

Inventory Valuation according to German Commercial and Tax Legislation

Author: Dr. Volker Thormählen¹, Bull AG, Cologne, Germany
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¹ Currently Dr. Volker Thormählen is the chairman of the German ORACLE Applications User Group being a Special Interest Group (SIG) within DOAG e.V., Stuttgart, Germany

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List of Abbreviations

#	Number
Art.	Article
AV	Average
AVCO	Average Cost
BGB	(German) Civil law
BiRiLiG	(German) Accounting directives act
BOM	Bill of Material
CRC	Current replacement cost
EC	European Community
EEC	European Economic Community
ESTG	(German) Income tax law
ESTR	(German) Income tax regulations
ESTDV	(German) Income tax ordinance
etc.	Et cetera (and others or and the like)
EU	European Union
FA	Fixed Assets
FIFO	First In, First Out
HGB	(German) Commercial code
HIFO	Highest In, First Out
IASC	International Accounting Standards Committee
IAS	International Accounting Standards
INV	Inventory
IPV	Invoice Price Variance
LIFO	Last In, First Out
LOCM	Lower of Cost or Market
LOFO	Lowest In, First Out
MAX	Maximum
MIN	Minimum
NP	Normal Profit
NRV	Net Realisable Value
OC	Original Cost
OE	Order Entry
PO	Purchase Order
UK	United Kingdom
USA	United States of America
WIP	Work In Progress

1. Introduction

The following inventory valuation methods applicable under *Historical Cost Accounting* will (in the main) be considered:⁵

- Individual cost
- Average cost (AVCO)
- First in, First Out (FIFO)
- Last in, First Out (LIFO)
- Base stock

Current Value Accounting is not allowed in Germany. Therefore, departures from *strict Historical Cost Accounting* (for example, *current replacement cost*) will be described in conjunction with the LOCM principle.

When describing the departures from Original Cost in the main the following *appraisal values* will be considered:

- Current replacement cost⁶ (CRC)
- Net realizable value (NRV)
- Latest purchase price⁷

In connection with the LOCM principle special attention will be given to damaged, obsolete, used and otherwise *deteriorated*⁸ items in inventory.

Elimination of intra-group profit (or loss) arising from the *intercompany transfers of merchandise* will be considered briefly.

Inventory valuation with *standard cost* will not be covered. German commercial and tax legislation does not even mention *Standard Cost Accounting*. Clearly this method belongs to *cost accounting* and not to *financial accounting*. In addition Standard Costing is rarely used by German trade and resale organisations⁹. Usually Standard Costing is applied for *serial production of standard items*.

Estimating ending inventories by the *Retail Method* or the *Gross Profit Method* will not be covered¹⁰.

The following inventory valuation is considered from the perspective of trade and resale organisations, that is, from the viewpoint of the Distribution modules (OE, INV, and PO). Therefore, emphasis is on costs of purchase and corresponding costs of

⁴ Historical cost, original cost, actual cost, and real costs are used as synonyms in this paper.

⁵ Output-based inventory valuation methods other than the LOCM principle (like the *Gross Profit Method* or the *Retail Method*) will not be covered in this paper.

⁶ Definition (see IAS2, revised 1993, paragraph 4): '*Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs of completion and less the estimated costs necessary to make the sale.*'

⁷ In order to approximate FIFO or CRC.

⁸ For example, change in price levels.

⁹ See paragraph 17 of IAS2 (revised 1993): '*Techniques for the measurement of the cost of inventories, such as the standard cost method or the retail method may be used for convenience if the results approximate cost. Standard costs take into account normal levels of materials and supplies, labour, efficiency and capacity utilisation. They are regularly reviewed and, if necessary, revised in the light of current conditions.*'

¹⁰ Furthermore goods in transit and goods out on consignment will not be considered explicitly.

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sale rather than on costs of conversion. Nevertheless, in order to enhance the degree of completeness, table 1 displays the major components of manufacturing costs with regard to constituting capital expenditures. Please note the difference between the mandatory and optional components of costs of conversion according to German commercial and tax legislation.

2. Review of German trade and tax legislation for inventory valuation

A summary of the German trade and tax legislation as far as required for inventory valuation purposes is given in table 2.

Germany has adopted The *EEC Fourth Directive*¹¹ (passed in 1978) in a law called 'Bilanzrichtlinien-Gesetz' (BiRiLiG)(:= *accounting directives act*) on Dec. 19, 1985 for fiscal years starting after Dec. 31, 1986. Table 3 exhibits the relevant articles of the 4th Directive being the source for German legislation.

Regarding inventory valuation and cost of sale figure 1 summarizes the European Accounting Standards in this functional domain. The mathematical expression $\min(OC, NRV)$ has the following meaning: lower of *Original Cost* and *Net Realizable Value*.

It was already mentioned above, that *Current Value Accounting* is not approved in Germany. But it is allowed by other Member States of the European Union, for example in Belgium, Denmark, Netherlands, and UK.

3. Applicable Balance Sheet Values for Inventories

Table 2 contains the *most important legal provisions* for inventory valuation in Germany. The *mandatory* components of the costs of purchase and the costs of conversion are clearly defined by German and European legislation (see table 2 and table 3).

Figure 2 clearly shows that *actual acquisition or production cost* are approved for both, commercial and tax balance sheet. The usage of the other value types shown in figure 2 will be explained later.

Figure 3 illustrates the main contents of table 2 from a *statutory* point of view.

