



TECHNICKÁ UNIVERZITA V LIBERCI  
Fakulta strojní



# Patent Analysis Using SW Patent Inspiration

Workshop for PhD Students of FT TUL

*doc. Ing. Petr Lepšík, Ph.D.*

12/11/2019



## Why do we do a patent review?

- Mapping of the **state of the art**
- Checking the **novelty of your own solution**
- **Inspiration** in innovation process during designing own solutions by decomposition / analysis of existing solutions



# SW, videos, entry, licence, support

AULIVE PatentInspiration

support@patentinspiration.com @PatentInspire



Features Pricing Blog Contact Support

Free entry

Member Login

PatentInspiration Demo: Roller Skate

Domain (CPC) Přeřát později Sdílet

Human needs Operations & transport Chemistry & materials Construction Digital, health & medicine Physics Electricity New technologies

Quick Introduction  
Quick introduction on how to use PatentInspiration.

Roller Skate  
Demo on the functionality of PatentInspiration.

Solar Panels  
Short case study on solar panels.

Toothbrush  
Distilling innovation data from patents.

Cosmetic Cream  
Short case study of cosmetic cream

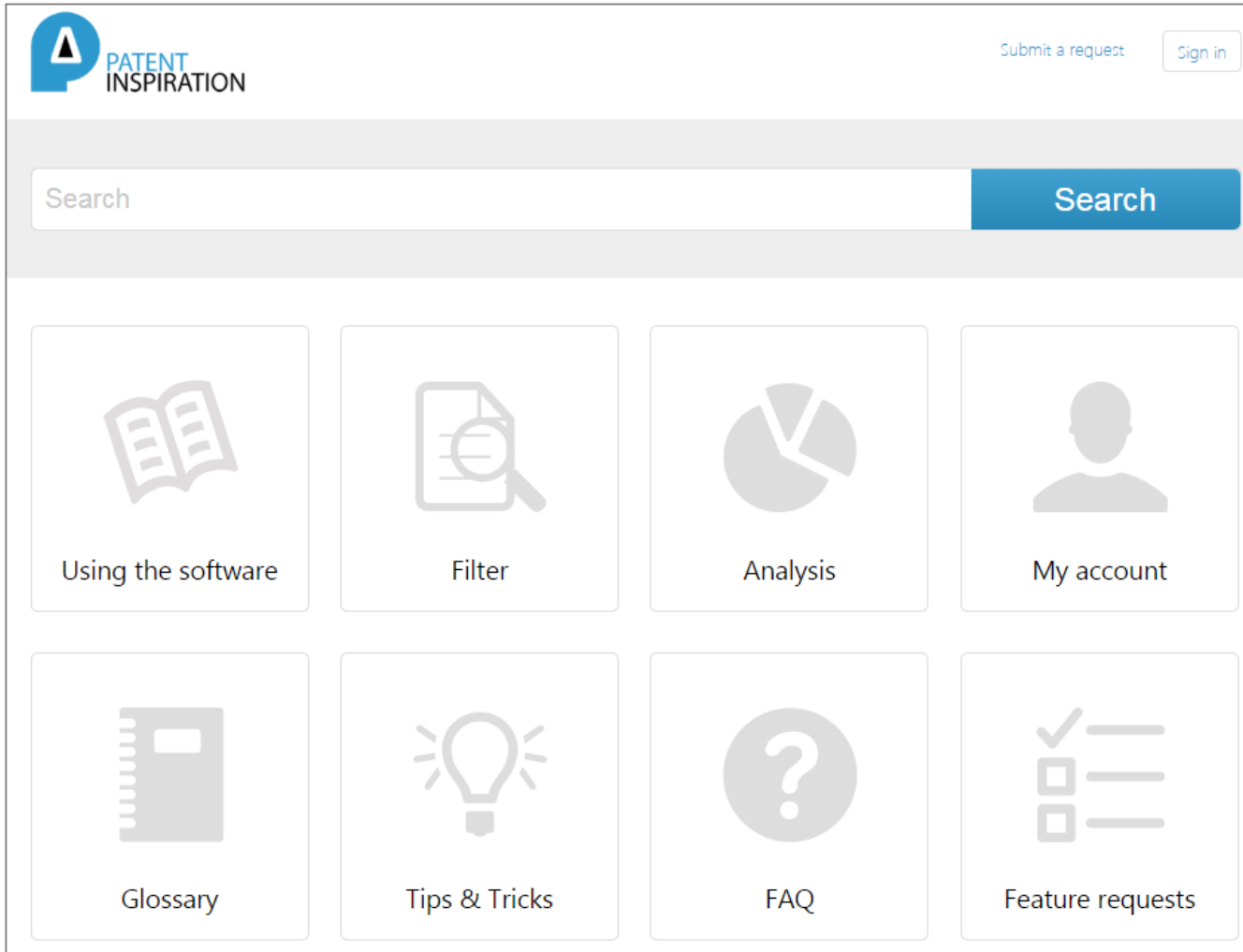
Questions?  
Click here to chat with us

Online - Chat With Us

<http://www.patentinspiration.com/>



# Tutorial



The screenshot shows the PATENT INSPIRATION support page. At the top left is the logo and name. At the top right are links for "Submit a request" and "Sign in". Below this is a search bar with a "Search" button. The main content area contains eight icons in a 2x4 grid, each with a corresponding label: "Using the software" (book icon), "Filter" (magnifying glass over document icon), "Analysis" (pie chart icon), "My account" (person icon), "Glossary" (notebook icon), "Tips & Tricks" (lightbulb icon), "FAQ" (question mark icon), and "Feature requests" (checkboxes icon).

<https://support.patentinspiration.com/hc/en-gb>



# Patent search

Undo Redo History

AND OR NOT Patents with (nanofiber) OR (nanofiber OR "nano-fiber" OR "nano fiber" OR "electrospun nanofibers" OR nanomaterial OR "electro-spinning") in Title or Abstract

Disable Edit Delete

Enter a keyword, applicant, inventor, code or number

## Narrow results by filtering... ?

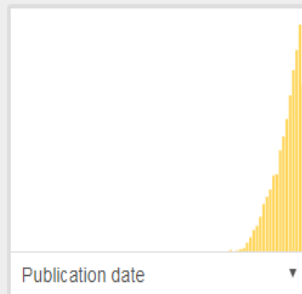
- show only one per family Order by text content
- patents without empty title or abstract
- only applications that are granted

- only with images
- Publication date Last 20 years, 10 years, 5 years

01-01-1900 - 01-01-2100

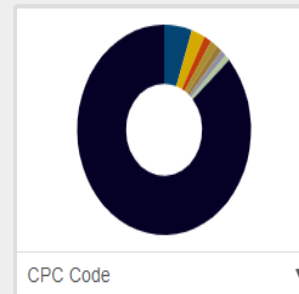
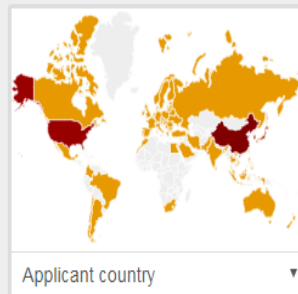
View 25754 patents Clear

## Visual filter assistant



UNIV SHINSHU  
JUJO PAPER CO L  
MATSUSHITA ELEC  
AMOGREENTECH  
UNIV DONGHUA

Applicant



# Key words and relative terms

## Find related terms ?

Find synonyms, antonyms and misspelled words to improve your filter results.  
e.g. *biodegradable, heat-exchanger, electric car*

