



CIRP UNIFIED KEYWORD LIST

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The use of keywords in the abstract of papers is fundamental for the documentation of papers and articles in the international scientific world. The CIRP community has always been aware of this requirement and, to this aim, the working group on UNIFICATION has prepared and continuously updated CIRP UNIFIED KEYWORD LIST, which **must** be used by all the authors of papers in the CIRP Annals and in any other publication under the CIRP heading. While preparing the abstract of your paper you have to identify your paper with **three** keywords from the list in the following order:

- one keyword identifying the general subject of the paper
- two keywords to detail particular aspects of the paper.

The keywords should be used in singular form, with the first letter in upper case, as they appear in the list. Because the keywords represent the dynamic working area of the CIRP, authors may use one keyword free, taking into account new emerging areas. The free keyword should always be **the last** one.

The Technical Secretary

Abrasion

Accuracy
Acoustic
Actuator
Adaptive control
Agent
Agile
Algorithm
Alignment
Alloy
Aluminium
Analysis
Anisotropy
Anomaly
Application
Artificial intelligence
Assembly
Atomic force microscopy (AFM)
Automation
Axiomatic

Ball

Bearing
Bending
Biomedical
Blanking
Blasting
Bonding
Boring
Brittle
Burr

Calcium fluoride

Calibration
Carbide
Carbon
Casting
Centerless
Ceramic
Chatter
Chemical vapor deposition (CVD)
Chip
Classification
Coating
Cold
Compensation
Composite
Computer aided design (CAD)
Computer aided manufacturing (CAM)
Computer aided planning (CAP)
Computer automated process planning (CAPP)
Computer numerical control (CNC)
Conceptual design
Concurrent engineering
Condition
Constraint
Control
Cooling
Co-operative

Coordinate measuring machine (CMM)

Coordination
Cost
Cracking
Cubic boron nitride (CBN)
Customisation
Cutting

Damage

Damping
Decision making
Decomposition method
Deep drawing
Deep hole drilling
Defect
Deformation
Deposition
Design
Development
Diagnostics
Diamond
Die
Die forging
Digital
Dimensional
Disassembly
Distance
Distributed
Dressing
Drilling
Drive
Dynamic
3D printing

Ecology

Edge
 Electrical discharge machining (EDM)
 Electro
 Electro chemical machining (ECM)
 Electrode
 Electron beam machining (EBM)
 Emergent synthesis
 Emission
 End milling
 Engineering
 Environmental
 Error
 Estimating
 Etching
 Evaluation
 Excimer laser
 Experimentation
 Extrusion

Face milling

Factory
 Failure
 Fatigue
 Feature
 Feed
 Feedback
 Fiber
 Finishing
 Finite element method (FEM)
 Fixture
 Flatness
 Flexibility
 Flexible
 Flexible manufacturing system (FMS)
 Flow
 Fluid
 Force
 Forging
 Form
 Formation
 Forming
 Fracture
 Frequency
 Friction
 Friction stir welding
 Function
 Functional
 Fuzzy logic

Gear

Genetic

Geometric modelling

Geometry
 Glass
 Grain
 Grinding
 Grooving
 Group technology

Handling

Haptic
 Hardening
 Hardness
 Heat treatment
 Hexapod
 High
 Hole
 Holography
 Holonic
 Honing
 Hot
 Human
 Hydroforming
 Hydrostatic

Identification

Image
 Impact
 Improvement
 In-process
 Information
 Injection
 Inspection
 Integrated
 Integration
 Integrity
 Intelligent
 Interferometry
 Interpolator
 Investment casting
 Ion beam machining (IBM)

Joining**K**inematic

Knowledge
 Knowledge based system

Lapping

Laser
 Laser beam machining (LBM)
 Laser cutting
 Laser micro machining
 Learning
 Lifecycle
 Linear

Logistics

Lubrication

Machinability

Machine
 Machining
 Magnesium
 Magnetic bearing
 Maintenance
 Man-machine system
 Management
 Management information system (MIS)
 Manipulator
 Manufacturing
 Material
 Measurement
 Measuring instrument
 Mechanical
 Mechanism
 Mechatronic
 Metal
 Method
 Methodology
 Metrology
 Micromachining
 Micromanipulator
 Microscope
 Microstructure
 Milling
 Miniaturization
 Model
 Modelling
 Module
 Mold (or Mould)
 Molding (or Moulding)
 Monitoring
 Motion
 Mounting

Nano fabrication

Nano indentation
 Nano technology
 Nd:YAG laser
 Neural network
 Nickel
 Nonlinear
 Numerical control (NC)

Object recognition

Observer
 On-line
 Ontology
 Open architecture
 Operation
 Optical
 Optimisation

Opto-electronic
Oxidation

Parallel

Parameter
Part
Pattern
Performance
Petri net
Photonics
Photochemical machining
Physical vapor deposition (PVD)
Piercing
Piezo-electric
Planning
Plastic
Plating
Polishing
Polymer
Positioning
Powder
Precision
Predictive
Press
Pressure
Probe
Process
Processing
Product
Production
Productivity
Profile
Programming
Project
Property
Prototyping
Punching

Quality

Quality assurance

Radius

Rapid
Rate
Recognition
Reconfigurable
Reconstruction
Reinforced
Reliability
Removal
Requirement
Residual stress
Resistance
Resolution
Reuse
Reverse

Robot
Roll
Rolling
Roughness
Roundness

Safety

Scanning
Scanning electron microscope (SEM)
Scanning probe microscope (SPM)
Scanning tunnelling microscope (STM)
Scheduling
Selective laser sintering (SLS)
Selective laser melting (SLM)
Sensor
Sequencing
Service
Servosystem
Shape memory alloy
Sheet
Sheet metal
Shotpeening
Silicon
Simulation
Single crystal
Sinking
Sintering
Software
Soldering
Solid
Specific energy
Speed
Spindle
Spline
Springback
Stability
Stamping
Standardization
Statistical
Steel
Stereolithography
Stiffness
Straightness
Strain
Strength
Stress
Structural analysis
Structure
Super abrasive
Super finishing
Support
Surface
Suspension system

Sustainable
Synthesis
System

Table

Tailored blank
Tapping
Technology
Temperature
Tensile
Test
Texture
Thermal
Titanium
Tolerancing
Tool
Tooling
Topography
Transfer
Transformation
Tribology
Tube
Turbine blade
Turning

Ultra-precision

Ultrasonic
Uncertainty

Vacuum

Vibration
Virtual
Viscoplasticity
Visual

Wafer

Water
Waterjet machining
Wear
Welding
What-if design
White layer
Wire EDM
Workpiece
Wrinkling

X-ray

Yield

Z