The 4th Directive contains, in Art. 35, the legal definitions for *Purchase Price* and *Production Cost*. Art. 35, 2. defines the *Purchase Price* as follows (see table 3):

'The purchase price shall be calculated by adding to the price paid the expenses incidental thereto.'

With regard to *supplementary initial costs*, reference should also be made to paragraph 13 of *IAS2* (revised 1993):

'Other Costs are included in the cost of inventories only to the extent that they are incurred in bringing the inventories to their present location and condition.'

¹¹ Hereafter called *4th Directive*

4. Review of Inventory Valuation Methods approved in Germany

The most important subdivision of cost formulas for inventory valuation is as follows:

- Individual Valuation
- Collective Valuation

Individual Valuation is the *predominant* principle in Germany. Collective Valuation is always an *exemption* from the general rule. Further subdivision of Collective Valuation can be represented by 3 branches (see figure 4):

- Average Costing
- Inventory Flow Methods
- Base Stock

Figure 5 shows that the three valuation methods mentioned above are based on Historical Cost Accounting.

In addition both figures are showing clearly, that all methods can be combined with two stock taking systems:

- Periodic inventory (e.g. yearly stock taking)
- Perpetual inventory (e.g. continuous stock taking)

The basic update formula¹² for perpetual inventory is described in figure 7. This formula is normally build into inventory modules in order to track quantities and associated values.

In the following the inventory valuation methods will be outlined in more detail.

5. Individual Valuation

When it is possible to identify individual units in an inventory with specific purchase prices, the later may be used to assign costs to the inventory and to the cost of goods sold. Hence the use of the *Identified Cost* method requires that individual cost records are kept for individual units (= piece, lot, or batch) purchased, so that the cost of each item in inventory is known.

The following describes the Individual Valuation¹³ from the legal point of view.

The principle of Individual Valuation is not a German speciality. In the USA the above mentioned expressions are well known and used. The USA regulations require that the goods with *specific identification* need to be valued by actual cost of each unit (*based upon cost of goods sold*). This method belongs to the *Cost Based Valuation Methods* (see figure 1, box named *Original Cost*).

¹² Simplified formula for the *Inventory Equation*: For example the unexplained deficits due to physical inventory (loss, etc.) and returns are not considered.

¹³ Synonyms for the *individual valuation* are: unit valuation, specific invoice price, specific item pricing, specific identification of cost, specific identification cost flow method, specific identification of individual costs, identified cost method.

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The International Accounting Standards Committee¹⁴ (IASB) came into existence on 29 June, 1973 as a result of an agreement by accountancy bodies in different countries including Germany and USA. The 'International Accounting Standards' (IAS) became valid through broad acceptance and use in the operational business.

In October 1975 IAS2 (*'Valuation and Presentation of Inventories in the Context of the Historical Cost System'*) has been published. In December 1993 this document was superseded by IAS2 (*'Inventories'*) becoming operative for financial statements covering periods beginning on or after 1 January 1995.

A special reference needs to be made to paragraph 19 of IAS2 (revised 1993):

'The cost of inventories of items that are not ordinarily interchangeable and goods or services produced and segregated for specific projects should be assigned by using specific identification of their individual costs.' - Specific identification of cost means that specific cost are attributed to identified items of inventory.

For materials, WIP's and finished goods as well as trade goods, the principle of Individual Valuation needs to be applied in Germany according to § 252 HGB and § 6 EStG. A store can not be valued *as a whole*, the goods in the stores need to be valued separately. This *Individual Valuation Principle* for inventory valuation of goods with specific identification is not solely used in Germany. For example, the inventory valuations in *France, Sweden and Japan* are legally based on the principle of Individual Valuation.

This is especially valid for the goods listed in figure 8.

The prerequisite for the application of the principle of Individual Valuation is the possibility of specific identification. This possibility can be achieved if the goods are identified using a specific *number* or a *mark*. For example, within technical wholesale trade the identification of technical utilities is usually performed through an asset or serial number.

The principle of Individual Valuation is essential for technical wholesale trade companies which trade new and used assets, with comparable functionality but a *strong variance* in the actual prices!

6. Collective Valuation

The German legal requirement documented in the § 240 / 3 and / 4 HGB reports cases and *categories of goods*, for which the *exemptions* from the principle of Individual Valuation are allowed (see table 2, part 1). These exemptions do not affect the general validity of the above explained principle of Individual Valuation.

¹⁴ International Accounting Standards Committee (IASB), 167 Fleet Street, London EC4A 2ES, United Kingdom, Tel.: +44 (0171) 353-0565, Fax: + 44(0171) 353-0562

The most important exemption is the *Collective Valuation*. This principle serves the purpose of the simplified valuation for fungible goods. *Fungible goods are those whose quantity is defined by counting or other quantitative measures (§ 91 BGB)¹⁵*. The figures 9 and 10 comprise the legal regulations for *Collective Valuation* in Germany:

Regarding *Collective Valuation* German commercial code (:= HGB) is compatible with the 4th Directive. Art. 40, 1. reads as follows (see table 3):

'The Member States may permit the purchase price or production cost of stocks of goods of the same category and all fungible items including investments to be calculated either on the basis of weighted average prices or by the 'first in, first out' (FIFO) method, the 'last in, first out' (LIFO) method, or some similar method.'

