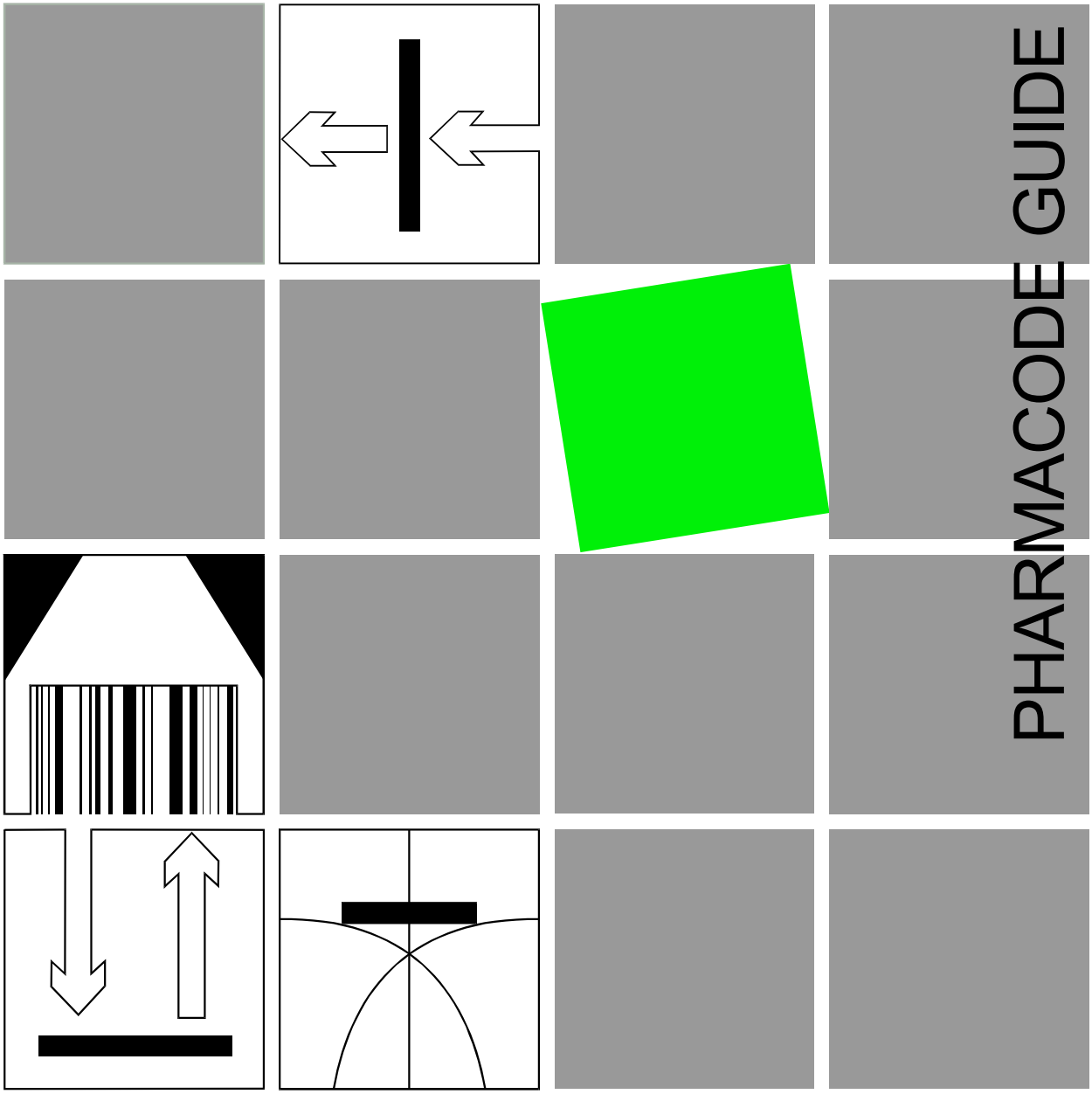
Laetus



PHARMACODE GUIDE

July 1997
PHARMACODE GUIDE, 4. Edition
Laetus-Number of this manual: 70 5 62 3101

Technical modifications and the correction of errors are subject to change without notice.

Foreword

With the 4th Edition of the "Pharmacode Guide", we have included many tips from our customers, originating directly from the use of the guide.
The Pharmacode was developed specifically to meet requirements in the pharmaceutical packaging process and has offered invaluable service to users. The prevention of intermixture is the most critical and important requirement of pharmaceutical end-packaging.
Pharmacode has become an important tool for putting GMP requirements into practice.

In spite of the rapid development of automatic identification techniques, and in particular bar code technology, the Pharmacode has retained its importance for the industry and has established itself world-wide as the pharmaceutical industry standard.
Its most important advantages are listed below:

- It can mark all relevant secondary and printed primary packaging.
- It can be read on all packaging machines, irrespective of model or year.
- The user allocates Pharmacodes independent of external organizations and regulations.
- Within limits, variable dimensions enable a high degree of flexibility and so meet the various demands of the individual packaging.
- The inherent printing color control, on the basis of the multicolored code structure which is possible, allows the simultaneous presence check of the printer's colors relevant to security and so monitors the presence of the information stipulated by pharmaceutical legislation.

The guide supports the users in the organization of code allocation, and also in daily practice, i.e. in operation. It is directed not only at production managers, operating engineers and packing developers but also at quality assurance departments and at suppliers, whether it be in packaging or in machining.

Over and above this guide, Laetus offers a wide variety of assistance and ways of offering the user optimal support through its Service department. This includes

- Working out masters code lists
- Making master films available
- Checking the printer's colors
- Varied accessories to assist in quality control and organization, as described in Chapter 6.

We hope that you will find this 4th Edition of the Pharmacode Guide a valuable tool. We would be happy to receive any suggestions for its improvement.

Contents

1.0 Code dimensions

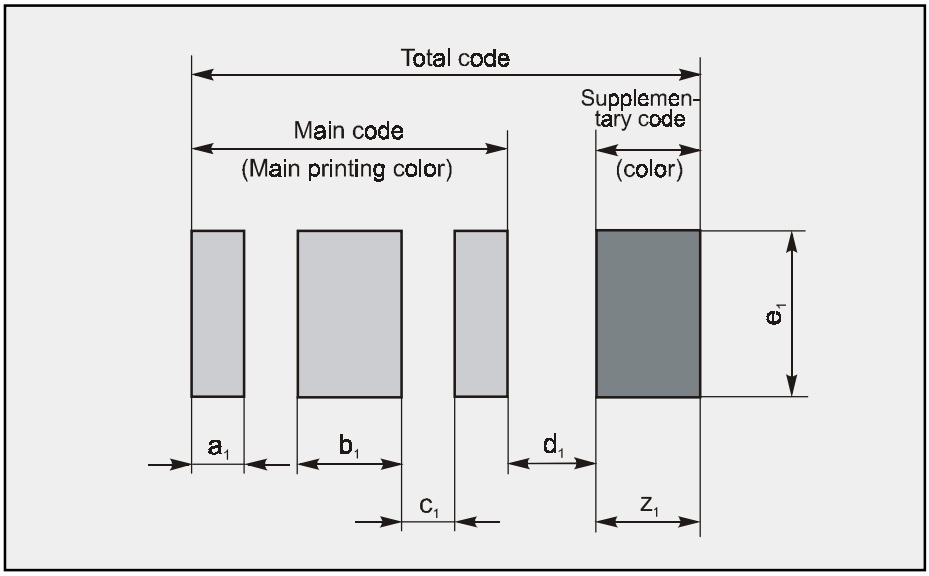
1.1 General guidelines

In the first chapter the generally valid dimensioning regulation for the Pharmacode are briefly described. The specifications are generally valid. In the second chapter additional data is added which should be taken into consideration, depending on the specific use.

There are two versions of the Pharmacode: a one-track and a two-track code. There are standard and miniature variations of the one-track Pharmacode.

> ***Note**:*
> We recommend that the height of the code dimension e1 is chosen as large as possible as this results in greater guide tolerances.

1.2 Standard one-track Pharmacode

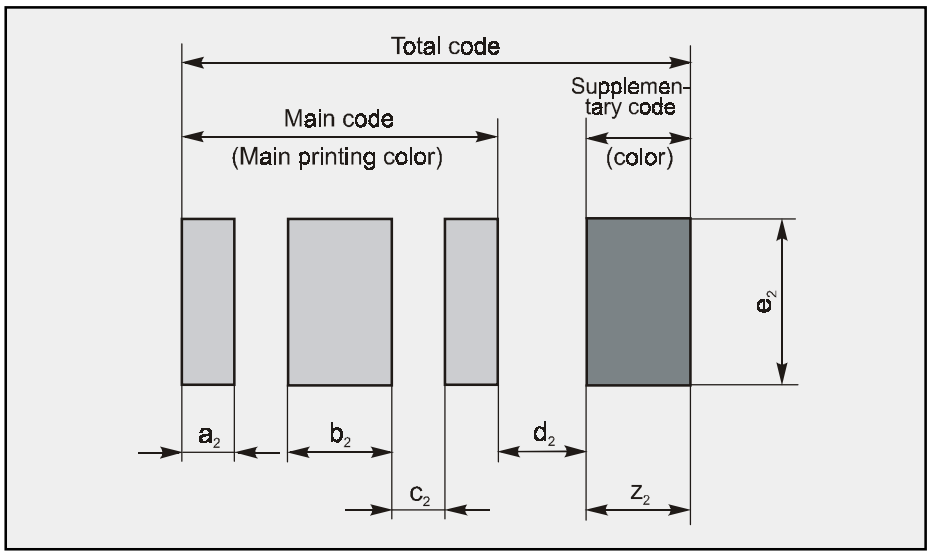


a_1 Width of thin code bar
b_1 Width of thick code bar
c_1 Gap between code bars of the main code
d_1 Gap between the main code and the supplementary code
e_1 Height of code bar
z_1 Width of color bar = Width b_1

	Standard	Minimum	Maximum
a_1	0,5 mm	0,4 mm	0,7 mm
b_1	1,5 mm	1,3 mm	2,5 mm
c_1	1,0 mm	0,9 mm	2,5 mm
d_1	1,5 mm	1,2 mm	2,5 mm
e_1	8,0 mm	application-specific	application-specific
z_1	1,5 mm	1,3 mm	2,5 mm
b_1/a_1	3		

1.3 Miniature one-track Pharmacode

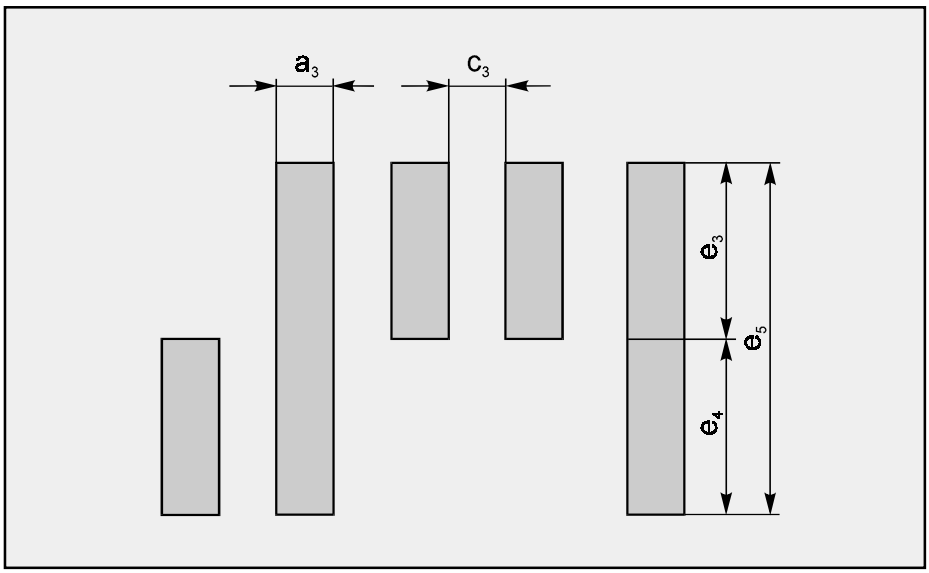
For applications which have restricted space requirements (e.g. small labels, narrow carton flaps, etc.) we recommend using the Miniature one-track Pharmacode.



a_2 Width of thin code bar
b_2 Width of thick code bar
c_2 Gap between code bars of the main code
d_2 Gap between the main code and the supplementary code
e_2 Height of code bar
z_2 Width of color bar = Width b_2

	Norm	Minimum	Maximum
a_2	0,35 mm	0,3 mm	0,45 mm
b_2	1,0 mm	0,9 mm	1,7 mm
c_2	0,65 mm	0,55 mm	1,65 mm
d_2	1,0 mm	0,8 mm	1,7 mm
e_2	6,0 mm	applikations-spezifisch	applikations-spezifisch
z_2	1,0 mm	0,9 mm	1,7 mm
b_2/a_2	3		

1.4 Two-track Pharmacode



a_3 Width of two-track code bar
c_3 Gap between the code bars
e_3 Height of upper code bar
e_4 Height of lower code bar
e_5 Height of long code bar

	Standard	Minimum	Maximum
a_3	1 mm	0,8 mm	2 mm
b_3	1 mm	0,8 mm	2 mm

	4 mm 2-track sensor head	6 mm 2-track sensor head
e_3	4 mm	6 mm
e_4	4 mm	6 mm
e_5	8 mm	12 mm

2.0 Code allocation

CODE ALLOCATION

2.1 General guidelines

GENERAL GUIDELINES

2.1.1 Object of code reading on packaging materials

OBJECT OF CODE READING ON PACKAGING MATERIALS

Coding on packaging materials can be used to detect the mixing of various packaging materials of the same kind (collapsible boxes, leaflets, etc.). Missing or bad print, e.g. in multiple or supplementary code printing, can also be detected.
Coding is the means by which legal security requirements in the field of pharmaceutical packaging can be guaranteed. It also helps to reduce interruptions of the production process.