**nanofiber** nanofibers carbon nanotubes nanotubes nano-fiber nanostructure

nanometer fiber nanotube carbon nanotube polymeric nanofibers nano fiber

swnt fibril cnts nanostructures nanotube rope

double-walled carbon nanotube nanofibre single wall nanotube carbon nanowires

carbon nano wire carbon nano-fiber nanohorns gnfs electrospun fibers

microfiber nanostructured material single-walled carbon nanotubes

multi-wall nanotube polymer nanofibers carbon nanorings

Select all

Cancel

# List of the patents (257.754)

<a href="#">Edit filter</a> <a href="#">Analyze patents</a>		25754 patents			
<input type="checkbox"/> Publication	Title	Publication Dat...	Standardized Applicant		
<input type="checkbox"/> WO2019208313A1	Cellulose nanofiber-containing aqueous dispersion	31 Oct 2019	ASAHI CHEMICAL IND		
<input type="checkbox"/> WO2019207468A1	Pinch valve monitoring	31 Oct 2019	FEELIT TECH LTD		
<input type="checkbox"/> WO2019205364A1	Enhanced raman detection method using satellite structure	31 Oct 2019	XIAMEN SPEC TECH ...		
<input type="checkbox"/> WO2019209762A1	Nanofiber microspheres and methods of use thereof	31 Oct 2019	UNIV NEBRASKA		
<input type="checkbox"/> WO2019208514A1	Cellulose-containing gear	31 Oct 2019	ASAHI CHEMICAL IND		
<input type="checkbox"/> US2019330767A1	Acid-type carboxymethylated cellulose nanofiber and production method thereof	31 Oct 2019	JUJO PAPER CO LTD		
<input type="checkbox"/> US2019327966A1	Polyvinyl alcohol/chitosan composite soluble electrospun nanofibers for disinfectant anti-bacterial and anti-...	31 Oct 2019	THE AMERICAN UNIV ...		
<input type="checkbox"/> US2019329225A1	Material comprising precious metal isolated atoms stable in solution	31 Oct 2019	DALIAN INST CHEM & ...		
<input type="checkbox"/> US2019329221A1	Synthesis and application of A Nanomaterial for Removal of Patulin	31 Oct 2019	UNIV JIANGNAN		
<input type="checkbox"/> US2019328393A1	Implantable nerve guidance conduits having polymer fiber guidance channel	31 Oct 2019	THE TRUSTEES OF T...		
<input type="checkbox"/> WO2019206989A1	Method of obtainment of nanomaterials composed of carbonaceous material and metal oxides	31 Oct 2019	GNANOMAT SL		
<input type="checkbox"/> EP3560963A1	Acid-type carboxymethylated cellulose nanofibers and production method therefor	30 Oct 2019	JUJO PAPER CO LTD		
<input type="checkbox"/> EP3560964A1	Acid-type carboxylated cellulose nanofibers	30 Oct 2019	JUJO PAPER CO LTD		
<input type="checkbox"/> US10456776B1	Method of fabricating a photocatalyst for water splitting	29 Oct 2019	UNIV KING SAUD		
<input type="checkbox"/> US10461325B1	Silicon-carbide reinforced carbon-silicon composites	29 Oct 2019	NANOSTAR INC		
<input type="checkbox"/> US10461320B1	Formation of silicon-carbide reinforced carbon-silicon composites	29 Oct 2019	NANOSTAR INC		
<input type="checkbox"/> AU2019240691A1	Porous adsorbent structure for adsorption of CO2 from a gas mixture	24 Oct 2019	EMPA EIDGENOESSIS...		
<input type="checkbox"/> WO2019200641A1	Efficient low-resistance micro-nano-fiber microscopic gradient structure filtration material, and preparation ...	24 Oct 2019	UNIV SOUTH CHINA T...		
<input type="checkbox"/> WO2019200871A1	Magnesium-based ferrous sulfide composite nanomaterial, preparation method therefor and use thereof	24 Oct 2019	UNIV SOUTH CHINA T...		
<input type="checkbox"/> WO2019203173A1	Method for manufacturing bacterium-produced cellulose carbon	24 Oct 2019	NIPPON TELEGRAPH ...		
<input type="checkbox"/> WO2019200986A1	Vibration wire type micro-vibration and sound emission sensing device with micro-nanofiber based fiber gra...	24 Oct 2019	UNIV HOHAI		
<input type="checkbox"/> WO2019200956A1	Electrostatically-charged nanofiber media and fabrication method thereof	24 Oct 2019	UNIV HONG KONG PO...		

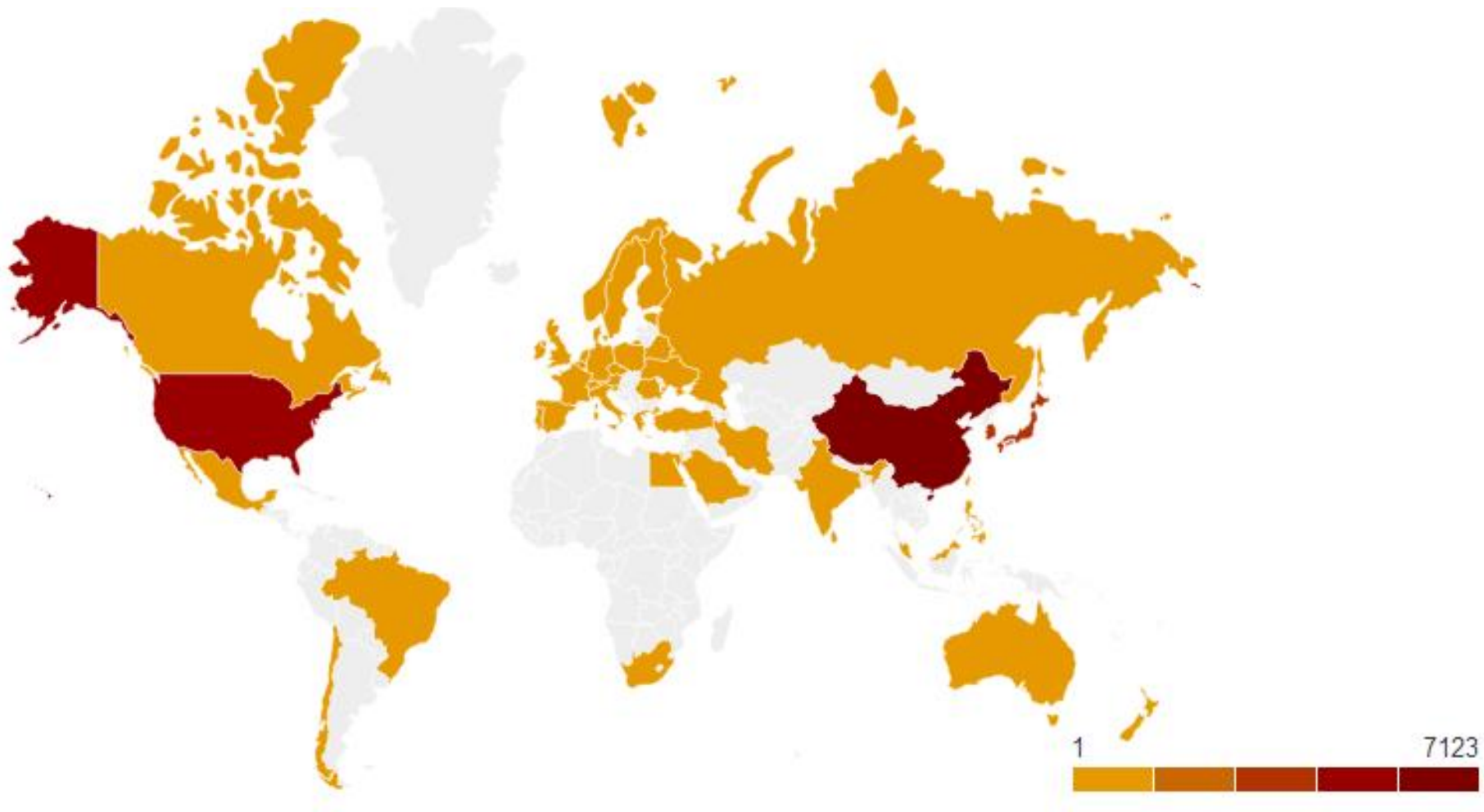






# COUNTRY (APPLICANT)

NANOFIBERS FT (25754 PATENTS)



Where are the patents, applicants or inventors located

# COUNTRY (APPLICANT)

Chosen patent from Czech republic TUL

BIBLIO TIME COMPARE XY MAP TEXT UNIT INNOVATIONLOGIC

CZ (4 of 202 patents)

Title	Abstract	Claims	Description
nanofib*,...	0	1	0

Filter Hits Edit: nanofib\*,nanofib\*,nan... 1

User Defined Hits Edit: Add your custom highlighting here

## Dressing for acute or chronic wound

**Abstract**  
The invention relates to a cover for acute or chronic wound which contains a functional layer consisting of a mixture of **nanofibers** and microfibers from a biocompatible and biodegradable copolymer of L-lactide and ε-caprolactone.