6.1 Average Cost

*'Under the weighted average cost formula, the cost of each item is determined from the weighted average cost of similar items at the beginning of a period and the cost of similar items purchased or produced during the period. The average may be calculated on a periodic basis, or as each additional shipment is received, depending upon the circumstances of the enterprise.'*¹⁶

Depending on the type of stock taking system (periodic or perpetual) either the Weighted or the Moving Average is used in practice. The Weighted Average is calculated on a periodic basis. The Moving Average is calculated as each additional shipment is received.

In Germany sections 36 / 3.2 and 3 EStR describe the average valuation, which is a subcategory of an *indirect* Individual Valuation. *This is the standard method required by the tax legislation in Germany.* The Weighted as well as Moving Average are approved. The so-called Simple Average of actual acquisition costs is legally not approved (see figure 9).

6.2 Inventory Flow Methods

In this context the most important cost formulas are FIFO and LIFO.

- The FIFO formula assumes that the items of inventory which were purchased first are sold first, and consequently the items remaining in inventory at the end of the period are those *most recently* purchased or produced. Consequently, when *periodic* inventories are used, FIFO is often designated as *Most-Recent-Invoice Method*.
- The LIFO formula assumes that items of inventory which were purchased or produced last are sold first, and consequently the items remaining in inventory are those first purchased or produced.

¹⁵ Fungible assets: *Items which are substantially indistinguishable from one another.*

¹⁶ See paragraph 22 of IAS2 (revised 1993)

In Germany simplified valuation methods corresponding to time or sequence of usage are allowed only for *inventories of similar types*, assuming certain usage sequence (see § 256 / 1 HGB, § 6 / 1 No. 2a EStG and section 36a EStR):

- Using FIFO or LIFO in Germany it is mandatory that *physical inventory flow is equal to cost flow* (see figure 10, left half). Therefore, application of FIFO is *not* permitted by tax legislation if the cost flow assumption is not realistic. For this reason, only *Quantity of Goods LIFO*¹⁷ is approved by tax legislation in Germany (see figure 11).
- Application of LIFO is not possible if a valuation reduction for imported goods¹⁸ has been effected.
- Dollar-value LIFO¹⁹ is legally not approved in Germany (see figure 11).
- HIFO (Highest In, First Out) and LOFO (Lowest In, First Out) are forbidden in Germany (see figure 10).

Figure 12 illustrates that the FIFO (LIFO) method is favorable during a period of falling (rising) market prices. In addition the so-called *inventory layers* are made visible. If costs of purchase tend to fall²⁰ FIFO and LIFO are superseded by LOCM at the end of the fiscal year!

LIFO is *not* allowed under most circumstances in several countries (for example, *France*), but is allowed and found, for example in *Germany, Italy* and *Netherlands*. LIFO is the predominant method in USA.

Perpetual LIFO is more complicated²¹ and more labour consuming than other cost formulas for Collective Valuation. Periodic LIFO is usually implemented using the annual layer approach. A lot of variants of the LIFO method are applied in practice. In fact LIFO is often mixed with elements of AVCO²².

¹⁷ Synonyms: Specific Goods LIFO, Unit LIFO

¹⁸ The valuation reduction for imported goods (:= *Importwarenabschlag*, see § 51 / 1 No 2 EStG and § 80 / 1 EStDV) is now repealed. It was a special depreciation allowed by trade legislation (§ 253 / 3 HGB) or a depreciation caused by tax legislation (§ 254 HGB) on current assets. The valuation adjustment (:= *Bewertungsabschlag*) is 20 percent. Therefore, carrying value = $(1 - 0.2) * \min(\text{costs of purchase, current market value at balance sheet date})$. Section 36a EStR rules out a combination with LIFO.

¹⁹ Dollars of cost rather than units are counted.

²⁰ For example, in a period of recession or depression.

²¹ Regarding complexities in applying LIFO see Welsch/Zlatkovich/White, chapter 9, p. 364

²² There is no difference between *periodic* LIFO and AVCO during the fiscal year. Only when the ending inventory is valued the cost flow assumption takes effect. Inventories on hand will be valued with last year's balance sheet values (assuming that beginning inventory = ending inventory). Hence there is no need to record issues during the year by layer and value. The valuation of a possible *surplus quantity* is performed as follows:

IF BI >= EI

THEN no change in value

ELSE

new value = $(EI - BI) * \text{cost of oldest receipt} + BI * \text{last year's cost}$

ENDIF

where BI:= beginning inventory and EI:= ending inventory. Instead the surplus quantity (EI - BI) is valued frequently by the *weighted AVCO*, being calculated only over a given period (< 7 month) of the fiscal year.

Following paragraphs in IAS2 (revised 1993) are to be referenced in connection with Collective Valuation of inventories:

- 21: FIFO or weighted average cost formulas
- 23: LIFO formula

For *all* Collective Valuation methods either the *actual purchase price* (original acquisition cost) stands for the highest value or the LOCM principle has to be applied (see below, *strict* LOCM principle).

Figure 13 summarizes the *Cost Flows* and *Physical Flows* assumed by Individual Valuation and Collective Valuation.

6.3 Base Stock

The Base Stock method is generally viewed as a predecessor of the LIFO method. The method assumes that there is a base stock of goods that should be maintained all times. The base stock represents a permanent commitment of resources, that is costed at a normal price which is viewed as the original cost.

