Interior Design Materials

Fall Term
2019-2020

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Text Book

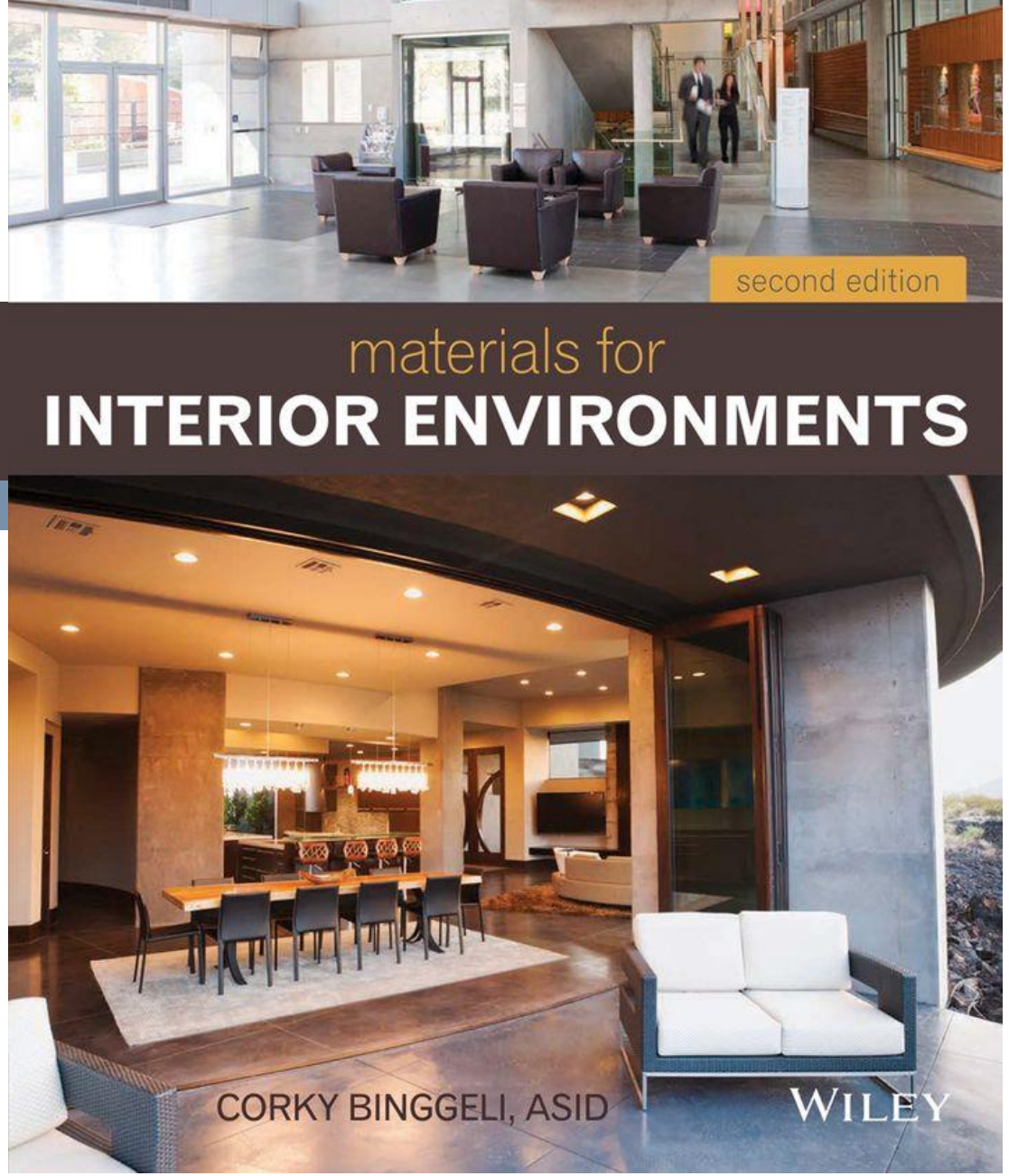
Materials for Interior Environments

by Corky Binggely –Wiley publications

Other references:

1- Materials for engineering

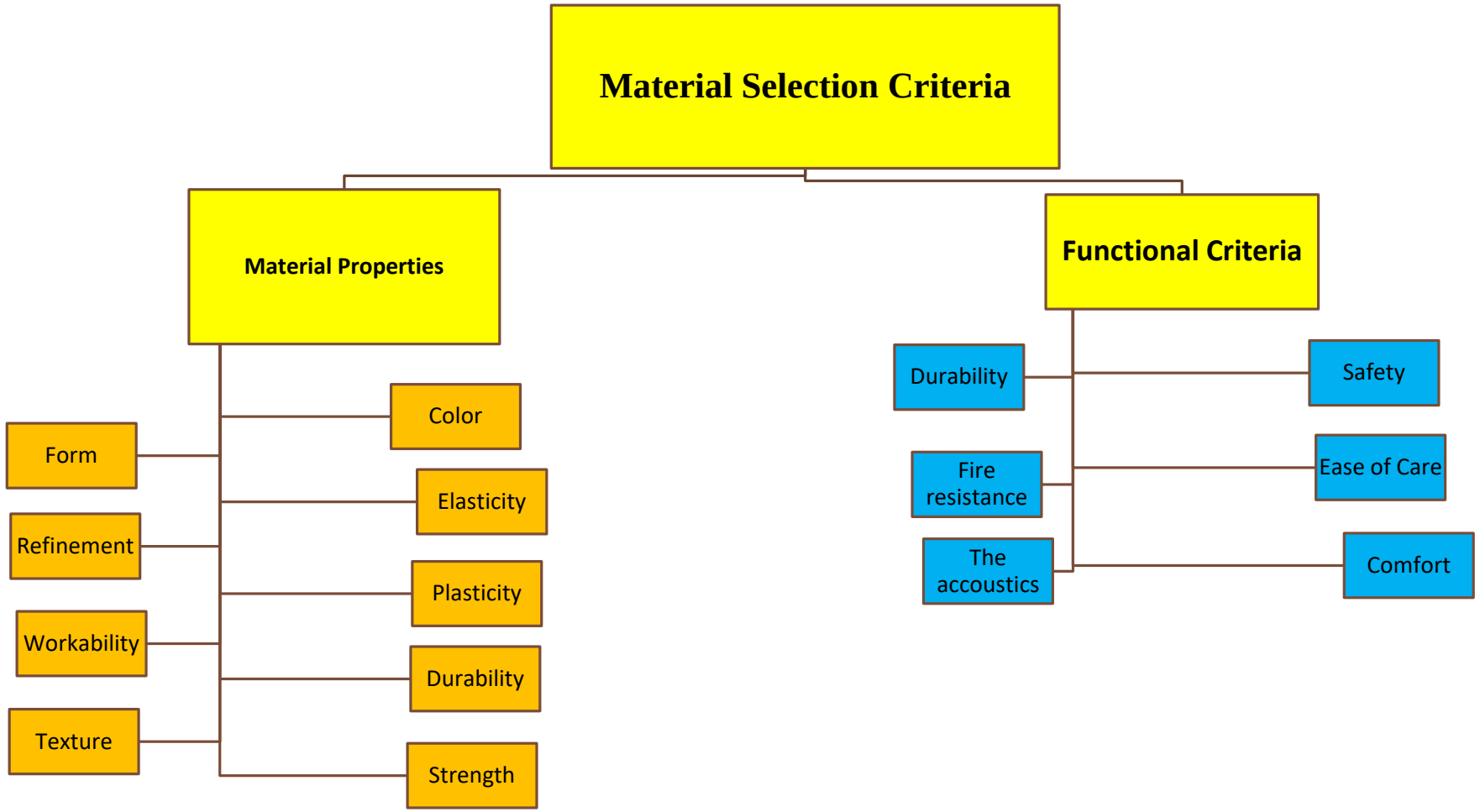
2- Science for painting



No	Date	Lecture title
1	03.10.2019	Introduction- Material Selection and Specification
2	10.10.2019	Sustainability of Materials
3	17.10.2019	Concrete Based Material
4	24.10.2019	Stone Materials
5	31.10.2019	Glass
6	07.11.2019	Ceramic
7	14.11.2019	Wood
8	21.11.2019	Midterm
9	28.11.2019	Plaster and Gypsum Boards
10	05.12.2019	Metal
11	12.12.2019	Synthetics
12	19.12.2019	Paints &Wall papers
13	02.01.2020	review

Evaluation Criteria

	Evaluation Type	Marks	No	Date
1	Daily reports	10	10	Daily
2	Midterm	20	1	19-25.11.2019
3	Term Report	15	1	19.12.2019
4	Class Activity	5	1	Daily
5	Quiz	10	2	07.11.2019 12.12.2019
6	Final	40	1	13-24.01.2020
Total		100		


Material Selection Criteria
Material Properties
Form
Color
Elasticity
Refinement
Plasticity
Workability
Durability
Texture
Strength
Functional Criteria
Durability
Safety
Fire resistance
Ease of Care
The accoustics
Comfort

Lecture Content:

- Material Selection Criteria
    - A- Properties of Materials
    - B- FUNCTIONAL CRITERIA
- HEALTH AND SAFETY CODES
- Terms & Definition
- Finish and Furniture Tests and Classifications

Material Selection and Specification

Interior designers select materials

- for its *aesthetic contribution* to the design concept.
- material's *appearance*.
- *acoustic* properties
- light reflectance.

*The material's shape, texture, proportion, and scale are related to the balance and symmetry of the space and the harmony of the design

