by the customer

- Information on the customer fiscal year and cumulative quantities reset due to a year change [Page 49]

- A wide range of cumulative go-ahead quantities

- Notes on the delivery schedule

Processing Delivery Schedules

Use

The R/3 System allows you to automatically process delivery schedules that you receive by Electronic Data Interchange (EDI). In this case, the system starts Workflow in the background. If you are correcting a document, or dealing with a customer who sends delivery schedules by more traditional means of communication, such as fax, phone, or mail, you can process delivery schedules manually online.

The customer regularly sends in new delivery schedules that update the scheduling agreement. In general, the following rules apply:

- A new forecast delivery schedule replaces the old forecast delivery schedule

- A new just-in-time (JIT) delivery schedule replaces the old JIT delivery schedule

- The JIT delivery schedule takes precedence over the forecast delivery schedule within the JIT delivery schedule horizon.

Features

Whether you receive a delivery schedule automatically by EDI, or enter one manually, the system checks:

- For instructions from the customer to combine [Page 37] the old and new delivery schedules

- For special processing [Page 16] instructions for the sold-to party

- For planning and delivery relevance [Page 38]

- Whether there are changes that exceed tolerance levels [Page 40]

- Whether a change of year [Page 49] has occurred

- Whether the delivery number sent in by the customer is valid

- Whether the cumulative quantity received by the customer matches all deliveries up to and including the last delivery confirmed by the customer

Once processing has been successfully completed, the system stores old delivery schedules in a history [Page 42]. You can support as many generations of documents as you wish in this way.

Activities

In order to process delivery schedules, you must first make the proper Customizing settings. For information on these settings, see the section on EDI in the Basis documentation and in the Implementation Guide (IMG).

To view, correct, or enter delivery schedules manually in the scheduling agreement, mark a scheduling agreement item and choose *Goto → Item → <Delivery schedule>*.

Combining Delivery Schedules

Use

The customer regularly sends in new delivery schedules that replace old delivery schedules. In some cases, however, the customer may want to **combine** old and new delivery schedules. To inform you of this special case, they send a special indicator in the delivery schedule.

Features

There are two indicators designed for this purpose:

- The requirement status key

    When the customer sets this key to "B", schedule lines in the old delivery schedule that come before or after the validity period of the new delivery schedule are copied to the new delivery schedule.

    The requirement status key has been designed for JIT delivery schedules that meet standards defined in VDA 4915, a requirement of the German Automobile Industry Association. This key is displayed in the delivery schedule header [Page 34].

- The forecast delivery schedule key

    When the customer sets this key to "1", schedule lines in the old delivery schedule that come before the validity period of the new delivery schedule are copied to the new delivery schedule.

    The forecast delivery schedule key has been designed for delivery schedules that meet Odette standards. This key is not displayed anywhere in the delivery schedule.

    These indicators are sent by the customer. You cannot change them.

Setting Requirements and Delivery Relevance

Use

Requirements and delivery relevance in delivery schedules is influenced by the document type [Page 10], and the schedule line category [Page 12] that the system determines using the requirements planning indicator specified in the scheduling agreement header.

Integration

To decide which type of delivery schedule is currently relevant for requirements and delivery, the system uses the JIT delivery schedule horizon and the material requirements planning indicator in the scheduling agreement header.

If there are planning delivery schedules in the scheduling agreement and you have entered a planning delivery schedule instruction, the system determines requirements and delivery relevance according to different criteria. If this is the case, see the requirements and delivery relevance section on planning delivery schedules [Page 125].

The R/3 System contains the following settings for the requirements and delivery relevance indicator:

- **Blank** - Delivery schedules are not used.

- **A** - Only forecast delivery schedules are relevant for requirements planning.

- **B** - Forecast delivery schedules and JIT delivery schedules are relevant for requirements planning and delivery.

- **C** - Only forecast delivery schedules are relevant for requirements planning. Only JIT delivery schedules are relevant for delivery.

- **D** - Forecast delivery schedules and JIT delivery schedules are relevant for requirements planning. Only JIT delivery schedules are relevant for delivery.

- **E** - JIT delivery schedules are not used.

The system determines relevance for requirements as follows:

MRP indicator B or D

- Up to the JIT delivery schedule horizon, the JIT delivery schedule is relevant for requirements

- After the JIT delivery schedule horizon, the forecast delivery schedule is relevant for requirements

MRP indicator A or C

- The JIT delivery schedule is not relevant for requirements

- The forecast delivery schedule is relevant for requirements

The system determines relevance for delivery as follows:

MRP indicator A or B

- Up to the JIT delivery schedule horizon, the JIT delivery schedule is relevant for delivery

- After the JIT delivery schedule horizon, the forecast delivery schedule is relevant for delivery

MRP indicator C or D

- Up to the JIT delivery schedule horizon, the JIT delivery schedule is relevant for delivery

- Schedule lines occurring after the JIT delivery schedule horizon are not relevant for delivery

Note the following when setting requirements planning and delivery relevance:

- When a schedule line in a forecast delivery schedule begins within the JIT delivery schedule horizon and ends outside of it, the horizon is reset and the forecast delivery schedule becomes relevant for requirements planning and delivery according to the planning indicator you have set.

    If, for example, a JIT delivery schedule horizon ends on 04/02 and the schedule line in the forecast delivery schedule begins on 04/01, the system sets the JIT horizon back to 03/31. The forecast delivery schedule is then relevant for planning and delivery as of 04/01 for planning indicator "B", for example.

- Relevance for requirements planning and delivery may change automatically when you make changes to the scheduling agreement. For example, when you move the date of the JIT delivery schedule closer to the current date, schedule lines in the forecast delivery schedule drop out of the JIT delivery schedule horizon and become relevant for delivery.

Activities

To set or view the material requirements planning indicator, choose *Goto → Header → Sales* in the scheduling agreement.

Monitoring Changes in Delivery Schedules

Use

When you manually create a new delivery schedule or automatically generate one from Electronic Data Interchange (EDI), the system checks the new delivery schedule against the old delivery schedules to ensure that tolerance levels are respected. If the system determines a problem, it issues a message and sets a delivery block.

Features

The system monitors changes of quantity in schedule lines with regard to specified tolerance levels. It checks:

- New forecast delivery schedules against old forecast delivery schedules
- New JIT delivery schedules against current forecast delivery schedules

> A **new JIT** delivery schedule is checked against the **current forecast** delivery schedule and not against the **old JIT** delivery schedule. This is because JIT delivery schedules should follow the forecast delivery schedule as closely as possible.
>
> A schedule line is valid when any of the following apply:

- The cumulative released quantity of the new delivery schedule does not exceed (in the case of increasing quantities) or fall below (in the case of decreasing quantities) the cumulative released quantity of the delivery schedule to which it is being compared by more than the tolerance quantity/percent.

- The cumulative released quantity of the new delivery schedule is less than or equal to (in the case of increasing quantities) the cumulative released quantity of the delivery schedule to which it is being compared on the schedule line date *plus* tolerance days.

- The cumulative released quantity of the new delivery schedule is greater than or equal to (in the case of decreasing quantities) the cumulative released quantity of the delivery schedule to which it is being compared on the schedule line date *minus* tolerance days.

If any one of the three checks is successful, the check is considered as a whole successful. The system does not carry out any further checks.

Example

The following example of a new forecast delivery schedule shows how the system carries out these checks:

Tolerance quantity = 90

Tolerance days = 3

Schedule lines	Old cumulative rel. qty.	New cumulative rel. qty.
05/07	1000	1100
05/08	1500	1600

05/09	2000	2000
05/10	2200	2100
05/11	2500	2400
05/12	3000	3000

The quantity is increased on 05/07. Because the deviation (100) exceeds the tolerance quantity (90), the new forecast delivery schedule does not pass the check against tolerance quantity. For this reason, the system also checks the deviation against tolerance days. It determines that the cumulative released quantity in the new forecast delivery schedule (1100) is less than the cumulative released quantity in the forecast delivery schedule from 05/10 (05/07 *plus* three tolerance days - 2200).The deviation on 05/07 is therefore permitted.

On 05/11, the system determines a decrease in quantity. Because the deviation (100) exceeds the tolerance quantity (90), the new forecast delivery schedule does not pass the check against tolerance quantity. For this reason, the system also checks the deviation against tolerance days. It determines that the cumulative quantity in the new forecast delivery schedule (2400) is greater than the cumulative released quantity in the old forecast delivery schedule on 05/08 (05/11 *minus* three tolerance days -1500). The deviation on 05/11 is therefore permitted.

Activities

To enter or view tolerance levels in quantity, percent, or number of days, mark an item in the delivery schedule and choose *Goto → Item → More → Delivery schedule control*.

Analyzing Delivery Schedules

Prerequisites

To reach the analysis screen, choose *Analys.* on the delivery schedule [Page 34] tabstrip.

In addition to general reporting functions [Ext.] for sales documents, there are specific functions for scheduling agreements with delivery schedules:

Procedure	What to do
Display schedule lines in an old delivery schedule	Select one delivery schedule and choose *Goto → Choose*. To display the cumulative quantity development in graphic form, choose *Goto → Graphics.*
Compare delivery schedules	Select two delivery schedules and choose *Goto → Compare*. Along with general information, the system displays the quantities, cumulative quantities, and cumulative quantity differences for the two delivery schedules. To display the comparison in graphic form, choose *Goto → Graphics.*
Compare cumulative go-ahead quantities for all delivery schedules on the analysis screen	Choose *Goto → Display go-ahead quantities*. The system displays the cumulative material go-ahead, production go-ahead, and delivery quantities To display the cumulative quantity development in graphic form, choose *Goto → Graphics.*
To display multiple delivery schedule types on one screen	Choose *Goto → Forecast <> JIT delivery schedule* **or** *Goto → Forecast <> Planning delivery schedule* **or** *Goto → JIT <> Planning delivery schedule*.

Cumulative Quantity

Definition

The accumulated quantity of a material up to a specific date.

Use

Cumulative quantities are an essential tool for planning and monitoring business transactions between you and your business partners. They allow you to look past constant changes to dates and quantities for an accurate picture of which materials have been delivered, received by the customer, or are underway.

Cumulative quantities can be found in the delivery schedule. Choose *Goto → Item →* <Delivery schedule> in the scheduling agreement. Or choose *DlvSch.Hdr* on the delivery schedule tabstrip to view cumulative go-ahead quantities.

The following cumulative quantities are supported in scheduling agreement processing.

- Beginning cumulative delivered quantity

  Quantity transferred from a legacy system to the R/3 System with initial data transfer [Page 22].

- Cumulative delivered quantity

  Sum of all deliveries made in the customer fiscal year.

- Cumulative issued quantity

  Sum of all delivered quantities for which goods issue has been posted. This sum is calculated even if the customer or external agent has not yet received or recorded the delivered quantities.

- Cumulative released quantity

  Sum of the cumulative quantity received by the customer, and schedule line quantities up to a specific date.

- Cumulative quantity received by the customer

  Sum of all deliveries received by the customer in the customer fiscal year.

- Current cumulative delivery go-ahead quantity

  Quantity up to which the component supplier can deliver finished products to the customer within the validity period of the delivery schedule. This quantity is only available in just-in-time (JIT) delivery schedules.

- Highest cumulative delivery go-ahead quantity

  The year's highest cumulative quantity. This quantity is only available in JIT delivery schedules.

- Current cumulative material go-ahead quantity

  Quantity up to which the component supplier can procure materials for production within the validity period of the delivery schedule. This quantity is not available in planning delivery schedules.

Cumulative Quantity

- Highest cumulative material go-ahead quantity

  The year's highest cumulative quantity. This quantity is not available in planning delivery schedules.

- Current cumulative production go-ahead quantity

  Quantity up to which the component supplier can produce materials for the customer within the validity period of the delivery schedule. This quantity is not available in planning delivery schedules.

- Highest cumulative production go-ahead quantity

  The year's highest cumulative quantity. This quantity is not available in planning delivery schedules.

- Quantity in transit based on cumulative quantities

  Quantity calculated from the difference between the current cumulative delivered quantity and the cumulative quantity received by the customer

- Quantity in transit based on deliveries

  Quantity calculated from the difference in cumulative quantities from the last delivery sent to the customer and the last delivery received by the customer.

The following cumulative quantities are relevant only to scheduling agreement processing with external agents [Page 66].

- Cumulative quantity issued by the external agent

  Sum of all deliveries made by external agents in the customer fiscal year. This quantity is not available in JIT delivery schedules.

- Cumulative issued quantity - Last delivery

  Quantity for the last delivery entered in the *Delivery by external agent* field. This quantity is not available in JIT delivery schedules.

Additional Information

The cumulative delivered quantity is central to the year change [Page 49] function as well as the engineering change [Page 27] function.

You correct cumulative delivered quantities manually for returns [Page 29].

The system uses cumulative delivered, received, and released quantities to calculate open quantities [Page 47].

Correcting Cumulative Delivered Quantities

Prerequisites

You correct cumulative quantities in scheduling agreements:

- In case of returns [Page 29]

- When there has been a processing error

- When there has been a year change [Page 49]

- When you are transferring initial quantities [Page 22] from a legacy system into the R/3 System

To do this, you create a **correction delivery** within the delivery schedule itself. This delivery is not relevant for requirements planning, shipping, goods issue, or billing.

Correct cumulative quantities only when the customer has **not** posted goods receipt.

Procedure

To create a correction delivery (document type **LFKO**):

1. Choose *Corr. delivery* on the delivery schedule [Page 34] tabstrip.

    The system displays a dialog box in which you enter a:

    − Correction delivery date

        For help on deciding where you want to position the correction delivery, choose *Display*. The system lists delivery dates in chronological order.

    − Correction quantity

        Enter a negative correction quantity by placing a minus sign **after** the quantity.

2. Choose *Enter* and save the scheduling agreement.

Result

When you save the correction delivery, the system updates the cumulative quantities in the delivery schedule.

To display correction deliveries, choose *Deliveries* on the delivery schedule tabstrip, or *Environment* → *Display document flow*.

Correcting Cumulative Delivered Quantities

Example

Correction delivery = 200 pieces

Delivery note	Date	Qty	Cml.qty
1	7/05	100	100
2	7/10	200	300
2873	7/14	-200	100
3	7/15	100	200
4	7/20	200	400
5	7/30	300	700

Your customer returns 200 pieces of material from a delivery made on 7/10 because of damage during transport. Several other deliveries have been made before you prepare the correction delivery, so you view a list and choose an appropriate date. In this case you decide on 7/14 because it occurs after the delivery on 7/10 and before the delivery on 7/15.

Calculating Open Quantities

Use

The open quantity is the quantity of a material, per schedule line, due for delivery. It is calculated based on the quantities:

- Delivered to the customer

- Actually received and reported back by the customer

- Requested by the customer in the current delivery schedule

Integration

The system calculates the **quantity in transit** from the cumulative delivered and cumulative received quantities. If there are any quantities in transit, they are subtracted from the open quantity.

Example

The system calculates the current open quantity for each schedule line in an incoming delivery schedule as follows:

Forecast delivery schedule

Date	Quantity	Open qty	Cml. released qty
10/01	500	200	1500
11/01	600	600	2100

You have delivered 1300 units to the customer who has confirmed receiving only 1000 units

- 1300 units have been delivered to the customer (cumulative delivered quantity)

- 1000 units have already been received by the customer (cumulative received quantity)

- 500 units have been requested by the customer for 10/01 in the current **forecast delivery schedule**

You first calculate the cumulative released quantity, which is the sum of the cumulative received quantity and schedule lines in the current delivery schedule. The cumulative released quantity is 1500 (1000 + 500).

You then calculate the open quantity by subtracting from the cumulative released quantity the amount that has already been delivered. The open quantity is 200 units (1500 - 1300).

Result: You deliver 200 more units.