**Timeline** (Timeline view)

**Applicants** (Standard names) ?  
TECHNICKA UNIVER... [CZ]

**Inventors** (Standard names) ?  
CHVOJKA JIRI [CZ]  
LUKAS DAVID [CZ]  
MIKES PETR [CZ]  
JENČOVÁ VĚRA [CZ]  
HORÁKOVÁ JANA [CZ]  
[+]

**IPC Codes**  
A61L15/26  
A61L15/44  
A61L15/64

**CPC Codes**  
A61L15/44  
A61L15/26  
A61L15/64  
A61L2300/404

**Family members (1 patent)** Actions

CZ31723U1 (TECHNICKA UNIVERZITA V LIBERCI) 2 May 2018  
A cover of an acute or chronic wound

Country (Applicant)

Where are the patents, applicants or inventors located

# APPLICANT

NANOFIBERS FT (25754 PATENTS)

## AMOGREENTECH CO LTD

CORNELL RES FOUNDATION INC • DAINIPPON INK & CHEMICALS • DAIO SEISHI KK

DU PONT • FINETEX ENE INC • HARBIN INST OF TECHNOLOGY

JUJO PAPER CO LTD • KAO CORP • KOLON FASHION MATERIAL INC

KOREA ADVANCED INST SCI & TECH • KOREA INST SCI & TECH

## MATSUSHITA ELECTRIC IND CO LTD

mitsubishi materials corp • nanosys inc

NAT UNIV CHONBUK IND COOP FOUND • NAT UNIV DONG HWA

## NISSIN KOGYO KK

samsung electronics co ltd • snu r&db foundation • topotec co ltd

TORAY INDUSTRIES • UNIV AKRON • UNIV BEIJING CHEMICAL

UNIV CALIFORNIA • UNIV CHANGCHUN SCIENCE & TECH

UNIV DONGHUA • UNIV JIANGNAN • UNIV JIANGSU • UNIV JILIN

UNIV JINAN • UNIV NANJING FORESTRY • UNIV NATIONAL DONG HWA

UNIV NORTHWESTERN • UNIV QINGDAO • UNIV SHANGHAI JIAOTONG

## UNIV SHINSHU • UNIV SOOCHOW

UNIV SOUTH CHINA TECH • UNIV SOUTHEAST • UNIV SUZHOU • UNIV TEXAS

UNIV TIANJIN • UNIV TIANJIN POLYTECHNIC • UNIV TSINGHUA

UNIV WUHAN TEXTILE • UNIV XIAMEN • UNIV ZHEJIANG

UNIV ZHEJIANG SCIENCE & TECH

What are the applicants

# INVENTOR

NANOFIBERS FT (25754 PATENTS)

BAUGHMAN RAY H • CHHABRA RAJEEV • CHO DAEHWAN • CUI JIANZHONG • **DING BIN**

DONG XIANGTING • FANG SHAOLI • **HE JIHUAN** • HOU HAOQING • ISELE OLAF ERIK ALEXANDER

ISHIKAWA KAZUNOBU • ISOGAI AKIRA • JEONG UI YOUNG • JOO YONG LAK

KATSUKAWA SHIHO • **KIM CHAN** • KIM HAK YONG • KIM ICK SOO • KIM ICK-SOO

KIM IL DOO • KOZLOV MIKHAIL • **KUROKAWA TAKAHIRO**

LEE JAE HWAN • LEE SEUNG HOON • LI LEI • LI YAN • LIMIN ZHU • LIU GUIXIA • LIU YANG

LONG YUNZE • MAGARIO AKIRA • MIRKIN CHAD A • MIYAWAKI SHOICHI

**NOGUCHI TORU** • OCHI TAKASHI

**PARK JONG CHEOL** • RENEKER DARRELL H

SEO IN YONG • SUMIDA HIROTO • TAKAHASHI MITSUHIRO

TAKEZAWA MIKIO • TOMINAGA YOSHIAKI • UEKI HIROYUKI • WANG DONG

WANG JINXIAN • WANG WEI • WATANABE KEI • YU JIANYONG • YU WENSHENG • ZHU BIZHONG

# COMPANY

NANOFIBERS FT (25754 PATENTS)

3M INNOVATIVE PROPERTIES CO • **AMOGREENTECH CO LTD**

AMOMEDI CO LTD • BOEING CO • CLARCOR INC

**CORNELL RES FOUNDATION INC**

DAINIPPON INK & CHEMICALS • DAIO SEISHI KK

DONALDSON CO INC • DOW CORNING • **DU PONT**

**FINETEX ENE INC** • HON HAI PREC IND CO LTD

HYPERION CATALYSIS INT • HYUNDAI MOTOR CO LTD • IBM • IND TECH RES INST

JAPAN SCIENCE & TECH AGENCY • **JUJO PAPER CO LTD**

KAO CORP • KOLON FASHION MATERIAL INC • KOREAIND TECH INST

KOREA INST SCI & TECH • KURARAY CO • LG CHEMICAL LTD

LINTEC AMERICA INC • MARINEPOLYMER TECH INC

**MATSUSHITA ELECTRIC IND CO LTD**

MILLIPORE CORP • MITSUBISHI HEAVY IND LTD • MITSUBISHI MATERIALS CORP

NANOSPHERE INC • NANOSYS INC • NAT INST FOR MATERIALS SCIENCE

NISSEI PLASTICS IND CO • **NISSIN KOGYO KK** • OLYMPUS CORP

PANASONIC IP MAN CO LTD • PROCTER & GAMBLE • RES TRIANGLE INST

**SAMSUNG ELECTRONICS CO LTD** • SHOWA DENKO KK

TECHNICKA UNIVERZITA V LIBERCI • TOPPAN PRINTING CO LTD

**TOPTec CO LTD** • **TORAY INDUSTRIES** • TOSHIBA KK

TOYOTA MOTOR CO LTD • ULVAC INC • UNIV BEIJING CHEM TECH

What are the companies

# ACADEMIC

NANOFIBERS FT (25754 PATENTS)

CENTRE NAT RECH SCIENT • HARBIN INST OF TECHNOLOGY

KOREA ADVANCED INST SCI & TECH • KOREA MACH & MATERIALS INST

MASSACHUSETTS INST TECHNOLOGY

NAT UNIV CHONBUK IND COOP FOUND

NAT UNIV DONG HWA • SNU R&DB FOUNDATION • TOKYO INST TECH

UNIV AKRON • UNIV BEIJING CHEMICAL • UNIV CALIFORNIA

UNIV CHANGCHUN SCIENCE & TECH • UNIV DALIAN TECH

UNIV DONGHUA • UNIV FUDAN • UNIV GUANGDONG TECHNOLOGY

UNIV JIANGNAN • UNIV JIANGSU • UNIV JILIN • UNIV JINAN

UNIV KOREA RES & BUS FOUND • UNIV KYOTO • UNIV NANJING FORESTRY

UNIV NAT CHONNAM IND FOUND • UNIV NATIONAL DONG HWA

UNIV NORTHWESTERN • UNIV QINGDAO • UNIV SHAANXI SCIENCE & TECH

UNIV SHANGHAI • UNIV SHANGHAI JIAOTONG • UNIV SHANGHAI SCIENCE & TECH

UNIV SHINSHU • UNIV SOOCHOW

UNIV SOUTH CHINA TECH • UNIV SOUTHEAST • UNIV SUZHOU

UNIV TEXAS • UNIV TIANJIN • UNIV TIANJIN POLYTECHNIC

UNIV TOKYO • UNIV TONGJI • UNIV TSINGHUA

UNIV WUHAN TEXTILE • UNIV XIAMEN • UNIV YANGZHOU

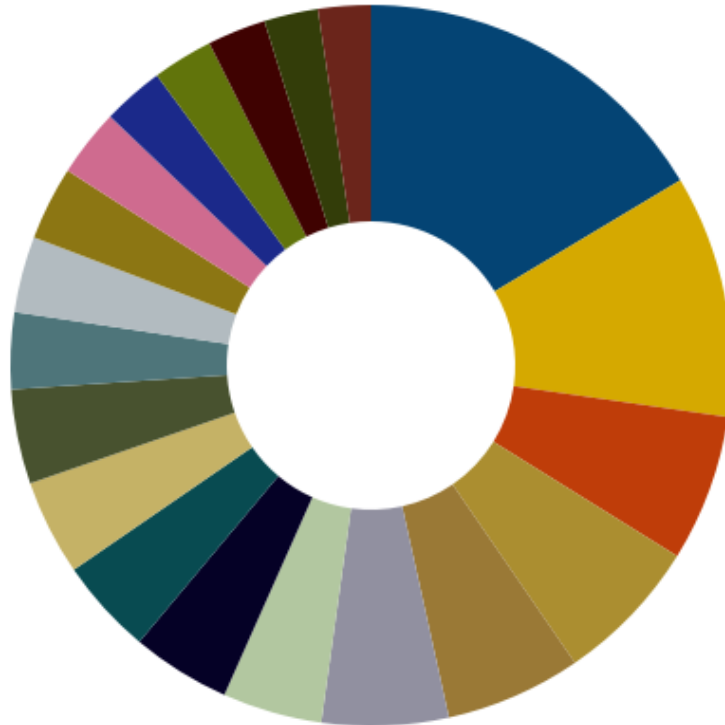
UNIV YONSEI IACF • UNIV ZHEJIANG • UNIV ZHEJIANG SCIENCE & TECH

UNIV ZHONGYUAN TECHNOLOGY

What are the schools, universities and institutions

# IPC CODE (MAINGROUP) - International Patent Classification

NANOFIBERS FT (25754 PATENTS)