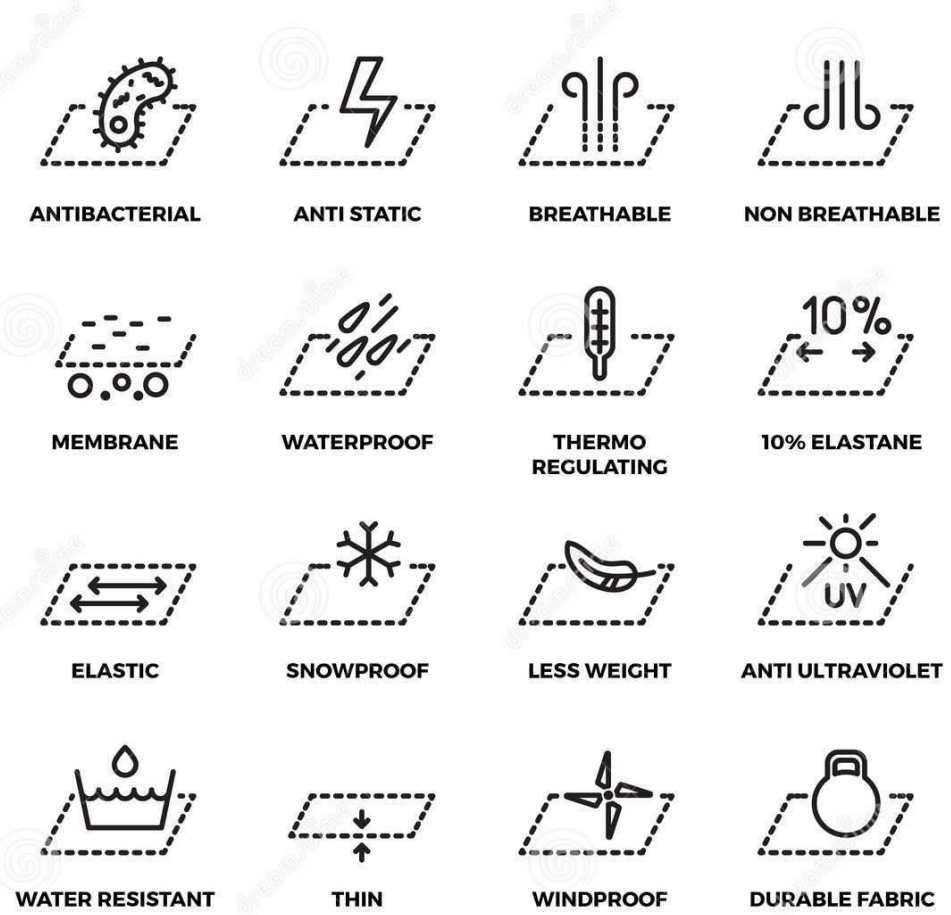
-The selection of materials is restrained by codes and regulations that have been instituted to ensure the public’s safety.

- For example, interior materials can either contribute potential fuel to a fire or resist ignition and flame spread.

A- Describing the Properties of Materials

1- Color: property dependent on the quality and quantity of light; one or more innate colors, and possibly other colors if processed

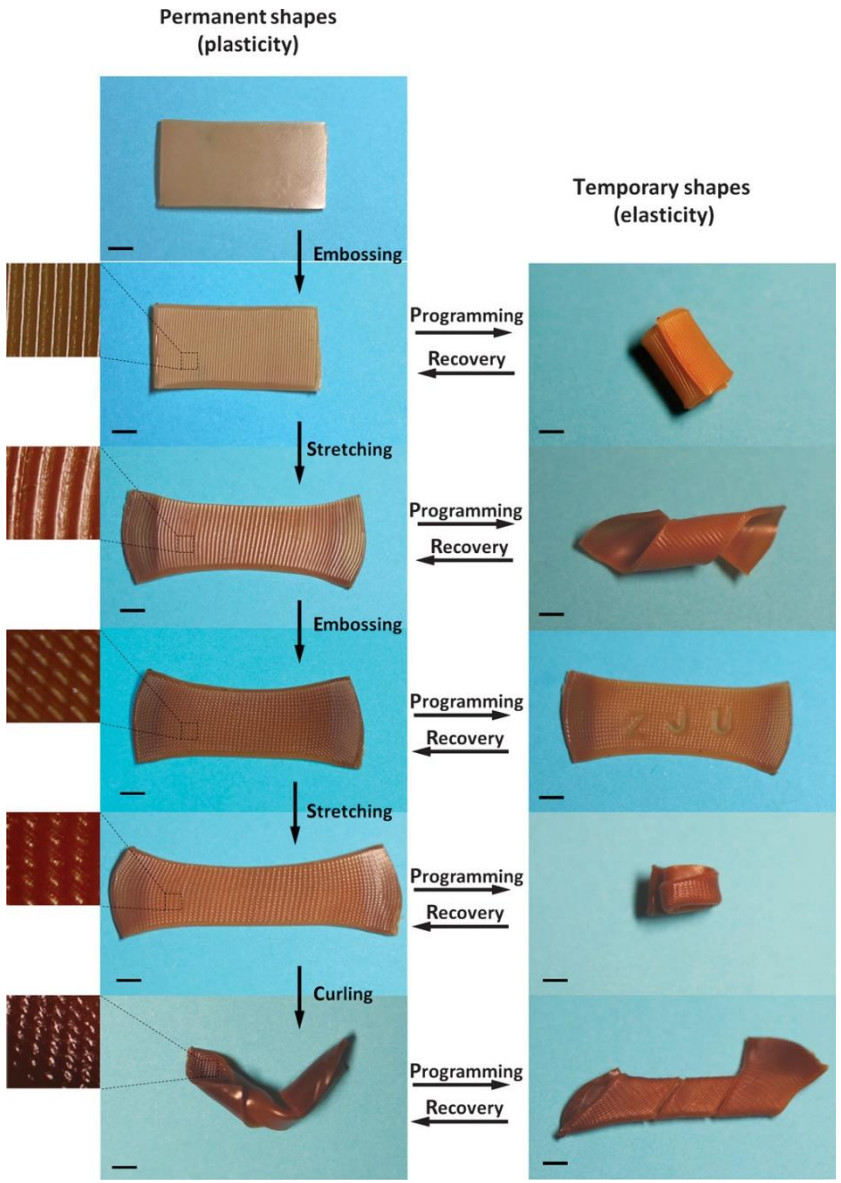
2- Durability: ability to resist destructive forces, retain original appearance, and continue to function as intended.