- The customer requests an additional 600 units on 11/01

Calculating Open Quantities

The cumulative released quantity increases to 2100 (1500 + 600). You subtract from this quantity the amount that you have delivered, which is now 1300 plus the 200 open units for which goods issue has been posted. The new open quantity is 600 units (2100 - 1500).

Result: You deliver 600 more units.

JIT delivery schedule

Date	Quantity	Open qty	Cml. released qty
10/01	50	-	1050
10/02	50	-	1100
10/04	100	-	1200
10/05	100	100	1300
10/07	100	100	1400

You have delivered 1300 units to the customer who has confirmed receiving only 1000 units

- 1300 units have been delivered to the customer (cumulative delivered quantity)

- 1000 units have already been received by the customer (cumulative received quantity)

- 50 units have been requested by the customer for 10/01 in the current **JIT delivery schedule**

You first calculate the cumulative released quantity, which is the sum of the cumulative received quantity and schedule lines in the current delivery schedule. The cumulative released quantity is 1050 (1000 + 50).

Since you have already delivered 1300 units to the customer, there have been more units delivered than released. The same is true for the schedule lines on 10/2 and 10/04.

Result: There are no open quantities for these schedule line dates.

Handling Year Changes

Use

Customers reset cumulative quantities to zero at year-end, whether it be a fiscal or calendar year. To let you know that they have begun a new year, they do one of two things:

- Tell you the date explicitly which you can enter in the delivery schedule
- Reset the cumulative received quantity in the first delivery schedule of the new year

When the system determines that a change of year has occurred for the customer, it automatically resets cumulative quantities.

Features

The system checks the *CRQ set to zero* field in the delivery schedule header [Page 34]. If you have entered a date and if the date is reasonable (not a past date, for example) then the system uses it to decide whether to carry out a year change.

If there is no date, or if the date is unreasonable, the system then checks the cumulative quantity reported back by the customer in the current delivery schedule. The system determines whether:

- The cumulative quantity received by the customer in the current fiscal year corresponds for the first time to the cumulative delivered quantity, taking the delivery schedule date and deliveries in transit into account

  If this is so, a year change has occurred. The system resets the cumulative received and cumulative delivered quantities to zero.

  > The system determines the current fiscal year from the *Fiscal year variant* field in the customer master of the ship-to party (*Marketing* screen). If there is no date available, the system uses the delivery schedule date.

- The cumulative received quantity in the current fiscal year and previous fiscal year correspond to the cumulative delivered quantity, taking the delivery schedule date and deliveries in transit into account

  If this is so, no year change has occurred.

Example

The following examples shows in simplified form (without quantities in transit) how the system recognizes a year change.

Scenario 1

Delivery schedule date: 10/12/99 $\rightarrow$ Fiscal year 1999

Cumulative delivered quantity (99) = 1000

Cumulative received quantity = 1000

Handling Year Changes

A customer sends you a delivery schedule in fiscal year 1999. The cumulative received quantity agrees with the cumulative delivered quantity in 1999. The customer is in fiscal year 1999. No year change has occurred.

Scenario 2

Delivery schedule date: 02/01/00 → Fiscal year 2000

Cumulative delivered quantity (99) = 1000

Cumulative delivered quantity (00) = 100

Cumulative received quantity = 1100

A customer sends you a delivery schedule in fiscal year 2000. The cumulative received quantity agrees with the sum of the cumulative delivered quantities from 1999 and 2000. No year change has occurred.

Scenario 3

Delivery schedule date: 10/01/00 → Fiscal year 2000

Cumulative delivered quantity (99) = 1000

Cumulative delivered quantity (00) = 100

Cumulative received quantity = 100

A customer sends you a delivery schedule in fiscal year 2000. The cumulative received quantity agrees with the cumulative delivered quantity in 2000. A year change has occurred.

Activities

The system determines the cumulative delivered quantity based on the delivery date and customer fiscal year.

Forecast delivery schedule

Date	Quantity	Cml. released qty
7/01	500	9500
7/30	500	10000
8/01	-	0
8/03	800	800
8/05	600	1400

Year-end 7/31/99 →

Cml. qty statistics up to 7/31 - Old year	Cml. qty statistics as of 7/31- New year
Cml. dlv. qty 10000	Cml. dlv. qty 800

To post cumulative quantities to another period to the one in which they are reported, you can simply change the delivery date. In the above example, if the customer assigns the delivery on 07/30 to the new fiscal year, simply change the delivery date in the delivery to 08/01. The cumulative quantity statistics will then be updated accordingly. In this case, the cumulative delivered quantity statistics would be 9500 for 1999 and 1300 for 2000.

Shipping Functions

Use

You use standard shipping functions [Ext.] to deliver materials in delivery schedules. Schedule lines in the scheduling agreement due for shipping appear in a shipping work list from which you create a delivery, pick, pack, create shipping documents and post goods issue.

Features

In addition to these standard functions, scheduling agreement processing offers you:

- Backward delivery scheduling [Page 52] *only*

  You can specify that the system is to schedule deliveries only backwards from the schedule line date. No forward scheduling is carried out. This ensures that schedule lines from the previous delivery schedule can be copied unchanged to the new one.

- Packing proposals [Page 26]

  When creating a delivery, the system proposes packing instructions from the scheduling agreement.To change a proposal, select a delivery item and choose *Edit* → *Packing*.

- Engineering changes [Page 27]

  When creating a delivery, the system takes an engineering change into account. You can change an engineering change or serial number up until goods issue is posted. Just select a delivery item and choose *Item* → *Status.*

- Material tags [Ext.]

  You can include material tags with package information that you send in EDI delivery notes. The tags in the R/3 Sytem meet Odette and AIAG standards and can be used by your customers to make the goods receipt process more efficient, for example by scanning incoming materials.

- KANBAN processing [Ext.]

  To deliver materials in delivery schedules using KANBAN, choose the *Shipping* tabstrip in the scheduling agreement and set delivery block **08** (KANBAN delivery). The system will not take this scheduling agreement into account when creating a delivery due list. You can then create deliveries manually with reference to the scheduling agreement when you receive a KANBAN delivery schedule.

Backward Delivery Scheduling Only

Use

When you change a sales document, such as adding schedule lines or rescheduling, the system carries out delivery scheduling for all the schedule lines, new and old. Because the material availability date lies in the past for backlog schedule lines, the system performs forward scheduling. This may have the undesired affect of the system rescheduling lines that may have already been confirmed.

You can specify for each sales document type that the system is to schedule deliveries *only* backwards. With no forward scheduling, you can better recognize backlogs in production and the customer receives goods on time.

To deactivate forward scheduling, set the *Backward* indicator in Customizing for delivery scheduling. Choose *Basic Functions → Delivery Scheduling and Transportation Scheduling → Define scheduling by sales document type*.

Note that when the availability check has been activated for the schedule line category in Customizing, and availability is poor, the system ignores the *Backward* indicator and carries out forward scheduling anyway.

This function is available for scheduling agreements and sales orders.

Features

Normally when you create a delivery for a backlog schedule line, the system resets the material availability date in the delivery to the current date, and copies this date to the delivery.

You can set the system to copy material availability dates *unchanged* to deliveries for sales document types for which you have set the backward delivery scheduling function. Just turn off rescheduling for the relevant delivery type in Customizing by choosing *Logistics Execution → Shipping → Deliveries → Define delivery types*. Unmark the *Rescheduling* field in the *Document content* section of the screen.

In this way, you can avoid having two requirements with different dates when you make partial deliveries. Also, when you plan requirements again, the system will not propose rescheduling for production orders already in process.

When rescheduling has been turned off for a delivery type, the system does not redetermine routes.

Billing Functions

Use

Scheduling agreement processing offers you and your customer the flexibility to bill deliveries based on delivery schedules in a variety of ways.

Features

Besides the standard billing functions, there is a wide range of billing methods specifically for the component supplier industry and their customers. These are:

- Self-billing procedures

  Self-billing documents bring efficiency to the billing process between you and your customer since you do not have to invoice the customer. Instead, customers are directly involved in the billing process. They prepare billing documents themselves that you either compare to your own (standard self-billing), or use as *original* documents (self-billing with invoice creation).

- Retroactive billing [Ext.]

  You may change the price of a material after it has already been billed and settled. In this case, you create a retro-billing list to revaluate billing documents with the new price. You create an additional billing document to settle the difference. The retro-billing list function is only available for the standard self-billing procedure.

Because of the long validity periods of scheduling agreements, the system carries out a second pricing run during billing. This ensures that any changes to pricing agreements are taken into account.

You make special Electronic Data Interchange (EDI) settings [Page 20] for billing documents in Customizing.

Self-Billing Document

Definition

Billing document prepared and sent in by the customer.

In both the standard self-billing procedure and self-billing with invoice creation, the customer sends in a document that is either compared to an existing internal invoice or used as an original invoice for the transaction. The customer sends in **correction documents** to correct quantities billed in the invoice, or **retro-billing documents** to adjust prices in the invoice.

Use

The customer can create the following billing documents:

Standard self-billing

- Credit advice

  The credit advice sent in by the customer is converted to an IDoc and compared to the invoice that you have already created in the R/3 System. This is to ensure that there are no differences between how the customer thinks a transaction should be billed, and how you think it should be billed.

- Credit memo requests for quantity corrections

  The customer sends in a credit memo request when you have billed a larger quantity of material in the invoice than what was actually delivered. If the credit memo request corresponds to data in the R/3 System, the system creates a credit memo request and then the corresponding credit memo.

- Credit and debit memo requests for retroactive billing

  The customer sends in a credit or debit memo request to balance out retroactive price adjustments.

The system recognizes what type of self-billing document is sent by the customer from a status set in the intermediate document:

0 = credit advice

1 = credit or debit memo request

The system determines whether the document is a credit or debit memo request by determining whether it has a negative value (credit), or positive value (debit).

Self-billing with invoice creation

- Invoice

  The system does not allow you to create an invoice for a delivery to the customer. Rather, the customer sends in an invoice which is converted to an IDoc and actually created in the R/3 System as the customer has prepared it.

  Keep the following in mind when handling these invoices:

– The customer must submit invoices with reference to one or more internal or external deliveries.

– The customer can send several invoices for one delivery item. The system will continue to create invoices as the customer sends them until the delivery quantity has been fully billed.

- Credit memos for quantity corrections

  The customer sends in a credit memo when they have billed a larger quantity of material in the invoice than what was actually delivered. The customer must submit credit memos of this type with reference to the invoice.

- Credit and debit memos for retroactive billing

  The customer sends in a credit or debit memo to balance out retroactive price adjustments. The customer must submit credit and debit memos of this type with reference to one or more invoices.

- Cancellation documents

  The customer sends in a cancellation document to cancel existing invoices, credit memos, or debit memos. The customer must submit documents of this type with reference to the document they wish to cancel.

The system recognizes what type of self-billing document is sent by the customer from a status set in the intermediate document:

`0 = invoice`

`1 = credit memo for retro-billing`

`2 = debit memo for retro-billing`

`3 = cancellation document`

`4 = credit memo for quantity corrections`

Standard Self-Billing
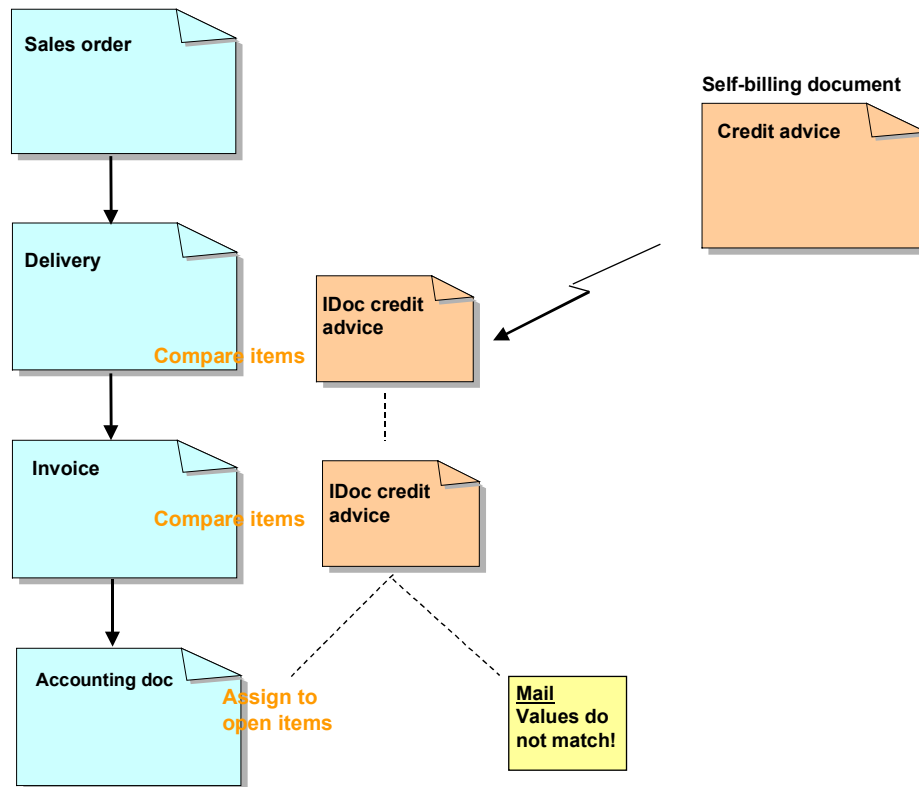
When the customer receives a delivery from you, they price the materials based on:

- Prices from the customer's purchasing department
- Differences between the delivery note and goods receipt
- Differences due to the quality of the material, for example
- Retroactive price adjustments

The customer uses materials and prices to prepare a credit advice that they send to you by Electronic Data Interchange (EDI). The system converts this advice into intermediate document (IDoc) GSVERF.

The system then determines the corresponding **internal delivery**, and from it the internal invoice, based on:

1. The internal delivery number sent in the external invoice
2. The internal delivery number determined from external agent deliveries (consignment issues) using the customer purchase order number
3. The external delivery number [Page 16] sent in the credit advice

Once the system has determined the corresponding delivery and invoice, it compares items in the credit advice, in IDoc form, with items in the corresponding internal delivery and invoice.

The system compares the following **condition values** for each item:

- Net value

- Cash discount

- Surcharges/Discounts

- Value-added tax (VAT)

If the values in the credit advice match the values in your invoice, the system assigns the credit advice number as a reference to the open items in the accounting document.
If the system finds any differences in the values, it terminates processing of the IDoc and sends a mail to the employee responsible. The employee can then correct the problem manually, or inform the customer to send one of the following **correction** or **retro-billing documents**:

- Credit memo requests for quantity corrections [Page 54]

- Credit and debit memo requests [Page 54] for retroactive billing

The system determines the invoices and the related deliveries for these documents in the same way as for a credit advice.

If the values in the customer credit memo request (**quantity correction**) match the values in your delivery, invoice, and the existing credit memo, the system automatically creates the corresponding credit memo request, then the credit memo. The system always enters "EDI" as the order reason, no matter what the reason is for creating a credit or debit memo request. It also copies the related credit advice number to the *Purchase order number* field in the purchase order section, and to the *Assignment* field in the accounting section.

Credit or debit memo requests based on **return deliveries**, are treated just as credit memo requests for quantity corrections, except that the system carries out pricing only for those materials that are returned. Also, instead of comparing each condition value, the system determines an overall difference per item and compares it to the overall correction value.

In the case of **retro-billing**, the system reprices all documents in the transaction before comparing the condition values of the items. It calculates the difference between the old and new prices in the delivery, invoice, and existing credit or debit memos, and compares it to the difference calculated by the customer in the credit or debit memo request. The difference calculated by the customer is copied to condition type EDI2, and the one that you calculate to condition type PDIF.If these values match, the system automatically creates a credit or debit memo request, then a credit or debit memo.