2.1.2 Aids

AIDS

A unique code, specific only to the versions of the object in question, is applied to labels, leaflets, the flaps of collapsible boxes, etc. This code is allocated in accordance with the "Code list", see section 4.9.2.

The organization of the code allocation is recorded in the appropriate Object Code Allocation List, see section 4.9.1.

The color comparison table, see section 5.5, is used to check whether any supplementary code color is legible.

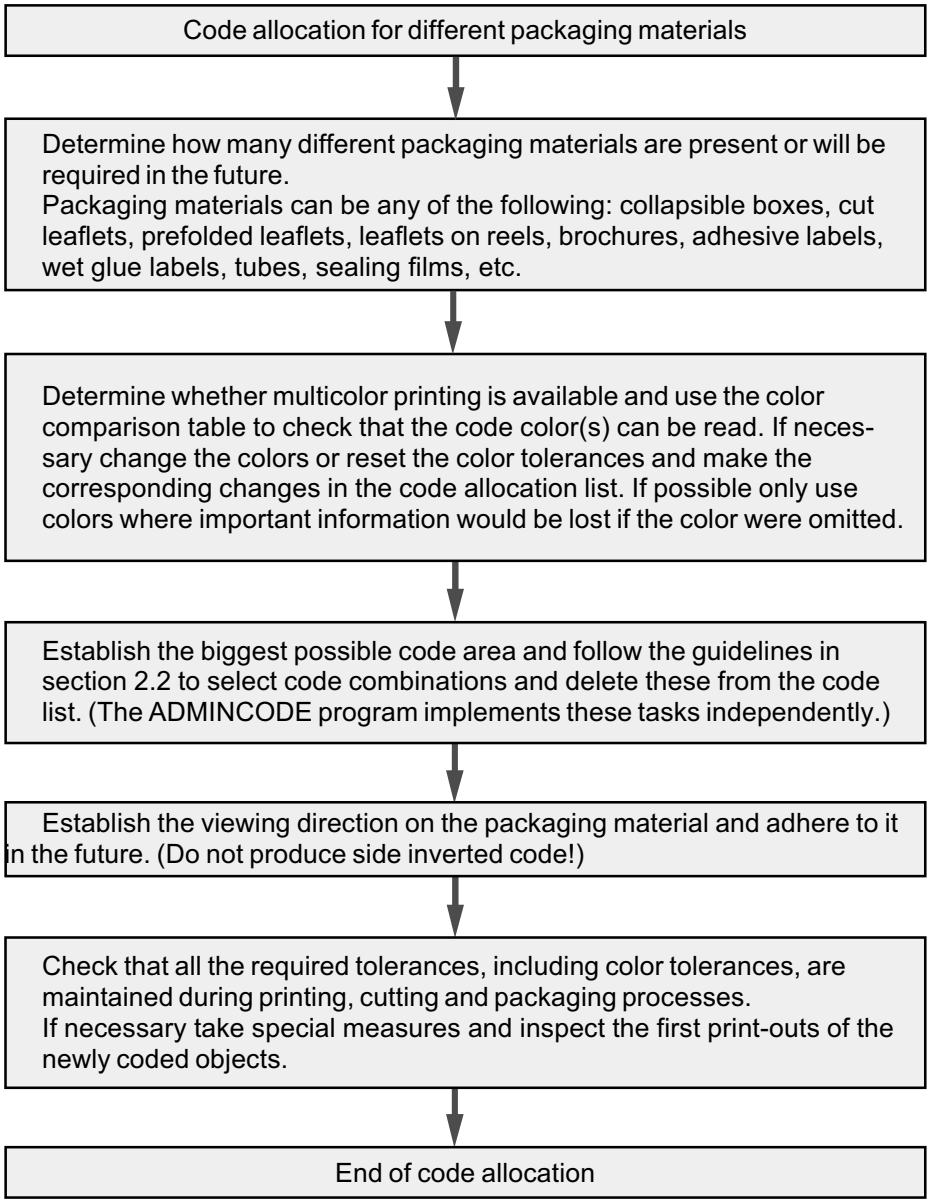
On the various packaging machines code reading devices compare the code on the packaging materials running past with a stored reference code and recognize any discrepancies arising, for example, from mixing or from poor printing.

Questions relating to particular application are dealt with in the Application Guidelines (chapter 3). Readers who are interested in the details will find further information in chapters 4 and 5.

The following flow chart illustrates the code allocation procedure:

PROCEDURE IN ALLOCATING CODES

2.1.3 Procedure in allocating codes

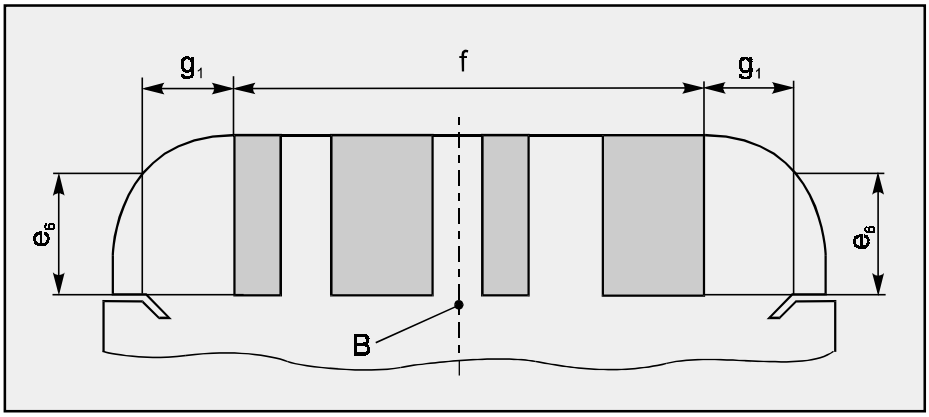


2.2 Sizing requirements for secondary and primary packaging materials

2.2.1 Collapsible boxes

We recommend printing the selected code combination on both flaps of collapsible boxes.

> ***Caution:***
> Code combinations which may occur as a result of a defective printing block must not reoccur on other collapsible boxes for the same size. In other words, the main code combination and the combination produced by the main and supplementary code must be deleted from the "Master code list". This is automatically implemented by the ADMINCODE program.



A Total code area $A=e_6 (f + 2 * g_1)$

B Center line
The code area should be printed centrally on the flap.

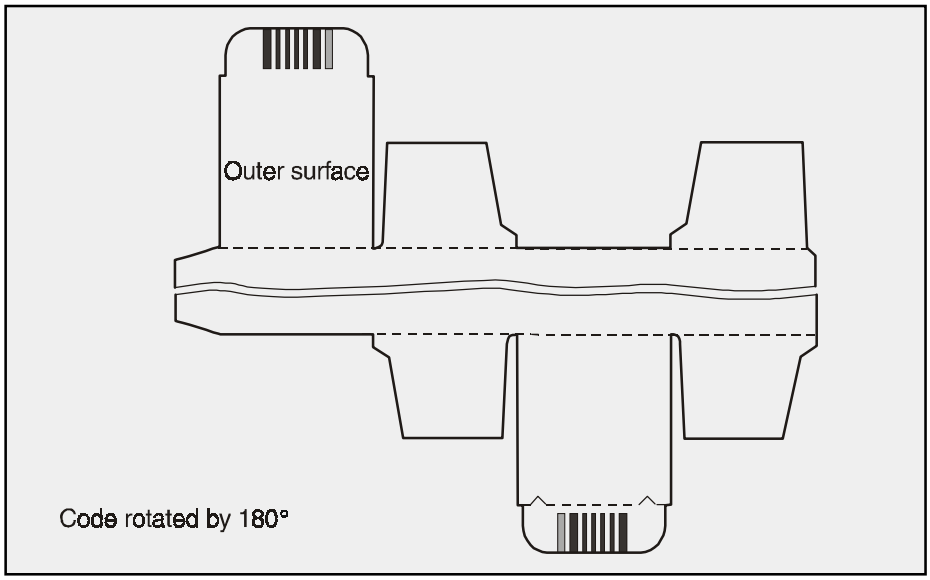
e_6 Code height
Select a minimum of 7 mm.
With flaps that are higher than 7 mm the code should be printed over the whole height of the flap.

f Usable code length

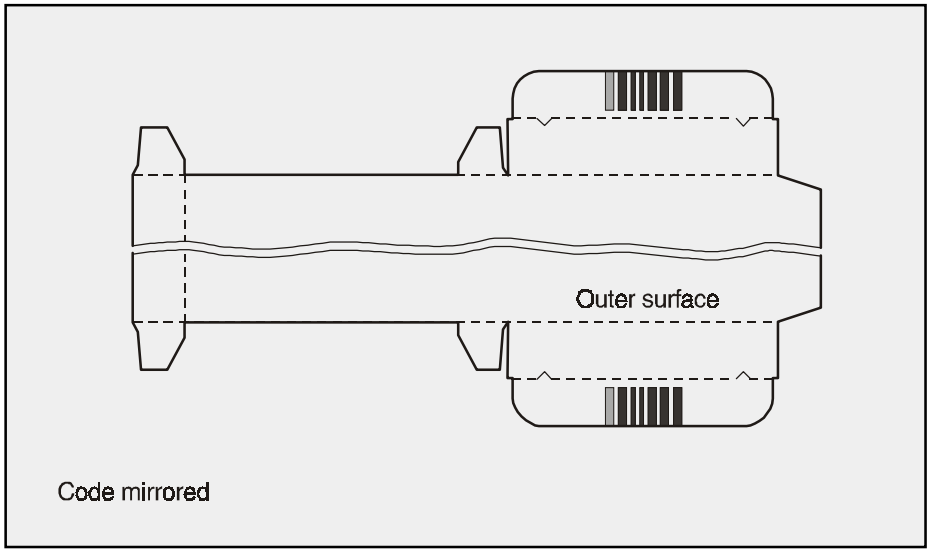
g_1 Distanz from edge
The gap of the first and last code bar from the edge of the collapsible box should be at least 6 mm. If laser scanner are being used, we recommend that this gap is 7 mm.

Important:
With narrower carton flaps, the code combinations selected must be smaller.

Collapsible box blank with staggered flaps



Collapsible box blank with symmetrical flaps



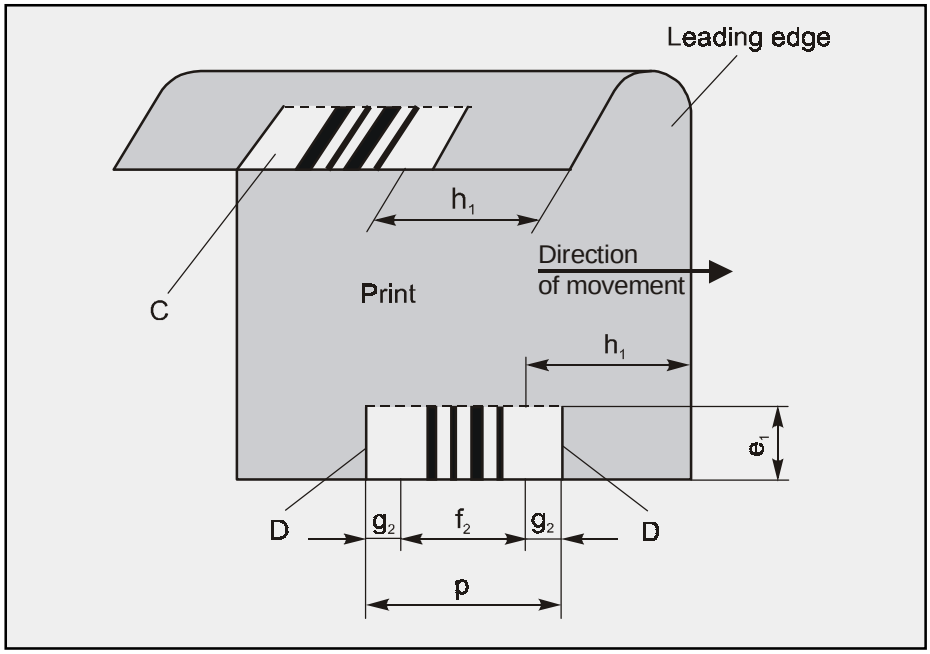
2.2.2 Leaflets

General guidelines:

a) With leaflets made of thin paper, the reverse side of the code area (including foreign print gap) must be free of print. Moreover, symmetrical codes must not be used as these can be read through the paper under certain circumstances, resulting in leaflets which are printed on one side only not being recognized during double-sided code reading.

b) A sufficiently large area must be left free on the leaflets for printing the code.

c) If, for reasons of security, different codes are printed on the front and reverse, the stack of leaflets may not be turned over from front to reverse or vice versa. This does, however, allow a check of the two sides to be made (check that front and reverse are not printed with the same text).



Below are a few practical tips relating to print and cut tolerances, as well as the guide tolerances of current leaflet folding machines.

p Reserve area = code area + 2x extraneous print gap

f Usable code area
This should be as large as the maximum code area size required for the leaflets.
The code selected for the leaflet in question should then be placed in the center of this free space.

e_1 Code height
Due to the generally high cut and guide tolerances, the code height for leaflets should be at least 8 mm.

> ***Note:***
> Larger code heights allow extended tolerances.

h_1 Distance from leading edge
75 mm gap (only for below table reading using Prisma).
25 mm gap – for code reading through window in brass deflector of a GUK folding machine.
This dimension applies to the gap between the leading edge of the print on the leaflet and the start of the code area.

If the leaflet is also to be processed laterally to the print direction shown here, the code print should also be arranged for the new direction of movement.

