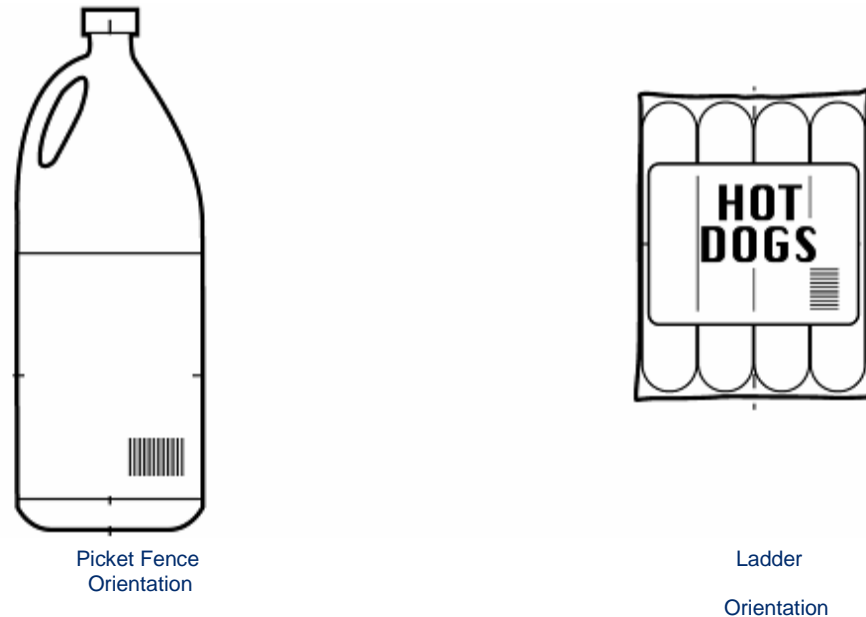


6.2.3. Orientation

Bar code orientation is determined primarily by the print process and any curvature of the item. If the printing process and curvature allow, the preferred placement is picket fence orientation, in which the bars of the bar code are perpendicular to the surface on which the package stands in its normal display position. For Human-Readable Interpretation Rules see Section 4.12. Empirical data has demonstrated that it makes no difference to the scanning process one way or the other. Rules for positioning bar codes on curved surfaces are given in Section [6.2.3.2](#).

Figure 6.2.3 – 1. Bar code orientation



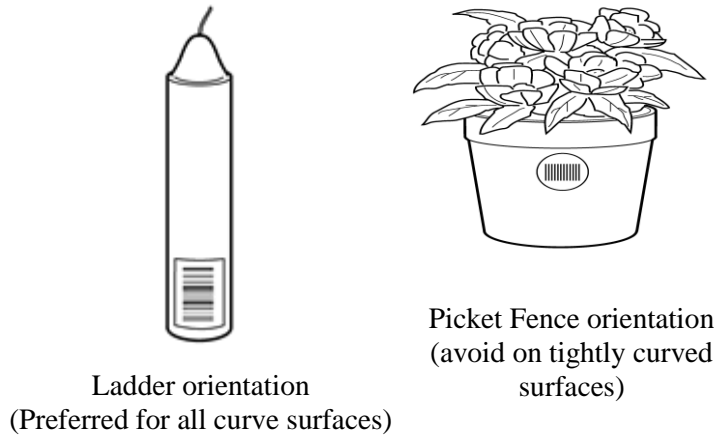
6.2.3.1. Printing Direction

Bar code orientation is often determined by the printing process. Some printing processes give much higher quality results if the bars of the symbol run in the direction of the print, also known as the web direction. The printing company should always be consulted.

6.2.3.2. Trade Items with Curved Surfaces

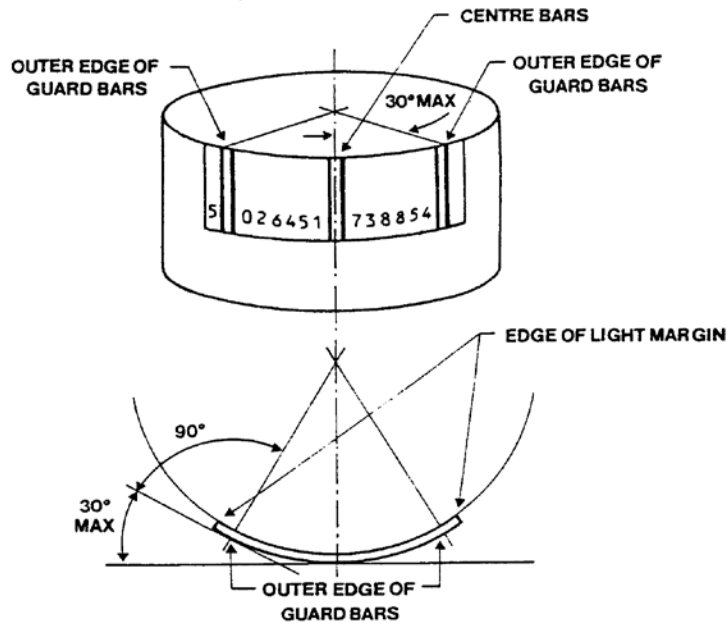
When a bar code is printed onto a curved surface it is sometimes possible for the extremes of the symbol to disappear around the curve, so that both ends cannot be visible to the scanner at the same time. This is more likely to occur the bigger the symbol and the tighter the curve of the packaging. In these situations, bars must be printed using certain combinations of the X-dimension and diameter of the curved surface (e.g., in ladder orientation on a can, in picket fence orientation on a cylindrical packet of biscuits). This helps ensure that the curve results in an apparent loss of height of the bars rather than the more serious apparent loss of complete bars.