The *Gruppenbewertung* (inventory valuation of groups of similar items, see above) and the *Festbewertung* (valuation for inventories of similar types by a fixed amount, *base stock*) are both exceptions to the Individual Valuation principle. These two methods are legally allowed in order to simplify inventory operations.

In Germany the Base Stock²³ method is applicable *only* for raw materials and consumables (see table 2). Therefore, this method has no practical importance as far as trade and resale organisations are concerned.

7. Lower of Cost or Market

When goods on hand no longer have the value evidenced by their Original Cost due to obsolescence²⁴ or other factors²⁵, the loss in value should be reflected in the accounting period in which the loss becomes apparent. *In these circumstances a departure from the Original Cost rule is required by accounting convention.*

An appropriate measure of value is the market price or current replacement cost of an item in inventory. When the market price or replacement cost of an item is lower than its Original Cost, indicating a decrease in anticipated sales revenue, the *LOCM value* is used in valuing the inventory instead of Original Cost subject to the rules shown in figure 14. *Please observe, that the appropriate current market price depends on the Item Category to be revalued.*

²³ Synonyms: normal stock, permanent stock, minimum balance

²⁴ Obsolescence for technical or commercial reasons. Corresponding items cannot be sold or leased with extra cost and/or which are offered for sale at reduced prices.

²⁵ For example:

- *damaged items*
- *inactive items* (no usage during the past x months and no forecasted usage)
- *surplus inventory* (in excess of x years' anticipated usage)
- *declining sales prices*
- *increasing costs of completion*

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Regarding Current Assets the *strict* LOCM principle has to be applied, in other words, a depreciation of inventories is *mandatory* if one of the following conditions is true (see figure 14):

- Inventory Carrying Value > Current Replacement Cost (CRC)
- Inventory Carrying Value > Net Relizable Value (NRV)
- Inventory Carrying Value > min(CRC, NRV)

If AVCO is used, a wide-spread heuristic rule for finding out the necessity of a depreciation is based on the following condition:

- Average Cost Price > Latest Costs of Purchase

If one of the above conditions is true, the corresponding inventory must be revalued to reflect the lesser 'Market Value'.

Inventories are usually written down to LOCM on an item by item basis. In some circumstances, however, it may be appropriate to group similar or related items²⁶. The application of the Item Category Method in conjunction with the strict LOCM principle is illustrated in figure 15.

Application of the LOCM principle has to take into consideration the purpose for which the inventory is held. For example, the quantity of inventory reserved for firm sales orders has to be valued by the agreed selling prices. Only the non-reserved stock is based on general selling prices²⁷.

The relative requirement to reinstate original values (being in operation in Germany, see table 2, part 2, last entry) is also part of IAS2. The wording in IAS2, paragraph 30, is as follows:

'A new assessment is made of net realisable value in each subsequent period. When the circumstances which previously caused inventories to be written down below cost no longer exist, the amount of the write-down is reversed so that the new carrying amount is the lower of the cost and the revised net realisable value. This occurs, for example, when an item of inventory, which is carried at net realisable value because its selling price has declined, is still on hand in a subsequent period and its selling price has increased.'

8. Obsolescence of Stock

Inventory items being unsalable at normal prices or unusable in the normal way because of damage, imperfections, shop wear, changes of style, odd or broken lots, or similar causes including

- second-hand goods taken in exchange,
- inactive, surplus and wholly or partially obsolete items

have to be revalued individually (or collectively) according to standard or company-specific valuation rules put into operation. Required downward revaluation is considered an unrealized *holding loss*.

²⁶ See IAS2 (revised 1993), paragraph 26

²⁷ See IAS2 (revised 1993), paragraph 28

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Depreciation of inventory values due to above mentioned factors is not always enough to do justice to the *strict* LOCM princile. *If a given inventory carrying value is still higher than the corresponding current market value an additional adjustment is mandatory.*

Generally the LOCM principle is applied to *individual* items. However, under certain circumstances, application of the principle to classifications or totals may have greater significance for accounting purposes. The method for handling obsolescence depicted in figure 16 is frequently used in Germany by legal entities which have to report to their headquarters in foreign countries. The related graph is regarded as self-explanatory.

9. Transfers between Stock Accounting and Property Accounting

If specific cost identification is used for Stock Accounting and Property Accounting, the flow of information throughout the life of any given tangible (wasting) asset is presented in figure 17. *This figure is essential for understanding the inventory of values issues raised below.*

Please note the various transfers within Property Accounting and between Property and Stock Accounting. Therefore, it is required, that the specific cost identification method (*Individual Valuation*) is supported by both, the Fixed Assets *and* the Inventory module.

The necessity to process an item as an identifiable unit through all stages of its life cycle is the core requirement in this functional area. Capitalised items will consequently have to be processed in the same manner as inventory items and vice versa.

In short, for identifiable tangible assets, the two *transaction types*

- receipt from property accounting (e.g. *Receipt from Account*)
- issue to property accounting (e.g. *Issue to Account*)

must not make the consistency of book values invalid²⁸.

10. Inventory Valuation and Equipment Accounting

The following 5 figures (18 to 22) build one logical unit. They display *group* and *statutory* accounting rules to be considered. The graphs are intended to be self-explanatory.

Structured English is applied in the next four figures (19 to 22) to explain functional requirements in this domain.

The 5 figures (18 to 22) explain that stock values have to be carried in parallel for group and statutory accounting.