The indicated distance from the leading edge enables a simple switch-over when the product is changed as well as a problem-free installation of the sensor head underneath the pick-up table.

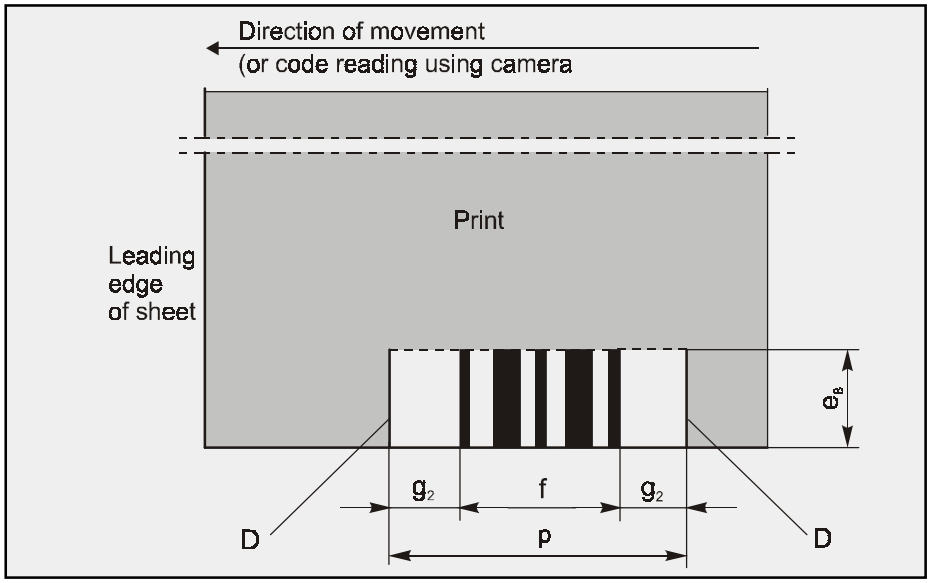
g_2 Foreign print gap
The gap between the sides of the code area and the foreign print should be 10 mm.

C Double code
If the same code is used for both sides, the code on the front side should be repeated on the back side in such a way that the code appears in the same position when the sheet is turned over. It should be noted here that it is not possible to make any side-specific check.

D Start or end bar (optional, but they improve security)
This additional bar serves to mark a clear delineation between the code area and any other printing of the edges of the paper (whether angular or curved). Any error recognition triggered by a product edge which is not straight is blocked by the start bar and cancelled out.

2.2.3 Prefolded leaflets

With prefolded leaflets, ensure that the code is on the upper side when the leaflet is folded and that the foreign print gaps are adhered to. In other words, the folded width of the leaflet must be greater than "p".



p Reserve area
= Code area + 2x extraneous print gap

f Usable code area
The code selected for the leaflet in question should be printed in the center of the folded leaflet.

e_8 Code height
Due to the generally high cut and guide tolerances, the code height for leaflets should be at least 8 mm.

g_2 Foreign print gap
The gap between the sides of the code area and the foreign print should be 10 mm.

D Start or end bar (optional, but they improve security)
This additional bar serves to mark a clear delineation between the code area and any other printing or the edges of the paper (angular or curved). Any error recognition triggered by a product edge which is not straight is blocked by the start bar and cancelled out.

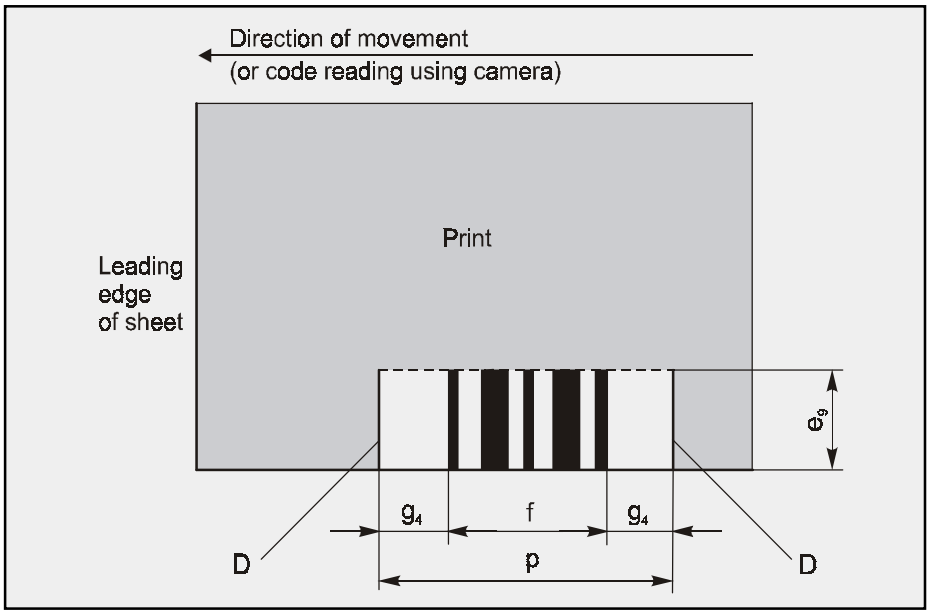
Note:
Larger code heights allow extended tolerances.

2.2.4 Labels, cut

> ***Caution:***
> Even code combinations which may occur as a result of a defective printing block must not reoccur on other labels of the same size.

Practical tips

relating to print and cut tolerances as well as guide tolerances of current wet labelling machines.



e_9 Code height
The code height should be set at a minimum of 5 mm.
When using an OR operation with 2 sensor heads, the code height can be reduced to a minimum of 3 mm. (This requires two separate code evaluations!)

f Usable code area

p Reserve area
Length = Code area + 2x foreign print gap

g_4 Foreign print gap
The gap between the first or last code bar and the extraneous print or the edges of the paper or the start or end bar "D" should be a minimum of 6 mm.

D Start or end bar (optional, but they improve security)
This additional bar serves to mark a clear delineation between the code area and any other printing or the edges of the paper (angular or curved). Any error recognition triggered by a product edge which is not straight is blocked by the start bar and cancelled out.

Note:
In order to achieve a suitable positioning of the code area, the relevant labelling machines and their proposed locations should be studied. Generally the label is read on the adhesive section, the leading edge of which begins at the same position, even with labels of different sizes. To prevent distortion in reading time the code area should always be at the same distance from the leading edge. The code area can vary upwards independently of this.

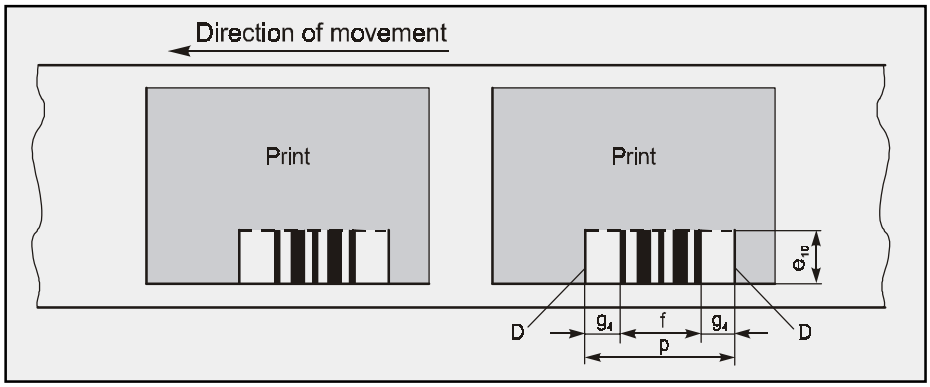
2.2.5 Adhesive labels

ADHESIVE LABELS

a) Using the same printing block with which the main text of the label is printed, a unique main code combination, for this style of label only, should also be printed on the labels. Additional printing using a second or third block (generally color) should extend the code with supplementary code symbols to ensure that there is no repetition.

b) The code area can be located equally well at positions other than those indicated below.
With long labels, the application of the code area, for instance in the type shown below, enables sensing of the last label on the dispenser edge of the labelling machine. This enables the simple tracing of faulty labels and the automatic rejection on the labelling machine of any objects labelled with these.

c) With transparent labels on clear carrier material, ensure that there is a white background where the label is read!



e_{10} Code height
The code height should be a minimum of 5 mm. When an OR operation with 2 sensor heads is used, the code height can be reduced to a minimum of 3 mm. (This requires two separate code evaluations!)

f Usable code area

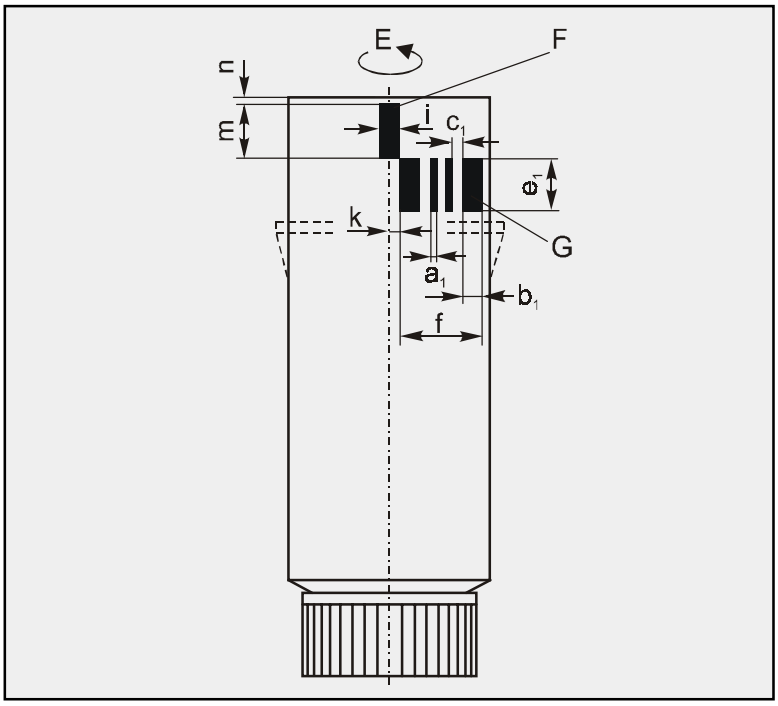
p Reserve area = Code area + 2x Extraneous print gap

g_4 Extraneous print gap
The gap between the first or the last bar and the start or end bar = min. 6 mm.

D Start or end bar (optional, but they improve security)
This additional bar serves to mark a clear delineation between the code area and any other printing or the edges of the paper (angular or curved). Any error recognition triggered by a product edge which is not straight is blocked by the start bar and cancelled out.

2.2.6 Tubes, Code reading in the turning station

For code reading on tubes with simultaneous alignment in the turning station it is necessary that the alignment station has minimum rotation of 1.5 turns – only if alignment is made immediately after the code reading. This is only possible if the code appears as indicated! If the positioning of the code is wrong or deviates, a minimum of 2.5 turns are required as well as a follow-up control.
With strongly reflective surfaces and/or imprecise tube guiding, we recommend using an OP-operated reading with two scanner heads (requires two separate code evaluations!).



F Print mark
The print mark is provided in the case of print mark control device being used.

l Print mark width
min. 2 mm

m Print mark height
min. 6 mm

f Usable code area
¼ of the tube circumference minus k (= 4 mm). If over ¼ of the circumference of the tube is used for printing the code, then part of the code might still be visible on the reverse side or it will not be possibel to place the code optimally and a follow-up control will be required.

E Direction of tube rotation
An assumed direction of rotation of the alignment station is shown here. If the direction of rotation is opposite to that shown here, the code is to be arranged as mirror image to the left.

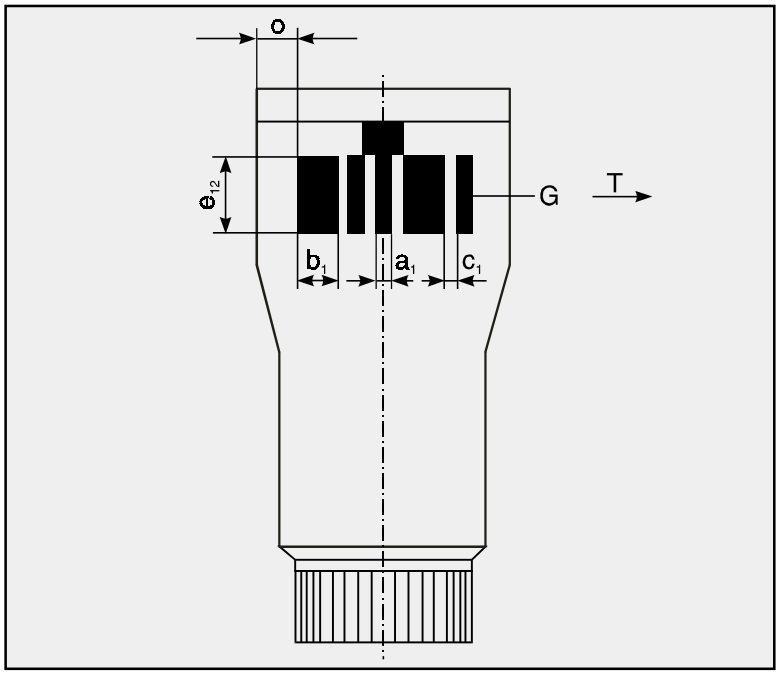
n Free, unpainted edge
min. 2 mm

k Distance from center
Distance between center line and first code bar
k = 4 mm

G One-track Pharmacode

e_1 Code height
min. 6 mm

2.2.7 Tubes, code reading (when flat)



T Direction of transport

o Gap between buckle edge and outer edge of code bar
= min. 6 mm

G One-track Pharmacode

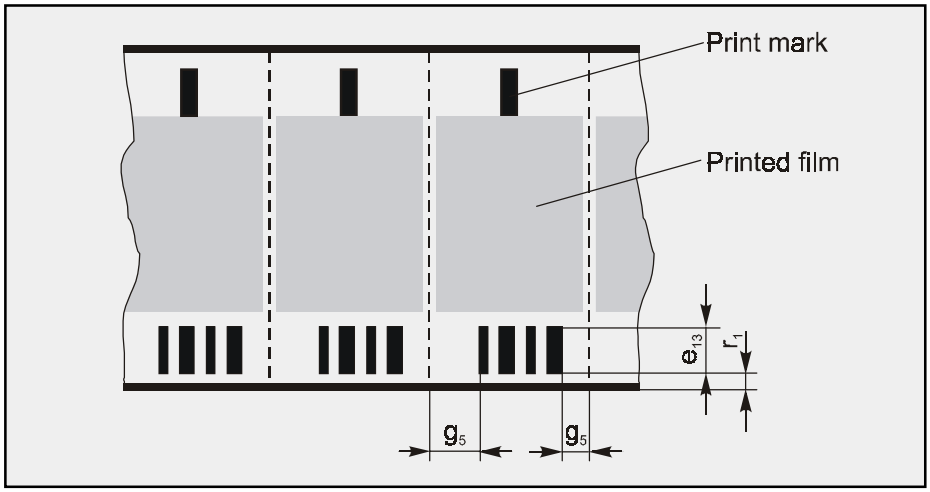
e_{12} Code bar height
Min. 6 mm

b_1 Width of thick code bar

2.2.8 Films

Application

To identify incorrect or missing print on films as well as to detect the failure of a single printing block, a code is applied to the film. However, to check for print interruptions it is necessary that the printing takes place machine synchronously, i.e. exactly one code is printed and moved for each machine cycle.
If this is not possible, a print mark must be provided in the same position as the coding.
When positioning the code, it is important to observe a general cutting edge tolerance of 3 mm.
With highly glossy films we recommend using a so-called covering film mirror. We strongly advise against reading the code from films that are not smooth, as reflections from the buckle edges can lead to incorrect information!