Figure 6.2.3.2 – 1. Bar code placement on curved surfaces



The angle between the tangent to the centre of the curved symbol and the tangent to the extremity of the curved symbol (outer edge of the guard bars for symbols in the EAN/UPC Symbology) must be less than 30 degrees. If this angle is more than 30 degrees, the symbol must be oriented such that the bars are perpendicular to the generating lines of the surface of the item.

Figure 6.2.3.2 – 2. Relationship between symbol and curvature



Figures 6.2.3.2 - 3 and 6.2.3.2 - 4 show the relationship between acceptable X-dimensions (narrow element width) for units of different diameters and the minimum diameters for different X-dimensions for bar codes printed in the picket fence orientation. Please refer to Section 5.5 for the minimum, target, and maximum X-dimension for the symbol, based on the scanning environment.

Figure 6.2.3.2 – 3 Relationship between diameter and the X-Dimension

Diameter of Container		Maximum Value of X-Dimension			
		EAN-13 or UPC-A Bar code		EAN-8 Bar code	
mm	Inches	mm	Inches	Mm	Inches
30 or below	1.18 or below	*	*	*	*
35	1.38	*	*	<i>(0.274)</i>	<i>(0.0108)</i>
40	1.57	*	*	<i>(0.314)</i>	<i>(0.0124)</i>
45	1.77	*	*	0.353	0.0139
50	1.97	<i>(0.274)</i>	<i>(0.0108)</i>	0.389	0.0153
55	2.16	<i>(0.304)</i>	<i>(0.0120)</i>	0.429	0.0169
60	2.36	0.330	0.0130	0.469	0.0185
65	2.56	0.356	0.0140	0.508	0.0200
70	2.75	0.386	0.0152	0.549	0.0216
75	2.95	0.413	0.0163	0.587	0.0232
80	3.25	0.446	0.0174	0.627	0.0247
85	3.35	0.469	0.0185	0.660	0.0260
90	3.54	0.495	0.0195	0.660	0.0260
95	3.74	0.525	0.0207	0.660	0.0260
100	3.94	0.551	0.0217	0.660	0.0260
105	4.13	0.578	0.0228	N/A	N/A
110	4.33	0.607	0.0239	N/A	N/A
115	4.53	0.634	0.0250	N/A	N/A
120 or above	4.72	0.660	0.0260	N/A	N/A

- Note:** An asterisk (*) indicates that the package diameter is too small to permit a picket fence orientation bar code, and the symbol must be rotated 90 degrees to a ladder orientation (see Section 5.5) The bar code is printed perpendicular to the generating lines of the surface of the container.

- Note:** *Italics* indicate X-dimensions that are permissible, but are not recommended on curved surfaces.

- Note:** EAN-8 Bar codes reserved for very small items (See Section 2.1.).

Figure 6.2.3.2 – 4. Relationship between the X-Dimension and diameter

X-Dimension		Minimum Diameter of Container					
		EAN-13 or UPC-A Bar code		EAN-8 Bar code		UPC-E Bar code	
mm	inches	mm	inches	mm	Inches	Mm	inches
0.264	0.0104	48	1.33	34	1.89	26	1.01
0.300	0.0118	55	1.51	38	2.14	29	1.51
0.350	0.0138	64	1.76	45	2.50	34	1.53
0.400	0.0157	73	2.02	51	2.86	39	1.54
0.450	0.0177	82	2.27	58	3.21	44	1.73
0.500	0.0197	91	2.52	64	3.57	49	1.92
0.550	0.0217	100	2.77	70	3.93	54	2.11
0.600	0.0236	109	3.02	77	4.29	59	2.31
0.650	0.0256	118	3.27	83	4.64	63	2.50
0.660	0.0260	120	3.35	85	4.72	64	2.54

6.2.3.3. Avoiding Scanning Obstacles

Anything that will obscure or damage a bar code will reduce scanning performance and SHALL be avoided. For example:

- Never position the bar code on the item in an area with inadequate space. Do not let the other graphics encroach on the space for the bar code.
- Never place bar codes, including Quiet Zones, on perforations, die-cuts, seams, ridges, edges, tight curves, folds, flaps, overlaps, and rough textures.
- Never put staples through a bar code or its Quiet Zones.
- Never fold a symbol around a corner.
- Never place a symbol under a package flap.
- Bar codes used for production control purposes should be obstructed wherever possible before entering general distribution (see Section 4.13.)

6.3. General Placement Guidelines for Point-of-Sale

This section outlines the guidelines for bar code placement on trade items that will be scanned at the Point-of-Sale. For detailed information on specific package types, see Sections [6.4](#), [6.5](#), and [6.6](#). Section [6.8](#) outlines guidelines for bar code placement on trade items that will be scanned in warehousing or General Distribution Scanning environments.

6.3.1. Number of Symbols

At least one bar code is needed on a trade item intended for the Point-of-Sale. Exceptions include large, heavy, or bulky items (see Section [6.4.9](#)) and random or unregistered wrapping (see Sections [6.3.3.7](#)) where two or more symbols with the same Global Trade Item Number (GTIN) may be required.

Trade items SHALL never have two or more bar codes encoding different Global Trade Item Numbers (GTINs). At the Point-of-Sale, this is particularly relevant with multipacks, such as over-wrapped items, sleeved items, and banded items, where the individual inner units carry a different GTIN from that on the outer wrapper or container. The bar codes on the inner products