If these values do not match, the system sends a mail to the employee responsible, but creates the document anyway. If you do not want this, make the appropriate settings in Customizing for the sales document type.

The customer sends a **payment advice note** based on their credit advice. The credit advice number that they include with the payment advice note indicates whether there are several deliveries per credit advice number or only one:

- The customer sends payment for a number of deliveries. These deliveries are covered by one credit advice, the number of which is sent with the payment.

- The customer sends payment for a number of deliveries. There is, however, only one delivery per credit advice. In this case, the customer groups the advice numbers and assigns a collective number, such as the EDI sequential number or vendor posting

Standard Self-Billing

number. Payment, then, is for the total of the credit advices represented by this collective number. To compare open items, you must refer to the individual credit advice numbers.

Condition Value Tolerances

Use

In the standard self-billing procedure, the system compares the net values, cash discounts, surcharges or discounts, and value-added tax (VAT) amounts in the credit advice with those in the existing internal invoice. If the system finds any differences in these values, it terminates processing of the IDoc. In this case, it does not assign the credit advice number to the accounting document.

With this function, you can define tolerance levels for condition values. In this case, even if the system determines differences in the external and internal condition values, it ignores them and assigns the credit advice number to the accounting document.

Features

You define tolerances in Customizing [Page 20] for each customer, currency, and condition. The system calculates differences for each billing item based either on percent or price.

If the tolerance levels that you have specified are exceeded, the system considers the differences relevant and terminates processing of the IDoc.

Example

You have defined the following tolerance levels for the net value:

- $300 <= Difference <= +$500

You make a delivery to the customer and create an invoice for it. Once the customer receives the delivery, they prepare a credit advice and send it to you. The system compares the items for the internal and external invoices:

Item	Internal invoice	Credit advice	Difference
10	$700	$200	- $500
20	$300	$500	+$200
30	$800	$1400	+$600

For **item 10**, the system determines that the difference of - $500 exceeds the low tolerance level of -$300. This difference is considered relevant and the system terminates processing of the IDoc.

For **item 20**, the system determines that the difference of +$200 is within the high tolerance level allowed, +$500. This difference is therefore considered irrelevant and is ignored. The system continues processing the IDoc and updates the accounting document with the credit advice number.

For **item 30**, the system determines that the difference of + $600 exceeds the high tolerance level of +$500. This difference is considered relevant and the system terminates processing of the IDoc.

Condition Value Tolerances

Activities

The system first processes tolerance items with a currency. If there are no such items, the system then proceeds with items without a currency.

Integration

User exit EXIT_SAPLVED5_001 [Page 61] is related to this function. You can use it for your more refined tolerance checks, when the condition value tolerance check in Customizing is too general. For example, you may want to run a complex mathematical program on the values.

User Exits for Standard Self-Billing

Use

EXIT_SAPLVED5_001

With this customer function, you can perform fine checks on internal and external condition values for credit advices (action **0** in E1EDK01).

When you receive an advice, the system determines internal condition values and compares these to the external values sent in by the customer. If they differ, the system transfers delivery items from the credit advice one by one.

For each item, the system transfers two characteristics each for the net value, cash discount, surcharges/discounts, and value-added tax:

- xxx_INTERN

    This is the value calculated based on internal conditions.

- xxx_EXTERN

    This is the corresponding value from the intermediate document (IDoc).

Based on your program in the user exit, the system compares these values to determine if the difference is relevant. If so, it terminates processing of the IDoc.

If you do not want a difference to be relevant, set the parameter WERT_DIFFERENZ to "N" or leave it blank. The system then ignores any difference that it finds.

Use the related standard function, which you set in Customizing for condition value tolerances [Page 59], for general tolerance checks.

EXIT_SAPLVED5_005

The system collects warnings in table XVBFS that occur when processing self-billing documents. For each entry in this table, the system creates a status record in the IDoc, and notifies the employee responsible [Page 32] by electronic mail.

With this customer function, you enhance the workflow parameters. You can:

- Add a warning to table XVBFS

    In this way, you can set the system to send a mail to a recipient for a particular warning.

- Remove a warning

    In this case, the system does not create a status record or workflow item.

EXIT_SAPLVED5_006

In EDI processing for incoming self-billing documents, the system transfers sets of data to screens in the R/3 System by batch input.

With this customer function, you can include billing or other data not covered by the standard transfer program, for example.

Self-Billing with Invoice Creation
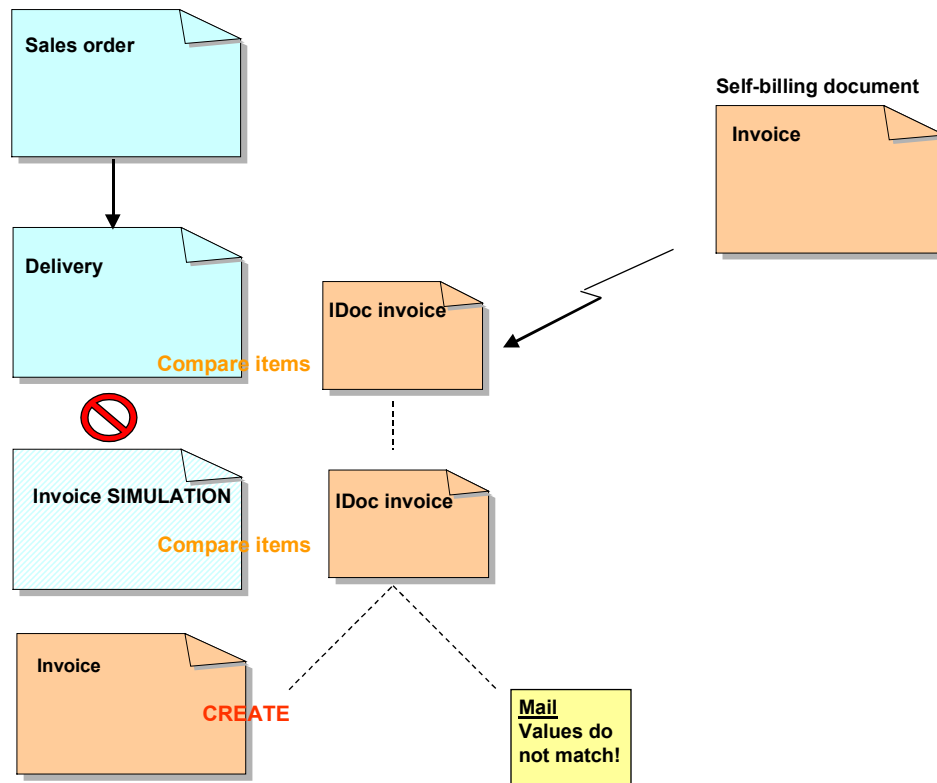
When the customer receives a delivery from you, they price the materials based on:

- Prices from the customer's purchasing department

- Differences between the delivery note and goods receipt

- Differences due to the quality of the material, for example

- Retroactive price adjustments

The customer uses materials and prices to prepare an invoice [Page 54] *on your behalf* that they send to you by Electronic Data Interchange (EDI). The system receives and converts this invoice into intermediate document (IDoc) GSVERF. It then forwards it to function module IDOC_INPUT_SBINV, which **determines the reference delivery** and items based on the internal delivery number, or external delivery number [Page 16], sent in the external invoice.

In this self-billing procedure, you cannot create an invoice for the delivery: no original invoice exists. However, the system **simulates invoice creation** to determine internal prices and their conditions.

Once the system has determined the reference delivery, and simulated an invoice, it **compares condition values** in these documents to those in the external invoice (in IDoc form). The system compares only those conditions specified in the IDoc and entered in Customizing [Page 20].

If the values in the external invoice match the values in the simulated invoice, and the delivery, the system creates an invoice in the R/3 System exactly as the customer has prepared it. Note that the system does not use the standard billing transaction here, but rather a special billing interface (GN_INVOICE_CREATE). The external invoice number, in the *External number* field, is used in the settlement process.

If the system finds any differences in the values, it updates the IDoc status records, and sends a mail to the employee responsible. It continues processing the IDoc and, if no serious errors occur, creates the document anyway. The employee then informs the customer to send one of the following **correction** or **retro-billing documents**:

- Credit memos for quantity corrections [Page 54]

- Credit and debit memos for price corrections [Page 54] in retroactive billing

- Cancellation documents [Page 54]

The system determines the invoices for these documents, along with the related deliveries, credit and debit memos, and cancellation documents.

If the values in the external credit memo (**quantity correction**) match the values in the invoice, and delivery, the system automatically creates a credit memo exactly as the customer has prepared it.

Credit or debit memo requests based on **return deliveries**, are treated just as credit memo requests for quantity corrections, except that the system carries out pricing only for those materials that are returned. Also, instead of comparing each condition value, the system determines an overall difference per item and compares it to the overall correction value.

In the case of **retro-billing**, the system reprices all documents in the transaction before comparing the condition values of the items. It calculates the difference between the old and new prices in the invoice and delivery, and enters it into condition PDIF to use in the pricing procedure. The difference calculated by the customer in the credit or debit memo is entered in the internal condition that you have assigned in Customizing. If these values match, the system automatically creates the credit or debit memo.

If these values do not match, the system sends a mail to the employee responsible, but creates the document anyway. If you do not want this, make the appropriate settings in Customizing for the sales document type.

Troubleshooting

The system may sometimes terminate processing of the intermediate document (IDoc) for an invoice sent in by the customer. In this case, no invoice is created in the R/3 System. This may happen for the following reasons:

- You have not made the appropriate Customizing settings for self-billing [Page 20], as well as the necessary general Customizing settings.

- There are different values for the internal and external conditions [Page 20] that you have assigned in Customizing.

- There are different value-added tax indicators.

- The order referred to in the external invoice is different from the order determined by the system from the delivery.

- There are different sales units of measure.

- The customer did not specify a material.

- There are different sales organizations.

- There are different currencies.

- The invoice referred to in the correction document [Page 54] does not exist or has been cancelled.

- The simulated invoice has no value.

- The external invoice contains items that the system normally would not copy to a billing document in the R/3 System.

- The external invoice requires an invoice split.

User Exits for Self-Billing with Invoice Creation

Use

EXIT_SAPLVED5_002

With this customer function, you can analyze and process warnings that the system collects when processing self-billing documents. You can, for example create a special message for a particular recipient or design a workflow that is different from the standard.

Additionally, you can process general data sent in the external billing document. For example, you can include this data in messages to give the recipient/customer more detailed information about the problem.

EXIT_SAPLVED5_003

With this customer function, you can program your own tolerance checks on internal and external conditions. You can, for example:

- Design condition value tolerance checks for a specific customer

- Perform tolerance checks based on quantities, for instance, a larger tolerance for larger quantities

The system always transfers header data and conditions from the billing document IDoc. Item data, on the other hand, is transferred only when there are conditions to be taken into account for the item.

If required, you can set the system to ignore any differences between condition values. If you want to continue processing even if there are differences in the values, leave the **D**IFFREL indicator blank.

The system sets the **W**ERTDIF indicator when there is a difference in condition values. Unmark this field if you want the system to ignore the difference.

EXIT_SAPLVED5_004

With this customer function, you can review and change data in the external billing document IDoc and data for the billing document interface *before* creating the document in the R/3 System.

For example, you can replace a currency with only two decimal places with a currency with four decimal places recognized by the R/3 System.

External Agent Functions

Use

External agent functions have been developed for just-in-time processing. The external service agent is a forwarding agent who normally has a warehouse in direct proximity to a customer manufacturing plant. To improve delivery times, the component supplier delivers materials to the external agent, who in turn makes frequent deliveries to the customer.

Features

External agents can be stored in the R/3 System and included in the exchange of information between component supplier and customer, such as in bills of lading, delivery notes, and other documents sent by Electronic Data Interchange (EDI).

You make special EDI settings [Page 19] for external agent processing in Customizing.

Scheduling agreement processing supports delivery orders [Page 73], documents based on the pick-up sheet used in the Material Information System (MAIS).

External Agent Process Flow
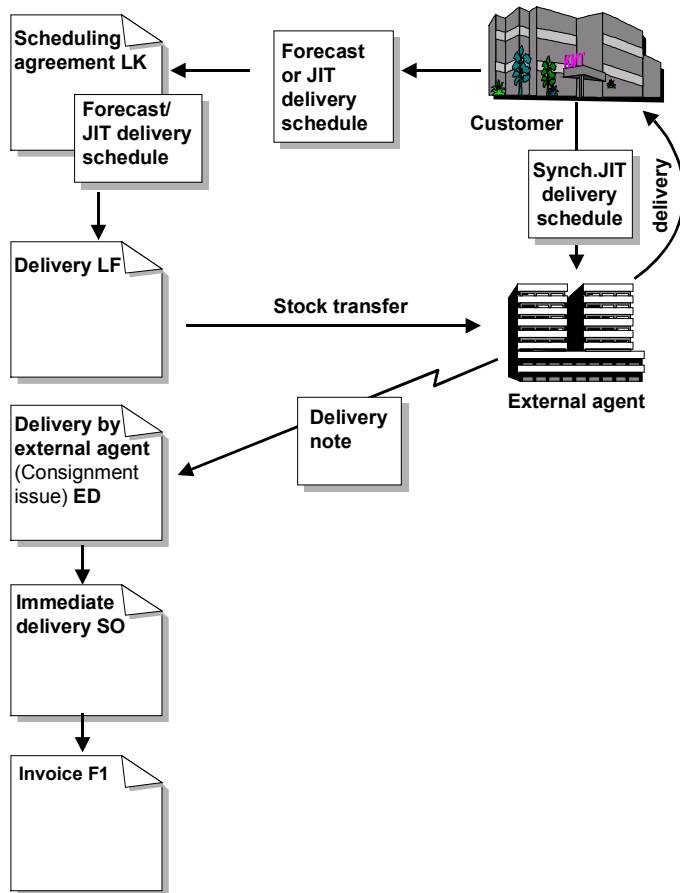
1. You have an existing **outline agreement** with the customer, in this case a scheduling agreement for external agents.

2. You have defined the external agent in the scheduling agreement as a forwarding agent and special stock partner.

3. On the basis of this scheduling agreement, the customer prepares data for a delivery and sends it to you in a forecast or just-in-time (JIT) delivery schedule.

4. An Electronic Data Interchange (EDI) system receives the incoming delivery schedule and converts it to an intermediate document [Page 30] (IDoc) which is then processed in the R/3 System.

5. A **forecast or JIT delivery schedule** is created from the data records in the IDoc. The system determines the related scheduling agreement and generates schedule lines in the delivery schedule according to the customer's requirements.

6. You create a **delivery** and post goods issue to transfer stock to the external agent warehouse as schedule lines become due.

7. The customer requests material directly from the external agent by sending the external agent a **sequenced JIT, or standard JIT delivery schedule**.

External Agent Process Flow

8. The external agent delivers the material from the consignment stock, and sends you a copy of the **delivery note** (by fax or EDI) so that you can compare it to your delivery to the external agent. The system automatically creates an immediate delivery.

9. On the basis of the external agent delivery note, the system creates a **delivery by external agent** document (consignment issue) with reference to the scheduling agreement.

10. You create an **invoice** with reference to the delivery by external agent.

External Agent Processing

Use

With this function, you create or receive documents in the SAP System for processing scheduling agreements involving external agents.

Integration

The following document types [Page 10] have been designed for processing with external agents:

Document Type	Description
LK	Scheduling agreement with delivery schedules
ED	Delivery by external agent (consignment issue)
EDKO	Correction
KAZU	Consignment pick-up
KRZU	Consignment returns

The related item categories [Page 11] are:

Item Category	Used for:
LKN	scheduling agreement type **LK**
KEN	document type **ED**
EDK	positive corrections (or the manual alternative **EDK1** for negative corrections) for document type **EDKO**
KAN	document type **KAZU**
KRN	document type **KRZU**

The related schedule line categories [Page 12] in the SAP System are **E4**, **E0**, **E5**, and **BN** for item category **LKN**.