²⁸ See IAS2 (revised 1993), paragraph 33: *'Some inventories may be allocated to other asset accounts, for example, inventory used as a component of self-constructed property, plant or equipment. Inventories allocated to another asset in this way are recognized as an expense during the useful life of that asset.'*

11. Elimination of unconfirmed intercompany inventory profit (or loss)

Sales of merchandise often take place between affiliated companies. As a consequence of these asset transfers, a profit is normally reported by the *selling* company in the period in which the intercompany sale occurs. However, if the merchandise transferred remains in the inventory of the *purchasing* affiliate, the profit should not be recognized from a consolidated (or entity) point of view until confirmed (or realized) by resale to *outside* interests.

Practice-proven concepts and automatic procedures applicable to unconfirmed profits (or losses) on merchandise transfers between affiliated companies should be available when setting up the Inventory module.

12. Summing up of the inventory valuation methods required in Germany

Regarding inventory valuation the following table contains a summary of the German requirements described above.

Valuation Method		Required?	Comment
Individual Valuation		Yes	Most important method <i>required by law</i>
Collective Val.	AVCO	Yes	Moving AV based on <i>full actual acquisition cost</i>
Collective Val.	FIFO	Yes	In general not permitted by tax legislation. But you can apply the method if the cost flow assumption is realistic.
Collective Val.	LIFO	Yes	It is mandatory that <i>physical inventory flow is equal to cost flow</i> .
Collective Val.	Base stock	Yes/No	No, as far as trade and resale organisations are concerned
Standard Cost		Yes/No	No, as far as trade and resale organisations are concerned
LOCM	CRC	Yes	For <i>strict</i> LOCM principle
LOCM	NRV	Yes	For <i>strict</i> LOCM principle
LOCM	Latest purchase price	Yes	For <i>strict</i> LOCM principle

Table 4: Summary of Major Requirements

Furthermore the following features are required in Germany:

- Feature for the presentation of the difference in values in the notes to financial statements (for more details please see table 2)²⁹
- Feature for the relative requirement to reinstate original values (for more details please see table 2 and 2). In Germany (and, for example, Netherlands) the precept of value adjustment already applies in special cases: A depreciation in accordance with reasonable commercial judgement to a lower future value ('*double*' LOCM principle) is possible. It concerns an unrealised loss of value which is brought forward in time. The lower value should, of course, not be maintained if the value reduction no longer exists³⁰. An *Inventory* module to be

²⁹ Regarding LIFO the IAS2 (revised 1993) demands the following disclosure:

'When the cost of inventories is determined using the LIFO formula ... the financial statements should disclose the difference between the amount of inventories as shown in the balance sheet at either:

(a) the lower of the amount arrived at in accordance with paragraph 21 (⇒ FIFO, weighted average cost) and net realisable value; or

(b) the lower of current cost at the balance sheet date and net realisable value.'

³⁰ In the USA a one-off exceptional depreciation of stock cannot be made retrospective by value adjustment.

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employed *throughout* Europe must offer each user the possibility of reproducing national requirements in respect of exceptional value adjustments.

In addition transfers between Stock Accounting and Property Accounting should be possible (*without any loss of information*) if the specific cost identification method is used in *both* subledgers (see figure 17).

Another general requirement is, that inventory valuation methods and corresponding stock accounts³¹ can be defined at least on *subinventory* level. Today this setup is only possible on *Inventory Organization* level. The range of German *standard* accounts for wholesale and foreign trade is divided into Account Class 3 (stock accounts) as well as into Account Class 8 (revenue accounts) according to *product groups*. A modern application for product management should be geared to facilitate the general commercial requirements in Germany. Unfortunately, in the application of Historical Cost Accounting (AVCO), there is only the possibility of setting up 1 product inventory account. Figure 27 shows the relevant relationships.

Paragraph 34 of IAS2 (revised 1993) requires the differentiated, balance sheet report of inventories '*in classifications appropriate to the enterprise*'. In paragraph 35 of IAS 2 (revised 1993) the following main categories are mentioned:

'Information about carrying amounts held in different classifications of inventories and the extent of the changes in these assets is useful to financial statement users. Common classification of inventories are merchandise, production supplies, materials, work in progress and finished goods. The inventories of a service provider may simply be described as work in progress.'

Regarding affiliates of multinational groups in Germany there are three additional requirements:

- valuation of damaged, inactive, surplus and wholly or partially obsolete inventory (see figure 16)
- carrying of stock values *in parallel* for group and statutory accounting (see figures 18 - 22)
- automatic intercompany invoicing with transfer prices and automatic procedures applicable to unconfirmed intercompany inventory profit (or loss) to be eliminated.

13. List of Italian requirements

In comparison with German requirements (as described above) comments on the list of Italian requirements³² received from ORACLE will be made (see table 5).

Conformity in major requirements can be stated.

