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## 1. Materials

Aramid-fibres-reinforced plastics (AFRP)	Hybrid composites
Biocomposites	Laminates
Biodegradable composites	Materials
Biomaterials	Metal-matrix composites (MMCS)
Biomimetic composites	Multifunctional composites
Biopolymers and renewable polymers	Nano composites
Bone	Particle-reinforced composites
Bone tissues	Polymer concrete
Boron-fibres-reinforced plastics (BFRP)	Polymer-matrix composites
Carbon-carbon composites (CCCS)	Polystyrene foam
Carbon-fibres-reinforced plastics (CFRP)	Polyurethane foam
Ceramic-matrix composites (CMCS)	Reinforced concretes
Composites	Reinforced concretes
Concretes	Short-fibres composites
Fibreglass; glass-fibres-reinforced plastics (GFRP)	Smart materials
Fibres-reinforced concretes	Structural composites
Flexible composites	Structural health monitoring (SHM)
Foam plastic	Textile composites

## 2. Binders

Aminoaldehydes	Epoxy
Binders	Fluoroplastics
Elastomers	Fluoropolymer

Furan  
Matrixes  
Phenolformaldehyde  
Poly(vinyl chloride)  
Poly(vinyldechloride)  
Polyacrylates  
Polyamides  
Polybutenes  
Polycarbonates  
Polyesters  
Polyethylenes  
Polyimides  
Polymers  
Polymethylmethacrylate

Polyolefins  
Polyoxazoles  
Polyphenylene oxides  
Polypropylenes  
Polystyrenes  
Polysulfones  
Polytetrafluoroethylene (PTFE)  
Polyurethanes  
Polyvinyl acetates  
Polyvinyl alcohols  
Resins  
Rubbers  
Thermoplastic resins  
Thermosetting resins

### **3. Fillers**

Aramid fibres  
Basalt fibres  
Boron fibres  
Calcium silicates  
Carbon fibres  
Carbon nanotubes  
Carbon technical  
Ceramic fibres  
Chalk  
Chark  
Coated fibres  
Fabrics; textiles; cloth  
Felt  
Fibres  
Fillers  
Films  
Foil  
Fullerenes  
Glass fibres  
Glass fillers  
Glass microspheres  
Graphene  
Graphite  
Gypsum  
High modulus fibres  
High-strength fibres  
Hollow fibres  
Kaolin  
Linen; canvas

Masterbatch  
Mats  
Metal fibres  
Metal powders  
Mica  
Modified fibres  
Montmorillonite clays  
Nano particles  
Nanoclays  
Nanocrystals  
Nanowires  
Natural fibres  
Nets  
Optical fibres  
Perlites  
Pigments  
Polymer (textile) fibres  
Profile fibres  
Quartz; silica  
Short fibres  
Silica  
Strand  
Talc  
Tapes  
Thread  
Whisker  
Whiskered fibres  
Yarns

## 4. Surfaces

Adherence; adhesion; coupling  
Adhesive layers  
Coatings  
Composite coatings  
Energy absorbing coatings  
Fibres-matrix bonds  
Film coatings  
Fracture surfaces  
Fracture surfaces  
Glue coatings

Interfaces  
Interphases  
Protective coatings  
Slip; sliding  
Surface conditions  
Surface layers  
Surfaces  
Wear resistant coatings  
Wettability

## 5. Structures

Amorphous structures  
Angle-ply reinforcements  
Anisotropic structures  
Bending defects  
Cellular structures  
Chaotic reinforcements  
Closed cell structures  
Continuous reinforcements  
Cracks  
Crossed reinforcements  
Cross-ply reinforcements  
Crystal defects  
Crystal structures  
Defects  
Delamination cracks  
Discrete structures  
Fatigue cracks  
Flat reinforcements  
Foams  
Frame structures  
Glass defects  
Glasses  
Grid structures  
Heterogeneous structures  
Homogeneous structures  
Honeycombs  
Hybrid structures  
Inclusion defects  
Initial cracks  
Interfacial defects  
Isotropic structures  
Lamina; ply  
Laminates