The following graphic illustrates how the document types are used in external agent processing:

Miller   **Farmer**   **Smith**

Component supplier   LF — Delivery   **External agent**   ED — Delivery by external agent   **Customer**

Adjust (raise) cumulative delivered quantity

Adjust (raise) cumulative quantity issued by the external agent
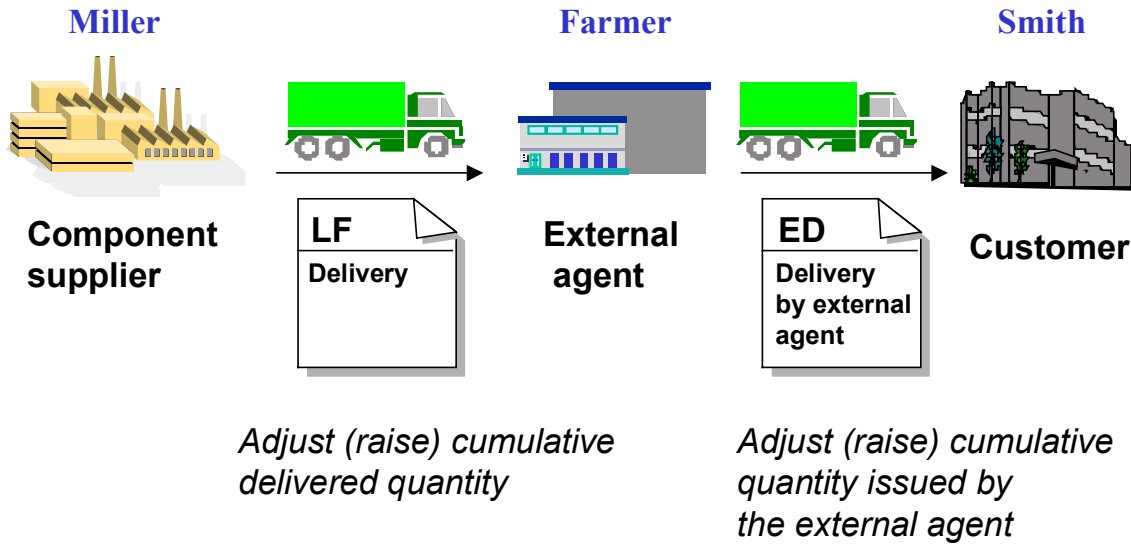
Features

When creating [Page 23] **scheduling agreements**, note the following:

- Use scheduling agreement type **LK**.

- Choose *Goto → Header → Partners* to enter the external agent as forwarding agent and special stock partner on the partner function screen (if this has not already been defined in the customer master).

- You can create forecast **and** just-in-time (JIT) delivery schedules in scheduling agreements for external agents. Note that you can only maintain the JIT delivery schedule horizon in the JIT delivery schedule header screen. When working with JIT delivery schedules, make sure that the MRP indicator in the header sales screen is not set to "E" (no JIT delivery schedules). The system proposes this indicator from the sales document type when you create a scheduling agreement.

When **transferring materials** to the external agent, note the following:

- Shipping is carried out for scheduling agreements of type **LK** in the same way as for consignment fill-ups (document type **KB**).When you create a standard delivery (document type **LF**) and post goods issue, the quantity to be delivered to the customer is transferred to the external agent as special stock. You do not bill this transaction.

- You create a *delivery by external agent*, document type **ED**, on the basis of the external agent delivery note. You do this in the same way as creating a sales order [Ext.] with reference to the scheduling agreement. Documents of this type are handled in the same way as consignment issues (document type **KE**).

- When you save the *delivery by external agent* document, the system automatically creates an immediate delivery. Post goods issue for this delivery to reduce the consignment stock on record and increase the cumulative quantity issued by the external agent.

- To ensure that the prices you are working with are valid at the time of goods issue, the system redetermines the pricing date (depending on Customizing settings, this could be the current or the requested delivery date). It then carries out new pricing for this date.

When correcting **cumulative quantities**, note the following:

- To correct cumulative delivered quantities (deliveries to the external agent), create a correction delivery [Page 45] (document type **LFKO**).

- To correct cumulative quantities issued by the external agent, use document type **EDKO**. Create with reference to the scheduling agreement. When you save the document, the system automatically creates a delivery. No changes are made to stock.

- For positive corrections, use item category **EDK** (proposed as default for materials with item category group NORM). Use item category **EDK1** for negative corrections.

- In the case of returns, cumulative quantities are not updated automatically!

  To transfer returns

  – from the customer to the external agent, use document type **KRZU** (consignment returns). Create returns with reference to the scheduling agreement.

    If the system should adjust the cumulative delivered quantity, you will need to create a correction delivery (document type **LFKO**).

  – from the external agent (if, for example, you have delivered too much) use document type **KAZU** (consignment pick-up).

    If the system should adjust the cumulative quantity issued by the external agent, you will need to create an external agent correction (document type **EDKO**).

  – directly from the customer, use document type **RZ** (scheduling agreement returns).

    If the system should adjust the cumulative delivered quantity and the cumulative quantity issued by the external agent, you will need to create a correction delivery (document type **LFKO**) and an external agent correction (document type **EDKO**).

  The following graphic illustrates how the document types are used when transferring returns in external agent processing, and how these document types affect the cumulative quantities:

RZ

Scheduling agreement returns

Miller

KAZU

Consignment pick-up

Farmer

KRZU

Consignment returns

Smith

Component supplier

External agent

Customer

LFKO

Correction delivery

Adjust (lower) cumulative delivered quantity

EDKO

External agent correction

Adjust (lower) cumulative quantity issued by the external agent
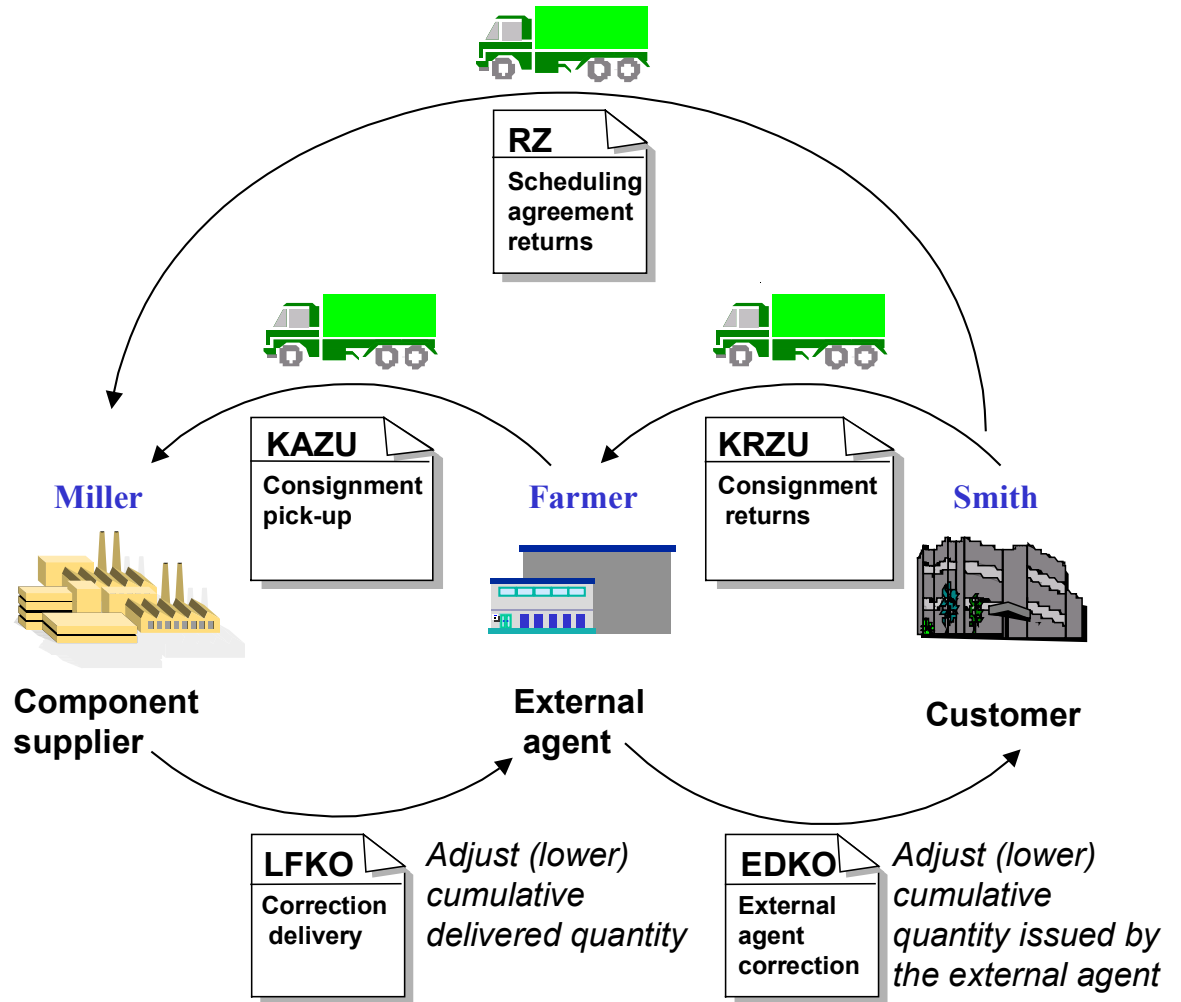
Delivery Order Processing (MAIS)

Purpose

Modern companies recognize the importance of a leaner materials management system and better information flow between business partners involved in ordering, delivering, and receiving materials. In the component supplier industry, in particular, a new procedure is being used to streamline business processes: the Material Information System (MAIS).

In the MAIS procedure, the customer transmits information to the component supplier **and** forwarding agent in a pick-up sheet (similar to a just-in-time delivery schedule). The information in this sheet details the materials required and the date on which the customer's forwarding agent is scheduled to "pick up" the materials at the supplier location.

Delivery order processing in the R/3 System has been designed for component suppliers and is based on the MAIS procedure. In delivery order processing, the pick-up sheet is entered into the R/3 System and processed as a delivery order.

Delivery order processing has been designed to optimize shipping control by providing:

- An efficient source of information for the customer, component supplier, and forwarding agent

- A simple process for ordering and receiving materials from the component supplier

- A secure basis for planning

Integration

A special sales document and scheduling agreement have been designed for delivery order processing. Delivery orders are delivered and billed in the standard way.

Electronic Data Interchange (EDI) plays an important role in delivery order processing.

There are no Customizing settings specific to delivery order processing.

Constraints

The following functions are not supported in delivery order processing:

- Engineering changes
- External service agent processing

Because of the high volume of quantities managed in KANBAN, we recommend you do not use KANBAN with delivery order processing.

Delivery Order Process Flow

Purpose

You create and process delivery orders in the R/3 System from information sent to you by the customer in pick-up sheets.

Process Flow

1. You have an existing **outline agreement** with the customer, in this case a special scheduling agreement for delivery order processing.

2. On the basis of this scheduling agreement, the customer prepares data for a delivery and transmits it in a **pick-up sheet** to you (and the forwarding agent).

3. An Electronic Data Interchange (EDI) subsystem receives the incoming pick-up sheet and converts it to an intermediate document [Page 81] (IDoc), which is then stored in your R/3 System.

4. You create a **delivery order** from the IDoc. Information in the delivery order is supplied either by the IDoc or entered manually from the pick-up sheet. The system determines the related scheduling agreement from this data and generates schedule lines in the delivery order according to the customer requirements. The delivery order is processed in the same way as a standard order.

5. You create a standard **delivery** to prepare the items for pick-up. A delivery is created for each unloading point.

6. The customer's forwarding agent picks up the materials at the scheduled time.

7. The delivery is **invoiced**. The customer refers to the pick-up sheet number in the billing document to settle payment.

Result

The customer reports back in the next pick-up sheet the quantity received on the basis of the previous pick-up sheet. You update the cumulative quantities [Page 78] in the scheduling agreement accordingly and create a new delivery order.

Pick-up Sheet

Definition

External document sent from the customer to the component supplier and forwarding agent with information about future deliveries. The pick-up sheet is used as a basis for creating the delivery order in the R/3 System.

Use

The pick-up sheet is used in a similar way to a just-in-time (JIT) delivery schedule. There are, however, several important differences:

- Pick-up sheets can contain more than one material from one or several scheduling agreements.

- Unlike the JIT delivery schedule, which is continually updated, the quantities and dates in the pick-up sheet are fixed. This means that the pick-up sheet must be delivered in full before it can be set to complete.

- The pick-up sheet is the central source of information for the customer, component supplier, and forwarding agent. It is the sole document that accompanies materials - making shipping documents, delivery notes, and goods issue slips unnecessary.

- JIT delivery schedules are transmitted daily. Pick-up sheets are transmitted weekly, up to three weeks before the required delivery.

Scheduling Agreements with Delivery Orders

Use

You create a special type of scheduling agreement on which to base delivery orders. These scheduling agreements contain forecast delivery schedules with fields specific to delivery order processing. The scheduling agreement and forecast delivery schedule contain all the background information necessary (such as materials and quantities) to create schedule lines in the delivery order.

Features

The standard systems contains several new features specifically for processing delivery orders:

- Scheduling agreement type **LZM**

- Item category **LZMA**

- Copy control from scheduling agreements to delivery orders

  You can copy items into the delivery order with reference to their related scheduling agreements. Choose *Sales → Maintain copy control for sales documents* in Customizing for Sales and Distribution. Use target document **TAM** and source document **LZM**.

There are several important differences between a scheduling agreement of type **LZM** and a standard scheduling agreement. In scheduling agreements with delivery orders:

- The system sets the MRP handling indicator for the delivery schedule type to *E* – no just-in-time (JIT) delivery schedules. You can view this in the sales overview in the header data.

- Cumulative quantities are based on delivery orders, **not** deliveries.

- The delivery order, unlike the forecast delivery schedule, is **not** processed or stored in the scheduling agreement.

Processing Scheduling Agreements with Delivery Orders

Procedure	What to do
Create a scheduling agreement and the related forecast delivery schedule	You create a scheduling agreement for delivery orders in exactly the same way as a scheduling agreement [Page 23] with delivery schedules. Use scheduling agreement type **LZM**.
Display information on delivery orders	Choose *Document flow* from any screen for a list of delivery orders for the scheduling agreement. Or choose possible entries on the *Pick-up sheet* field in the forecast delivery schedule for a list of delivery orders and their related pick-up sheets.
Display information on deliveries	For performance reasons, deliveries are not displayed in the document flow of the scheduling agreement. Choose *Deliveries* in the forecast delivery schedule to view a list of deliveries.

Cumulative Quantity - Delivery Orders

Definition

The accumulated quantity of a material up to a specific date.

Use

Cumulative quantities are an essential tool for planning and monitoring business transactions between you and your business partners. They allow you to look passed constant changes to dates and quantities for an accurate picture of the materials that have been delivered, received by the customer, or are underway.

Cumulative quantities for delivery order processing are found in forecast delivery schedules. Choose *Goto → Item → Forecast delivery schedule* in the scheduling agreement [Page 76]. Or choose *DlvSch.Hdr* on the forecast delivery schedule tabstrip to view cumulative go-ahead quantities.

Features

Cumulative quantities in delivery order processing are different from standard [Page 43]cumulative quantities in that they are calculated on the basis of the delivery order, **not** the delivery.

The cumulative quantities on the **left-hand** side of the forecast delivery schedule are based on <u>all</u> of the delivery orders for the scheduling agreement. These are the:

- Total cumulative quantity

- Cumulative quantity received by the customer

- Cumulative quantity in transit

If you are used to working with cumulative quantities based on deliveries, the open delivery quantity field (which heads the above quantities) should be of particular use to you. It represents quantities in relation to deliveries.

