Publishing paper grades
Traditional Classification of Printing Paper Grades

“QUALITY” (Brightness, Surface & Print Quality) vs. “VALUE” (Traditional Price)

- SC
- LWC Std
- MWC
- WFC
- WFC Art

Clear classification according to fibre content and surface properties.
Evolving Classification of Printing Paper Grades

Paper grades overlap much more and optical and surface properties are more important than fibre content.

“QUALITY” (Brightness, Surface & Print Quality)

“VALUE” (Traditional Price)
## Publishing paper grades

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
<th>Pulp</th>
<th>Coated/Uncoated</th>
<th>Gloss/Silk/Matt</th>
<th>gsm</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFC (Std. &amp; Art)</td>
<td>Woodfree coated</td>
<td>Chemical</td>
<td>Single, double and triple (Art)</td>
<td>Gloss, silk and matt</td>
<td>&gt; 80</td>
</tr>
<tr>
<td>MWC</td>
<td>Medium weight coated</td>
<td>Mostly mechanical</td>
<td>Double</td>
<td>Gloss, silk</td>
<td>70-115</td>
</tr>
<tr>
<td>Hi-Brite LWC</td>
<td>High brightness low weight coated</td>
<td>Mostly mechanical</td>
<td>Single</td>
<td>Gloss</td>
<td>57-90</td>
</tr>
<tr>
<td>Std. LWC</td>
<td>Standard low weight coated</td>
<td>Mostly mechanical</td>
<td>Single</td>
<td>Gloss</td>
<td>36-70</td>
</tr>
<tr>
<td>MFC</td>
<td>Machine finished coated</td>
<td>Mostly mechanical</td>
<td>Single</td>
<td>Matt</td>
<td>48-70</td>
</tr>
<tr>
<td>SC</td>
<td>Supercalandered</td>
<td>Mostly mechanical</td>
<td>Uncoated</td>
<td>Gloss</td>
<td>39-60</td>
</tr>
<tr>
<td>INP</td>
<td>Improved newsprint</td>
<td>Mostly mechanical</td>
<td>Uncoated</td>
<td>Matt</td>
<td>36-70 (52-55)</td>
</tr>
<tr>
<td>Std. NP</td>
<td>Standard newsprint</td>
<td>Mostly mechanical</td>
<td>Uncoated</td>
<td>Matt</td>
<td>35-48 (42-45)</td>
</tr>
</tbody>
</table>
Different Pulp Fibres Have Different Properties

**CHEMICAL PULP FIBRES**
- stronger
- long
- flexible
- white
- very little fine particles
  - + Brightness
  - + Strength
  - + Smoothness

**MECHANICAL PULP FIBRES**
- less strong
- short
- stiff
- yellowish
- lots of fine particles
  - + Stiffness
  - + Bulk
  - + Opacity
Surface of Gloss/Silk/Matt Papers

Gloss papers
Gloss*: 50-80
PPS: <1

Silk papers
Gloss*: 20-40
PPS: 1-2

Matt papers
Gloss*: 10-20
PPS: >2

Note! difference from dot gain point of view is greater between silk and matt than silk and gloss

* Tappi 75°
American paper grade classification

- American classification is based on brightness of a paper and mechanical/chemical fibre content

<table>
<thead>
<tr>
<th>Coated paper grades</th>
<th>Brightness (GE), %</th>
<th>&quot;Official&quot; comparison to European paper grades</th>
<th>Comparison to European paper grades from paper shade point of view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium (chemical pulp only)</td>
<td>&gt; 88</td>
<td>WFC Art</td>
<td>WFC Art/WFC</td>
</tr>
<tr>
<td># 1 (chemical pulp only)</td>
<td>85-88</td>
<td>WFC</td>
<td>WFC/MWC</td>
</tr>
<tr>
<td># 2 (chemical pulp only)</td>
<td>83-85</td>
<td>WFC</td>
<td>MWC/Hi-Brite LWC</td>
</tr>
<tr>
<td># 3 (also mechanical pulp)</td>
<td>79-83</td>
<td>MWC</td>
<td>Hi-Brite LWC</td>
</tr>
<tr>
<td># 4 (also mechanical pulp)</td>
<td>73-79</td>
<td>Hi-Brite LWC</td>
<td>Standard LWC</td>
</tr>
<tr>
<td># 5 (also mechanical pulp)</td>
<td>&lt; 73</td>
<td>Standard LWC</td>
<td></td>
</tr>
</tbody>
</table>

Generally European papers have higher brightness than corresponding US grades
Paper shade and luminance

![Graph showing paper shade and luminance with different types of paper: Coated fine and MWC's, Standard LWC, Hi-brite LWC, and Hi-Brite LWC. The graph includes a color scale and a bar chart showing L* (D50/2°) values for each type of paper.]
Web offset paper grades and ISO 12647-2

- **WFC** (e.g. Galerie Art)
- **MWC** (e.g. Galerie Fine)
- **Hi-brite LWC** (e.g. Galerie Brite)
- **Std. LWC** (e.g. Galerie Lite)
- **MFC** (e.g. Solarispress, UPM Satin)
- **SC** (e.g. UPM Max, Publipress)
Web offset paper grades and ISO 12647-2

• "Problematic" paper grades
  • WFC matt
    • Roughness of WFC matt grades can be high causing higher dot gain
    • With silk grades macroscopic roughness is close enough to glossy grades
  • Hi-Brite LWC
    • Depending on case the right profile can be either ISOcoated or ISOwebcoated
  • MFC
    • MFC is basically a matt version of std. LWC
      – paper shade and luminance are very similar
    • MFC can be however clearly rougher → higher dot gain