14. Shortcomings of the Inventory module

Regarding inventory valuation the functionality of the *Inventory* module³³ is not comprehensive. Its major deficiencies are:

³¹ Synonym: inventory accounts

³² Source: G. Sgarbazzini, Inventory and WIP valuation, Requirement Analysis Document, Version 1, Dec. 27, 1995, page 6-7

³³ Release 10.4.2

- No support of the *Individual Valuation* of serialized and lot-controlled inventory items (see figure 23).
- No support of *FIFO-costing* for inventory items with limited shelf life (see figure 23) and other cost flow assumptions.
- The *Inventory* module does not provide a function for the *automatic (!)* support of the user in observing the *strict* LOCM principle. This omission is highlighted in figure 24. Figure 25 repeats in more detail what is available from ORACLE. It also explains precisely what is meant by the LOCM principle by using mathematical notation³⁴.
- No method for *automatic (!)* depreciation of inventories due to obsolescence is supported (see figure 16).
- ORACLE's AVCO method uses the PO price instead of the invoice price. Therefore an invoice price variance (IPV) is permanently maintained, where $IPV = (PO \text{ unit price} - \text{actual invoice unit price}) * \text{quantity received}$. Please note also that ORACLE's PO price is not equivalent to the actual purchase price defined in Art. 35, 2. of the 4th Directive (see table 3) because *incidental acquisition expenses* are not explicitly considered. Consequently, a moving average of **full actual acquisition costs** is not truly available as legally required in Europe.
- No standard interface between the *Assets* and the *Inventory* module. Due to the lack of specific cost identification method in the standard *Inventory* functionality, a closed-loop asset tracking is not possible (see figure 17).
- No *Book Class*³⁵ definition in the *Inventory* module. Consequently, carrying of stock values *in parallel (!)* for group and statutory accounting is not possible (see figures 18 to 22). *Simultaneous* support of different methods for inventory valuation is also required for the disclosure of the *difference in values* when (a) Collective Valuation methods are used or (b) when the accounting policies adopted in measuring inventories (*including the cost formula used*) are changed. Without the required *simultaneous* support of different methods for inventory valuation the impacts of the *change of the methods* can not be evaluated and documented. The Consistency Convention requires that accounting policies shall not be changed arbitrarily and without notice of the effects of the change to those who use the accounts.
- No definition of inventory valuation methods and corresponding stock accounts *at least (!)* on *subinventory level*³⁶.
- No features for the elimination of unconfirmed intercompany profit (or loss) in the ending inventories of affiliated companies.

15. Recommendations for Enhancements

We recommend to base the required enhancements of the *Inventory* module on:

³⁴ The formula $LOCM = \min(OC, NRV, \max(CRC, NRV - NP))$ represents the USA version of the LOCM principle, where NP is an allowance for normal profit. In other versions NP is *not* subtracted from NRV.

³⁵ See ORACLE's Assets module, Book Controls form: *Book Class = {Corporate, Tax, Budget}*

³⁶ Assume you are using AVCO. Assume also you are trading with new and used equipment being identified with the same item number. A flag is indicating the item's status. Normally the selling price and corresponding cost of sales differ between new and used items. You could store new and used items in a *separate* subinventory. *This does not solve the pricing and costing problem, because ORACLE's Inventory module carries the same values for a given item across all subinventories.* A possible workaround using multiple inventory organisations (or using different item numbers) involves too much effort.

Inventory Valuation according to German Commercial and Tax Legislation

- Inventory valuation methods described in relevant articles of the 4th Directive (see table 3)
- International Accounting Standards³⁷

Regarding inventory valuation German legislation is just a subset of the 4th Directive. This is already true or will be true for all Member States of the European Union³⁸.

16. Concluding Remarks

No claim concerning the completeness and correctness of the statements in this survey can be made. They represent purely the author's own understanding of the matter.

If functional requirements as described in this document are not entirely understandable please contact:

BULL AG
c/o Dr. Volker Thormählen
Theodor-Heuss-Str. 60-66
D-51149 Köln (Porz-Eil)
Germany
Telephone: +49(2203) 305-1719
Telefax: +49(2203) 305-1699

³⁷ For example: International Accounting Standards 1995, issued by ISAC, London

³⁸ The guidelines for the harmonisation of accounting procedures within the European Union do not represent binding legislation for German businesses, but members of the EU are required under Article 189 Paragraph 3 of the EEC Agreement to amend their national laws, regulations and norms in line with the guidelines.

17. Relevant Literature

Useful information about *European Accounting* (including inventory valuation) may be found in the following publications:

Alexander, D., Nobes, C., *An European Introduction to Financial Accounting*, New York, etc., 1994

Blake, J., Amat, O., *European Accounting*, London, 1993

Clayton, M.R., Comm, D. D. B., Hinton, J.K., *Handbook on the EEC Fourth Directive*, London, 1979

Gräfer, H., Demming, C. (editors), *Internationale Rechnungslegung*, Stuttgart, 1994

Griffin, C.H., Williams, T.H., Larson, K.D., *Advanced Accounting*, R. D. Irwin, Inc. Homewood, Illinois, 1977 (Consolidated Statements - Intercompany Profit on Asset Transfers, Page 237- 285)

IASC (editor), *International Accounting Standards*, London, 1995

Welsch, G. A., Zlatkovich, C. T., White. J. A., *Intermediate Accounting*, 4th edition, R. D. Irwin, Inc., Homewood, Illinois, 1976

Possibility of Capital Expenditures according to ...		
<i>Type of Costs</i>	<i>German Commercial Legislation</i>	<i>German Tax Legislation</i>
1 Direct material costs	Mandatory	Mandatory
2 Indirect material costs	Optional	Mandatory
3 Direct labour and other direct production costs	Mandatory	Mandatory
4 Fixed and variable production overheads	Optional	Mandatory
5 Depreciation (of fixed assets)	Optional	Mandatory
6 Special (direct) production costs	Mandatory	Mandatory
7 Voluntary social service costs	Optional	Optional
8 Administrative Overheads	Optional	Optional
9 Interest expenses on borrowed capital (as far as not being a component of the costs of conversion)	Prohibited	Prohibited
10 Selling costs	Prohibited	Prohibited
Costs of conversion = \sum 1 to 8		