e_{13} Code height
12 mm

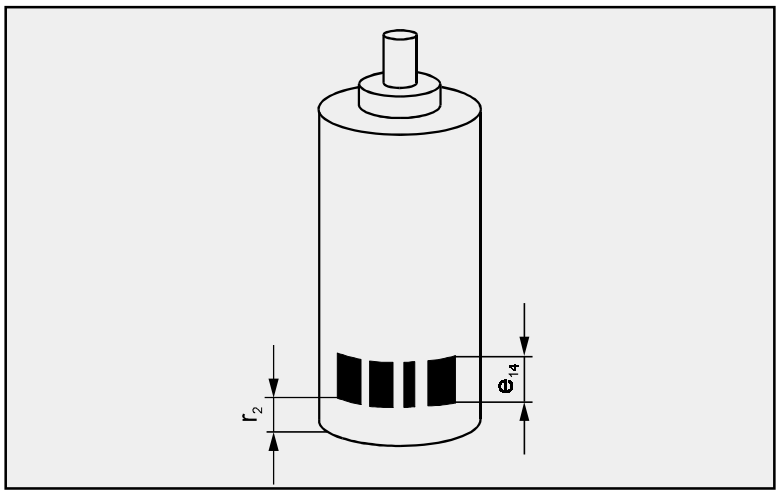
g_5 Foreign print gap
10 mm, with free-running reading without machine cycle. The entire zone between the individual codes must remain free.

r_1 Distance from edge
5 mm

2.2.9 Cylindrical objects in the turning station
(printed or labelled)

Minimum prescribed frequency of rotation = 1.5 rotations.

We recommend that the code is printed on both sides, if possible, observing a gap of 8 mm between the last and first code bar.



One-track Pharmacode

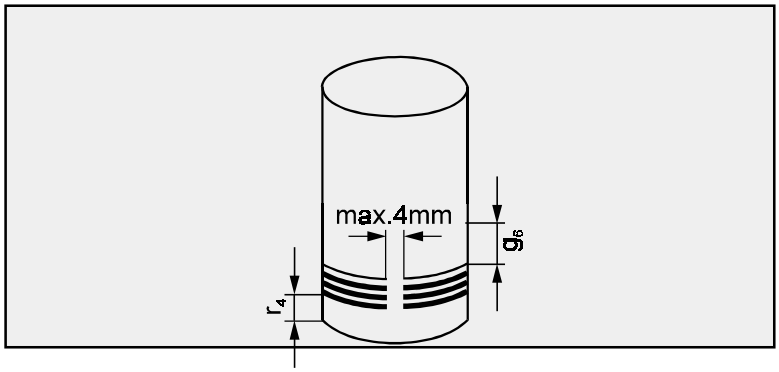
e_{14} Code height
7 mm

r_2 Distance from lower edge
8 mm

CYLINDRICAL OBJECTS WITHOUT ALIGNMENT

2.2.10 Cylindrical objects without alignment

When checking cylindrical objects where no turning station is available, a vertical code can be imitated by printing on rings which correspond in width to the dimensions of the standard code. Depending on the transport position of the object, the check then takes place using a code camera or a laser scanner or a single beam sensor head. The gap between the end of one code bar and the start of the next should be kept as small as possible (max. 4 mm). The rings must not overlap in such a way that printing inaccuracies would affect the width of the rings or the gaps.



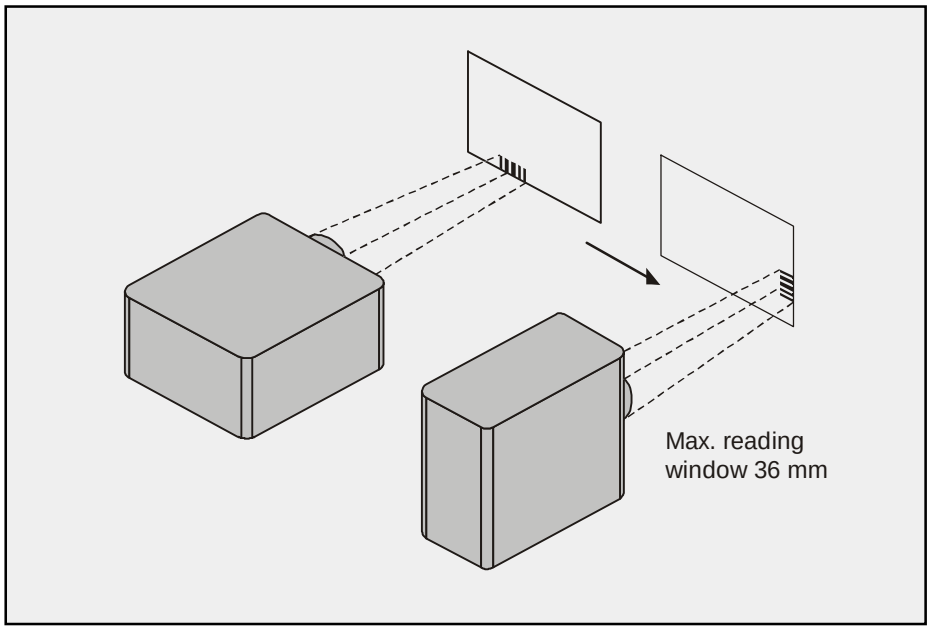
g_6 Foreign print gap
h = 8 mm

r_4 Distance from edge
r = 8 mm

3.0 Application guide lines

The practical possibilities in applying the Pharmacode depend, of course, on the reading device selected.
The standard specifications are based on the functioning of a reading head which emits a direct light beam.
In addition, Pharmacodes can be read using line cameras or laser scanners. As described below, the functionality may be extended but also restricted, depending on the technology used.

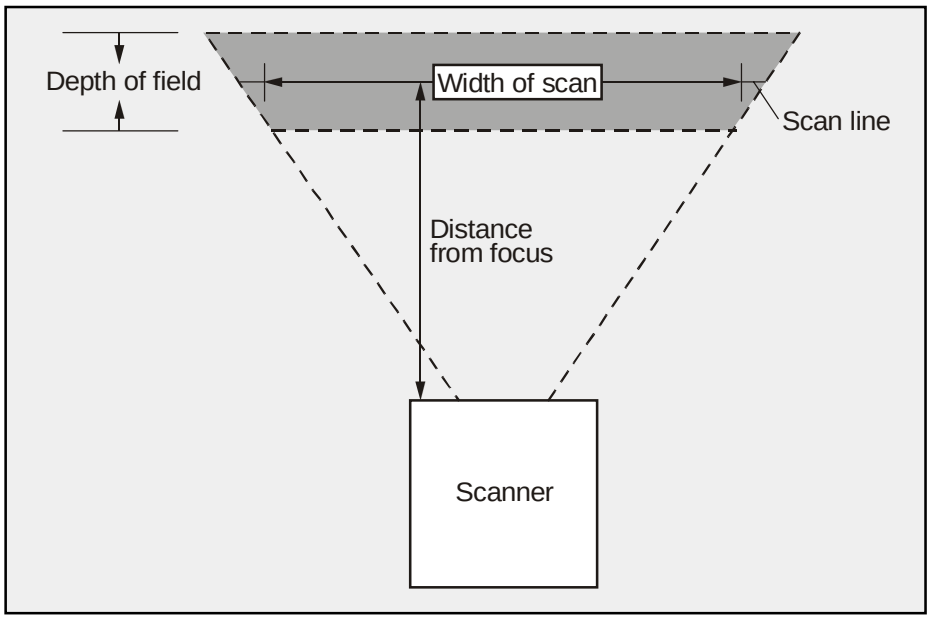
3.1 Code camera



The recording time of code cameras is extremely short, which means that it is possible to record both stationary and fast-moving coding. Because the code camera records the code as a whole, orientation in machine or traverse direction is possible.
The optical System of the code camera causes a restriction in the selection of the coding. The maximum length of code that can be evaluated depends on the type of code camera and can be found on the data sheet.
Otherwise the dimension regulations in 1.2 apply.

3.2 Laser scanner

Laser scanners have a moveable light beam so that, as with the code camera, stationary or moving coding can be read in machine or traverse direction. Laetus supplies a range of laser scanners of the MS and IMLS models. The selection of sensing distance, reading window or reading speed can be made by using special print characters or technical instructions.



The essential difference between reading Pharmacodes using laser scanners or reading them using single-beam reading heads and code cameras is the monochromatic light source and the decoding procedure. The following restrictions apply:

Code reading is only possible if there is sufficient contrast between the background and the code bars, e.g. black or dark colors on white background. Red cannot be read with a laser scanner!
Additional requirements have to be taken from the respective laser scanner handbook.

3.3 UV coding

UV-CODING

Pharmacodes can also be printed "invisibly". Instead of a color visible to the human eye, a transparent printing fluid enhanced with luminiphors is used. The following conditions must be met to guarantee a perfect reading:

- Minimum degree of luminescence of code bars ≥ 8 on Laetus white scale.
- Minimum contrast of code bars to background luminescence ≥ 2 on Laetus white scale. (Max. value for background = 8)
- No other printing in the coding area.

Luminescence values:

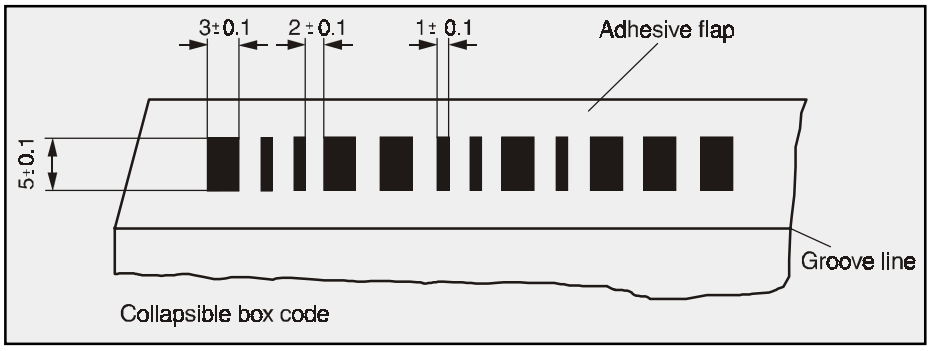
Code bars	8	9	10	11	12
Backround (highest values)	6	7	8	8	8

The Laetus UV Code camera *(for data see Argus 4 System information)* reads UV coding under the same conditions as the Code camera 512. Because of the special optical system, the total usable length of the UV Pharmacode is reduced to 15 mm. As a result the number of possible code combinations is limited (*see section 4.2).*

3.4 Guidelines for printing companies

Suppliers of the pharmaceuticals industry install the relevant systems to meet the special requirements of this client group.
This means that packaging materials for various companies can be manufactured or processed by one printing company. For the printing company the Pharmacode is not a unique means of identification since identical code combinations may occur.
In principle the Pharmacode can be used as a means of identifying packaging materials at the printer's. If the code is allocated by the pharmaceutical company, the printer must take special care to ensure that different packaging materials with identical codes are not mixed.
The collapsible box code has been specifically developed to meet the requirements of collapsible box manufacturers. It is usually located on the adhesive flap and is therefore no longer visible once the collapsible box has been completed. The structure of the collapsible box code is similar to that of the Pharmacode.