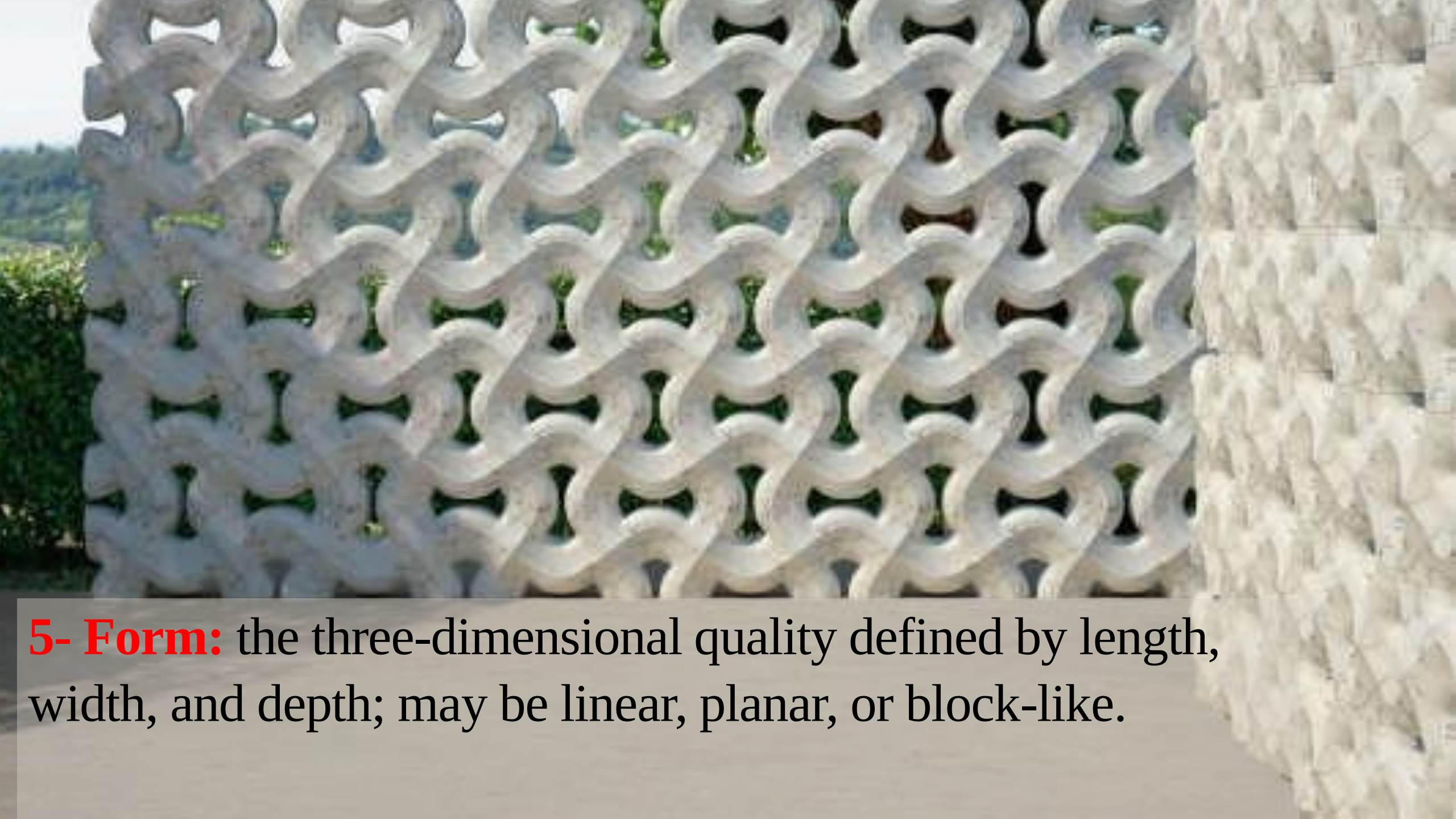


3- Elasticity:

resiliency or flexibility; the ability to return to initial form after deformation.

4- Plasticity: ability to be formed or shaped; allowing continuous deformation without rupturing or relaxing.