- **D01D5/00 (4051 patents, 16%)** Formation of filaments
- **D04H1/00 (2684 patents, 11%)** Non-woven fabrics formed wholly or mainly of staple fibres or like relatively short fibres
- **H01M4/00 (1624 patents, 7%)** Electrodes
- **B82Y30/00 (1621 patents, 7%)** Nanotechnology for materials or surface science
- **B82Y40/00 (1506 patents, 6%)** Manufacture or treatment of nanostructures
- **D01F9/00 (1401 patents, 6%)** Man-made filaments or the like of other substances
- **B01D39/00 (1102 patents, 4%)** Filtering material for liquid or gaseous fluids
- **C01B31/00 (1095 patents, 4%)** Carbon
- **C08K3/00 (1064 patents, 4%)** Use of inorganic substances as compounding ingredients
- **D01F6/00 (1058 patents, 4%)** Monocomponent man-made filaments or the like of synthetic polymers
- **D01F1/00 (1047 patents, 4%)** General methods for the manufacture of man-made filaments or the like

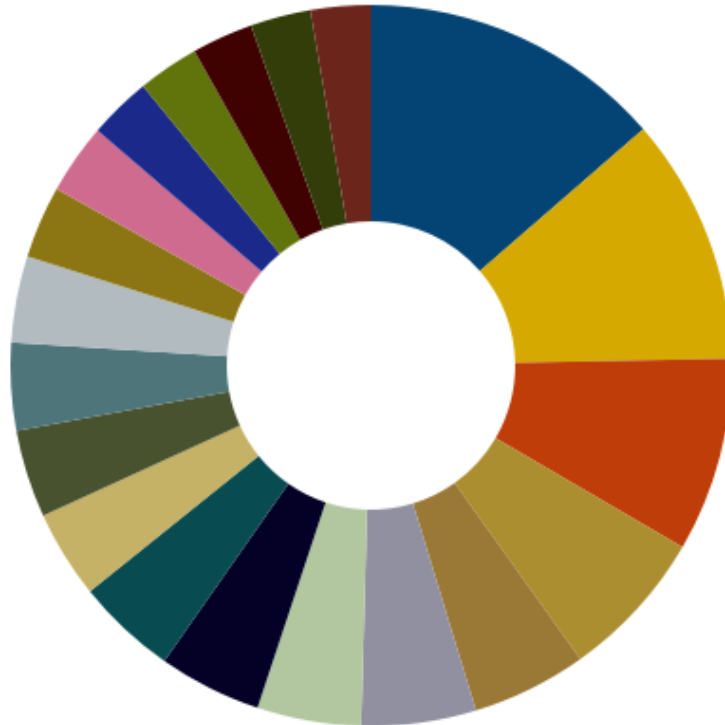
Which codes are used



# CPC CODE (MAINGROUP)

NANOFIBERS FT (25754 PATENTS)

The Cooperative **P**atent Classification (**CPC**) is a **patent** classification system, which has been jointly developed by the European **P**atent Office (EPO) and the United States **P**atent and Trademark Office (USPTO).

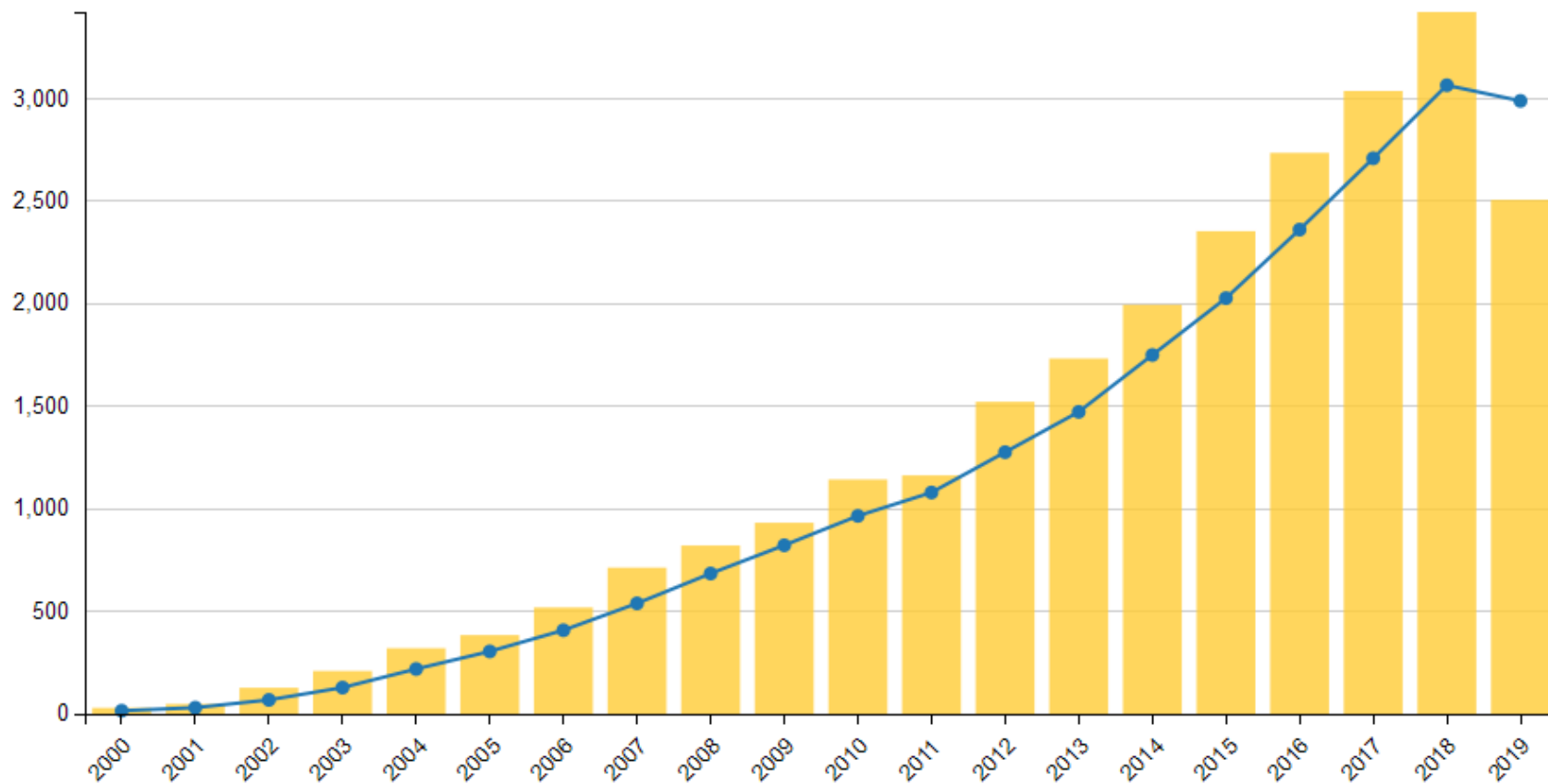


- B82Y30/00 (2406 patents, 14%)** Nanotechnology for materials or surface science
- D01D5/00 (1956 patents, 11%)** Formation of filaments
- Y10T428/00 (1537 patents, 9%)** Stock material or miscellaneous articles
- B82Y40/00 (1190 patents, 7%)** Manufacture or treatment of nanostructures
- D04H1/00 (911 patents, 5%)** Non-woven fabrics formed wholly or mainly of staple fibres or like relatively short fibres
- C01B32/00 (907 patents, 5%)** Carbon;Compounds thereof
- Y02E60/00 (824 patents, 5%)** Enabling technologies or technologies with a potential or indirect contribution to GHG emissions mitigation
- Y10S977/00 (815 patents, 5%)** Nanotechnology
- H01M4/00 (797 patents, 5%)** Electrodes
- D01F9/00 (696 patents, 4%)** Artificial filaments or the like of other substances;Manufacture thereof;Apparatus specially adapted for the manufacture of carbon filaments
- D01F6/00 (695 patents, 4%)** Monocomponent artificial filaments or the like of synthetic polymers;Manufacture thereof

