Right Moisture Content: Right Timber, Coatings and Processes

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Types of Coating

Material	Protection against weathering	Protection against moisture ingress	Protection against UV degradation	Transparency	Maintenance frequency	Ease of maintenance
Preservative	Poor	Poor	Poor	Clear colourless	Not applicable	Not applicable
Paint	Very good	Very good	Very good	Opaque pigmented	Four years or more	Moderate
Varnish	Limited	Very good	Limited	Translucent Often pigmented	Frequent 2-3 years	Moderate
Stain	Good	Good	Good	Translucent Pigmented	Frequent 3-4 years	Easy

BS EN 927-1 Paints and varnishes. Coating materials and coating systems for exterior wood. Classification and selection

Hiding power

- transparent: clearly visible grain patterns with little or no pigmentation
- semi-transparent: includes coatings which are pigmented, but which do not totally obscure the wood surface
- opaque: substrate colour and pattern obliterated, but substrate profile and texture may still be discernable.

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Gloss level

Five categories are based on the measurement of specular gloss:

- matt: reflectance up to 10 when tested to 60° in accordance with ISO 2813
- semi-matt: reflectance > 10 up to 35
- semi-gloss: reflectance > 35 up to 60
- gloss: reflectance > 60 up to 80
- high gloss: reflectance > 80.

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Component classification by end use

- Non-stable, Free movement permitted
  - Overlapping cladding, fencing, garden sheds
- Semi-stable, Some movement permitted
  - Tongued and grooved cladding, wooden houses and chalets, garden furniture
- Stable, Minimal movement permitted
  - Joinery including windows and doors

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Classification by exposure conditions

Construction	Climate		
	Moderate	**Hard**	**Extreme**
Sheltered	Mild	Mild	Medium
Partly Sheltered	Mild	Medium	Severe
Not Sheltered	Medium	Severe	Severe

Common Problems

- Blistering
- Extractive Staining
- Resin Exudation
- Salt efflorescence
- Iron staining
- Ultra-violet degradation

Door and window timber standards

- EN 14220:2006
- **Timber and wood-framed materials in internal windows, internal door leaves and internal doorframes — Requirements and specifications**

- EN14221:2006
- **Timber and wood-based materials in external windows, external door leaves and external doorframes — Requirements and specifications**

Moisture Content
EN 14220:2006 and EN 14221:2006

- 7 Moisture content

- Moisture content is usually subject to national requirements and end use conditions. Where national requirements and end use are not available, the moisture content of the timber shall not exceed 13 % for heated buildings or 16 % for use in unheated buildings. Specific national requirements are given in Annex A. The measurement method shall comply with EN 14298.

- The moisture content shall be estimated using either the method described in EN 13183 2, or EN 13183 3. In the case of a dispute the method to be used shall be the method described in EN 13183-1 (Destructive method).

Moisture Content – EN 14220:

- 7 Moisture content …continued

- NOTE 1
- The more accurate method described in EN 13183-1 is a Destructive method and may not always be appropriate.

- Moisture content measurements are applicable at the completion time of product manufacture and prior to coating

- NOTE 2 – for EN 14221:2006 only
- For special conditions the contract may specify alternative moisture contents.

Quality recommendations - informative

- France
- Germany
- Norway
- Sweden
- UK

EN 14298:2004
Sawn timber — Assessment of drying quality

- The quality of drying is expressed in terms of target and average moisture content of the lot as well as defining the moisture content variation between individual pieces expressed as allowable upper and lower limits.

- In conformity to EN 1438, the following symbols are used:

- ω moisture content in percent
- ω_{targ} target moisture content in percent
- ω_m average moisture content in percent

EN 14298:2004
Sawn timber — Assessment of drying quality

- 93.5 % of the pieces shall have an individual moisture content between the upper and lower limits.
- These limits are 1,3 x ω_{tar} and 0,7 x ω_{tar} respectively.

Target moisture content %

- Allowable range of average moisture content around target moisture content %

- 7, 8, 9 -1/+1

- 10, 11, 12 -1,5/+1,5

- 13, 14, 15 - 2,0/+1,5

- 16, 17, 18 - 2,5/+2,0

Target moisture content %

- In the UK the climate will vary the EMC from about 8% in July to about 20% in November
- Timber moves Tangentially about 1% for every 3 -5% change in MC
- Timber moves radially about half this amount.
- Within a yearly cycle “high” movement timber could move 4%

Design for good performance

- Water Shedding Angles: 7^{o} minimum
- Extended Sills: minimise and stabilise joint
- Sharp Edges – Minimum 3mm Radius
- Break Joints: Differential movement between components
- End grain sealing
- Glazing: Prevention of moisture ingress!
- Bottom rebate detail: How is moisture managed?

The End

Thank you for listening

Any questions?

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