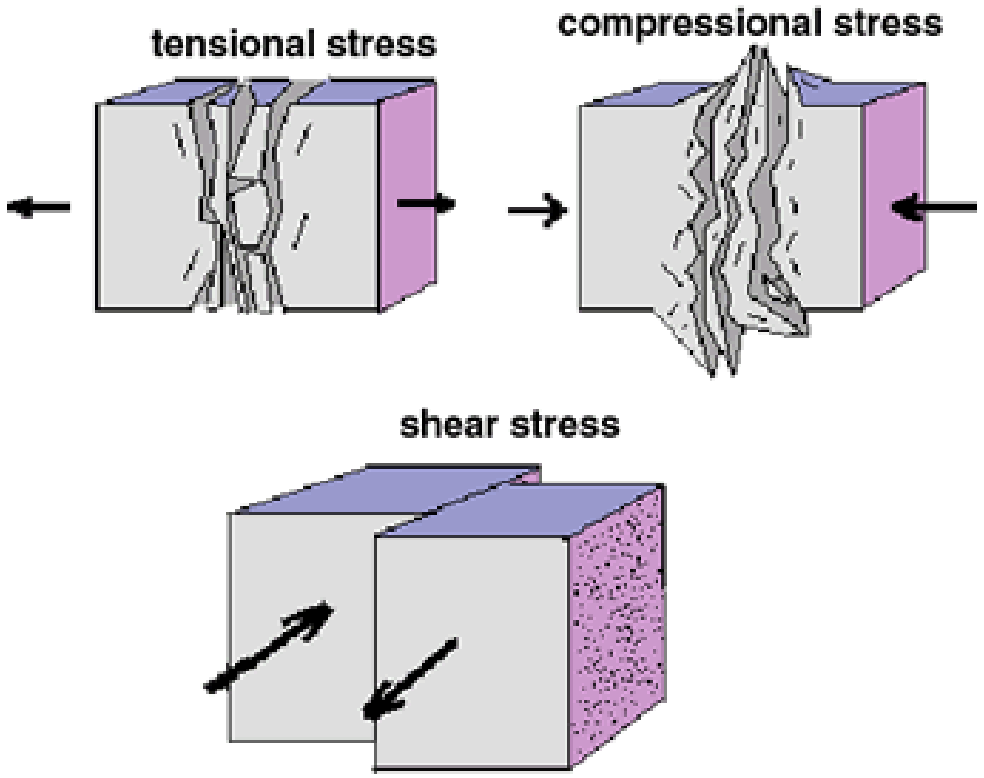




5- Form: the three-dimensional quality defined by length, width, and depth; may be linear, planar, or block-like.

6- Refinement: ability to form and retain precise, thin, closely spaced elements; depends on strength, durability, and manufacturing process.

7- Strength: ability to resist stress, to bend without breaking.



8- Workability: the ease of altering a material from its primary form.

9- Texture:

relative smoothness or roughness of a surface;

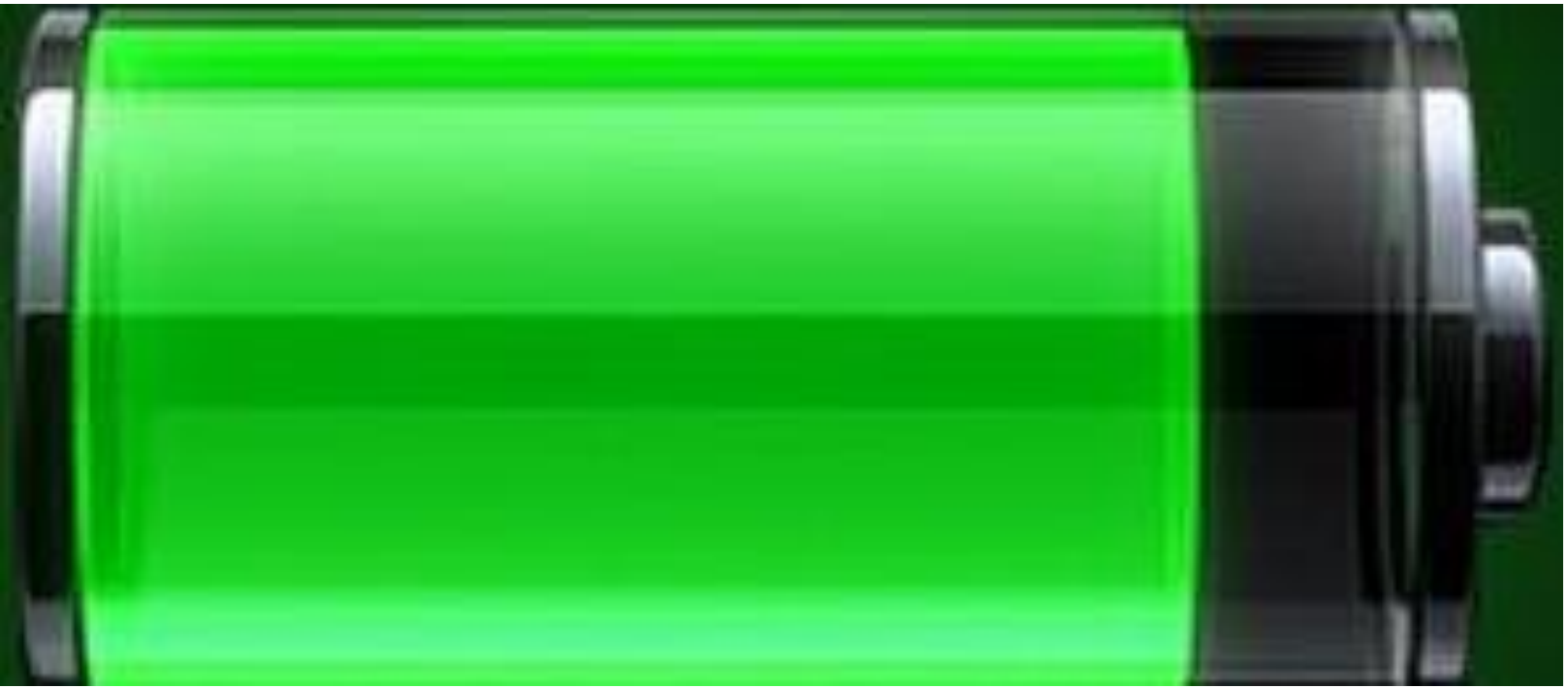
may be large- or small-scale.