The cumulative quantities on the **right-hand** side of the forecast delivery schedule are calculated on the basis of the *Pick-up sheet* field that contains the pick-up sheet number from the **latest** delivery order only. These are the:

- Cumulative quantity according to the pick-up sheet number

- Cumulative quantity in transit according to the pick-up sheet number

The customer sends in the latest pick-up sheet number and cumulative quantity received with each new pick-up sheet. Although the system maintains these fields in the forecast delivery schedule, you can change them manually if the customer has sent incorrect data. Choose *possible entries* to select the correct pick-up sheet from the list of the delivery orders relating to the scheduling agreement (the pick-up sheet number is listed as the purchase order number); or correct the cumulative quantity manually.

When maintaining cumulative quantities, note that:

- The system does **not** adjust the cumulative quantity when you cancel an item in the forecast delivery schedule, or create a return based on a delivery order. You must do this

Cumulative Quantity - Delivery Orders

manually. The standard system contains a sales document type and two item categories for this purpose:

− Sales document type **MAKO**

− Item category **MAK** for positive corrections

− Item category **MAK1** for negative corrections

- When the customer posts goods receipt, their cumulative quantities are updated. For this reason, you should correct your cumulative quantities only when the customer sends the items back without having posted goods receipt.

- For a year change, you must post cumulative quantities to a different period to the one in which they are reported. To do this, change the cumulative quantity date to match the pick-up date. A new field, *Cml qty date* (cumulative delivery order quantity date), has been designed for this purpose in the delivery order header for sales.

Year changes for delivery order processing are carried out in much the same way as a standard . Keep in mind that there are several basic differences. The system works with the cumulative delivery order quantity instead of the cumulative delivered quantity, for example.

Correcting Cumulative Quantities - Delivery Orders

Prerequisites

You adjust cumulative quantities in scheduling agreements for delivery orders:

- In case of returns

- When there has been a processing mistake

- When there has been a year change

- When you are transferring initial quantities [Page 22] from a legacy system into the R/3 System

If you are correcting cumulative quantities on the basis of a return, use the special return [Page 88] for delivery orders (type **RM**).

Correct cumulative quantities only when the customer has **not** posted goods receipt.

Procedure

1. Create an order using sales document type MAKO.

2. Enter the amount to be adjusted.

3. Enter an item category.

   Scroll right in the sales overview to the *Item category* field. Enter **MAK1** to **reduce** the cumulative quantity, or **MAK** to **increase** the cumulative quantity.

Result

When you save the correction document, the system updates the cumulative quantities in the forecast delivery schedule.

Intermediate Documents for Delivery Orders

Use

You process an incoming pick-up sheet just as other Electronic Data Interchange (EDI) documents. The data in the pick-up sheet is converted to an intermediate document (IDoc) which you use to create a delivery order in the R/3 System.

Features

ORDERS 03 is the pick-up sheet IDoc used in delivery order processing. It is a subset of EDIFACT DELJIT, version D.94B.

You can process this IDoc using the full range of incoming EDI message functions available in the standard system. EDI messages other than incoming pick-up sheets are not supported in delivery order processing.

The system triggers workflow to create a delivery order from the pick-up sheet IDoc. You can enhance all EDI, ALE and Workflow - Customizing functions to meet your specific requirements.

Delivery Orders

Use

You create a delivery order in the R/3 System from a pick-up sheet sent in by the customer. This can be done automatically from a pick-up sheet IDoc [Page 81] or manually.

The delivery order contains information detailing the material(s) to be picked up by the customer's forwarding agent and the pick-up date and times. It is based on one or more scheduling agreements [Page 76] for delivery orders.

The pick-up sheet [Page 75] and its corresponding R/3 document, the delivery order, are used in a similar way to the just-in-time (JIT) delivery schedule.

Features

Since the delivery order has been modeled after the sales order, you can create a delivery order with the full range of sales order functions.

The R/3 System contains a sales document type and item category specifically for processing delivery orders:

- Sales document type **TAM**

- Item category **TAMA**

  The following characteristics are specific to delivery orders:

- The system sets the pick-up date as the **delivery date**. Although you can enter several materials in a delivery order, there can only be <u>one</u> "delivery" date for all of the items. You can view this date in the schedule line item detail.

- The system sets the pick-up date as the **pricing date** in the sales overview.

- There are special conventions for copying packing instructions [Page 26].

  In scheduling agreements with delivery orders, deliveries are created from delivery orders. To be able to copy packing proposals from the scheduling agreement to the delivery, you must first copy them to the delivery order.

  In delivery order processing, packing proposals are either copied directly from the pick-up sheet, or you enter them manually. When you save a delivery order, the system determines if there are any packing proposals to consider.

  If there are none, the system accesses the scheduling agreement and copies any proposals there to the delivery order. It only does this, however, when at least one of the following applies:

  – You have specified in Customizing that proposals are to be copied to the delivery

  Choose *Logistics Execution → Shipping → Copying control → Specify copy control for deliveries* and maintain the *Data transfer ShUn* (data transfer shipping unit) field.

  – There is a packing proposal for at least one other item in the delivery order

    When the customer gives you packing instructions on one item in the pick-up sheet, they usually want all items in the pick-up sheet to be packed.

  You can influence how the system copies packing proposals with a user exit [Page 89].

Delivery Orders

- You cannot use **items** that are not attached to a scheduling agreement for delivery orders. The different types of cumulative quantities [Page 78] used in delivery order processing require that they be recorded and updated centrally in scheduling agreements of this type.

- The delivery order generates new **requirements**, which the delivery reduces from those generated by the related scheduling agreement(s).

- Cumulative quantities in the scheduling agreement are based on the delivery order, **not** the delivery.

- For a **change of year**, you can post cumulative quantities to another period by maintaining a date field [Page 78] in the delivery order header.

You cannot enter or change data in the delivery tolerance section for shipping (item detail). This is because the customer specifies in the pick-up sheet exactly how much of a material is required. It is this exact quantity that is, as a rule, delivered to the customer.

Creating Delivery Orders

Prerequisites

Before creating a delivery order, you must first have received a pick-up sheet from the customer by fax or, ideally, by Electronic Data Interchange (EDI).

You can create a delivery order only on the basis of a scheduling agreement [Page 76] for delivery orders. A valid scheduling agreement (type **LZM**) is therefore required.

Procedure

Other than entering data specific to delivery orders, you create a delivery order in the same way as a standard sales order [Ext.].

1. Create an order using sales document type **TAM** with reference to a scheduling agreement.

   A dialog box appears.

2. Enter data to find the related scheduling agreement.

   Use the customer material number in the pick-up sheet as a basis for this search, or any of the other search options. If there is more than one scheduling agreement that matches your criteria, simply choose the appropriate one from the selection list.

3. Specify the pick-up date and times.

   If you do not use EDI, enter the pick-up date and times manually from the pick-up sheet. These date and times are of central importance in the delivery order. You cannot continue processing until you have entered this information.

   ⚠️

   If you wish to enter a pick-up date or times different from those in the pick-up sheet, or change the date or times proposed by the system from the IDoc, you must inform the forwarding agent.

4. Choose *Enter*.

   The system copies data from the dialog box into the delivery order entry screen. It also copies the material and customer material from the scheduling agreement.

5. In the purchase order number field, enter the pick-up sheet number.

   In this way, you associate the delivery order with the pick-up sheet. This helps keep the document flow transparent when dealing with an external document such as the pick-up sheet. You can, for example, display the delivery order and this pick-up sheet number (as the purchase order number) in the scheduling agreement [Page 77].

6. Enter the quantity requested by the customer in the pick-up sheet.

7. Enter additional information, as required.

   All data required for delivery order processing is in the pick-up sheet. You may want to enter additional data, however, for information purposes. Scroll right in the item overview to enter a sequence number or receiving point, for example.

Creating Delivery Orders

To enter an additional material, choose *Sales document → Create with reference to scheduling agreement* again.

Items cannot be deleted once you have saved the delivery order. This is to ensure that the original customer requirements sent by EDI are not changed. If you accidentally enter an item that you later do not want, simply reject it.

Deliveries for Delivery Orders

Use

You create a delivery to prepare the order items for pick up by the customer's forwarding agent.

Features

When processing deliveries for delivery orders, note that:

- You create a standard delivery [Ext.] for a delivery order.

- The delivery date is the pick-up date.

- You can create a delivery for each unloading point. If there is more than one unloading point involved (and consequently several deliveries), you can combine deliveries into one shipment to ensure that the customer receives all the items together.

- The customer and forwarding agent plan according to the pick-up sheet. If you cannot deliver the order in full, or if you want to change the delivery date and times, you must inform your business partners.

- If you cannot deliver the order in full, you can create a partial delivery, then a subsequent delivery. You can also configure the system beforehand to set the order to complete if a delivery cannot be delivered in full.

- There are special conventions for copying packing proposals.

- You cannot print material tags for complete shipments, but rather for each delivery. Collective shipments are not possible in delivery order processing because each delivery goes to a different unloading point.

- Cumulative quantities [Page 78] in the scheduling agreement are based on delivery orders, **not** deliveries.

Billing Documents for Delivery Orders

Use

When you create a billing document for a delivery order, all data relevant to billing is copied from the delivery order and delivery.

Features

When processing billing documents for delivery orders, note that:

- You create a standard billing document [Ext.] for a delivery order.

- Self-billing [Page 56] can be used in delivery order processing. The customer uses the pick-up sheet number as the basis for settling payment.

Returns for Delivery Orders

Use

You can create a return for delivery order items.

Features

When processing returns for delivery orders, note that:

- The standard system contains the sales document type **RM** for delivery order returns. You create a return for delivery orders in the same way as a standard return [Ext.].

- Choose *Goods issue* to post goods receipt.

Cumulative quantities are **not** updated automatically. You must correct [Page 80] them manually.

User Exits for Delivery Orders

Use

With this customer function, you can control how the system copies packing proposals into the delivery order.

When you mark the flag *E_COPY* in this user exit, the system copies existing packing proposals from scheduling agreements to the delivery order for items that do not have proposals. The system does this even if you have not maintained the *Data transfer ShUn* (data transfer shipping unit) field in Customizing for Shipping.

If you leave this flag blank, the system does not copy packing proposals from the scheduling agreement under any circumstances.

Activate this customer function by setting the flag E_ACTIVE.

Planning Delivery Schedule Processing

Purpose

Planning delivery schedules have been developed to bring efficiency and manageability to the material planning and shipping processes. In addition to forecast and just-in-time (JIT) delivery schedules, Release 4.0 contains this new delivery schedule type for the component supplier industry. The planning delivery schedule is an **internal** delivery schedule that has been designed to help you:

- Plan requirements for future periods not covered by forecast and JIT delivery schedules

- Plan requirements when weekly or monthly delivery schedules sent in by the customer are not detailed enough, and are therefore unsuitable for planning

- Plan requirements independently of inaccurate or unreliable forecast delivery schedules sent in by the customer

- Plan requirements in advance, before having even received forecast delivery schedules from a customer

Integration

Electronic Data Interchange (EDI) plays an important role in planning delivery schedule processing. We recommend that you install the EDI component.

Planning delivery schedule functions rely heavily on settings that you make in Customizing. These settings are described in detail in Planning Delivery Schedule Creation [Page 93].

Features

You create planning delivery schedules manually from internal data or by **splitting** weekly and monthly schedule lines sent in by the customer into daily schedule lines tailored to your company's shipping and planning processes.

In addition to this main feature, planning delivery schedules have the same standard functions available in forecast and JIT delivery schedules. For example, you can analyze [Page 42] them, and compare them to other delivery schedules associated with the scheduling agreement. This includes:

- Comparing delivery schedule histories

- Comparing schedule lines

- Comparing cumulative released quantities

We have also designed two **user exits** that you can use to manipulate planning delivery schedules according to your specific requirements.

Planning Delivery Schedule

Definition

An **internal** delivery schedule used to fine-tune requirements planning. The planning delivery schedule serves to:

- Limit the planning period of schedule lines in forecast delivery schedules

- Break down the weekly or monthly schedule lines sent in by the customer into daily requirements

Planning delivery schedules are based on forecast delivery schedules. You can, however, use sources other than the scheduling agreement, such as data from *Sales and Operations Planning (SOP)*.

Use

You can create a planning delivery schedule in the scheduling agreement, either manually or from a planning system. You then use it to plan shipping on the customer-material level. The planning delivery schedule is relevant for requirements even before the first forecast delivery schedule has been received from the customer. You can specify whether the planning delivery schedule is also relevant for delivery.

Later, the customer sends in a forecast delivery schedule, which is entered manually or introduced into the scheduling agreement by intermediate document (IDoc). You use the forecast delivery schedule to generate a **new** planning delivery schedule. Here, the system overwrites schedule lines in your **previous** planning delivery schedule with actual customer requirements. This is done only for schedule lines within a specific time frame, which you specify. You can reuse schedule lines from the previous planning delivery schedule in the new one for periods not covered by the forecast delivery schedule.

> Because the planning delivery schedule typically deviates from the forecast delivery schedule, the original forecast delivery schedule is stored unchanged in the scheduling agreement so you can easily review any changes.

Structure

The planning delivery schedule is structured in the same way as forecast and just-in-time (JIT) delivery schedules.

Integration

The characteristics of the planning delivery schedule are determined by its instruction [Page 95].

Planning delivery schedules complement other delivery schedules in the scheduling agreement. When the planning delivery schedule is relevant for planning or delivery, for example, it replaces the forecast delivery schedule in that function. For more information on how forecast, and JIT delivery schedules affect requirement and delivery relevance in the planning delivery schedule, see Requirements and Delivery Relevance [Page 125]**.**

Planning Delivery Schedule Creation

Use

You can use internal planning data, or customer data, to create an internal delivery schedule tailored to your company's production.

There are three ways to create a planning delivery schedule. You can:

- Set the system to generate one when the customer sends a forecast delivery schedule

  This method is ideal for incoming EDI forecast delivery schedules. The system creates a planning delivery schedule without you having to take the time to trigger the function manually.

- Manually trigger the system to generate one on request

  This method allows you to control when a planning delivery schedule is created.

- Create one without schedule lines, which you then enter manually or by batch input

  This method is ideal for advance planning when there is no internal data, no forecast delivery schedule, or when the forecast delivery schedule is inaccurate or unreliable.

There are two ways to enter schedule lines in a planning delivery schedule. Depending on the settings you make in Customizing, you can:

- Split and copy schedule lines from the forecast delivery schedule

  This is the most common method for assembling schedule lines in a planning delivery schedule. It consists of dividing the weekly or monthly schedule lines in the forecast delivery schedule into daily schedule lines in the planning delivery schedule. Note that you can only split weekly and monthly schedule lines. Daily schedule lines are copied from the forecast delivery schedule unchanged.

    This splitting function is not associated with the delivery interval [Page 18] function in scheduling agreement processing.

- Copy schedule lines unchanged from the forecast delivery schedule

  This method is useful when schedule lines in the forecast delivery schedule are detailed enough, but you want to limit the planning period. For example, if the forecast delivery schedule covers 16 weeks and you only want to plan for 8 weeks, you simply copy the schedule lines for those 8 weeks, unchanged, into the planning delivery schedule.

In both cases, you may choose to adopt schedule lines from the previous planning delivery schedule for periods during which customer schedule lines are imprecise, or if there are no customer schedule lines that cover the full period for which you want to plan.

    You can change schedule lines with a user exit [Page 127] after the system has finished generating the planning delivery schedule.