Which codes are used

# ACTIVITY (PUBLICATION DATE)

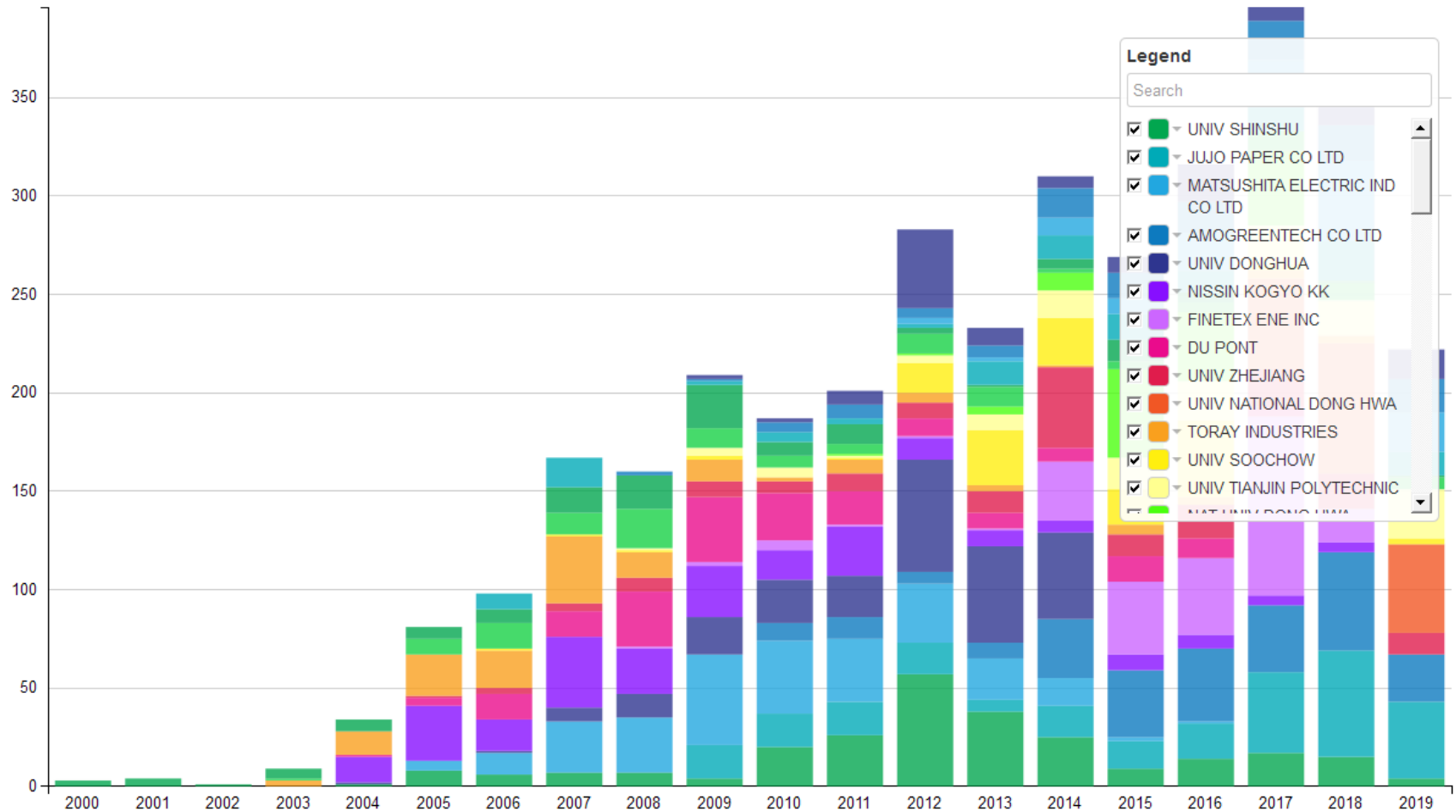
NANOFIBERS FT (25754 PATENTS)



Number of patents over time

# APPLICANT TIMELINE

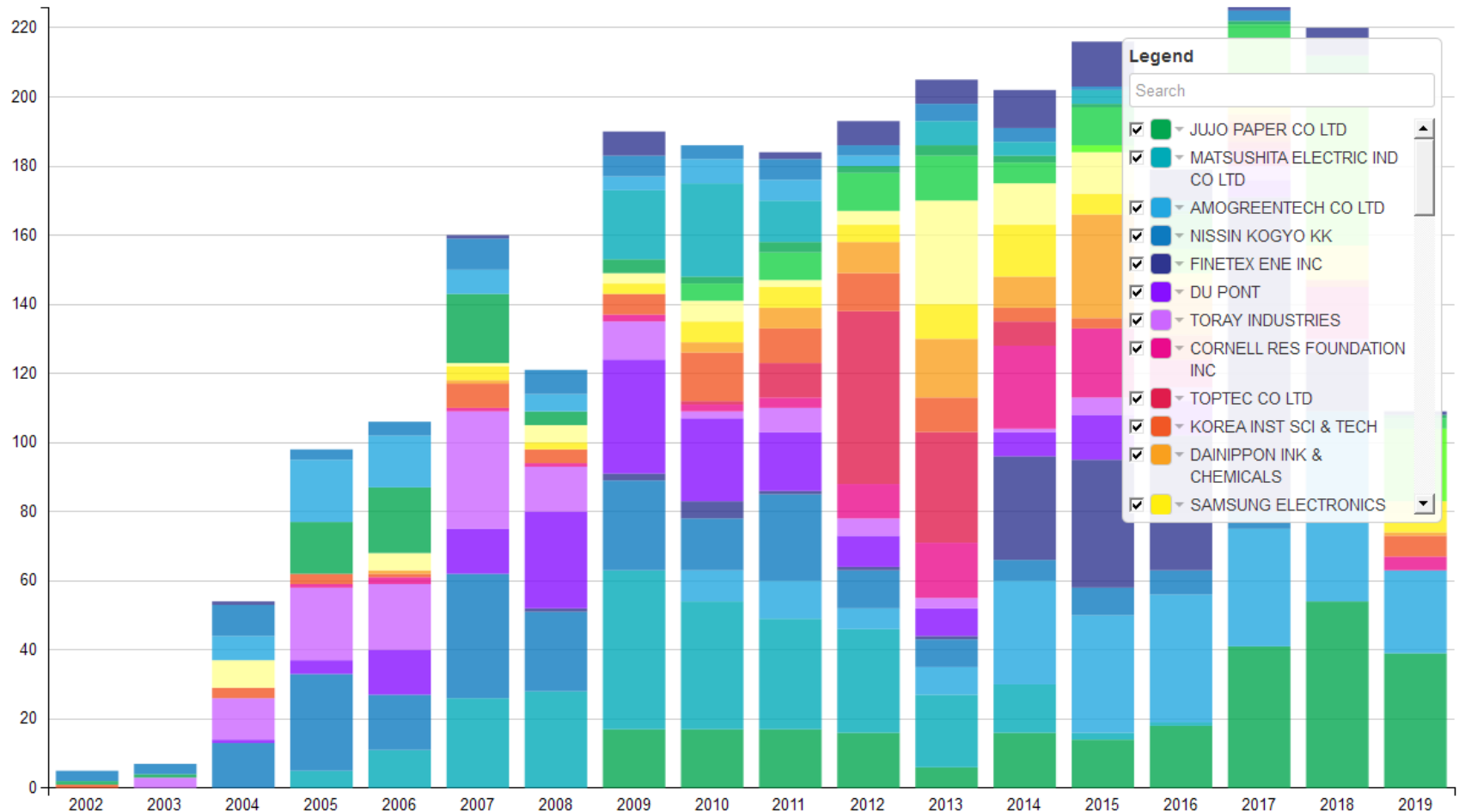
NANOFIBERS FT (25754 PATENTS)