B- FUNCTIONAL CRITERIA

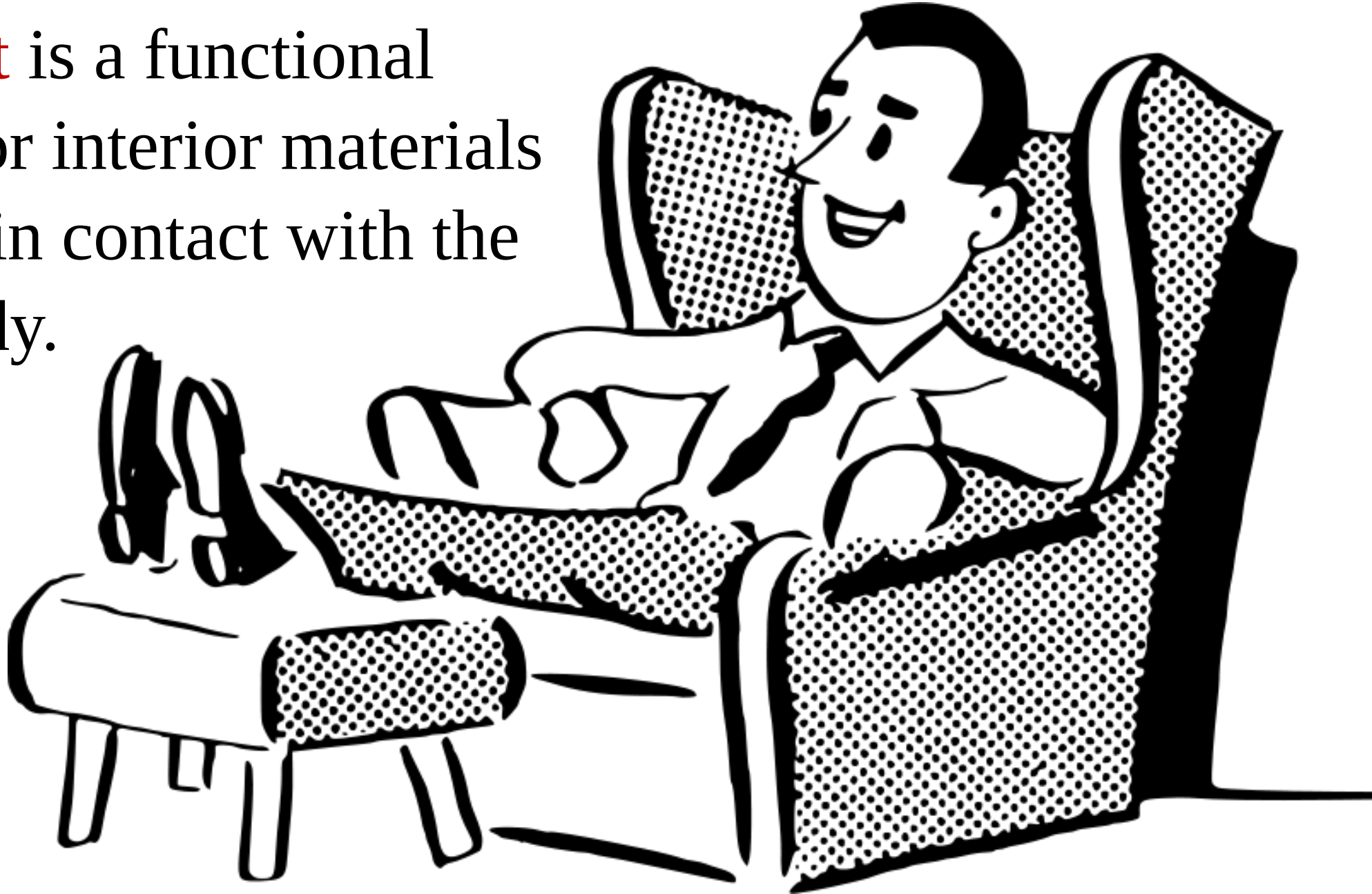
The basic functional qualities of materials suggest their appropriate uses.
These include safety, durability, comfort, ease of care, fire resistance, and acoustic properties.

1- Safety issues for interior materials include toxicity, health effects, slip resistance, and shatter resistance.

2- Durability involves evaluating a material for its ability to stand up to its intended use.



3- Comfort is a functional criterion for interior materials that come in contact with the human body.



4- Ease of care affects a material ’s continued performance over time.

5- Fire resistance designers often limit their initial material selections to those that meet the requirements of fire codes.

- ability of a material to ignite and burst into flame

- some materials produce toxic chemicals that may be odorless and produce no smoke or flame.

- how much smoke it will produce and whether fi re will quickly spread across its surface.

6- The acoustic properties of interior materials affect the acoustic quality of a space by absorbing or reflecting sound within it, and by transferring sound from one space to another

HEALTH AND SAFE43TY CODES

buildings that support human health and safety. Whether a project is large or small, the interior designer benefits from an awareness of the impact it will have on the welfare of its users and the community of which it is part.

Building Codes

a designer determines which codes are applicable.

The International Code Council (ICC) publishes the International Codes (I Codes).

The International Building Code® (IBC) or codes based on it have been widely accepted throughout the United States.

Other I-Codes with provisions related to interior materials include:

- ✓ International Residential Code for One- and Two-Family Dwellings® (IRC)
- ✓ International Existing Building Code® (IEBC)
- ✓ International Green Construction Code® (IGCC)

Occupancy Classifications

Occupancy classifications were developed to address risk factors associated with specific types of building use. They consider the way a space is used

The **occupant load** is closely related to the occupancy classification. Interior materials-related code issues affected by occupancy include accessibility requirements, finish and furniture selection and placement, and means of egress.