Longitudinally-transverse reinforcements  
Macrocracks  
Macrodefects  
Main crack  
Microcracks  
Microdefects  
Microstructures  
Molecular structures  
Monotropic structures  
Multilayered structures  
Non-glue crack  
Notches  
Off-axis reinforcements  
Open-cell structures  
Orthotropic structures  
Periodic structures  
Piecewise homogeneous structures  
Pores  
Porous structures  
Radiation defects  
Reinforcement factor  
Reinforcement factor by mass  
Reinforcement factor by volume  
Reinforcement factor by weight  
Reinforcements  
Sandwiches  
Separation cracks  
Silver cracks  
Spatial reinforcements  
Spiral reinforcements  
Stochastic structures  
Structures  
Tetragonal structures

Thermal cracks  
Thin films  
Three-layer structures  
Transversely isotropic structures

Two-layer structures  
Unidirectional reinforcements  
Winding structures

## 6. Processes and phenomena

Absorption  
Adhesion  
Adsorption  
Ageing  
Artificial aging  
Atmospheric aging  
Bowschinger effect  
Break  
Breakage  
Brittle fracture  
Buckling  
Buckling  
Climatic aging  
Cohesion  
Compaction  
Corrosion  
Corrosion destruction  
Corrosion fatigue  
Crack growth  
Crack growth  
Crack interaction  
Cracking  
Cracking  
Cracks accumulation  
Cracks retardation  
Creep  
Creep recovery  
Crosslinking  
Crystallization  
Cutting  
Damage  
Damping  
Debonding  
Deformations  
Delamination  
Desorption  
Destruction  
Diffusion  
Displacement  
Ductile fracture

Dynamic fatigue  
Emission  
Erosion  
Fatigue  
Fatigue  
Fatigue  
Fatigue fracture  
Fibres bridging  
Fibres pull-out  
Fracture  
Fragmentation  
Friction; tribology  
Glass transition  
Heat transfer  
Hysteresis  
Interlayer fracture  
Local fracture  
Long-term creep  
Long-term fracture  
Loosening  
Low-cycle fatigue  
Mass transfer  
Microfracture  
Moisture absorption  
Neck formation  
Non-linear behaviour  
Physicochemical  
Plastic fracture  
Processes and phenomena  
Progressive failure  
Quasi-brittle fracture  
Radiation aging  
Relaxation  
Relaxation  
Resonance  
Retardation  
Rheology  
Short-term creep  
Shrinkage  
Sorptions

Spontaneous fracture  
Static fatigue  
Steady creep  
Strengthening  
Stress relaxation  
Swelling  
Tearing  
Thermal aging  
Thermal creep  
Thermal cycling  
Thermal destruction

Thermal fatigue  
Thixotropy  
Transverse cracking  
Twisting  
Unwinding  
Vibro-creep  
Warping  
Water uptake  
Weakening  
Wear

## **7. Factors**

Aggressive environments  
Constructive factors  
Degradation  
Edge effects  
Environmental degradations  
Exposure times  
Factors  
Hygrothermal effects  
Irradiation

Loading methods  
Loading rates  
Moisture  
Scale factors  
Stress concentrations  
Technological factors  
Temperature  
Vacuum

## **8. Properties**

Acoustic properties  
Antifriction properties  
Coefficients of brittleness  
Coefficients of crystallization  
Coefficients of elasticity  
Coefficients of elasticity dynamic  
Coefficients of elasticity static  
Coefficients of heat transfer  
Coefficients of melting  
Coefficients of thermal conductivity  
Coefficients of thermal diffusivity  
Coefficients of thermal expansion  
Coefficients of viscosity  
Complex elastic modulus  
Complex moduli  
Compliance  
Compressibility  
Compressive strength  
Conversion rates  
Corrosion resistances  
Creep curves

Critical length  
Cyclic strength  
Damage tolerance  
Damageability  
Damping coefficients  
Damping decrements  
Deformability  
Deformations; strains  
Degree of conversion  
Density  
Diffusion coefficients  
Durability  
Durability  
Dynamic elastic modulus  
Dynamic strength  
Effective properties  
Elastic constants  
Elastic limits  
Elastic modulus  
Elastic strains  
Elasticity