Example

You want to plan requirements for a certain customer for the next 16 weeks. You create a planning delivery schedule on the basis of information that you have gathered in an internal planning system. A few days later, the customer sends you a forecast delivery schedule that covers only 12 weeks. You decide to generate a planning delivery schedule by copying the schedule lines from the forecast delivery schedule for those 12 weeks, splitting them into units and days that fit your production schedule. For the remaining four weeks that you require, you simply adopt schedule lines from the previous planning delivery schedule in the scheduling agreement.

For another customer, you create a six-week planning delivery schedule on the basis of internal data. When the customer sends in a forecast delivery schedule for the same six weeks, you notice that the first four weeks of schedule lines in the customer delivery schedule are detailed enough for production, but the last two are inaccurate. You decide to copy the first four weeks of schedule lines unchanged into the new planning delivery schedule. You adopt the remaining two weeks of schedule lines from the previous planning delivery schedule, which already exists in the scheduling agreement.

Activities

You tailor this function to your company's planning requirements by making settings in Customizing for planning delivery schedule instructions and delivery schedule splitting rules.

Constraints

You cannot create planning delivery schedules on the basis of just-in-time (JIT) delivery schedules.

Maintaining Instructions in Customizing

Prerequisites

The planning delivery schedule instruction contains the set of characteristics that control how planning delivery schedules are created. You must enter [Page 119] an instruction in the scheduling agreement in order to create or change planning delivery schedules.

> ⚠️
>
> You must be careful when deleting instructions from **Customizing**. If you delete an instruction that has already been entered in a scheduling agreement, the system freezes that scheduling agreement. You cannot maintain *any* delivery schedules until you change the instruction in or remove it from the scheduling agreement.

Procedure

1. In Customizing for Sales and Distribution, choose *Sales → Sales Documents → Scheduling Agreements with Delivery Schedules → Maintain planning delivery sched. instruct./splitting rules*.

2. Enter a name for your instruction.

3. Specify whether or not schedule lines in planning delivery schedules are relevant for delivery.

4. Set the base date.

5. Specify whether the split validity period is measured in weeks or months.

6. Enter a split validity period

7. Set the indicator for adopting schedule lines from the previous planning delivery schedule.

8. Set the indicator for generating planning delivery schedules automatically when a forecast delivery schedule is created.

Specifying Delivery Relevance

Schedule lines in planning delivery schedules are already relevant for requirements. In the instruction, you specify if they are relevant for delivery. If so, they replace schedule lines in the forecast delivery schedule.

The delivery relevance indicator pertains only to schedule lines whose dates lie *outside* the just-in-time (JIT) delivery schedule horizon. For more information on how forecast and JIT delivery schedules affect requirements and delivery relevance in the planning delivery schedule, see Requirements and Delivery Relevance [Page 125].

Setting Base Dates

The system uses the base date to determine the split validity period, and the splitting rule range. These are important in deciding those schedule lines in the forecast delivery schedule to be included in (or excluded from) the planning delivery schedule.

You can set the forecast delivery schedule date, or the date on which the planning delivery schedule is generated, as the base date.

Use the forecast delivery schedule date if you do not want the planning delivery schedule results to be dependent on the day the planning delivery schedule is actually generated.

This is useful when you receive a forecast delivery schedule early on, but actually generate a planning delivery schedule later. In this way, the date of generation will not affect the split validity period or splitting rule range. If there is no forecast delivery schedule for the scheduling agreement item, the system uses the date of the previous planning delivery schedule as the base date.

Use the planning delivery schedule generation date if you want to push back the split validity period and splitting rule range. Note that the base date does not affect the beginning date of the split, which is still the forecast delivery schedule date.

No matter what date you decide to use as the base date, schedule lines in the forecast delivery schedule whose dates lie before the planning delivery schedule creation date are included. Schedule lines from the forecast delivery schedule date up to the base date will be split in the same way as those schedule lines whose dates lie on or after the base date.

⚠️

You must specify a base date. Otherwise, the system does **not** copy schedule lines into the planning delivery schedule.

Example

You create a planning delivery schedule for a customer with internal planning data. On the first of April, you receive a forecast delivery schedule from the customer:

Forecast Delivery Schedule Received on 04/98

D	Date	Time	Order qty...
W	15	00:00	50 pcs
W	17	00:00	50 pcs
M	05.1998	00:00	100 pcs
M	06.1998	00:00	100 pcs
M	07.1998	00:00	100 pcs
M	08.1998	00:00	100 pcs

You have set the split validity period so that only schedule lines in the first three months from the base date are copied from the forecast delivery schedule into the new planning delivery schedule. Note that the month of the base date is counted as the first month.

If you set the forecast delivery schedule as the base date, schedule lines for weeks 15 and 17, and months 05/98 and 06/98 are copied into the new planning delivery schedule. This applies even if you decide to generate the new planning delivery schedule in May.

If you set the generation date as the base date, and generate the planning delivery schedule in June, the system copies schedule lines for weeks 15 and 17, and months 05/98, 06/98, 07/98, and 08/98 from the forecast delivery schedule into the new planning delivery schedule.

Entering Split Validity Periods

When generating a planning delivery schedule, the system uses the split validity period to determine the split end date.

> The base date is 04/02/1998. This is Thursday, week 14,1998.
>
> If you set the delivery schedule validity period to 32 weeks, the system determines the last day of week 45,1998 (or 11/08/1998) as the validity end date.
>
> If you set the validity period to seven months, the system determines the last day of month 10,1998 (or 10/31/98) as the validity end date.
>
> If you do not specify a date type for the validity period, the system determines the split validity period by using the base date as the start date, and the last day of the period made up of the daily, weekly, and monthly schedule lines in the forecast delivery schedule as the end date.

Based on the base and end dates, the system calculates those schedule lines that are included in (or excluded from) the planning delivery schedule:

- The system does not take into account schedule lines in the forecast delivery schedule whose dates lie completely after the validity end date.

- Daily schedule lines whose dates lie within the validity period are copied unchanged to the planning delivery schedule.

- Weekly and monthly schedule lines in the forecast delivery schedule whose dates lie within the validity period are split according to the split rule and copied to the planning delivery schedule.

  A schedule line may contain dates that lie both within and without the validity period. In this case, the system splits the schedule lines, but includes in the planning delivery schedule only those generated schedule lines that lie on or before the validity end date. Generated schedule lines that lie after the validity end date are not taken into account.

  A schedule line with no split rule is copied unchanged to the planning delivery schedule if at least one of its dates lies within the validity period.

The system also takes into account the *Adopt schedule line* indicator to determine if schedule lines whose dates lie completely after the validity end date are to be copied from the previous planning delivery schedule.

Setting the *Adopt Schedule Lines* Indicator

You normally create a planning delivery schedule from internal planning data even before you have received information on requirements from the customer. When you later receive a forecast delivery schedule from the customer, you create a **new** planning delivery schedule by overwriting schedule lines in the previous planning delivery schedule with actual requirements.

Schedule lines from the forecast delivery schedule that lie within the split validity period are split and copied. For future periods, however, you may decide to include schedule lines from the previous planning delivery schedule to complement information from the forecast delivery schedule. When you set the "Adopt schedule lines" indicator, the system adopts unchanged into the **new** planning delivery schedule those schedule lines in the **previous** planning delivery schedule whose dates lie completely **after** the validity period end date.

Setting the *Automatic* Indicator

When you set this indicator, the system generates a planning delivery schedule each time you receive a forecast delivery schedule (for example, by EDI) and save it in the scheduling agreement. It does this immediately before checking changes in cumulative quantities against tolerance levels.

When the system generates the planning delivery schedule, it issues message V4151 to inform you. If you do not want this variable message, such as in the case of incoming EDI, simply switch it off in Customizing for Sales.

> Even with this indicator set, the system does not perform the *Automatic* function, if you:
>
> Create a planning delivery schedule manually
>
> Change an existing planning delivery schedule

Maintaining Splitting Rules in Customizing

Prerequisites

Splitting rules are assigned to a planning delivery schedule instruction. They control the **proportions** by which schedule lines in the forecast delivery schedule are split and copied to days in the new planning delivery schedule. Using them, you can split customer schedule lines into more manageable units and days for planning management.

> The splitting function is not associated with the delivery interval [Page 18] function in scheduling agreement processing.

Procedure

1. In Customizing for Sales and Distribution, choose *Sales → Sales Documents → Scheduling Agreements with Delivery Schedules → Maintain planning delivery sched. instruct./splitting rules → Maintain Delivery Schedule Splitting Rules*.

2. Enter a **name** for your splitting rule.

3. Enter a split share in the weekdays that you require for the forecast delivery schedule split.

4. Define how the system reacts when schedule lines falls on a holiday.

5. Specify how the system rounds schedule line quantities when generating a planning delivery schedule.

6. Assign splitting rule ranges to an instruction.

   Choose *Sales → Sales Documents → Scheduling Agreements with Delivery Schedules → Maintain planning delivery sched. instruct./splitting rules → Assign Delivery Schedule Splitting Rules*.

   In the dialog box, specify for which instruction you are entering a splitting rule. Then enter a splitting rule and specify its ranges in weeks or months.

Entering Split Shares

Split shares control how the system splits weekly or monthly schedule lines in a forecast delivery schedule into daily schedule lines in the planning delivery schedule. Using split shares, you can define a finely tuned split or a more general split according to your planning requirements.

The system determines days and split shares in the new planning delivery schedule for the corresponding weekly or monthly schedule line in the forecast delivery schedule. It calculates the average quantity (the schedule line quantity divided by the sum of split shares) and assigns this quantity to days according to the number of split shares per day.

> The holiday rule and rounding quantity may influence how quantities are split.
>
> If you do not enter any split shares, the system does **not** split or copy schedule lines from the forecast delivery schedule.
>
> Times, schedule line types, and the cumulative quantity received by the customer are copied from the forecast delivery schedule in the split. You can change these manually.

Example 1

Weekly Schedule Line

Forecast Delivery Schedule

D	Date	Time	Order quantity...
W	25.1998	00:00	600 pcs

Splitting Rule in Customizing

Split share sum = 3

Split rule	Mon	Tue	Wed	Thu	Fri	Sat	Sun
SD1	1	0	1	0	1	0	0

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	06/15	00:00	200 pcs
D	06/17	00:00	200 pcs
D	06/19	00:00	200 pcs

Average qty
600/3 =
200

You want to split the schedule line in the forecast delivery schedule for week 25, 1998 (06/15–06/21) with 600 pieces. In Customizing, you maintain the splitting rule, assigning one split share each to Monday, Wednesday, and Friday. When you generate the new planning delivery schedule, the system calculates the average quantity by taking the schedule line quantity and

dividing it by the split share sum. The system then assigns this quantity, 200 pieces (600 pieces divided into 3 split shares), to each split share. The resulting planning delivery schedule has 3 daily schedule lines with 200 pieces each.

Monthly Schedule Line

Forecast Delivery Schedule

D	Date	Time	Order quantity...
M	07.1998	00:00	1,820 pcs

Splitting Rule in Customizing

Split share sum = 14

Split rule	Mon	Tue	Wed	Thu	Fri	Sat	Sun
SD1	1	0	1	0	1	0	0

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	07/01	00:00	130 pcs
D	07/03	00:00	130 pcs
D	07/06	00:00	130 pcs
D	07/08	00:00	130 pcs
D	07/10	00:00	130 pcs
D	07/13	00:00	130 pcs
D	07/15	00:00	130 pcs
D	07/17	00:00	130 pcs
D	07/20	00:00	130 pcs
D	07/22	00:00	130 pcs
D	07/24	00:00	130 pcs
D	07/27	00:00	130 pcs
D	07/29	00:00	130 pcs
D	07/31	00:00	130 pcs

Average qty 1,820/14 = 130

Using the same splitting rule, you want to split the schedule line in the forecast delivery schedule for month 07, 1998 with 1,820 pieces. In this example, there is a total of 14 split shares – 14 days (Mondays, Wednesdays, and Fridays) in July that have been assigned one split share each. When you generate the new planning delivery schedule, the system calculates the average quantity, 130 pieces (1,820 pieces divided into 14 split shares), and assigns it to each split share. The resulting planning delivery schedule has 14 daily schedule lines with 130 pieces each.

Example 2

Weekly Schedule Line – Percentage Split

When you work with a total of 100 split shares for a **weekly** schedule line, the split shares you assign to weekdays are, in effect, percentage points.

Entering Split Shares

Forecast Delivery Schedule

D	Date	Time	Order quantity...
W	25.1998	00:00	600 pcs

Splitting Rule in Customizing

Split share sum = 100

Split rule	Mon	Tue	Wed	Thu	Fri	Sat	Sun
SD2	15	30	15	30	10	0	0

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	06/15	00:00	90 pcs
D	06/16	00:00	180 pcs
D	06/17	00:00	90 pcs
D	06/18	00:00	180 pcs
D	06/19	00:00	60 pcs

Average qty 600/100 = 6

You want to split the schedule line in the forecast delivery schedule for week 25, 1998 (06/15–06/21) with 600 pieces. In Customizing, you maintain the splitting rule, assigning 15 split shares each to Monday and Wednesday; 30 split shares each to Tuesday and Thursday; and 10 split shares to Friday, for a total of 100 split shares.

When you generate the new planning delivery schedule, the system calculates the average quantity, 6 pieces (600 pieces divided into 100 split shares), and assigns it to each split share. The resulting planning delivery schedule has the following daily schedule lines:

- Monday and Wednesday are assigned 90 pieces each (6 pieces *x* 15 split shares, or 15% of the total schedule line quantity)

- Tuesday and Thursday are assigned 180 pieces each (6 pieces *x* 30 split shares, or 30% of the total schedule line quantity)

- Friday is assigned 60 pieces (6 pieces *x* 10 split shares or 10% of the total schedule quantity)

Monthly Schedule Line

Forecast Delivery Schedule

D	Date	Time	Order quantity...
M	07.1998	00:00	1,820 pcs

Splitting Rule in Customizing

Split share sum = 455

Split rule	Mon	Tue	Wed	Thu	Fri	Sat	Sun
SD2	15	30	15	30	10	0	0

New Planning Delivery Schedule

D	Date	Time	Order quantity...	D	Date	Time	Order quantity...
D	07/01	00:00	60 pcs	D	07/17	00:00	40 pcs
D	07/02	00:00	120 pcs	D	07/20	00:00	60 pcs
D	07/03	00:00	40 pcs	D	07/21	00:00	120 pcs
D	07/06	00:00	60 pcs	D	07/22	00:00	60 pcs
D	07/07	00:00	120 pcs	D	07/23	00:00	120 pcs
D	07/08	00:00	60 pcs	D	07/24	00:00	40 pcs
D	07/09	00:00	120 pcs	D	07/27	00:00	60 pcs
D	07/10	00:00	40 pcs	D	07/28	00:00	120 pcs
D	07/13	00:00	60 pcs	D	07/29	00:00	60 pcs
D	07/14	00:00	120 pcs	D	07/30	00:00	120 pcs
D	07/15	00:00	60 pcs	D	07/31	00:00	40 pcs
D	07/16	00:00	120 pcs				

Average qty 1,820/455 = 4

Using the same splitting rule, you want to split the schedule line in the forecast delivery schedule for month 07, 1998 with 1,820 pieces.

When you generate the new planning delivery schedule, the system calculates the average quantity, 4 pieces (1,820 pieces divided into 455 split shares for the whole month), and assigns it to each split share. The resulting planning delivery schedule has the following daily schedule lines:

- Mondays and Wednesdays are assigned 60 pieces each (4 pieces *x* 15 split shares)

- Tuesdays and Thursdays are assigned 120 pieces each (4 pieces *x* 30 split shares)

- Fridays are assigned 40 pieces each (4 pieces *x* 10 split shares)

Entering Split Shares

Example 3

Splitting Monthly Schedule Lines into Weekly Schedule Lines

Forecast Delivery Schedule

D	Date	Time	Order quantity...
M	07.1998	00:00	1,820 pcs

Splitting Rule in Customizing

Split share sum = 4

Split rule	Mon	Tue	Wed	Thu	Fri	Sat	Sun
SD3	1	0	0	0	0	0	0

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	07/06	00:00	455 pcs
D	07/13	00:00	455 pcs
D	07/20	00:00	455 pcs
D	07/27	00:00	455 pcs

Average qty 1,820/4 = 455

By assigning split shares to only one day for each week for a month, you are in effect, splitting monthly schedule lines into weekly schedule lines.