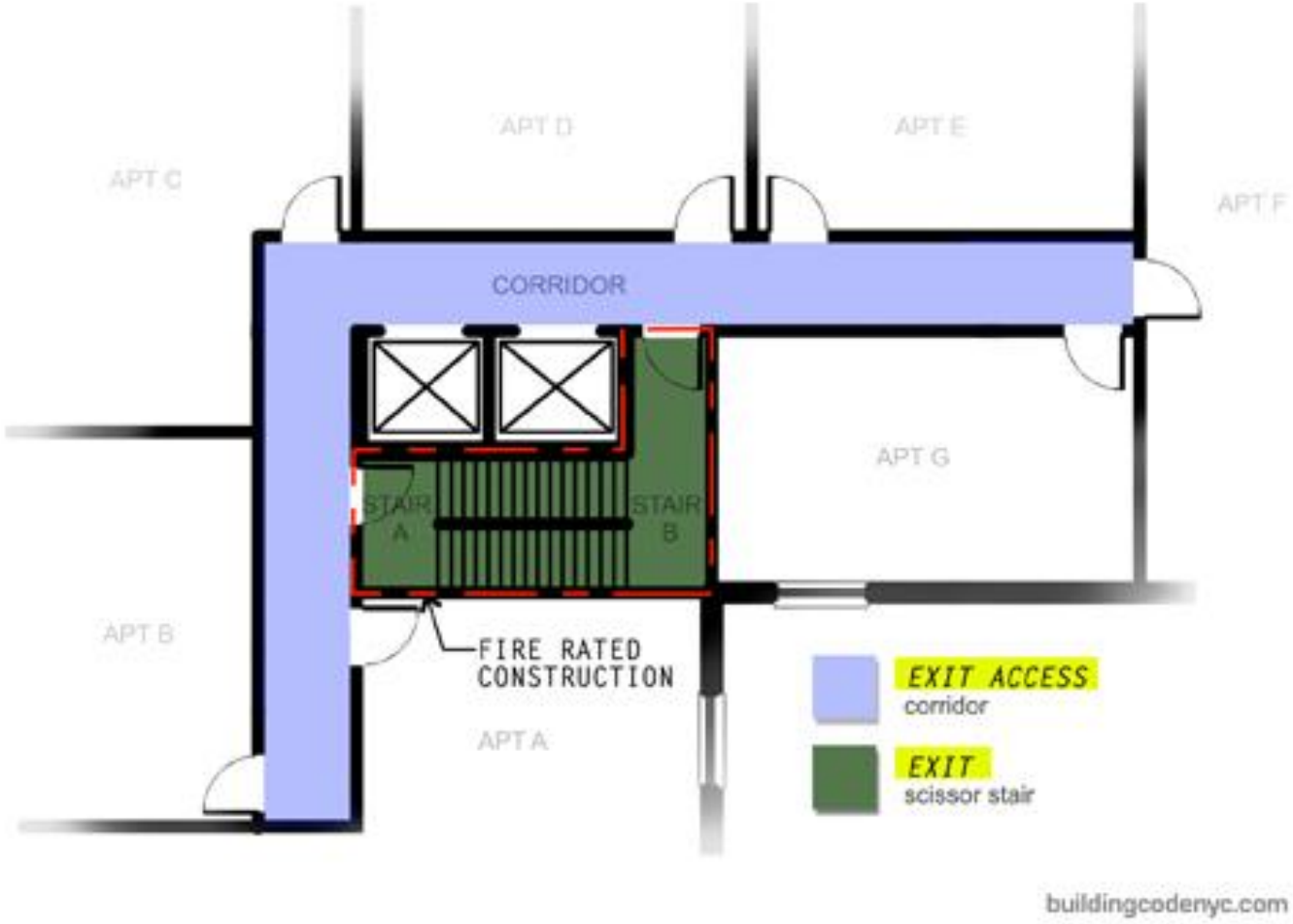
The **occupant load**: the number of people that is assumed to safely occupy a space or building.

Building Construction Types

Building construction types are classified by building codes according to their resistance to fire. Building elements rated in hours include bearing and non-bearing walls and partitions and floor construction and secondary members