Dimensioning regulations of the collapsible box code



4.0 Practical guidelines, code list

4.1 Number of possible code combinations

The one-track or two-track Pharmacode is not a purely binary or tertiary code. There is no neutral element in the addition (zero) as there would be with complete numerical system. For this reason, the possible combinations are dependent on the number of digits according to the following formula:

	One-track code					Two-track code				
n	$K = \sum_{n=1}^{n} 2^n$					$K = \sum_{n=1}^{n} 3^n$				
1	2	+	0	=	2	3	+	0	=	3
2	4	+	2	=	6	9	+	3	=	12
3	8	+	6	=	14	27	+	12	=	39
4	16	+	14	=	30	81	+	39	=	120
5	32	+	30	=	62	243	+	120	=	363
6	64	+	62	=	126	729	+	363	=	1092
7	128	+	126	=	254	2187	+	1092	=	3279
8	256	+	254	=	510	6561	+	3279	=	9840
9	512	+	510	=	1022	19683	+	9840	=	29523
10	1024	+	1022	=	2046	59049	+	29523	=	88572
11	2048	+	2046	=	4094	177147	+	88572	=	265719
12	4096	+	4094	=	8190	531441	+	265719	=	797160
13	8192	+	8190	=	16382	1594323	+	797160	=	2391483
14	16384	+	16382	=	32766	4782969	+	2391483	=	7174452
15	32768	+	32766	=	65534	14348907	+	7174452	=	21523359
16	65536	+	65534	=	131070	43046721	+	21523359	=	64570080

4.2 Space requirements

Exact complicance with the standard dimensions for the Pharmacode is essential for the following calculation of the possible number of code combinations relating to a specific space. Empty spaces in front of and after the coding are not taken into consideration.
The space requirements for a specific coding are calculated by adding up all of the bar widths and the gaps.

Code bar area ≤ B	**One-track code (binary)**		**To-track code (tertiary)**
B in mm	Number of code bars	of whitch max. thick	Code numbers
5	3	1	39
7	4	2	120
9	5*	2	363
11	6*	3	1092
13	7*	3	3279
15	8*	4	9840
17	9*	4	29523
19	10*	5	88572
21	11*	5	265719

*) If the number of code bars is reduced by 1, the corresponding number of thick code bars can be increased by 1.

Example: B = 11 mm table = 6/3
or 5/4

i. e. with only 5 code bars, 4 may be thick for B ≤ 11 mm

4 x 1.5 + 0.5 + 4 x 1.0 = 10.5 mm

4.3 Converting a one-track Pharmacode into a decimal number

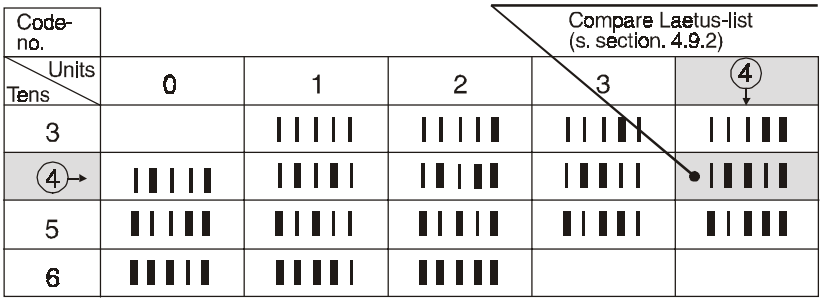
When determining the positions with the highest or lowest value, the machine direction of the code should be taken into account *(see section 4.6)*.

The value of the thick bars and thin bars can be seen in the following table:

Thin bars ▬	Position	Thick bars ▮
1	1	2
2	2	4
4	3	8
8	4	16
16	5	32
32	6	64
64	7	128
128	8	256
256	9	512
512	10	1024
1024	11	2048
2048	12	4096
4096	13	8192
8192	14	16384
16384	15	32768
32768	16	65536

Example of application

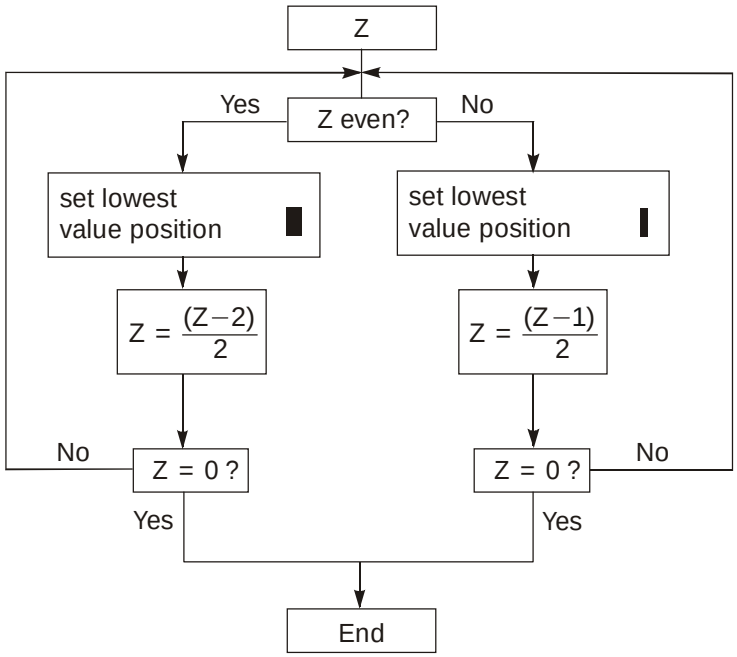
Step	Execution
1	
2	16 + 16 + 8 + 2 + 2 = 44
3	Result = 44



DEVELOPING A ONE-TRACK PHARMACODE

4.4 Developing a one-track Pharmacode

To create a one-track Pharmacode from a numerical value "Z" the following flow chart should be used:



4.5 Converting a two-track Pharmacode into a decimal number

When determining the position with the highest or lowest value, the machine direction of the code should be taken into account *(see section 4.6)*.

The value of the bars can be seen in the following table:

Pos.	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
▮	14348907	4782969	1594323	531441	177147	59049	19683	6561	2187	729	243	81	27	9	3	1
▮	28697814	9565938	3188646	1062882	354294	118098	39366	13122	4374	1458	486	162	54	18	6	2
▮▮	43046721	14348907	4782969	1594323	531441	177147	59049	19683	6561	2187	729	243	81	27	9	3

Exemple

1 ▮ ▮ ▮ Machine direction

2 81 + 18 + 3 + 3

Result = 105

3

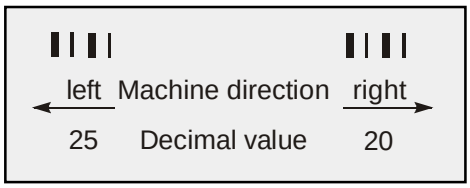
MACHINE DIRECTION AND DISPLAY

4.6 Machine direction and display

MACHINE DIRECTION, LEFT OR RIGHT

4.6.1 Machine direction, left or right

Pharmacodes do not have any special characters which determine the beginning or end of a code. The evaluation of a Pharmacode is thus dependent on the machine direction.



All illustrations in this manual correspond to a left machine direction, i.e. the position with he highest value is always on the left, as in a decimal number system.
Reading always takes place from the highest value to the lowest, i.e. the code bar which is read first is always that with the highest value, while the code bar read last has the lowest value.

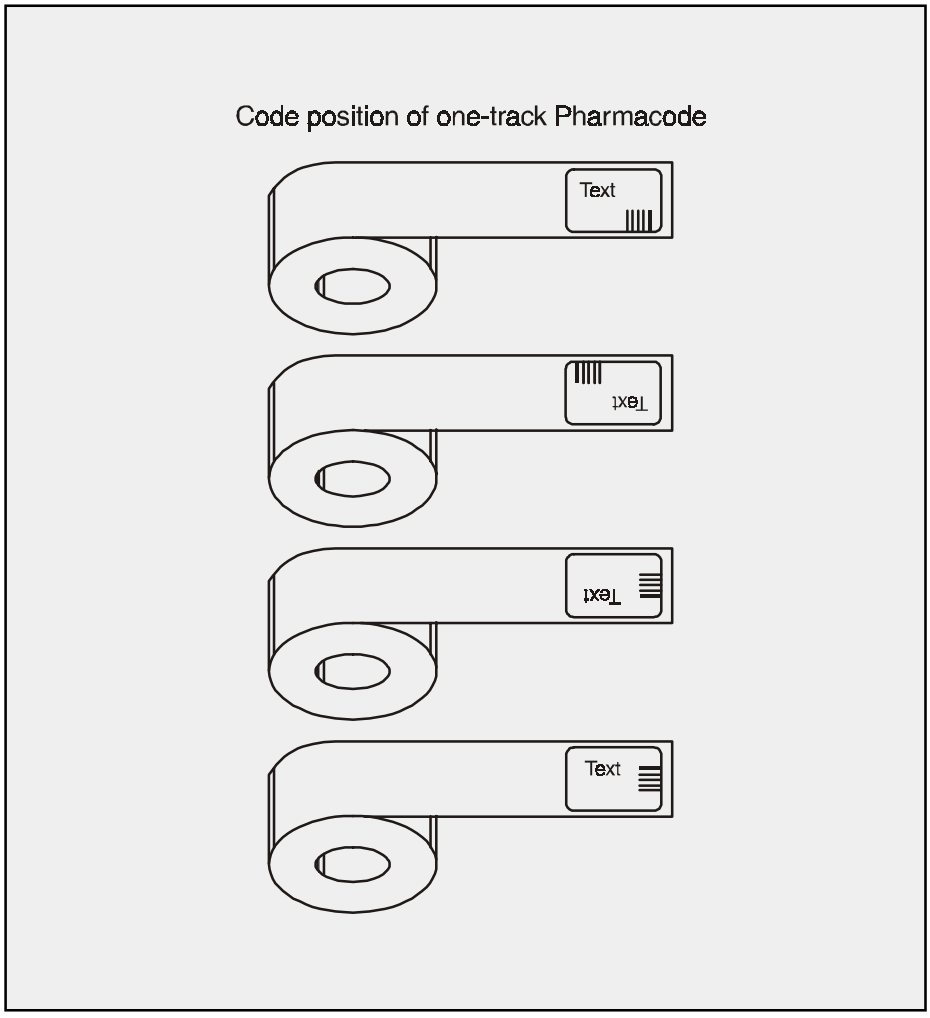
As most machines run to the right, this should be taken into account in the design of the packaging materials (the result will appear as in the illustration "machine direction right").

TRAVERSE AND ROTATED READING

4.6.2 Traverse and rotated reading

If code carriers can be aligned in various ways, the Pharmacode uses the primary printing for orientation.
If, for reasons of space, the Pharmacode has been aligned at right angels to the text, the following rules apply:

- Align the text so that it can be read from left to right.
- From the starting point of the standard positioning (highest value at 9 o'clock) rotate the code 90° in an anticlockwise direction.
- The highest value is now at the bottom (or 6 o'clock).



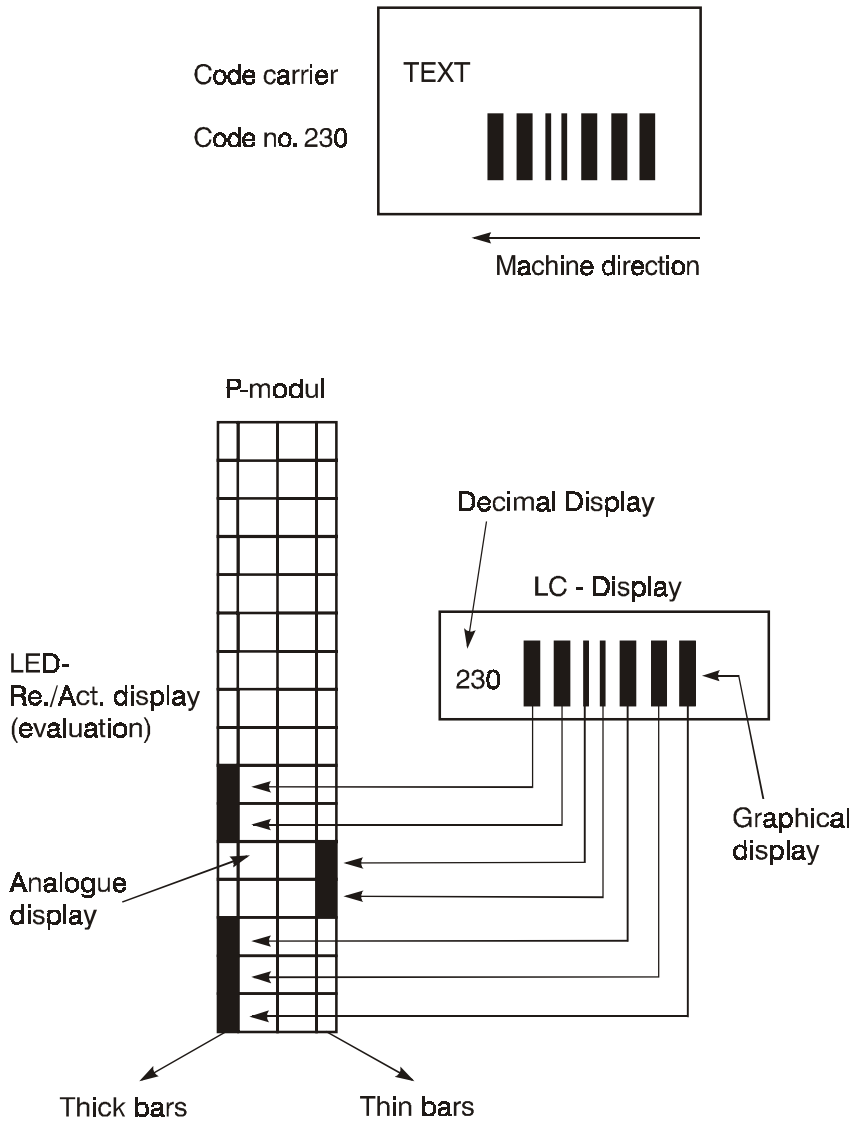
4.6.3 Inverse reading

INVERSE READING

As machine processes vary, a Pharmacode can, under certain conditions, be read in the reverse direction, i.e. the code is read mirrored. This is known as inverse reading. When the code is entered as a decimal value, an incorrect reading will inevitably result.
The ARGUS operating menu allows you to invert the reading direction electronically. If this function is activated *(see ARGUS operating instructions)*, a correct reading will take place with the correct decimal entry, in spite of the inverted machine direction.