Table 1: Capital Expenditures according to German Commercial and Tax Legislation

Valuation Rules	German Commercial Legislation	German Tax Legislation	Comments
Principle of original purchase price or production cost (Prinzip der historischen Anschaffungs- oder Herstellungskosten)	§ 255 / 1 and 2 HGB	Section 32a / 1 EStR	Legal definition of acquisition cost: <i>Cost of inventory = invoice price - discounts + incidental acquisition cost + subsequent acquisition cost.</i> Production cost must include at least all direct cost. Related production overheads may be included. Selling expenses are not allowed to be a component of production cost.
Individual valuation (Einzelbewertung)	§ 252 / 1 No. 3 HGB	§ 6 / 1 No. 2 EStG Section 36 / 3 clause 1 EStR	Applicable for all assets, except those, where the determination of individual values can't be cost-justified.
Base value (Festbewertung)	§ 240 / 3 HGB in connection with § 256 clause 2 HGB	Section 36 / 5 EStR	Applicable only for raw materials and consumables.
Inventory valuation of groups of similar items. (Gruppenbewertung)	§ 240 / 4 HGB in connection with § 256 clause 1 HGB	Section 36 / 3 clause 3 and / 4 EStR (weighted average)	Applicable only for goods belonging to the same line or having the same use.
Inventory flow methods (Verbrauchsfolgefiktionen)	§ 256 clause 1 HGB	§ 6 / 1 No. 2a EStG 1990, (LIFO), Section 36 / 4 clause 6 EStR, (LIFO), Section 36a EStR (LIFO)	Applicable only for fungible inventory items, that is, raw materials and consumables, work in progress, finished goods and goods for resale.
Presentation of the difference in values in the notes to financial statements (Ausweis des Unterschiedsbetrags im Anhang)	§ 284 / 2 No. 4 HGB	None	Application of <i>collective valuation methods</i> can lead to a situation where book value < market value. This is likely, if LIFO is used and market prices are rising permanently. The difference in value must be disclosed in the notes to financial statements if the hidden reserve is significant (10 percent or more) and the market value is known.

Table 2: Inventory Valuation according to German Commercial and Tax Legislation, Part 1 of 2

Valuation Rules	German Commercial Legislation	German Tax Legislation	Comments
Strict lower of cost or market principle <i>(Strenges Niederstwertprinzip)</i>	§ 253 / 3 clause 1 and 2 HGB	§ 6 / 1 No. 1 EStG: Going concern value or value to the business <i>(steuerlicher Teilwert)</i> § 5 / 1 EStG: Principle that the treatment followed for book purposes must be also adopted in the tax balance sheet. <i>(Maßgeblichkeitsprinzip der Handelsbilanz für die Steuerbilanz)</i>	If an inventory has declined in value an extraordinary depreciation is mandatory at balance sheet date.
Depreciation option for anticipation of decline in value (for example the special write off on obsolete and damaged goods) <i>Abschreibungswahlrecht auf den niedrigeren, nahen Zukunftswert (z. B. die sogenannte Gängigkeitsabschreibung)</i>	§ 253 / 3 clause 3 HGB	Same as above	Decline in value expected in the near future (after balance sheet date) may be anticipated.
Relative requirement to reinstate original values <i>(Relatives Wertaufholungsgebot)</i>	§ 280 / 2 HGB	§ 6 / 1 No. 2 clause 3 EStG and § 6 / 3 EStG	Restricted to corporate enterprises. For them a de facto write up option exists, if the 'Lower of Cost or Market' principle has been applied to current assets and if the reasons for which the extraordinary depreciations were made in the corporate and tax books have ceased to apply. If the extraordinary depreciations were made in the tax books only the strict requirement to reinstate original values has to be applied, that is, an appreciation is mandatory.

Table 2: Inventory Valuation according to German Commercial and Tax Legislation, Part 2 of 2

Valuation Rules	The EEC Fourth Directive on Company Law (4. EG-Richtlinie)	
Principle of original purchase price or production cost	Art 32	The items shown in the annual accounts shall be valued in accordance with Articles 34 to 42, which are based on the principle of purchase price or production cost.
	Art. 35, 2.	The purchase price shall be calculated by adding to the price paid the expenses incidental thereto.
	Art. 35, 3., (a)	The production cost shall be calculated by adding to the purchasing price of the raw materials and consumables the costs directly attributable to the product in question.
	Art. 35, 3., (b)	A reasonable proportion of the costs which are only indirectly attributable to the product in question may be added into the production costs to the extent that they relate to the period of production.
	Art. 39, 1., (a)	Current assets must be valued at purchase price or production cost, without prejudice to (b) and (c) below.
	Art. 39, 2.	The definition of purchase price and production cost given in Article 35 (2) and (3) shall apply. The Member States may also apply Article 35 (4). Distribution cost may not be included in production costs.
Individual valuation	Art. 31, 1., (e)	The components of asset and liability items must be valued separately.
Base value	Art. 38	Tangible fixed assets, raw materials and consumables which are constantly being replaced and the overall value of which is of secondary importance to the undertaking may be shown under 'Assets' at a fixed quantity and value, if the quantity, value and composition thereof do not vary materially.
Inventory valuation of groups of similar items.	Art. 40, 1.	The Member States may permit the purchase price or production cost of stocks of goods of the same category and all fungible items including investments to be calculated either on the basis of weighted average prices or by the 'first in, first out' (FIFO) method, the 'last in, first out' (LIFO) method, or some similar method.
Inventory flow methods	Art. 40, 1.	See above.