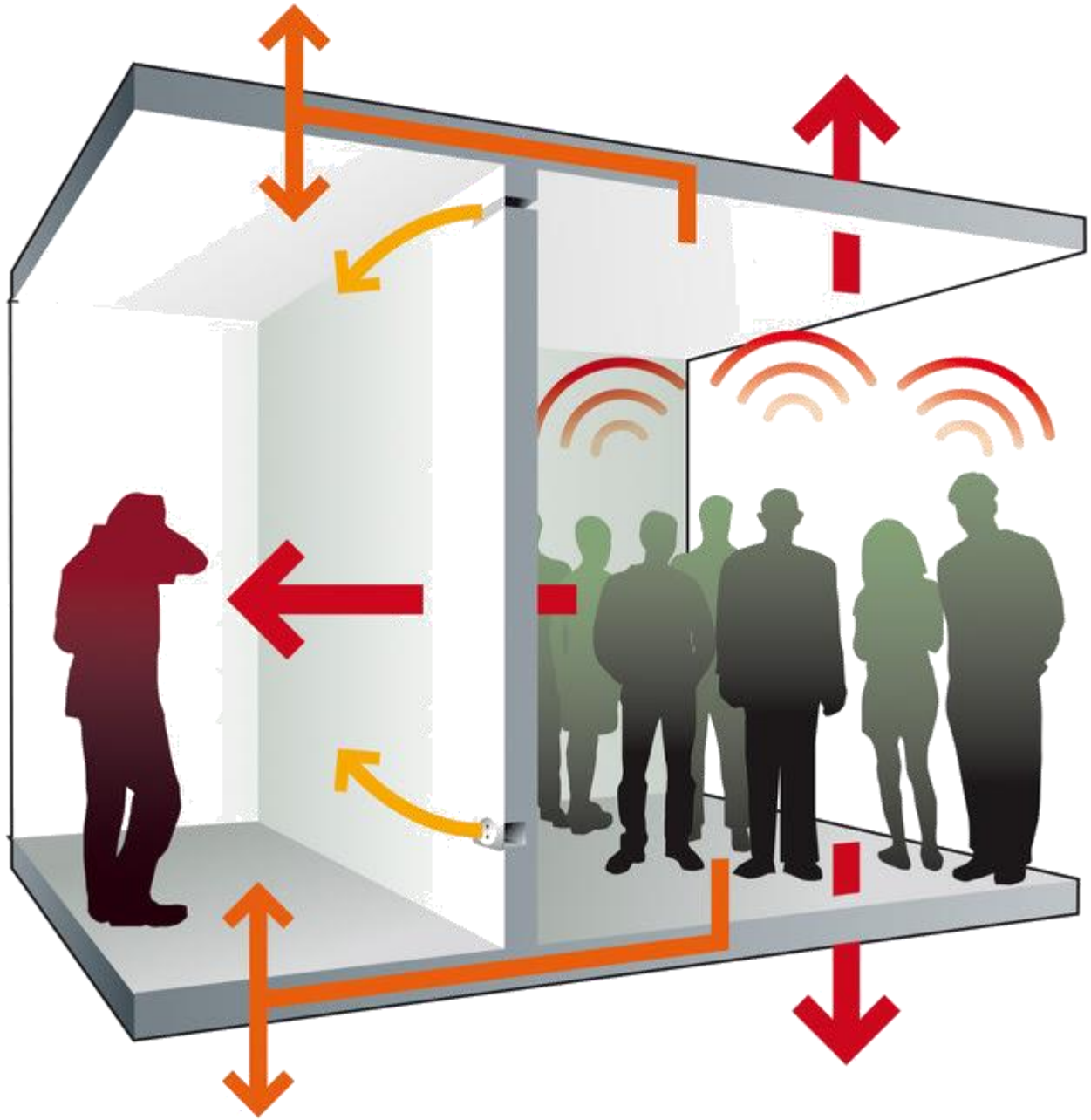
(ease of ignition, length of burn, flame spread, and heat generation).

Means of egress is defined as a continuous and unobstructed path of travel from any point in a building to its exterior or a public way.



Sound Transmission

These requirements for specific **sound transmission coefficient (STC)** levels affect the selection of materials and their use in assemblies.



Transmission du bruit : → directe / → indirecte ou latérale / → parasite

Residential Codes

Code	Comments
International Residential Code (IRC)	Single- and two-family homes, duplexes, and townhouses
ICC 700, National Green Building Standards (NGBS or ICC 700)	Used with IRC; requirements for resource, water, energy efficiency, and indoor environmental quality
ASHRAE/IESNA 90.2, Energy- Efficient Design of New Low-Rise Residential Buildings	Energy efficiency standard
International Energy Conservation Code (IECC)	Includes chapter on residential buildings
Fair Housing Accessibility Guidelines (FHAG)	Accessibility Requirements

Finish and Furniture Tests and Classifications

The process of identifying the appropriate finish classification begins with identifying the occupancy classification of the building or space, and whether it is a new or existing building.

Tests for finishes and furniture look at the potential of the material to contribute to the overall fire and smoke growth and spread

Test	Description
Mattress Test	Pass/fail test used to determine heat release, smoke density, generation of toxic gases, and weight loss when a mattress is exposed to a flame
Methenamine Pill Test	Pass/fail flammability test required for all carpets and certain rugs manufactured for sale in U.S.
Radiant Panel Test	Measures tendency to spread a fire, and minimum energy required to sustain a flame for carpet, resilient and hardwood flooring, wall base
Room Corner Test	For napped, tufted, or looped textiles used as coverings on walls and ceilings
Smolder Resistance Test	Tests how new upholstered furniture smolders before either flaming or extinguishing (Cigarette Ignition Test)
Steiner Tunnel Test	Tests flame spread and smoke developed for interior finishes applied to walls, ceilings
Toxicity Test	Measures the amount of toxicity a material emits when it is burned (LC50 or Pitts Test)
Upholstered Seating Test	Pass/fail flame-resistance test for entire piece of furniture
Vertical Flame Test	Pass/fail test for vertical treatments (window treatments, large wall hangings, and decorative plastic films)

HUMAN FACTORS AND MATERIAL SELECTION

The selection of materials are culturally and age- appropriate, and designed to fit a variety of human sizes and shapes.

- Privacy
- Security
- Personal interior spaces reflect the character of their owners
- The materials for social spaces are usually chosen to suit the intended group of users.
- Materials for hospitality spaces and restaurants demand a high level of aesthetic discrimination.
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Accessible design addresses the requirements of a single group within the larger population, specifically, people with disabilities.

An accessible design for a public space should meet the needs of a broad range of users.

Slip-resistant materials without irregularities should be selected for walking surfaces.

Universal design

It differs from accessible design by addressing as widespread a group as possible. Many of the same features that promote safety and independence for seniors, such as handrails and nonslip flooring, also function well for the general population

Cost Estimating

To respect a client's budget, a designer should provide guidance as to where money can be spent wisely, and where it makes sense to economize.

One of the most important budgetary considerations for interior designers is the **life-cycle cost** of a product

transportation, installation, maintenance, upgrade, refurbishment, disposal, and recycling