4.7 Display on ARGUS 4/6

ARGUS 4/6 code readers have one graphical, one analogous and one decimal display for the code. The various representations are obtained as follows:



4.8 Testing and adjustment code

TESTING AND ADJUSTMENT CODE

Laetus provides a specially developed Pharma testing code for calibrating an ARGUS device. This contains all permitted tolerances and thus enables the optimum setting of the IV board.

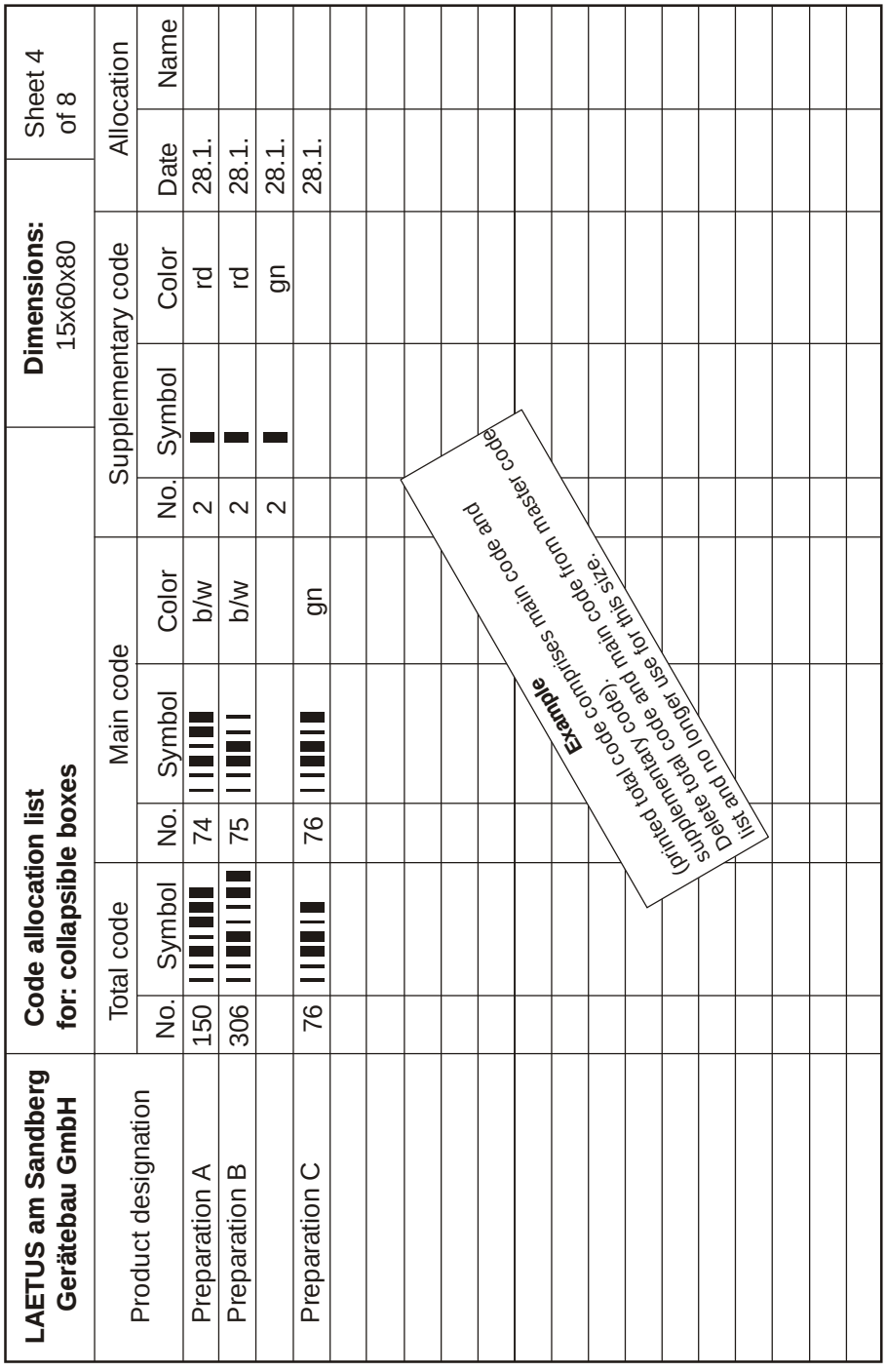
Codes exposed on photo film are precise to within +/- 50 µ and can be obtained from Laetus under order no. 65 8 62 9000.

4.9 Code allocation list

CODE ALLOCATION LIST

The code allocation list serves as a form for the handwritten, uniform and comprehensive allocation of the diverse codes.
Section 4.9.1 shows an example. In *7.0* you will find a detachable form. This enables you to make duplicates of the above-mentioned code allocation list.
For automatic code allocation, tested under all security aspects, the code administration software ADMINCODE can be obtained from Laetus under order no. 65 8 67 0004 *(see section 6.8)*.

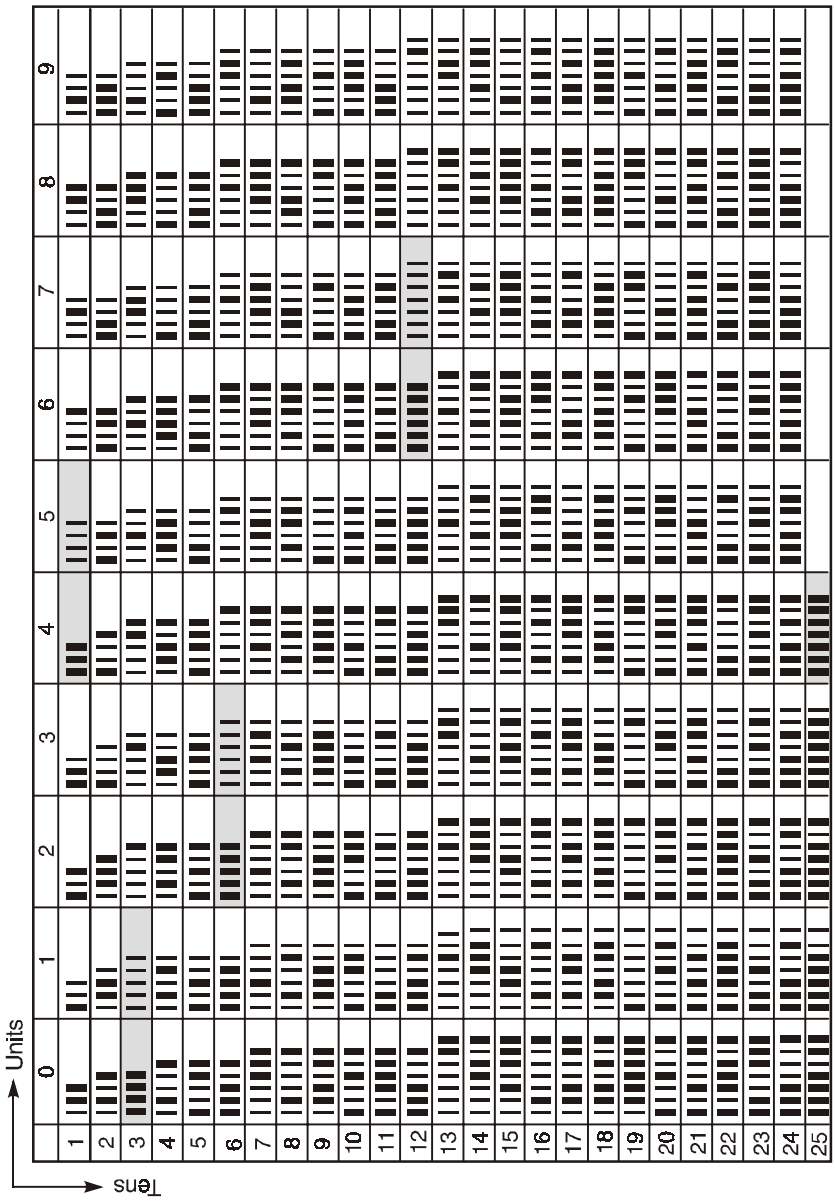
4.9.1 Application example



4.9.2 Code list for one-track Pharmecode

CODE LIST FOR ONE-TRACK PHARMECODE

One page is shown below as an example. Programs for generating complete lists of all code combinations can be sent on request *(see section 6.5)*.



For reasons of legibility, coding that is only one bar wide should never be used!

5.0 Code colors

5.1 Guidelines for color comparison tables

A great advantage of the Pharmacode lies in the possibility of inherent print color control of security-relevant data. Through the structuring of the bar code in bars of different colors, the completeness of the indispensable printing colors and thus the presence of the appropriate printing block can be checked.
The following color comparison list is intended to simplify the assessment of the readability of certain colors envisaged for printing. It is based on the 1990 edition of the *"PANTONE Matching System"* color chart.

The colors printed and numbered in the color chart from standard-basic colors I - process colors II (c. 750 variations) were measured using an ARGUS code reader standard sensor head; double-folded brilliant white thick typing paper is used as contrasting base. The double layers of the paper more or less correspond to the opacity of brilliant white collapsible box surfaces or stacks of leaflets.

The standard sensor head emits a voltage when a specific color is displayed. The differential voltage between the shade being evaluated and the known value of standard white as the background is used by the code reading device.

In many cases it is sufficient when testing packaging materials to find the corresponding shade in the color chart, determine whether the white of the background (on which the code is ultimately to be printed) standard white leaflet, and then check in the list whether this color has been assessed as legible.

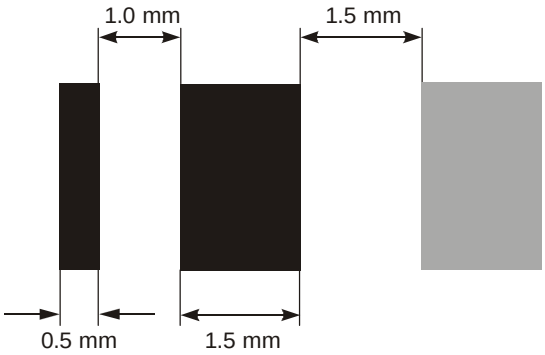
Because of the translucence of leaflets which are to be read separately, a distinct reduction in the differential voltage occurs in leaflet coding. Please take this into account when allocating colors to leaflets.

Reductions in contrast can also occur as a result of using recycled paper or other dark papers or material, or on account of moisture on wet adhesive labels, and must be taken into consideration accordingly.

5.2 Guidelines for the dimensions of multicolored coding

GUIDELINES FOR THE DIMENSIONS OF MULTICOLORED CODING

In order to maintain the minimum gap of 0.9 mm between the code bars, we recommend increasing the gap between the bars printed in the basic colors (mostly black) and the following colored bars.

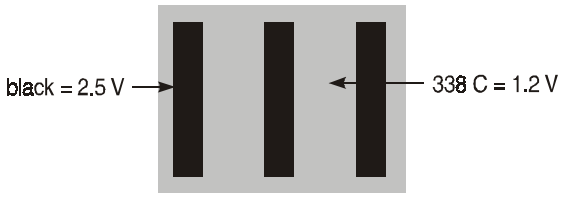


When colored code bars are used, the gap is increased to 1.5 mm

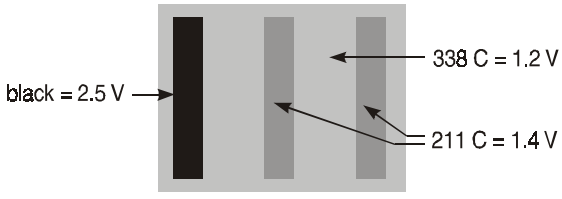
5.3 Establishing color contrast with background colors

ESTABLISHING COLOR CONTRAST WITH BACKGROUND COLORS

The effective contrast results from the difference between the measured value of the code bar in question and the background color. This value must always exceed 1.1 V.



Difference: 2.5 V–1.2 V = 1.3 V –> OK



Color bars-difference:
1.4 V–1.2 V = 0.2 V –> Contrast too low, unreadable

To retain code bar color 211 C, the background would have to be changed from color 338 C to white.

EVALUATION OF COLORS

5.4 Evaluation of colors

The client can also evaluate an equivalent color list. The following conditions must be observed:

- The code reading sensor head should be aligned at the specified distance at an angle of 20 degrees to the test object. The sensor head should be set electrically in such a way that a comparison of brilliant white and deep matt black paper produces a differential voltage of 2.5 V at the analogous outputs of the sensor head (track A or track B against ground).
- The differential voltage of the colors to be measured is determined by subtracting the measured voltage value from the value measured with standard white.
- The measurement must be made on a color sample which is larger than the light spot scanned by the sensor head; in other words, larger than 1 mm x 2 mm.
- Laetus offers an easy-to-use measuring instrument with a standard sensor head for creating color comparison lists for in-house color palettes *(see section 6.1)*

COLOR COMPARISON TABLE SHOWING READABILITY OF CODE COLORS

5.5 Color comparison table showing readability of code colors

The table was created using the PANTONE color chart and standard white paper (double). The COSA sensor head was used as a reading sensor. Boxes highlighted in gray indicate preferred colors. The minimum differential voltage for a permitted reading must be greater than 1.1 volts.