Who or what over time

# COMPANY TIMELINE

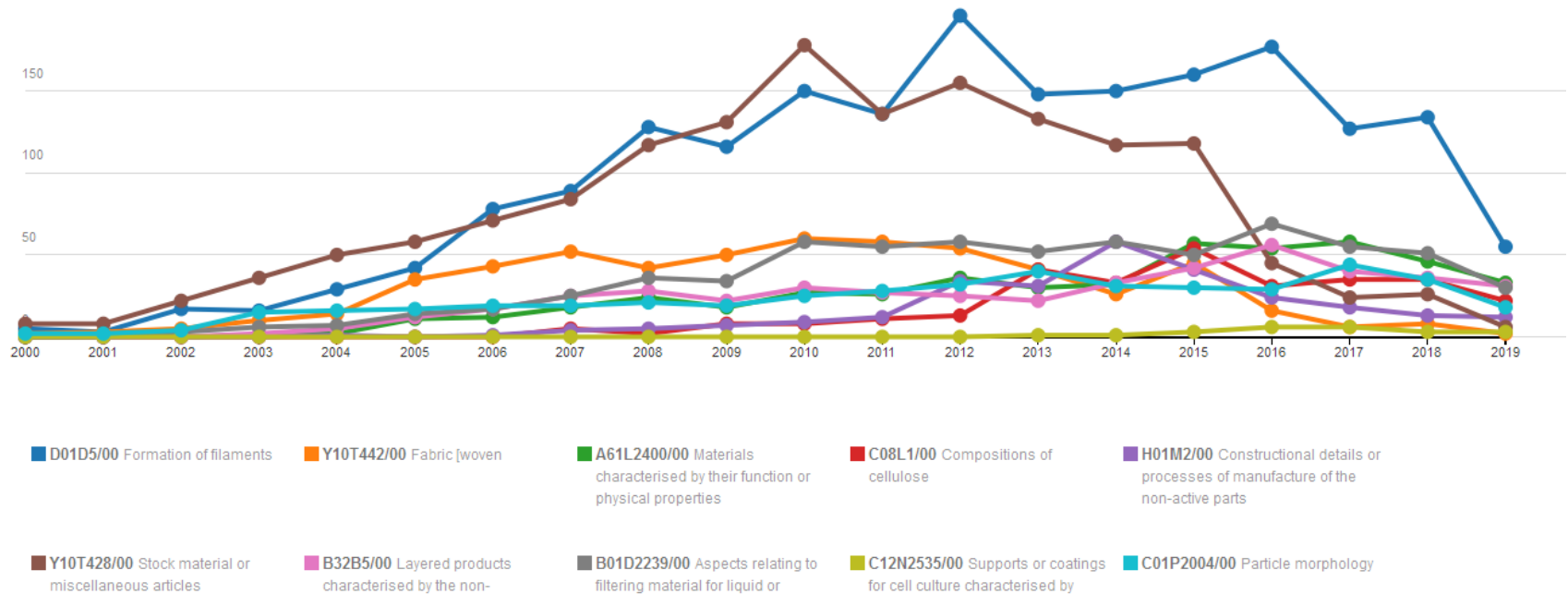
NANOFIBERS FT (25754 PATENTS)



Who or what over time

# CODE EVOLUTION (CPC)

NANOFIBERS FT (25754 PATENTS)



Who or what has an increasing trend of minimum 3 years

# PROBLEMS VS COMPANIES

NANOFIBERS FT (25754 PATENTS)



Who or what versus who or what

# NOUNS

NANOFIBERS FT (25754 PATENTS)

absorption • adhesion • adsorption • alcohol • **battery** • capacity • **carbon** • catalyst  
**cellulose** • **chemical** • collector • deg • density • dioxide • **energy** • **fiber** • filtration  
graphene • graphite • growth • hydrogen • ion • lithium • matrix • **membrane** • **nano**  
**nanofiber** • nano-fiber • **nanomaterial** • nanometer • nanoparticles  
**nanotubes** • network • nozzle • **particles** • phase • **polymer** • porosity • powder  
**precursor** • prospect • **reaction** • salt • silicon • sodium • **strength** • substance • synthesis  
tissue • web

Which nouns are mentioned



# ADJECTIVES

NANOFIBERS FT (25754 PATENTS)

aqueous • average • biological • catalytic • certain • **composite** • conductive  
continuous • controllable • efficient • electrochemical • **electrospinning** • **electrostatic**  
fiber • fine • flexible • **following** • functional • hollow • industrial • inorganic • long  
**mechanical** • mixed • molecular • multiple • nano-fiber • nanomaterial • natural • negative  
nonwoven • non-woven • **organic** • polymeric • porous • prepared • raw • secondary  
solid • **solvent** • spinning • stable • strong • technical • thermal • thin  
three-dimensional • ultrasonic • uniform • wide

Which adjectives are mentioned

# VERBS

NANOFIBERS FT (25754 PATENTS)

anchored • binding • calcining • carbonizing • catalyzing • coagulating • complexing  
composited • conjugated • crosslinked • cultured • dilute • doped • drum • drying  
dye • electrospinning • electro-spinning • elongated • endowed • exfoliated • felt  
fibrillating • fluorinated • grafted • hybridized • hydrolyzing • implant • impregnated • knitted  
lubricating • mass-producing • polymerized • precipitating • pretreating • reacting  
spinning • spun • stimulating • stretching • substituted • targeted • toughening  
treating • twisting • volatilized • washing • weaving • wetting • woven

Which verbs are mentioned

# GLOSSARY

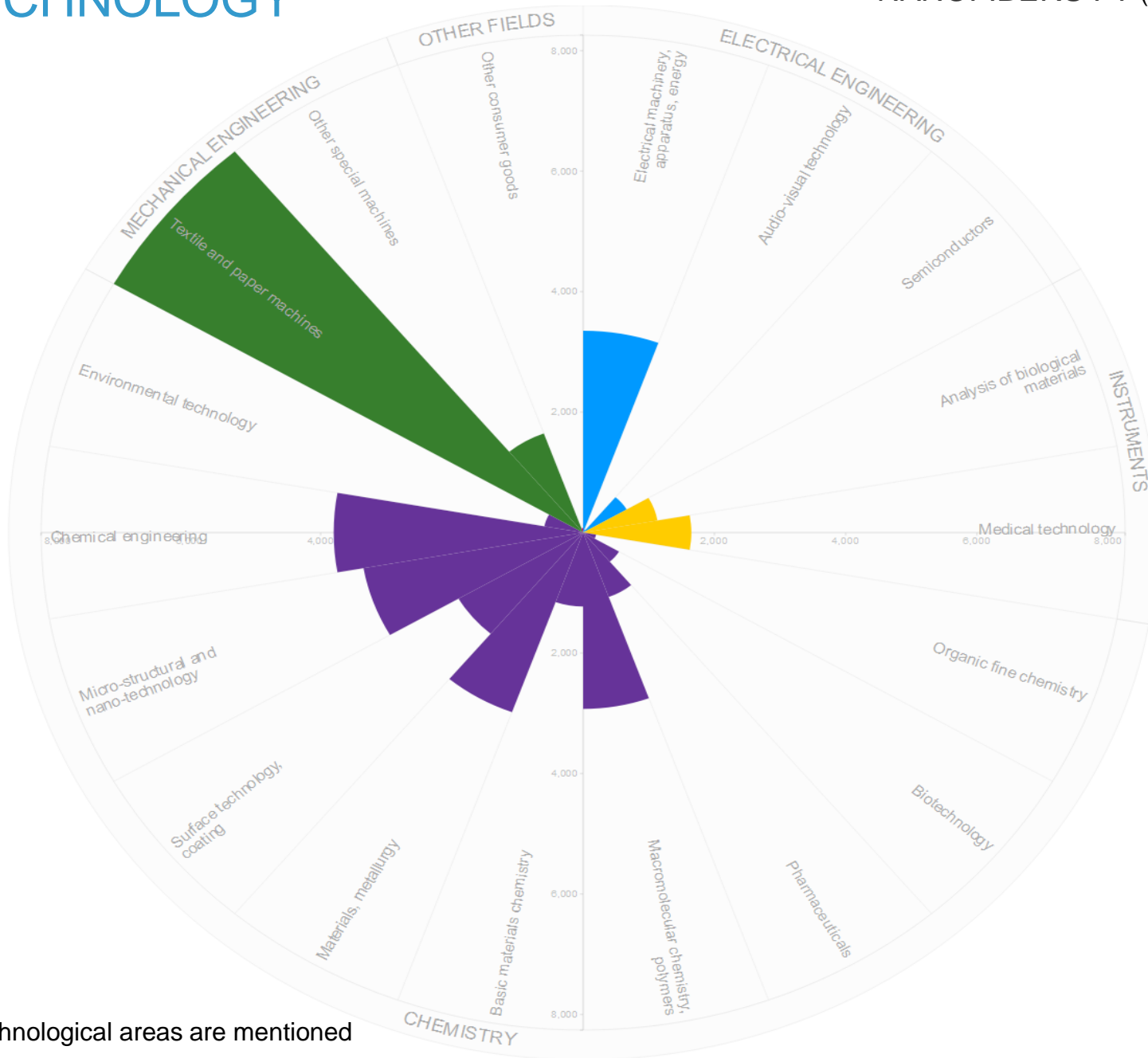
## NANOFIBERS FT (25754 PATENTS)