You want to split the schedule line in the forecast delivery schedule for month 07, 1998 with 1,820 pieces. In Customizing, you maintain the splitting rule, assigning only one split share to Monday. When you generate the new planning delivery schedule, the system calculates the average quantity, 455 pieces (1,820 pieces divided into 4 split shares for the whole month), and assigns it to each split share. The resulting planning delivery schedule has 4 daily schedule lines (all Mondays) with 455 pieces each.

Setting Holiday Rules

A holiday rule specifies how the system handles schedule line quantities in the planning delivery schedule that fall on a holiday.

When splitting weekly or monthly schedule lines from the forecast delivery schedule, the system assigns schedule lines to the planning delivery schedule according to the split share that you have assigned to weekdays. Sometimes, these weekdays may be designated as holidays. You set the holiday rule to specify how the system deals with schedule line split shares that coincide with holidays.

You can:

- Treat holidays as standard workdays

  The system ignores holiday designations and assigns generated schedule lines unchanged to the planning delivery schedule.

- Shift quantities to the workday directly preceding the holiday

  The system shifts a schedule line to the first workday before the holiday, in the same week or month, even if you have not specified a split share for that day. If you have already assigned a split share to that day, the system adds this quantity to it.

  If there is no preceding workday (for example when a holiday falls on a Monday or first day of the month), the system shifts or adds the schedule line to the first workday after the holiday, in the same week or month. If there is no workday (for example during a shutdown), the system ignores holiday designations and assigns generated schedule lines, unchanged, to the planning delivery schedule.

- Divide schedule line quantities among the remaining days with a split share

  The system divides the schedule line quantity among the other days, in the same week or month, with a split share. If all other days with split shares are designated as holidays, the system ignores these designations and assigns generated schedule lines, as they are, to the planning delivery schedule.

Schedule line dates are requested delivery dates. For this reason, the system checks each date against the ship-to party calendar to determine if the daily schedule line generated in the planning delivery schedule falls on a holiday. The system uses the calendar stored in the scheduling agreement item for the unloading point. There is a user exit [Page 127] that allows you to modify this calendar.

Note that the system does not take goods receiving hours for a particular customer into account when splitting schedule lines. You can, however, define a splitting rule that corresponds to these times.

Setting Holiday Rules

Example

No Holiday Rule

Forecast Delivery Schedule

D	Date	Time	Order quantity...
W	23.1998	00:00	600 pcs

Splitting Rule in Customizing

Split share sum = 3

Split rule	Mon	Tue	Wed	Thu	Fri	Sat	Sun
SD1	1	0	1	0	1	0	0

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	06/01	00:00	200 pcs
D	06/03	00:00	200 pcs
D	06/05	00:00	200 pcs

Average qty 600/3 = 200
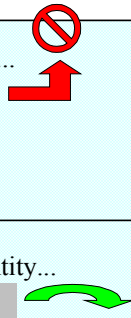
Monday, 06/01 is a holiday.

You want to split the schedule line in the forecast delivery schedule for week 23, 1998 (06/01–06/07) with 600 pieces. In Customizing, you maintain the splitting rule, assigning one split share each to Monday, Wednesday, and Friday. When you generate the new planning delivery schedule, the system calculates the average quantity by taking the schedule line quantity and dividing it by the split share sum. The system assigns this quantity, 200 pieces (600 pieces divided into 3 split shares) to each split share. The resulting planning delivery schedule has the following daily schedule lines:

- Monday, 06/01, is assigned 200 pieces even though it is a holiday
- Wednesday, 06/03, is assigned 200 pieces
- Friday, 06/05, is assigned 200 pieces

Holiday Rule – Shift Quantities

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	06/01	00:00	200 pcs
D	06/03	00:00	200 pcs
D	06/05	00:00	200 pcs

D	Date	Time	Order quantity...
D	06/01	00:00	200 pcs
D	06/03	00:00	200 pcs
D	06/05	00:00	200 pcs

Next work day
Tuesday, 06/02

D	Date	Time	Order quantity...
D	06/02	00:00	200 pcs
D	06/03	00:00	200 pcs
D	06/05	00:00	200 pcs

You want to perform a split under the same conditions as in the previous example. The only difference is that you have set the holiday rule to shift quantities.

When the system determines that Monday is a holiday, it attempts to shift this day's schedule line to the first preceding workday in the same week. Since 06/01 is a Monday, there is no preceding workday. The system then shifts the schedule line to the first following workday, in this case Tuesday, 06/02. The resulting planning delivery schedule has the following daily schedule lines:

- Tuesday, 06/02, is assigned 200 pieces

- Wednesday, 06/03, is assigned 200 pieces

- Friday, 06/05, is assigned 200 pieces

Setting Holiday Rules

Holiday Rule – Divide Quantities

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	06/01	00:00	200 pcs
D	06/03	00:00	200 pcs
D	06/05	00:00	200 pcs

D	Date	Time	Order quantity...	100 pcs
D	06/03	00:00	200 pcs ◄	
D	06/05	00:00	200 pcs ◄	100 pcs

D	Date	Time	Order quantity...
D	06/03	00:00	**300 pcs**
D	06/05	00:00	**300 pcs**

You want to perform a split under the same conditions as in the previous example. The only difference is that you have set the holiday rule to **divide** quantities.

When the system determines that Monday is a holiday, it divides the schedule line quantity for 06/01 (200 pieces), among the two remaining schedule lines for the week. The resulting planning delivery schedule has the following daily schedule lines:

- Wednesday, 06/03, is assigned 300 pieces

- Friday, 06/05, is assigned 300 pieces

Setting Quantity Rounding

You may encounter unmanageable quantities when splitting schedule lines from the forecast delivery schedule. It is difficult to establish planning or delivery relevance for these quantities, and therefore they may not be suitable for processing. You set the rounding rule to specify how the system is to deal with these quantities. You can round generated schedule line quantities to:

- Three decimal places

- The number of decimal places (0, 1, 2, or 3) defined for the sales unit in the scheduling agreement item

- Multiples of the delivery rounding quantity in the scheduling agreement

    If this rounding quantity has not been specified in the scheduling agreement item, the system rounds schedule line quantities to the number of decimal places defined for the sales unit.

Using any one of these rounding procedures may result in a remaining quantity that the system does not associate with any schedule line in the planning delivery schedule. The system assigns this quantity to the first schedule lines generated in the planning delivery schedule, according to the split shares that you have specified.

Example

No Rounding

Forecast Delivery Schedule

D	Date	Time	Order quantity...
W	24.1998	00:00	500 pcs

Splitting Rule in Customizing

Split share sum = 3

Split rule	Mon	Tue	Wed	Thu	Fri	Sat	Sun
SD1	1	0	1	0	1	0	0

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	06/08	00:00	166.666 pcs
D	06/10	00:00	166.666 pcs
D	06/12	00:00	166.666 pcs

Average qty
500/3 =
166.66666...

Not rounded, displayed as:
166.666
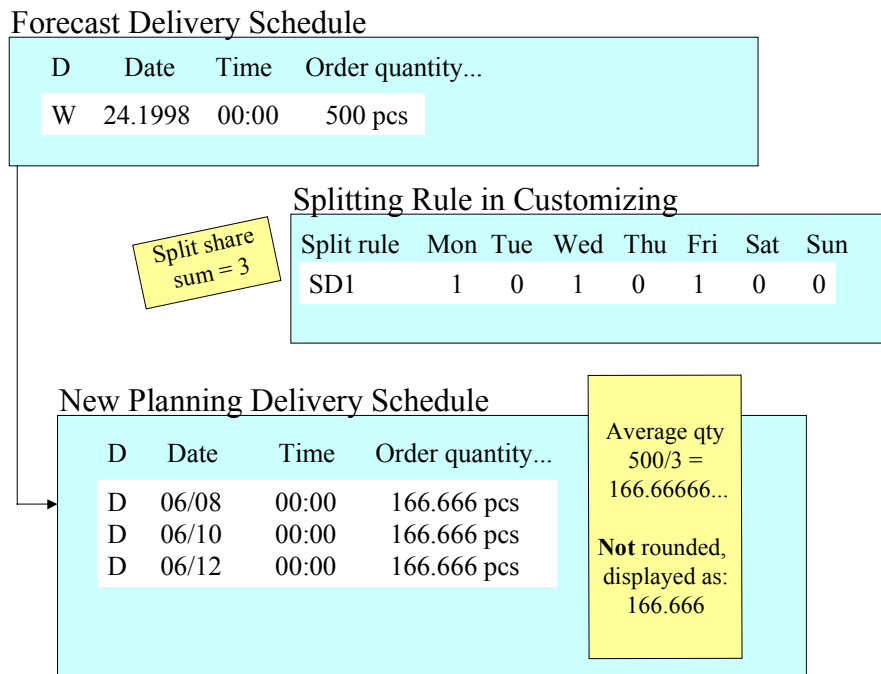
You want to split the schedule line in the forecast delivery schedule for week 24, 1998 (06/08–06/14) with 500 pieces. In Customizing, you maintain the splitting rule, assigning one split share

Setting Quantity Rounding

to Monday, Wednesday, and Friday. The sales unit *piece* has been set in the scheduling agreement item to be rounded to *0* decimal places. The delivery rounding quantity is 5 pieces.

When you generate the new planning delivery schedule, the system calculates the average quantity by taking the schedule line quantity and dividing it by the split share sum. The system assigns this quantity, 166.66666... pieces (500 pieces divided into 3 split shares) to each split share. The resulting planning delivery schedule has 3 daily schedule lines each with 166.666... pieces. However, the schedule line quantity is **displayed** to only three decimal places.

Rounding to Three Decimal Places

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	06/08	00:00	166.666 pcs
D	06/10	00:00	166.666 pcs
D	06/12	00:00	166.666 pcs
			= 499.998 pcs

Rounded to 3 decimal places: 166.666 pieces

Remainder is .002 pcs

D	Date	Time	Order quantity...
D	06/08	00:00	166.666 pcs
D	06/10	00:00	166.666 pcs
D	06/12	00:00	166.666 pcs

D	Date	Time	Order quantity...
D	06/08	00:00	166.667 pcs
D	06/10	00:00	166.667 pcs
D	06/12	00:00	166.666 pcs

If you set the system to round to three decimal places, the system treats the above schedule line split differently. It rounds the schedule line quantities in the planning delivery schedule to 166.666 pieces. Because of the split and rounding process, the total quantity falls short of the original schedule line (500 pieces) by 0.002 pieces. This remaining quantity is divided and assigned to the schedule lines according to their split shares.

The resulting planning delivery schedule has schedule lines for days 06/08 and 06/10 with 166.667 pieces each, and 06/12 with 166.666 pieces.

Rounding According to the Sales Unit

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	06/08	00:00	166.000 pcs
D	06/10	00:00	166.000 pcs
D	06/12	00:00	166.000 pcs

Rounded to 0 decimal places: 166.000 pieces

= 498 pcs   Remainder is 2 pcs

D	Date	Time	Order quantity...
D	06/08	00:00	166.000 pcs
D	06/10	00:00	166.000 pcs
D	06/12	00:00	166.000 pcs

D	Date	Time	Order quantity...
D	06/08	00:00	167.000 pcs
D	06/10	00:00	167.000 pcs
D	06/12	00:00	166.000 pcs

If you set the system to round according to the sales unit (in this example *0* decimal places), the system rounds the schedule line quantities in the planning delivery schedule to 166 pieces. Because of the split and rounding process, the total quantity falls short of the original schedule line (500 pieces) by 2 pieces. This remaining quantity is divided and assigned to the schedule lines according to their split shares.

The resulting planning delivery schedule has schedule lines for days 06/08 and 06/10 with 167 pieces each, and 06/12 with 166 pieces.

Setting Quantity Rounding

Rounding to Multiples of the Delivery Rounding Quantity

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	06/08	00:00	165 pcs
D	06/10	00:00	165 pcs
D	06/12	00:00	165 pcs

Rounded to multiples of 5: 165.000 pieces

= 495 pcs

Remainder is 5 pcs

D	Date	Time	Order quantity...
D	06/08	00:00	165 pcs
D	06/10	00:00	165 pcs
D	06/12	00:00	165 pcs

D	Date	Time	Order quantity...
D	06/08	00:00	170 pcs
D	06/10	00:00	165 pcs
D	06/12	00:00	165 pcs

If you set the system to round to multiples of the delivery rounding quantity, in this case multiples of five, the system rounds the schedule line quantity in the planning delivery schedule to 165 pieces. Because of the split and rounding process, the total quantity falls short of the original schedule line (500 pieces) by 5 pieces. This remaining quantity is assigned to the first schedule line according to its split share.

The resulting planning delivery schedule has schedule lines for the day 06/08 with 170 pieces, and for days 06/10 and 06/12 with 165 pieces.

Assigning Splitting Rules

You can split schedule lines in the forecast delivery schedule from different time periods according to instructions and their various splitting rules. The system determines these periods based on splitting rule ranges.

To split a schedule line in a forecast delivery schedule, the system uses:

- The range that is valid for the date type of the schedule line

  The system uses ranges with the date type *week* to split weekly schedule lines, and ranges with the date type *month* to split monthly schedule lines. Remember that daily schedule lines in a forecast delivery schedule are copied **unchanged** into the planning delivery schedule.

- The shortest range that covers the schedule line date

  Because ranges are always defined from the base date, you may have several splitting rule ranges covering one schedule line date. For example, you may have splitting rules valid for two months, and for seven months from the base date. If both rules cover the schedule line date, the system uses the splitting rule with the shortest range, in this example two months.

If none of the ranges cover a schedule line date that lies within the validity period [Page 99] (for example if all the ranges have expired), the system copies the schedule line unchanged to the new planning delivery schedule.The same applies if a range has been specified but no splitting rule.

> The week (or month) of the base date is always counted as the first week (or month).
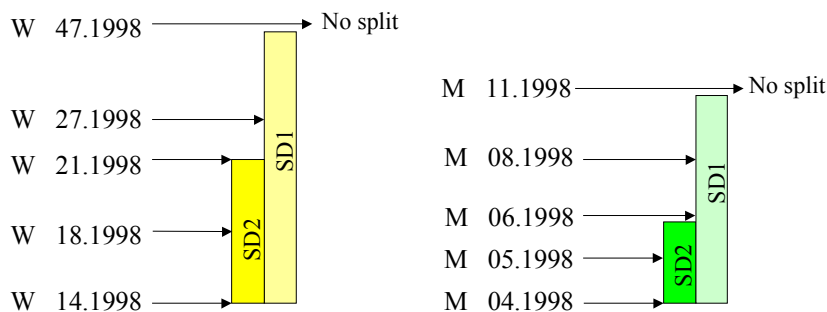>
> If you enter 0 for the range, the system takes the week or month previous to the base date as the range end date.

Assigning Splitting Rules

Example

Assign Splitting Rules
in Customizing

D	Range	Split rule...
2	08	SD2
2	32	SD1
3	02	SD2
3	07	SD1

Weeks { 2, 2 }   *Months* { 3, 3 }

W 47.1998 ────→ No split

W 27.1998 ───→ SD1

W 21.1998 ───→

W 18.1998 ───→ SD2

W 14.1998 ───→

M 11.1998 ────→ No split

M 08.1998 ───→ SD1

M 06.1998 ───→

M 05.1998 ───→ SD2

M 04.1998 ───→

The base date of the planning delivery schedule is 04/02/98. This is a Thursday, week 14,1998.