Chart color	Differential voltage in volts
Yellow C	0,00
Yellow 012 C	0,00
Orange 021 C	1,30
Warm Red C	1,70
Red 032 C	1,90
Rubine Red C	**2,30**
Rhodamine Red C	**2,00**
Purple C	**2,30**
Violet C	**2,50**
Blue 072 C	**2,60**
Reflex Blue C	**2,60**
Process Blue C	**2,50**
Green C	**2,20**
Black C	**2,50**
Process Yellow C	0,00
Process Magenta C	**2,20**
Process Cyan C	**2,10**
Process Black C	**2,50**
100 C	0,00
101 C	0,00
102 C	0,00
Yellow C	0,00
103 C	1,20
104 C	1,50
105 C	**2,00**
106 C	0,00
107 C	0,00
108 C	0,00
109 C	0,10
110 C	0,90
111 C	1,50
112 C	1,80
113 C	0,00
114 C	0,00

Chart color	Differential voltage in volts
115 C	0,10
116 C	0,20
117 C	1,30
118 C	1,70
119 C	**2,10**
120 C	0,00
1205 C	0,00
121 C	0,00
1215 C	0,00
122 C	0,10
1225 C	0,20
123 C	0,30
1235 C	0,40
124 C	0,90
1245 C	1,30
125 C	1,50
1255 C	1,70
126 C	1,70
1265 C	**2,00**
127 C	0,30
128 C	0,40
129 C	0,70
130 C	1,10
131 C	1,60
132 C	1,70
133 C	**2,20**
134 C	0,10
1345 C	0,10
135 C	0,30
1355 C	0,20
136 C	0,40
1365 C	0,40
137 C	0,60
1375 C	0,80

Chart color	Differential voltage in volts
138 C	1,20
1385 C	1,40
139 C	1,70
1395 C	1,90
140 C	**2,10**
1405 C	**2,30**
141 C	0,70
142 C	1,00
143 C	1,10
144 C	1,60
145 C	1,80
146 C	**2,10**
147 C	**2,20**
148 C	0,20
1485 C	0,10
149 C	0,30
1495 C	0,40
150 C	0,70
1505 C	0,70
151 C	1,10
Orange 021 C	1,30
152 C	1,30
1525 C	1,70
153 C	1,70
1535 C	**2,00**
154 C	**2,00**
1545 C	**2,40**
155 C	0,40
1555 C	0,30
156 C	0,70
1565 C	0,50
157 C	1,30
1575 C	0,90
158 C	1,80
1585 C	1,20
159 C	**2,00**
1595 C	1,60
160 C	**2,20**
1605 C	**2,00**

Chart color	Differential voltage in volts
161 C	**2,40**
1615 C	**2,20**
162 C	0,20
1625 C	0,60
163 C	0,70
1635 C	0,80
164 C	0,90
1645 C	1,10
165 C	1,30
1655 C	1,40
166 C	1,60
1665 C	1,60
167 C	1,80
1675 C	**2,00**
168 C	**2,30**
1685 C	**2,20**
169 C	0,40
170 C	0,80
171 C	1,20
172 C	1,50
173 C	1,70
174 C	**2,20**
175 C	**2,30**
176 C	0,40
1765 C	0,80
1767 C	0,70
177 C	0,90
1775 C	1,10
1777 C	1,50
178 C	1,20
1785 C	1,50
1787 C	1,80
Warm Red C	1,70
1788 C	1,80
Red 032 C	1,90
179 C	1,70
1795 C	**2,00**
1797 C	**2,10**
180 C	1,80

Chart color	Differential voltage in volts
1805 C	**2,10**
1807 C	**2,30**
181 C	**2,20**
1815 C	**2,30**
1817 C	**2,40**
182 C	0,50
183 C	1,20
184 C	1,60
185 C	**2,00**
186 C	**2,10**
187 C	**2,20**
188 C	**2,30**
189 C	0,90
1895 C	0,70
190 C	1,40
1905 C	1,20
191 C	1,80
1915 C	1,80
192 C	**2,10**
1925 C	**2,10**
193 C	**2,20**
1935 C	**2,30**
194 C	**2,30**
1945 C	**2,30**
195 C	**2,30**
1955 C	**2,30**
196 C	0,80
197 C	1,30
198 C	1,90
199 C	**2,20**
200 C	**2,30**
201 C	**2,30**
202 C	**2,40**
203 C	1,10
204 C	1,60
205 C	**2,00**
206 C	**2,20**
207 C	**2,30**
208 C	**2,40**

Chart color	Differential voltage in volts
209 C	**2,40**
210 C	1,00
211 C	1,30
212 C	1,70
213 C	**2,00**
214 C	**2,20**
215 C	**2,30**
216 C	**2,40**
217 C	0,90
218 C	1,70
219 C	**2,10**
Rubine Red C	**2,30**
220 C	**2,40**
221 C	**2,40**
222 C	**2,50**
223 C	1,30
224 C	1,70
225 C	**2,00**
226 C	**2,20**
227 C	**2,40**
228 C	**2,40**
229 C	**2,40**
230 C	0,80
231 C	1,50
232 C	1,70
Rhodamine Red C	**2,00**
233 C	**2,20**
234 C	**2,30**
235 C	**2,30**
236 C	0,80
2365 C	0,60
237 C	1,40
2375 C	1,70
238 C	1,80
2385 C	**2,10**
239 C	**2,10**
2395 C	**2,40**
240 C	**2,20**
2405 C	**2,40**

Chart color	Differential voltage in volts	Chart color	Differential voltage in volts
241 C	**2,30**	2612 C	**2,50**
2415 C	**2,40**	2613 C	**2,50**
242 C	**2,40**	2617 C	**2,50**
2425 C	**2,40**	262 C	**2,50**
243 C	0,80	2622 C	**2,40**
244 C	1,20	2623 C	**2,50**
245 C	1,50	2627 C	**2,50**
246 C	**2,20**	263 C	0,80
247 C	**2,30**	2635 C	1,20
248 C	**2,40**	264 C	1,40
249 C	**2,40**	2645 C	1,60
250 C	0,70	265 C	**2,20**
251 C	1,40	2655 C	**2,00**
252 C	1,90	266 C	**2,50**
Purple C	**2,30**	2665 C	**2,20**
253 C	**2,30**	267 C	**2,50**
254 C	**2,40**	Violet C	**2,50**
255 C	**2,40**	268 C	**2,50**
256 C	0,90	2685 C	**2,50**
2562 C	1,30	269 C	**2,50**
2563 C	1,50	2695 C	**2,50**
2567 C	1,60	270 C	1,30
257 C	1,40	2705 C	1,60
2572 C	1,80	2706 C	0,80
2573 C	1,90	2707 C	0,90
2577 C	**2,00**	2708 C	1,20
258 C	**2,20**	271 C	1,80
2582 C	**2,30**	2715 C	1,90
2583 C	**2,20**	2716 C	1,70
2587 C	**2,30**	2717 C	1,40
259 C	**2,50**	2718 C	**2,20**
2592 C	**2,50**	272 C	**2,10**
2593 C	**2,40**	2725 C	**2,30**
2597 C	**2,50**	2726 C	**2,40**
260 C	**2,50**	2727 C	**2,30**
2602 C	**2,50**	2728 C	**2,50**
2603 C	**2,50**	273 C	**2,50**
2607 C	**2,50**	2735 C	**2,50**
261 C	**2,50**	2736 C	**2,50**

Chart color	Differential voltage in volts
Blue 072 C	**2,60**
2738 C	**2,60**
274 C	**2,60**
2745 C	**2,50**
2746 C	**2,50**
2747 C	**2,60**
2748 C	**2,60**
275 C	**2,60**
2755 C	**2,50**
2756 C	**2,50**
2757 C	**2,60**
2758 C	**2,60**
276 C	**2,50**
2765 C	**2,50**
2766 C	**2,50**
2767 C	**2,60**
2768 C	**2,60**
277 C	0,80
278 C	1,50
279 C	**2,10**
Reflex Blue C	**2,60**
280 C	**2,60**
281 C	**2,60**
282 C	**2,60**
283 C	1,30
284 C	1,80
285 C	**2,40**
286 C	**2,60**
287 C	**2,60**
288 C	**2,60**
289 C	**2,60**
290 C	0,70
2905 C	1,20
291 C	1,20
2915 C	1,80
292 C	1,70
2925 C	**2,20**
293 C	**2,50**
2935 C	**2,50**

Chart color	Differential voltage in volts
294 C	**2,50**
2945 C	**2,50**
295 C	**2,60**
2955 C	**2,60**
296 C	**2,50**
2965 C	**2,60**
297 C	1,30
2975 C	0,90
298 C	1,90
2985 C	1,70
299 C	**2,20**
2995 C	**2,20**
300 C	**2,50**
3005 C	**2,50**
301 C	**2,60**
3015 C	**2,50**
302 C	**2,50**
3025 C	**2,50**
303 C	**2,50**
3035 C	**2,50**
304 C	0,80
305 C	1,50
306 C	1,90
Process Blue C	**2,50**
307 C	**2,50**
308 C	**2,50**
309 C	**2,50**
310 C	1,40
3105 C	1,10
311 C	1,70
3115 C	1,60
312 C	**2,20**
3125 C	**2,00**
313 C	**2,50**
3135 C	**2,40**
314 C	**2,50**
3145 C	**2,40**
315 C	**2,50**
3155 C	**2,40**

Chart color	Differential voltage in volts	Chart color	Differential voltage in volts
316 C	**2,50**	333 C	1,20
3165 C	**2,50**	Green C	**2,20**
317 C	0,50	334 C	**2,30**
318 C	1,00	335 C	**2,30**
319 C	1,60	336 C	**2,40**
320 C	**2,40**	337 C	1,00
321 C	**2,40**	3375 C	0,70
322 C	**2,40**	338 C	1,40
323 C	**2,40**	3385 C	1,10
324 C	0,90	339 C	**2,10**
3242 C	0,90	3395 C	1,60
3245 C	0,80	340 C	**2,30**
3248 C	1,20	3405 C	**2,00**
325 C	1,50	341 C	**2,40**
3252 C	1,30	3415 C	**2,20**
3255 C	1,30	342 C	**2,40**
3258 C	1,70	3425 C	**2,30**
326 C	**2,00**	343 C	**2,40**
3262 C	1,80	3435 C	**2,40**
3265 C	1,70	344 C	0,80
3268 C	**2,00**	345 C	1,10
327 C	**2,40**	346 C	1,40
3272 C	**2,20**	347 C	**2,30**
3275 C	**2,10**	348 C	**2,30**
3278 C	**2,30**	349 C	**2,40**
328 C	**2,50**	350 C	**2,40**
3282 C	**2,30**	351 C	0,40
3285 C	**2,20**	352 C	0,70
3288 C	**2,40**	353 C	0,90
329 C	**2,50**	354 C	1,90
3292 C	**2,40**	355 C	**2,10**
3295 C	**2,20**	356 C	**2,20**
3298 C	**2,40**	357 C	**2,30**
330 C	**2,40**	358 C	0,80
3302 C	**2,50**	359 C	0,90
3305 C	**2,40**	360 C	1,50
3308 C	**2,50**	361 C	1,90
331 C	0,40	362 C	**2,00**
332 C	0,70	363 C	**2,10**

Chart color	Differential voltage in volts
364 C	**2,20**
365 C	0,30
366 C	0,60
367 C	0,90
368 C	1,60
369 C	1,80
370 C	**2,00**
371 C	**2,20**
372 C	0,20
373 C	0,20
374 C	0,50
375 C	0,90
376 C	1,30
377 C	1,70
378 C	**2,20**
379 C	0,20
380 C	0,30
381 C	0,40
382 C	0,70
383 C	1,30
384 C	1,60
385 C	**2,00**
386 C	0,00
387 C	0,10
388 C	0,20
389 C	0,40
390 C	0,90
391 C	1,50
392 C	1,80
393 C	0,00
3935 C	0,00
394 C	0,00
3945 C	0,00
395 C	0,10
3955 C	0,20
396 C	0,20
3965 C	0,20
397 C	0,90
3975 C	1,20

Chart color	Differential voltage in volts
398 C	1,20
3985 C	1,60
399 C	1,60
3995 C	**2,10**
400 C	0,70
401 C	1,10
402 C	1,50
403 C	1,70
404 C	**2,00**
405 C	**2,20**
Black C	**2,50**
406 C	0,90
407 C	1,30
408 C	1,50
409 C	1,70
410 C	**2,00**
411 C	**2,20**
412 C	**2,40**
413 C	0,90
414 C	1,10
415 C	1,50
416 C	1,70
417 C	**2,00**
418 C	**2,10**
419 C	**2,50**
420 C	0,70
421 C	1,10
422 C	1,40
423 C	1,50
424 C	**2,00**
425 C	**2,20**
426 C	**2,50**
427 C	0,40
428 C	0,80
429 C	1,40
430 C	1,70
431 C	**2,10**
432 C	**2,40**
433 C	**2,50**