<b>A</b> AFM atomic force microscopy (243) ALD atomic layer deposition (106) ABS acrylonitrile butadiene styrene (103)	<b>B</b> BSA bovine serum albumin (116) BR butadiene rubber (72) BET brunauer-emmett-teller (60)	<b>C</b> CVD chemical vapor deposition (493) CNT carbon nanotube (340) CNF carbon nanofiber (325) CMC carboxymethyl cellulose (119) CV cyclic voltammetry (104) CD circular dichroism (88) CR chloroprene rubber (71) CA cellulose acetate (70) CTAB cetyltrimethylammonium bromide (61) CO carbon (61)	<b>D</b> DMF dimethylformamide (416) DSC differential scanning calorimetry (182) DMSO dimethyl sulfoxide (178) DI deionized (157) DCM dichloromethane (71) DC direct current (69)
<b>E</b> ECM extracellular matrix (187) EC ethylene carbonate (100) EDS energy dispersive spectroscopy (88) EGF epidermal growth factor (86) EMI electromagnetic interference (78) EDX energy dispersive x-ray (73)	<b>F</b> FTIR fourier transform infrared (143) FBS fetal bovine serum (111) FWHM full width half maximum (90) FGF fibroblast growth factor (79)	<b>G</b> GO graphene oxide (80)	<b>H</b> HPLC high pressure liquid chromatography (87) HRTEM high resolution transmission electron microscopy (87) HA hydroxyapatite (80) HF hydrofluoric (61) HDPE high density polyethylene (60)
<b>I</b> ITO indium tin oxide (195) IR infrared (130) IPA isopropyl alcohol (92)	<b>L</b> LED light emitting diode (80)	<b>M</b> MWNT multi-walled nanotubes (116) MWCNT multi-walled carbon nanotubes (96) MEA membrane electrode assembly (73)	<b>N</b> NMP n-methyl-2-pyrrolidone (184) NR natural rubber (80) NGF nerve growth factor (76) NHS n-hydroxysuccinimide (74) NMR nuclear magnetic resonance (72) NIR near infrared (62)
<b>P</b> PET polyethylene terephthalate (473) PVA polyvinyl alcohol (431) PVDF polyvinylidene fluoride (373) PEO polyethylene oxide (368) PAN polyacrylonitrile (287) PLA polylactic acid (274) PEG polyethylene glycol (209) PBS phosphate buffered saline (204) PTFE polytetrafluoroethylene (192) PMMA polymethyl methacrylate (171) PVC polyvinyl chloride (149) PCL polycaprolactone (144) PS polystyrene (142) PE polyethylene (125) PDMS polydimethylsiloxane (121) PC propylene carbonate (119) PGA polyglycolic acid (117) PBT polybutylene terephthalate (114) PECVD plasma enhanced chemical vapor deposition (109) PAA polyacrylic acid (108) PVP polyvinyl pyrrolidone (106) PU polyurethane (103) PVD physical vapor deposition (103) PI polyimide (99) PA polyamide (93) PEI polyethylenimine (93) PES polyethersulfone (92) PEN polyethylene naphthalate (90) PDGF platelet-derived growth factor (81) PEM proton exchange membrane (65) PLGA polyglycolic acid (60)	<b>R</b> RF radio frequency (78)	<b>S</b> SEM scanning electron microscope (1385) SBR styrene-butadiene rubber (140) SWNT single-walled nanotube (112) SDS sodium dodecyl sulfate (99) SWCNT single-walled carbon nanotube (80) SEI solid electrolyte interphase (70)	<b>T</b> TEM transmission electron microscopy (750) THF tetrahydrofuran (220) TGA thermogravimetric analysis (205) TEOS tetraethyl orthosilicate (98) TFA trifluoroacetic acid (74) TOPO trioctylphosphine oxide (70) TPU thermoplastic polyurethane (60)
<b>U</b> UV ultraviolet (142)	<b>V</b> VEGF vascular endothelial growth factor (115)	<b>X</b> XRD x-ray diffraction (316) XPS x-ray photoelectron spectroscopy (162)	

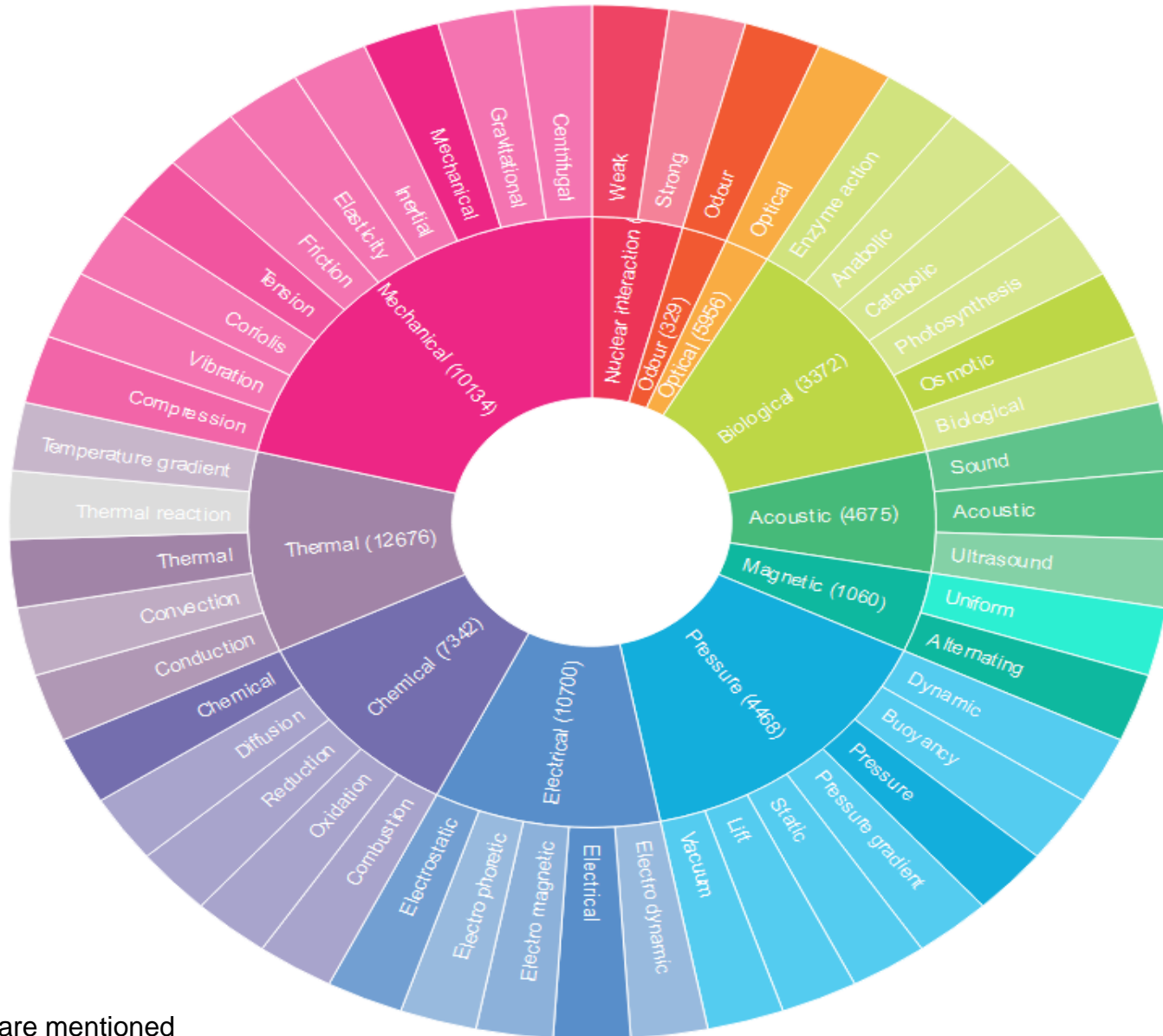
Which abbreviations are mentioned

# TECHNOLOGY

NANOFIBERS FT (25754 PATENTS)