Table 3: Inventory Valuation in Europe according to the EEC Fourth Directive, Part 1 of 2

Valuation Rules	The EEC Fourth Directive on Company Law (4. EG-Richtlinie)	
Presentation of the difference in values in the notes to financial statements	Art. 40, 2.	Where the values shown in the balance sheet, following application of the methods of calculation specified in paragraph 1, differs materially, at the balance sheet date, from the value on the basis of the last known market value prior to the balance sheet date, the amount of that difference must be disclosed in total by category in the notes on the accounts.
Strict Lower of cost or market principle	Art. 39, 1., (b)	Value adjustments shall be made in respect to current assets with a view to showing them at the lower market value or, in particular circumstances, another lower value to be attributed to them at the balance sheet date.
Depreciation option for anticipation of decline in value	Art. 39, 1., (c)	The Member States may permit exceptional value adjustments where, on the basis of a reasonable commercial assesment, these are necessary if the valuation of these items is not to be modified in the near future because of fluctuations in value. The amount of these value adjustments must be disclosed separately in the profit and loss account or in the notes on the accounts.
Relative requirement to reinstate original values	Art. 39, 1., (d)	Valuation at the lower value provided for in (b) and (c) may not be continued if the reasons for which the value adjustments were made have ceased to apply.
Disclosue	Art. 39, 1., (e)	If current assets are subject to exceptional value adjustments for taxation purposes alone, the amount of the adjustments and the reasons for making them must be disclosed in the notes on the accounts.
<p>Remarks: (1) Germany has adopted the EEC Fourth Directive in a law called 'Bilanzrichtlinien-Gesetz' (BiRiLiG)(:= <i>accounting directives act</i>) on 24. Dec. 1985 for fiscal years starting after Dec. 31, 1986.</p> <p>(2) In Art. 33 the EEC Fourth Directive allows '<i>valuation by the replacement value method</i>' for stocks when making up a balance sheet. Nevertheless Current Value Accounting is forbidden in Germany. Consequently, inventory valuation applying <i>current replacement values</i> if not allowed in Germany.</p>		

Table 3: Inventory Valuation in Europe according to the EEC Fourth Directive, Part 2 of 2

No	Italian Requirement	Comment
1	Support to tax accepted inventory valuation (yearly layer and by transaction; FIFO, LIFO, and Weighted Average outflow assumptions);	From a practical point of view the Moving Average using actual costs and being based on Perpetual Inventory represents the best approach, that is, average cost per unit updated by each transaction.
2	Flexible definition of the layer (movement, period, year);	Attention! If you are applying Periodic LIFO with monthly layers you are trying in fact to approximate Perpetual LIFO .
3	Flexible definition of movements to include in computation of the layer (e.g. for purchases: goods received from vendor, net/gross of returned goods, gross/net of goods repaired from the vendors, etc.);	Excellent! Transaction types should control the update of inventory values when (physical) stock movements are occurring. (By the way, ORACLE Development should avoid to design fixed transaction types as they have been hard-coded into the Fixed Assets module. Our vision is to get transaction types based on controlling parameters).
4	Capability to support more than a costing method by item at the same time (at least two: Legal and Operational);	Agreed! A 'Book Class' like the one built into the Fixed Assets module (see its Book Controls form in FA) is required. The FA module could be used for Individual Valuation of Current Assets as well, if an integration with the Inventory module is achievable.
5	A market value can be managed for each Raw Material and Finished Product item;	All right! Since the strict LOCM principle is the most important accounting convention (overruling original cost) a current market value is required for each inventory item.
6	The system supplies a 'default' Raw Material market value based on last three months purchases weighted average (if any purchases occurred); user can update manually this value or insert a new one if no purchase occurred in the period.	Disapproved in part! If the appropriate current market price is permanently rising (or falling) then average cost is not a good measurement for the strict LOCM principle. In this case the latest purchase (or sales) price often represents a more cautious valuation.

Table 5: Comments on Italian Requirements, Part 1 of 2

No	Italian Requirement	Comment
7	The system supplies a 'default' Finished Product market value based on last three months sales weighted average (if any sale occurred); user can update manually this value or insert a new one if no sale occurred in the period.	Analogous to No 6.
8	An automatic comparison process enable you to choose the 'lower between cost or market', if the market value is lower than the cost, this value will be used from now on as Legal cost of the stock on hand of that item inventory;	Excellent! Laying emphasis on automatic calculations is in accordance with our vision of a world-class Inventory module.
9	Reports supporting computation showing physical movement in/out with appropriate reference to Italian legal documents (Purchase invoices, Vendor waybill, Sales invoices, Sales waybill).	To some extent this requirement seems to be an Italian particularity. But keeping a purchase day book (e. g. goods-bought ledger) and a sales day book (e. g. outgoing goods ledger) is also commercial practice in Germany. - Obviously this requirement (No 9) is overlapping with No 3.
Source of Italian requirements: G. Sgarbazzini, Inventory and WIP valuation, Requirement Analysis Document, Version 1, Dec. 27, 1995, page 6-7		

Table 5: Comments on Italian Requirements, Part 2 of 2