Elastic-plastic strains  
Electrical properties  
Electroelasticity  
Embrittlement  
Endurance  
Energy  
Equilibrium moisture contents  
Erosion resistances  
Fatigue life  
Fatigue limits  
Fatigue strength  
Fluidity  
Fracture energy  
Fracture energy  
Fracture toughness  
Friction coefficients  
Frost resistance  
Glass transition coefficients  
Hardness  
Heat capacity  
Heat resistance  
Highelasticity  
Highly elastic strains  
High-temperature properties  
Impact strength  
Impact strength  
Inelasticity  
Interfacial strength  
Interlaminar stresses  
Internal friction; damping  
Large strains  
Limit of endurance  
Limit of proportionality  
Logarithmic decrement  
Loss angles  
Magnetic properties  
Mass  
Mechanical losses factors  
Mechanical properties  
Microhardness  
Moisture permeability  
Normal strains  
Operating properties  
Optical properties  
Permeability  
Plastic strains  
Plasticity  
Porosity

Properties  
Radiation resistances  
Relaxation curves  
Relaxation times  
Residual life  
Residual strains  
Residual strength  
Residual stresses  
Residual stresses  
Retardation spectrums  
Retardation times  
Rheological properties  
Safety factors  
Secant elastic modulus  
Shear strains  
Shear strength  
Small strains  
Softening factors  
Spectrum of relaxation times  
Static strength  
Stiffness  
Strength  
Strength  
Stress intensity factors  
Stress-strain curves  
Synergism  
Tangent elastic modulus  
Technological properties  
Technological stresses  
Tensile strength  
Thermal activation coefficients  
Thermal conductivity  
Thermal diffusivity  
Thermal expansion  
Thermal properties  
Thermomechanical properties  
Thermophysical properties  
Torsional strength  
Transport properties  
Ultimate strains  
Viscoelasticity  
Viscoplasticity  
Viscosity  
Viscous strains  
Viscous-plastic strains  
Volume strains  
Water permeability  
Wear resistance

Yield coefficients  
Yield strength

Young's modulus

## 9. Technology

3-d printing  
Annealing  
Autoclave  
Braiding  
Circumferential winding  
Compression moulding  
Cross winding  
Curing  
Extrusion  
Filling  
Forming  
Heat treatment  
Impregnation  
Injection moulding  
Kinematics of winding  
Knitting  
Liquid composite moulding  
Longitudinal-circumferential winding  
Machining  
Magnetic treatment  
Microwave processing  
Modification  
Molding; casting

Moulding  
Plasticizer  
Prepreg  
Programmed winding  
Pultrusion  
Reaction injection moulding (RIM)  
Recycling  
Reinforcement placement  
Resin film infiltration (RFI)  
Resin transfer moulding (RTM)  
Semifinished  
Stabilization  
Stacking sequence  
Stitching  
Surface treatments  
Technological equipment  
Technology  
Treatment  
Vacuum infusion  
Welding; joining  
Winding  
Winding conditions

## 10. Design

Actual models  
Analytical models  
Analytical solutions  
Axisymmetric stability  
Bending stability  
Boundary-value problems  
Composite models  
Constitutive equations  
Criterion functions  
Deformation surfaces  
Design  
Design optimizations  
Dynamic stability  
Elasticity theory  
Failure criterion  
Finite element models

Fracture surfaces  
Load-bearing capacity optimizations  
Local stability  
Longitudinal stability  
Mass optimizations  
Material optimizations  
Mathematical models  
Multipurpose optimizations  
Nonaxisymmetric stability  
Numerical solutions  
Optimization criterion  
Optimization of structural elements  
Optimizations  
Optimizations of crack resistance  
Optimizations of durability  
Optimizations of reliability

Optimizations of stability  
Orientational averaging  
Physical models  
Plate theory  
Process optimizations  
Representative elements  
Response surfaces  
Restrictions on optimizations  
Safety factors  
Shell theory  
Stability  
Stability criterion  
Stability overall

Static stability  
Stiffness optimizations  
Strength criterion  
Strength optimizations  
Strength surfaces  
Stress concentrations  
Stress-strain states  
Structural elements  
Structural models  
Theory of layered composites  
Torsional stability  
Transverse stability  
Yield surfaces

## **11.Applications**

Aerospace applications  
Applications  
Automotive applications  
Civil engineering  
Composite repair