Based on this date, the system determines the splitting rule range end dates. Schedule lines are split in the forecast delivery schedules as follows:

- Weekly schedule lines up to and including week 21 are split according to splitting rule SD2.

- From week 22 up to and including week 45, they are split according to splitting rule SD1.

- From week 46, the system copies schedule lines from the forecast delivery schedule as they are.

- Monthly schedule lines up to and including month 5 are split according to splitting rule SD2. From month 6 up to and including month 10, they are split according to splitting rule SD1. From month 11, the system copies schedule lines as they are.

⚠️

> The splitting rule range specifies how long the delivery schedule splitting rule is valid.

> The delivery schedule split validity period specifies the **overall** validity of the delivery schedule split.

> Although both influence schedule line splits, the split validity period overrides the splitting rule range in every case.

> In this example, if the split validity period has been set to seven months, generated schedule lines for week 45 with dates lying after the validity end date 10/31/98 are not included in the planning delivery schedule.

10/31/98 ⟶

W   27.1998 ⟶   SD1

W   18.1998 ⟶   SD2

W   14.1998 ⟶
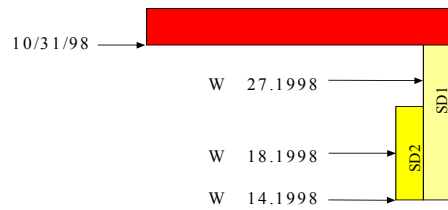
No schedule lines split or copied after 10/31!

Creating Planning Delivery Schedules

Prerequisites

You have an existing outline agreement with the customer - in this case, a scheduling agreement with delivery schedules.

You create a planning delivery schedule in the same way as a forecast or just-in-time (JIT) delivery schedule, except that you maintain Customizing settings for planning delivery schedule instructions and delivery schedule splitting rules, and enter an instruction in the scheduling agreement.

Procedure

1. In the scheduling agreement, choose *Goto → Item → More → Dlv. sched. control*. Enter an instruction in the field *PlanDS instruction* or select one from the list of possible entries.

    You cannot create planning delivery schedules until you enter an instruction in the scheduling agreement.

    You may decide to enter an instruction in a scheduling agreement when using the splitting function, or if a customer does not usually send JIT delivery schedules. If, however, you do not create or maintain planning delivery schedules **regularly** in the scheduling agreement, we recommend that you *remove the instruction* once you are done. This ensures that schedule lines in the planning delivery schedule do not affect schedule lines in the other delivery schedules associated with the scheduling agreement, in particular in regard to requirements and delivery relevance [Page 125].

    Although you can remove an instruction for a planning delivery schedule that is intact, we recommend otherwise. Either delete schedule lines in the planning delivery schedule or create a new planning delivery schedule with no schedule lines before removing the instruction.

2. If you have set the automatic [Page 101] indicator in Customizing, the system will generate a planning delivery schedule **automatically** when a forecast delivery schedule is saved in the scheduling agreement. To view or change this planning delivery schedule, choose *Goto → Item → Planning delivery schedule*.

    If you have not set this indicator, you have to trigger the generation **manually** by choosing *Back → Goto → Item → Planning delivery schedule*. Then choose *Generate plan. dlv. sched*.

    To generate a planning delivery schedule with **no schedule lines**, choose *Back → Goto → Item → Planning delivery schedule*. Then choose *New dlv sched w/o proposal*.

Creating Planning Delivery Schedules - Example

Relevant data:

- You want to plan requirements for a customer for the next three months

- Wednesday, November 18, is a holiday

- Delivery rounding quantity is five

- Sales unit rounded to three decimal places

You have made the following Customizing settings:

Base date = Delivery schedule date
Split validity period 2 months
Adopt schedule lines
Relevant for delivery
Automatic generation

Planning Delivery Schedule Instruction

Instructn	D	B	T	Val	P	A	...
PLNA	X	1	3	2	X	X	

Holiday rule = Preceding work day
Round to multiples

Split rule	Mon	Tue	Wed	Thu	Fri	Sat	Sun	H	R
SD1	1	0	1	0	1	0	0	1	2
SD2	10	15	10	0	12	0	0	1	1

Delivery Schedule Splitting Rule

Round according to sales unit

Range = 1 month

Instructn	PLNA

D	Range	Split rule
3	1	SD2
3	2	SD1

Splitting Rule Assignment

Range = 2 months

You receive the following forecast delivery schedule:

Forecast Delivery Schedule (Created on 10/01)

D	Date	Time	Order quantity...	
M	10.1998	00:00	375 pcs	→ Split rule **SD2** will be used to split this schedule line
M	11.1998	00:00	375 pcs	→ Split rule **SD1** will be used to split this schedule line
M	12.1998	00.00	375 pcs	→ The system will not split or copy this schedule line since it lies after the split validity period

Creating Planning Delivery Schedules - Example

This is the planning delivery schedule that you have already entered manually into the scheduling agreement using internal data:

Existing Planning Delivery Schedule

D	Date	Time	Order quantity...
D	10/02	00:00	22 pcs
D	10/05	00:00	25 pcs
D	10/06	00:00	25 pcs
D	10/07	00:00	27 pcs
D	10/09	00:00	27 pcs
...			
D	11/02	00:00	27 pcs
D	11/04	00:00	28 pcs
D	11/06	00:00	30 pcs
D	11/09	00:00	35 pcs
D	11/16	00:00	28 pcs
D	11/17	00:00	27 pcs
...			
D	11/30	00:00	24 pcs
D	12/01	00:00	25 pcs
D	12/02	00:00	20 pcs
D	12/04	00:00	18 pcs
D	12/07	00:00	32 pcs

These schedule lines are overwritten by schedule lines from the forecast delivery schedule

Split validity period end date 11/30

These schedule lines are retained because the *Adopt schedule lines* indicator has been set

The system generates the following planning delivery schedule automatically:

New Planning Delivery Schedule

D	Date	Time	Order quantity...
D	10/02	00:00	22.500 pcs
D	10/05	00:00	18.750 pcs
D	10/06	00:00	28.125 pcs
D	10/07	00:00	18.750 pcs
D	10/09	00:00	22.500 pcs
...			
D	11/02	00:00	35.000 pcs
D	11/04	00:00	35.000 pcs
D	11/06	00:00	35.000 pcs
D	11/09	00:00	30.000 pcs
D	11/16	00:00	30.000 pcs
D	11/17	00:00	30.000 pcs
...			
D	11/30	00:00	30.000 pcs
D	12/01	00:00	25.000 pcs
D	12/02	00:00	20.000 pcs
D	12/04	00:00	18.000 pcs
D	12/07	00:00	32.000 pcs

This is how the system calculates the schedule lines:

October Schedule Line From the Forecast Delivery Schedule

D	Date	Time	Order quantity...
M	10.1998	00:00	375 pcs

Delivery Schedule Splitting Rule

Split share sum = 200 for the whole month

Split rule	Mon	Tue	Wed	Thu	Fri	Sat	Sun
SD2	10	15	10	0	12	0	0

New Planning Delivery Schedule - October

D	Date	Time	Order quantity...
D	10/02	00:00	22.500 pcs
D	10/05	00:00	18.750 pcs
D	10/06	00:00	28.125 pcs
D	10/07	00:00	18.750 pcs
D	10/09	00:00	22.500 pcs
...			

Average qty 375/200 = 1.875 pcs

Rounded according to sales unit - 3 decimal places

November Schedule Line From Forecast Delivery Schedule

D	Date	Time	Order quantity...
M	11.1998	00:00	375 pcs

Delivery Schedule Splitting Rule

Split rule	Mon	Tue	Wed	Thu	Fri	Sat	Sun
SD2	1	0	1	0	1	0	0

Split share sum = ~~13~~ 12 because of holiday

New Planning Delivery Schedule - November

D	Date	Time	Order quantity...
D	11/02	00:00	35 pcs
D	11/03	00:00	35 pcs
D	11/04	00:00	35 pcs
D	11/05	00:00	30 pcs
D	11/09	00:00	30 pcs
...			
D	11/17	00:00	30 pcs
D	11/30	00:00	30 pcs

Average qty 375/12 = 30 pcs

Rounded to multiples of the delivery rounding quantity - 5 pieces. This results in a remainder of 15 pieces which is assigned to the first 3 schedule lines.

Friday, November 18 is a holiday. According to the holiday rule that you have set in the delivery schedule splitting rule, the quantity of 30 pcs normally assigned to this day is assigned to the preceding work day, Tuesday, November 17.

Troubleshooting

Problem	Solution
The system does not allow you to create or maintain planning delivery schedules	Check that you have entered an instruction [Page 119] in the scheduling agreement
The system does not allow you to maintain any sort of delivery schedule in the scheduling agreement	Check that you have not deleted in Customizing the planning delivery schedule instruction [Page 95] for the scheduling agreement
No schedule lines are generated in the planning delivery schedule	Check that you have: • Entered a base date [Page 97] • Assigned a splitting rule [Page 102] and splitting rule range [Page 116] • Entered split shares [Page 103] • Set the automatic [Page 101] indicator **Note**: Even if you have marked this indicator, the system performs the *automatic* function if you create or change a planning delivery schedule manually.
Unexpected schedule lines quantities in the planning delivery schedule	Check your settings for the: • Holiday rule [Page 108] • Quantity rounding [Page 112]
Unexpected schedule line dates	Check your settings for the: • Holiday rule [Page 108] • Quantity rounding [Page 112]
Schedule lines in the planning delivery schedule do not correspond to your required planning period	Check your settings for the: • Split validity period [Page 99] • Splitting rule ranges [Page 116]
Unexpected split end date	Check your settings for the: • Split validity period [Page 99] • Splitting rule ranges [Page 116]
Schedule lines from the forecast delivery schedule are copied but not split	Check that you have assigned a: • Splitting rule [Page 102] • Splitting rule ranges [Page 116]

Unexpected requirements or delivery relevance for schedule lines in the scheduling agreement	Check your settings for the delivery relevance [Page 96]. Also review the instruction [Page 95] that you have entered in the scheduling agreement.
Schedule lines in the previous planning delivery schedule are not copied to the new schedule	Check that you have set the adopt schedule lines [Page 100] indicator

Requirements and Delivery Relevance in Planning Delivery Schedules

Use

Requirements and delivery relevance in delivery schedules is influenced by the document type [Page 10], and the schedule line category [Page 12], which the system determines using the requirements planning indicator specified in the scheduling agreement header.

The system determines a schedule line category for schedule lines in planning delivery schedules that is relevant for requirements. You can also specify whether you want these schedule lines to be relevant for delivery.

These relevances are affected by forecast delivery schedules and just-in-time (JIT) delivery schedules.

Features

The R/3 System contains the following settings for the requirements and delivery relevance indicator:

- **Blank** - Delivery schedules are not used.

- **A** - Only forecast delivery schedules are relevant for requirements planning.

- **B** - Forecast delivery schedules and JIT delivery schedules are relevant for requirements planning and delivery.

- **C** - Only forecast delivery schedules are relevant for requirements planning. Only JIT delivery schedules are relevant for delivery.

- **D** - Forecast delivery schedules and JIT delivery schedules are relevant for requirements planning. Only JIT delivery schedules are relevant for delivery.

- **E** - JIT delivery schedules are not used.

For more information, see Setting Requirements and Delivery Relevance [Page 38].

Integration

Planning delivery schedules replace forecast delivery schedules for requirements and, in some cases, delivery relevance when you enter a planning delivery schedule instruction [Page 119] in the scheduling agreement item. For this reason, we recommend that you remove the instruction if you do not **regularly** create or maintain planning delivery schedules in the scheduling agreement. This ensures that schedule lines in the planning delivery schedule do not affect the requirements and delivery relevance of the other types of delivery schedules in the scheduling agreement.

To decide which type of delivery schedule is currently relevant for requirements and delivery, the system uses the JIT delivery schedule horizon, the material requirements planning indicator in the scheduling agreement header, and the delivery relevance indicator in the planning delivery schedule instruction. A more precise method for determining relevance is not yet available.

When there is a planning delivery schedule in a scheduling agreement, the system determines relevance for requirements as follows:

MRP indicator B or D

Up to the JIT delivery schedule horizon, the JIT delivery schedule is relevant for requirements.

After the JIT delivery schedule horizon, the planning delivery schedule is relevant for requirements.

MRP indicator A or C

The JIT delivery schedule is not relevant for requirements.

The planning delivery schedule is relevant for requirements (independent of the JIT delivery schedule horizon).

The system determines relevance for delivery as follows:

The delivery relevance indicator has been set to "yes" in the planning delivery schedule instruction

Up to the JIT delivery schedule horizon, the JIT delivery schedule is relevant for delivery.

After the JIT delivery schedule horizon, the planning delivery schedule is relevant for delivery.

The delivery relevance indicator has been set to "no" in the planning delivery schedule instruction – MRP indicator A or B

Up to the JIT delivery schedule horizon, the JIT delivery schedule is relevant for delivery.

After the JIT delivery schedule horizon, the forecast delivery schedule is relevant for delivery.

The delivery relevance indicator has been set to "no" in the planning delivery schedule instruction – MRP indicator C or D

Up to the JIT delivery schedule horizon, the JIT delivery schedule is relevant for delivery.

Schedule lines occurring after the JIT delivery schedule horizon are not relevant for delivery.

Activities

To view the material requirements planning indicator, choose *Goto → Header → Sales*.

You specify delivery relevance [Page 96] in Customizing.

User Exits for Planning Delivery Schedules

Use

EXIT_SAPFV45L_001

This user exit enables you to change schedule lines once the system has a planning delivery schedule. You can:

- Even out the results of the planning delivery schedule generation (for example, by averaging schedule lines)

- Project data into the future (for example by using known trends in dates and quantities)

- Introduce data into the planning delivery schedule that is external to the scheduling agreement, such as data from *Sales and Operations Planning (SOP)*

  A batch input function is available in the standard system.

- Manipulate the proposed schedule lines using your own dialog module

- Determine if there are only minor differences between the old and new planning delivery schedules and, if so, retain the old one

You can use any of the following import parameters:

- I_VBAK - Document header
- I_VBAP - Document item
- I_KUWEV - Ship-to party view with calendar ID KNFAK
- I_VBLB_LAB - Forecast delivery schedule header
- XVBEP - Table of (still) current schedule lines

  You must not change this table under any circumstances!
- VBEP_GEN_TAB - Table of schedule lines generated in the *plan.dlv.sched*.

From these parameters, you can select relevant schedule lines with the following conditions:

- POSNR EQ VBAP-POSNR - Schedule line belongs to the current item

- WMENG GT 0 - Not automatically generated in scheduling
- UPDKZ NE 'D' - Not deleted

- ABART EQ '1' - Forecast delivery schedule

- ABART EQ '2' - Just-in-time (JIT) delivery schedule

- ABART EQ '5' - Planning delivery schedule

You can modify table VBEP_GEN_TAB.

EXIT_SAPFV45L_002

Using holiday rules [Page 108], which you assign to each splitting rule, you can control how the system handles schedule lines that fall on a holiday.

Schedule line dates are requested delivery dates. For this reason, the system checks each generated schedule line against the ship-to party calendar to determine if it falls on a holiday. The system uses the calendar stored in the scheduling agreement item for the unloading point.

With this user exit, you can set the system to access another calendar at the start of the splitting process. This user exit is useful when there is no calendar available (for example, when no unloading point has been specified for the item).

The following import parameters are available:

- I_VBAK - Document header

- I_VBAP - Document item

- I_KUWEV - Ship-to party view with calendar ID KNFAK

- C_CALENDAR - Calendar ID for holiday rules

You can modify calendar ID C_CALENDAR (initial value KUWEV-KNFAK).