Chart color	Differential voltage in volts	Chart color	Differential voltage in volts
434 C	0,40	4495 C	**2,00**
435 C	0,70	450 C	**2,30**
436 C	1,10	4505 C	1,60
437 C	1,70	451 C	1,60
438 C	**2,20**	4515 C	1,20
439 C	**2,40**	452 C	1,20
440 C	**2,40**	4525 C	0,90
441 C	0,60	453 C	0,80
442 C	0,80	4535 C	0,60
443 C	1,20	454 C	0,50
444 C	1,60	4545 C	0,30
445 C	**2,20**	455 C	**2,30**
446 C	**2,30**	456 C	1,80
447 C	**2,40**	457 C	1,60
Warm Gray 1 C	0,40	458 C	0,60
Warm Gray 2 C	0,70	459 C	0,40
Warm Gray 3 C	1,00	460 C	0,30
Warm Gray 4 C	1,10	461 C	0,10
Warm Gray 5 C	1,30	462 C	**2,40**
Warm Gray 6 C	1,40	4625 C	**2,40**
Warm Gray 7 C	1,60	463 C	**2,30**
Warm Gray 8 C	1,80	4635 C	**2,10**
Warm Gray 9 C	1,90	464 C	**2,20**
Warm Gray 10 C	**2,00**	4645 C	1,70
Warm Gray 11 C	**2,20**	465 C	1,50
Cool Gray 1 C	0,30	4655 C	1,30
Cool Gray 2 C	0,60	466 C	1,10
Cool Gray 3 C	0,80	4665 C	0,80
Cool Gray 4 C	1,00	467 C	0,90
Cool Gray 5 C	1,20	4675 C	0,60
Cool Gray 6 C	1,20	468 C	0,60
Cool Gray 7 C	1,40	4685 C	0,30
Cool Gray 8 C	1,70	469 C	**2,30**
Cool Gray 9 C	1,80	4695 C	**2,40**
Cool Gray 10 C	**2,00**	470 C	**2,10**
Cool Gray 11 C	**2,10**	4705 C	**2,30**
448 C	**2,40**	471 C	1,80
4485 C	**2,30**	4715 C	**2,00**
449 C	**2,40**	472 C	0,90

Chart color	Differential voltage in volts
4725 C	1,60
473 C	0,50
4735 C	1,20
474 C	0,40
4745 C	0,90
475 C	0,20
4755 C	0,60
476 C	**2,40**
477 C	**2,40**
478 C	**2,40**
479 C	1,80
480 C	1,20
481 C	0,90
482 C	0,60
483 C	**2,40**
484 C	**2,30**
485 C	**2,20**
486 C	1,40
487 C	1,00
488 C	0,70
489 C	0,40
490 C	**2,40**
491 C	**2,30**
492 C	**2,20**
493 C	1,20
494 C	0,60
495 C	0,40
496 C	0,30
497 C	**2,40**
4975 C	**2,50**
498 C	**2,30**
4985 C	**2,20**
499 C	**2,20**
4995 C	1,80
500 C	1,20
5005 C	1,50
501 C	0,60
5015 C	1,00
502 C	0,30

Chart color	Differential voltage in volts
5025 C	0,70
503 C	0,10
5035 C	0,40
504 C	**2,40**
505 C	**2,30**
506 C	**2,30**
507 C	1,30
508 C	0,90
509 C	0,50
510 C	0,40
511 C	**2,40**
5115 C	**2,50**
512 C	**2,30**
5125 C	**2,40**
513 C	**2,20**
5135 C	**2,10**
514 C	1,40
5145 C	1,70
515 C	1,00
5155 C	1,20
516 C	0,70
5165 C	0,70
517 C	0,40
5175 C	0,40
518 C	**2,50**
5185 C	**2,40**
519 C	**2,40**
5195 C	**2,40**
520 C	**2,40**
5205 C	**2,00**
521 C	1,80
5215 C	1,60
522 C	1,50
5225 C	1,20
523 C	1,10
5235 C	0,70
524 C	0,80
5245 C	0,50
525 C	**2,50**

Chart color	Differential voltage in volts	Chart color	Differential voltage in volts
5255 C	**2,50**	5477 C	**2,40**
526 C	**2,50**	548 C	**2,50**
5265 C	**2,40**	5483 C	1,90
527 C	**2,50**	5487 C	**2,10**
5275 C	**2,30**	549 C	**2,10**
528 C	**2,00**	5493 C	1,50
5285 C	1,90	5497 C	1,70
529 C	1,50	550 C	1,70
5295 C	1,40	5503 C	1,10
530 C	1,20	5507 C	1,30
5305 C	1,00	551 C	1,30
531 C	0,90	5513 C	0,60
5315 C	0,60	5517 C	0,90
532 C	**2,40**	552 C	0,90
533 C	**2,40**	5523 C	0,40
534 C	**2,40**	5527 C	0,70
535 C	1,50	553 C	**2,50**
536 C	1,20	5535 C	**2,40**
537 C	0,90	554 C	**2,40**
538 C	0,60	5545 C	**2,10**
539 C	**2,50**	555 C	**2,40**
5395 C	**2,50**	5555 C	1,70
540 C	**2,60**	556 C	1,70
5405 C	**2,40**	5565 C	1,30
541 C	**2,50**	557 C	1,30
5415 C	**2,20**	5575 C	0,90
542 C	**2,00**	558 C	1,00
5425 C	1,80	5585 C	0,70
543 C	1,60	559 C	0,70
5435 C	1,20	5595 C	0,50
544 C	1,20	560 C	**2,40**
5445 C	0,80	5605 C	**2,50**
545 C	0,90	561 C	**2,20**
5455 C	0,60	5615 C	**2,30**
546 C	**2,50**	562 C	**2,10**
5463 C	**2,50**	5625 C	**2,00**
5467 C	**2,50**	563 C	1,20
547 C	**2,50**	5635 C	1,50
5473 C	**2,40**	564 C	0,90

Chart color	Differential voltage in volts
5645 C	1,00
565 C	0,70
5655 C	0,80
566 C	0,40
5665 C	0,50
567 C	**2,40**
568 C	**2,20**
569 C	**2,10**
570 C	1,20
571 C	0,80
572 C	0,50
573 C	0,30
574 C	**2,40**
5743 C	**2,40**
5747 C	**2,40**
575 C	**2,20**
5753 C	**2,20**
5757 C	**2,10**
576 C	**2,00**
5763 C	**2,00**
5767 C	1,70
577 C	1,20
5773 C	1,50
5777 C	1,40
578 C	0,90
5783 C	1,20
5787 C	0,80
579 C	0,70
5793 C	0,80
5797 C	0,50
580 C	0,40
5803 C	0,50
5807 C	0,40
581 C	**2,20**
5815 C	**2,40**
582 C	1,80
5825 C	**2,10**
583 C	1,30
5835 C	1,50

Chart color	Differential voltage in volts
584 C	0,60
5845 C	1,20
585 C	0,40
5855 C	0,80
586 C	0,30
5865 C	0,60
587 C	0,10
5875 C	0,40
600 C	0,00
601 C	0,00
602 C	0,00
603 C	0,10
604 C	0,20
605 C	0,50
606 C	0,70
607 C	0,00
608 C	0,00
609 C	0,10
610 C	0,30
611 C	0,60
612 C	0,90
613 C	1,30
614 C	0,20
615 C	0,30
616 C	0,40
617 C	0,80
618 C	1,20
619 C	1,80
620 C	1,90
621 C	0,50
622 C	0,80
623 C	1,30
624 C	1,70
625 C	**2,00**
626 C	**2,40**
627 C	**2,50**
628 C	0,50
629 C	0,80
630 C	1,20

Chart color	Differential voltage in volts	Chart color	Differential voltage in volts
631 C	1,80	670 C	0,40
632 C	**2,00**	671 C	0,70
633 C	**2,40**	672 C	1,10
634 C	**2,50**	673 C	1,50
635 C	0,70	674 C	1,90
636 C	1,00	675 C	**2,20**
637 C	1,40	676 C	**2,30**
638 C	1,80	677 C	0,50
539 C	**2,20**	678 C	0,70
640 C	**2,40**	679 C	1,00
641 C	**2,50**	680 C	1,40
642 C	0,60	681 C	**2,00**
643 C	0,90	682 C	**2,20**
644 C	1,40	683 C	**2,40**
645 C	1,80	684 C	0,50
646 C	**2,10**	685 C	0,80
647 C	**2,40**	686 C	1,00
648 C	**2,50**	687 C	1,50
649 C	0,70	688 C	1,90
650 C	1,10	689 C	**2,20**
651 C	1,60	690 C	**2,40**
652 C	**2,10**	691 C	0,30
653 C	**2,40**	692 C	0,70
654 C	**2,50**	693 C	1,00
655 C	**2,60**	694 C	1,30
656 C	0,60	695 C	1,90
657 C	1,00	696 C	**2,20**
658 C	1,60	697 C	**2,30**
659 C	**2,00**	698 C	0,40
660 C	**2,40**	699 C	0,70
661 C	**2,50**	700 C	1,00
662 C	**2,60**	701 C	1,40
663 C	0,60	702 C	1,80
664 C	0,80	703 C	**2,10**
665 C	1,20	704 C	**2,30**
666 C	1,70	705 C	0,10
667 C	**2,10**	706 C	0,40
668 C	**2,30**	707 C	0,80
669 C	**2,50**	708 C	1,20

Chart color	Differential voltage in volts
709 C	1,60
710 C	1,90
711 C	**2,00**
712 C	0,00
713 C	0,10
714 C	0,30
715 C	0,60
716 C	1,00
717 C	1,40
718 C	1,60
719 C	0,20
720 C	0,30
721 C	0,70
722 C	1,20
723 C	1,50
724 C	**2,00**
725 C	**2,20**
726 C	0,40
727 C	0,70
728 C	1,00
729 C	1,30
730 C	1,70
731 C	**2,30**
732 C	**2,40**
Yellow C 2X	0,00
116 C 2X	0,40
130 C 2X	1,50
165 C 2X	1,60
Warm Red C 2X	1,20
1788 C 2X	**2,10**
185 C 2X	**2,20**
485 C 2X	**2,30**
Rubine Red C 2X	**2,30**
Rhodam. Red C 2X	**2,30**
239 C 2X	**2,40**
Purple C 2X	**2,50**
2592 C 2X	**2,50**
Violet C 2X	**2,60**
Reflex Blue C 2X	**2,60**

Chart color	Differential voltage in volts
Process Bl. C 2X	**2,50**
299 C 2X	**2,50**
306 C 2X	**2,20**
320 C 2X	**2,50**
327 C 2X	**2,50**
Green C 2X	**2,40**
354 C 2X	**2,30**
368 C 2X	**2,10**
375 C 2X	1,50
382 C 2X	1,30
471 C 2X	**2,10**
464 C 2X	**2,40**
433 C 2X	**2,60**
Black 2 C	**2,40**
Black 3 C	**2,50**
Black 4 C	**2,50**
Black 5 C	**2,50**
Black 6 C	**2,50**
Black 7 C	**2,40**
Black 2 C 2X	**2,60**
Black 3 C 2X	**2,60**
Black 4 C 2X	**2,60**
Black 5 C 2X	**2,60**
Black 6 C 2X	**2,60**
Black 7 C 2X	**2,50**
801 C	**2,20**
802 C	1,30
803 C	0,00
804 C	0,00
805 C	0,70
806 C	1,10
807 C	1,70
801 C 2X	**2,40**
802 C 2X	1,50
803 C 2X	0,00
804 C 2X	0,20
805 C 2X	0,80
806 C 2X	1,20
807 C 2X	1,80

Chart color	Differential voltage in volts
808 C	1,90
809 C	0,30
810 C	0,00
811 C	0,50
812 C	1,00
813 C	1,40
814 C	1,90
808 C 2X	**2,30**
809 C 2X	0,60
810 C 2X	0,00
811 C 2X	0,60
812 C 2X	1,10
813 C 2X	1,80
814 C 2X	**2,20**
871 C	**2,00**
872 C	**2,00**
873 C	**2,00**
874 C	**2,00**
875 C	**2,00**
876 C	**2,00**
877 C	1,80

6.0 Accessories

ACCESSORIES

6.1 Contrast meter

CONTRAST METER

Order no. 60 9 83 0015
Mains voltage : 220 V

The contrast meter allows a check to be made of the contrast between code bars and background.

Components

- Aluminium housing for power supply, anodized
- Digital measuring instrument
- Calibrating revolving head
- Standard sensor head
  with test object guide
  Test distance f = focus = 36 mm

6.2 Measuring magnifier

MEASURING MAGNIFIER

Order no. 60 8 58 5519

With millimeter grid. The magnifying lens is used for checking code dimensions.

6.3 Pantone Matching System

PANTONE MATCHING SYSTEM

Order no. 60 8 90 5520

A color comparison scale which is used when testing the readability of color codes.

6.4 Films

FILMS

We can supply true-to-size films for all one-track Pharmacode combinations, i.e.:
the print documentation required for the printing task in question will be available to you without further expenditure or trouble.

6.5 PC-programs for creating Pharmacode lists

PC-PROGRAMS FOR CREATING PHARMACODE LISTS

Edicode I + II, Order no. 65 8 67 0001 + 65 8 67 0002

Lists of one-track or two-track Pharmacodes (not true-to-size) can be created on screen or as printout *(see section 4.9.2).*

PC-PROGRAM FOR CREATING TRUE-TO-SIZE PHARMACODING

6.6 PC-program for creating true-to-size Pharmacoding

Pricode, Order no.: 65 8 67 0003

Pricode creates true-to-size one-track Pharmacodes on MS Windows PCs. We can provide the names of suppliers for Apple Macintosh applications.

TEST CODE

6.7 Test code

Order no.: 65 8 62 9000

A precisely dimensioned test code has been developed for calibrating the IV-board *(see section 4.8).*

ADMINCODE (CODE ADMINISTRATION PROGRAM)

6.8 ADMINCODE (Code aministration program)

Order No.: 65 8 67 0004

The code administration program ADMINCODE takes care of creating the master code list and allocating new codes. Suggestions are generated by the program or can be entered numerically or graphically. Double allocations are prevented. The space requirements are calculated simultaneously. The allocated codes are saved permanently and can be printed out.
The minimum required system comprises a PC with processor 386 (or higher), at least 6 MB working memory, VDU with 600x800 resolution and Windows 3.1 (or higher).

Appendix: Code allocation list

Laetus **Division of Romaco GmbH**	**Code allocation list** **for:**						**Dimension:**			Sheet of Sheets
Designation of product	Total Code		Main Code			Supplementary Code			Allocation	
	No.	Symbol	No.	Symbol	Color	No.	Symbol	Color	Date	Name