Marine applications  
Rail applications  
Renewable energy  
Sport applications

## **12.Structures**

Adhesive joints  
Anisotropic shells  
Articulated supports  
Assembled shell  
Axisymmetric shells  
Beams  
Bolted joints  
Butt joints  
Carrier elements  
Casing with cut-outs  
Cellular shells  
Clamping  
Combination supports  
Compound structures  
Conical shells  
Cylindrical shells  
Deflections  
Durability  
Ellipsoidal shells  
Energy intensity  
Flywheels  
Forced vibrations

Free supports  
Free vibrations  
Heterogeneity  
Joints  
Load-carrying capacity  
Membranes  
Natural frequency  
Oil and gas structures  
Pipelines  
Pipes  
Plates  
Products  
Rectangular shells  
Reinforced shells  
Repair  
Resonance vibrations  
Resonant frequency  
Resources  
Rings  
Riveted joints  
Rod systems  
Rods



Sandwich structures  
Shallow shell  
Shells  
Spherical shells  
Structural elements  
Structures  
Support conditions  
Thick-walled constructions

Thick-walled shells  
Thin-walled constructions  
Thin-walled shells  
Torus shells  
Triangular shells  
Turbine blades  
Welded joints  
Working capacity

### **13.Diagnostics**

Defectoscopy  
Delivery-delivery diagnostics  
Destructive testing  
Diagnostics  
Diagnostics during operation

Diagnostics in manufacturing  
Material diagnostics  
Non-destructive testing  
Product diagnostics  
Semi-destructive testing

### **14.Prediction**

Aging forecasting  
Analogy methods  
Baro-time analogy  
Concentration-time analogy  
Deformation-time analogy  
Elastic-viscous analogy  
Extrapolation  
Forecasting methods  
Life prediction  
Master curves  
Moisture-time analogy

Multifactorial forecasting  
Multi-parameter prediction  
Polarization-time analogy  
Prediction  
Prediction of properties  
Radiation-time analogy  
Stress-time analogy  
Temperature-time analogy  
Time reduction function  
Vibro-time analogy

### **15.Methods**

Accelerated tests  
Acoustic emission  
Acoustic methods  
Analytical analysis  
Analytical modelling  
Atomic force microscopy (AFM)  
Ballistic tests  
Biaxial loading  
Chromatography  
Complex loading  
Compression  
Computational mechanics

Computational modelling  
Continuous loading  
Control tests  
Crumpling  
Cut  
Cyclic loading  
Damage mechanics  
Differential scanning calorimetry (DSC)  
Digital image correlation  
Dilatometry  
Dynamic loading

Dynamic mechanical thermal analysis (DMTA)	Physical methods
Electric methods	Probabilistic methods
Electron energy loss spectroscopy (EELS)	Product testing
Electron microprobe analysis	Pulsed loading
Experiment planning	Qualitative analysis
Explosion	Radio wave methods
External pressure	Raman spectroscopy
Finite element analysis (FEA)	Repeated loading
Finite element methods	Sample tests
Flexure; bending	Scanning electron microscopy (SEM)
Fractography	Scanning/transmission electron microscopy (STEM)
Hardness testing	Secondary ion mass spectrometry (SIMS)
High-speed impact	Self-consistency methods
Holography	Shear
Hydrostatic pressure	Simple loading
Impact	Spectroscopy
Indentation	Static loading
Infrared spectroscopy (IR)	Statistical analysis
Interlayer shear	Structural analysis
Internal pressure	Tension
Loading	Test equipments
Low-speed impact	Testing the models
Magnetic methods	Thermogravimetric analysis (TGA)
Mechanoluminescence	Thermophysical methods
Methods	Three-axle load
Micro-mechanics	Torsion
Microscopy	Transmission electron microscopy (TEM)
Modelling	Transverse compression
Moire techniques	Transverse shear
Multiscale modelling	Ultrasonics
Numerical analysis	Uniaxial loading
Optical methods	Variable loading
Optical microscopy	Vibration
Penetration methods	Vibration
Phase analysis	X-ray diffraction (XRD)
Photoelectron spectroscopy (XPS)	X-ray fluorescence (XRF)