Choices of raw material

Types of fibre
Basically the choice is between long fibres (spruce/pine) and short fibres (e.g. birch). The board maker carefully selects and blends different fibres to achieve the appearance and functional properties desired for specific products.

Types of pulp
There are three different pulping processes, which all produce different kinds of pulp: mechanical, chemical, and recycled fibre.

Mechanical
This process gives a very high yield of fibre from the timber. The presence of lignin in the pulp makes the fibres hard and rigid. This produces a paperboard with high stiffness, limited strength, low density and lower resilience. Mechanically separated virgin fibre pulp containing lignin reacts more strongly to changes in external environment, humidity and temperature, a reaction that can have a negative effect on flatness and dimensional stability.

As a result, paperboard made solely from mechanical pulp is relatively weak. The paperboard retains the yellowish colour of the wood used and is pure because it is made solely of natural and known raw materials.

Chemical
This process preserves the length of the virgin fibre. The pure cellulose extracted has a high degree of consolidation. Both of these features produce a very strong paperboard sheet.

The fibre is flexible and soft, giving good creasing, embossing, and die-cutting properties and low dust generation.

Bleached cellulose pulp has high whiteness, brightness and light stability. Paperboard made of virgin fibre pulp has the highest possible purity and provides packaged products with the best odour and taste neutrality.

Recycled
This separation and recycling process utilises a wide variety of waste paper and board. Each time a fibre is recycled it is contaminated and shortened and its capacity for consolidation is reduced. This means that virgin fibre must be added to maintain the quality of recycled pulp. Recycled pulp is carefully cleaned and screened during stock preparation. Mixed waste paper is not usually de-inked for paperboard manufacture and hence the pulp may retain traces of inks, adhesives and other residues which together give this kind of paperboard a grey colouration.

The resulting product has less predictable composition and poorer functional properties than virgin fibre-based boards.
In addition to the types of fibres and pulp, the construction and coating of the paperboard sheet also affect the paperboard’s final properties. Selecting and combining types of fibres, the pulp preparation process, sheet construction and coating give the paperboard the final properties it needs to meet a wide variety of market demands.

**Solid bleached board (SBB)**
SBB is made exclusively from bleached chemical pulp. It usually has a coated top surface and some grades are also coated on the reverse side. The term SBS (Solid Bleached Sulphate), derived from the method of pulp production, is sometimes used to describe this product.

This is a medium density paperboard with excellent surface printing properties to meet graphical and packaging needs. It gives a wide scope for structural design and can be cut, creased and embossed with ease. It is a pure and hygienic primary fibre paperboard and is suitable for the packaging of aroma and flavour sensitive products.

**Folding box board (FBB)**
FBB comprises middle layers of mechanical pulp sandwiched between outer layers of chemical pulp. The top layer of chemical pulp is bleached and pigment coated. The back of the paperboard is cream (manila) in colour. This is because the back layer of bleached or unbleached chemical pulp is translucent, allowing the colour of the middle layers to influence the appearance. The back layer may, however, be thicker or have pigment coating – this product is known as White Back Folding Box Board. The combination of inner layers of mechanical pulp with outer layers of chemical pulp creates a strong and stiff sheet, taking advantage of the well-known I-beam principle in physics. The mechanical pulp can be of CTMP (Chemithermomechanical pulp), RMP (Refiner mechanical pulp) or TMP (Thermomechanical pulp) origin. This is a low density material with high stiffness. Fully coated grades give excellent printing and visual impact. This is a primary fibre paperboard with consistent purity for product safety.

**Solid unbleached board (SUB)**
SUB is made exclusively from unbleached chemical pulp. The base board is brown. To achieve a white surface it might be coated, sometimes in combination with a layer of bleached, white fibres under the coating.

The paperboard is used where there is a high strength requirement, e.g. carrier sleeves, liquid packaging, etc.
White lined chipboard (WLC)
WLC comprises middle plies of recycled pulp. The top layer or liner of bleached chemical pulp is frequently pigment coated. The second layer or underliner may also comprise bleached chemical pulp or mechanical pulp.

The reverse side layer can be made from specially selected recycled pulp or may be white through the use of bleached chemical pulp. There are additional grades of unlined chipboards with coloured (dyed) liner plies.

This is a medium density product which is widely used in general packaging. It is difficult to generalise about WLC because of the wide range of qualities available.

Abbreviations/keys  According to DIN 19303

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>GZ</td>
<td>Coated SBB</td>
</tr>
<tr>
<td>AZ</td>
<td>Cast Coated SBB</td>
</tr>
<tr>
<td>GC1</td>
<td>Coated FBB, white back</td>
</tr>
<tr>
<td>GC2</td>
<td>Coated FBB, cream back</td>
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<tr>
<td>GN</td>
<td>Coated SUB, white or brown back</td>
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<tr>
<td>GT</td>
<td>Coated WLC, cream or white back</td>
</tr>
<tr>
<td>GD1</td>
<td>Coated WLC, grey back (spec.volume &gt;1.45 cm³/g)</td>
</tr>
<tr>
<td>GD2</td>
<td>Coated WLC, grey back (spec.volume 1.3 to 1.45 cm³/g)</td>
</tr>
<tr>
<td>GD3</td>
<td>Coated WLC, grey back (spec.volume &lt;1.3 cm³/g)</td>
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<td>UZ</td>
<td>Uncoated SBB</td>
</tr>
<tr>
<td>UC1</td>
<td>Uncoated FBB, white back</td>
</tr>
<tr>
<td>UC2</td>
<td>Uncoated FBB, cream back</td>
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<td>Uncoated WLC, cream or white back</td>
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<td>FBB</td>
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<td>SUB</td>
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<tr>
<td>WLC</td>
<td>White Lined Chipboard</td>
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<td>G</td>
<td>Gestrichen, coated</td>
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<td>U</td>
<td>Ungestrichen, uncoated</td>
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<tr>
<td>A</td>
<td>Gussgestrichen, cast coated</td>
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<tr>
<td>Z</td>
<td>Chemisch gebleichte Frischfasern, bleached virgin chemical pulp</td>
</tr>
<tr>
<td>C</td>
<td>Holzstoff, virgin mechanical pulp</td>
</tr>
<tr>
<td>N</td>
<td>Chemisch ungebleichte Frischfasern, unbleached virgin chemical pulp</td>
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