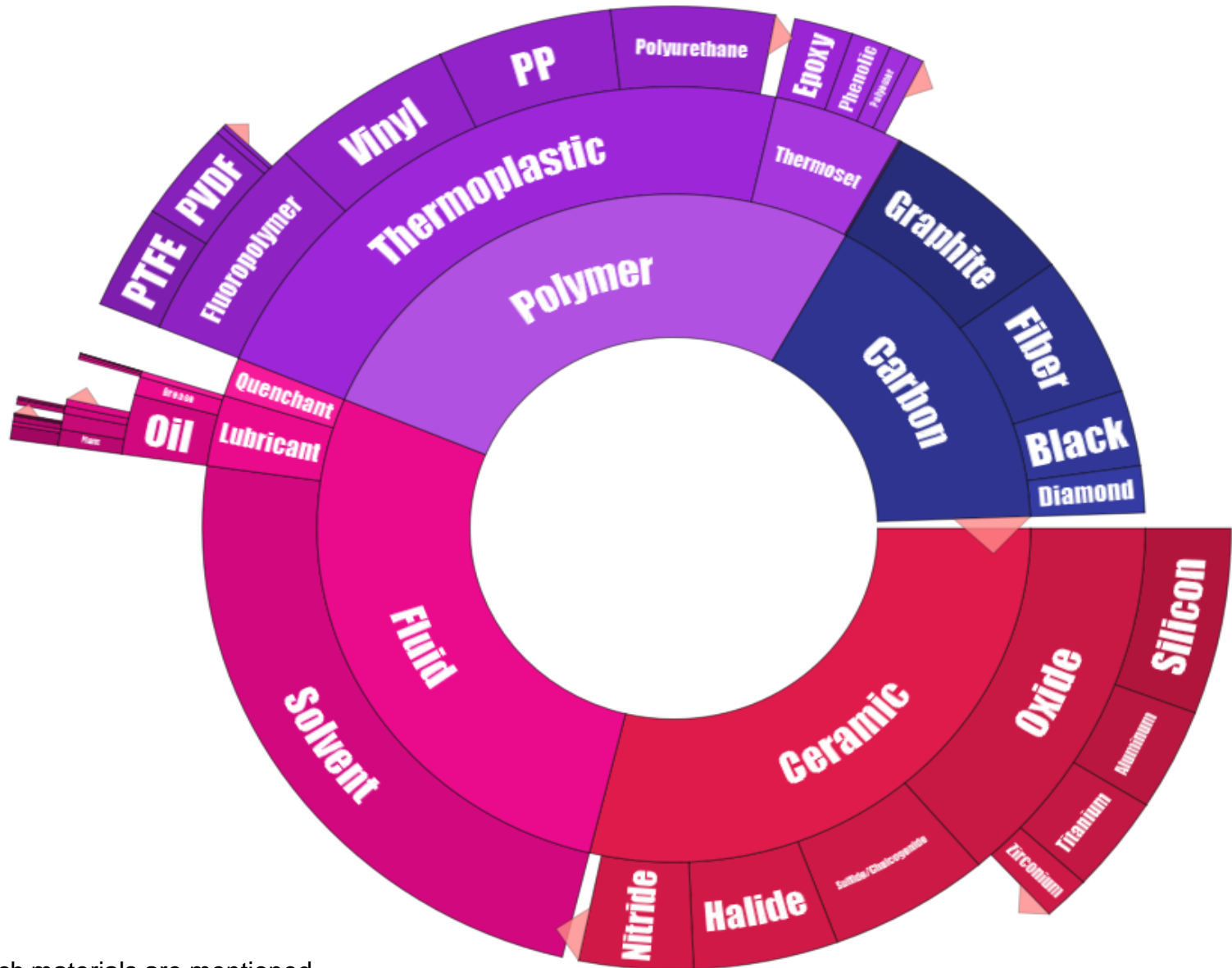
Which technological areas are mentioned



Which fields are mentioned

# MATERIALS

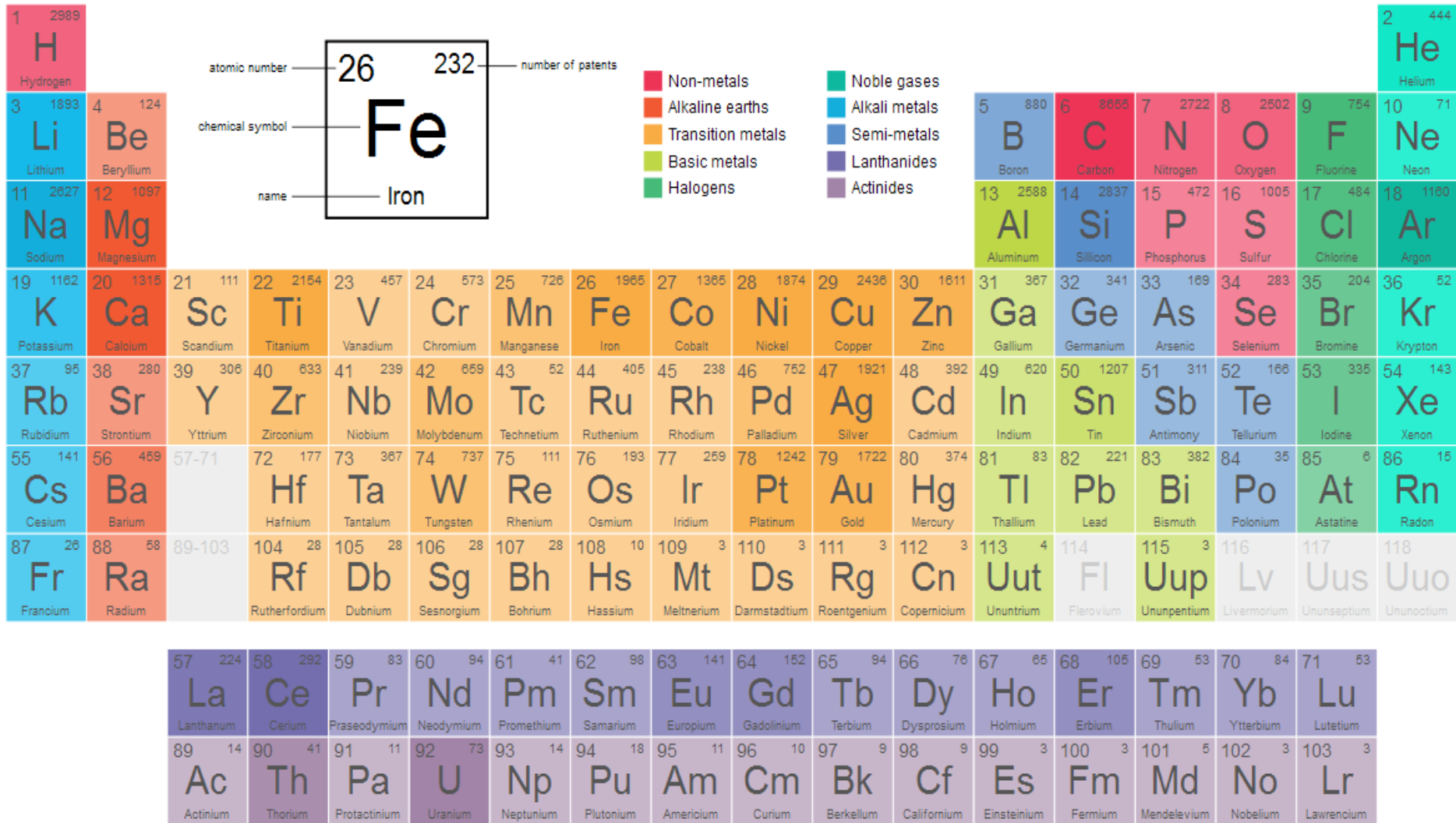
NANOFIBERS FT (25754 PATENTS)



Which materials are mentioned

# ELEMENTS

NANOFIBERS FT (25754 PATENTS)



Which elements are mentioned



# DOMAIN (CPC)

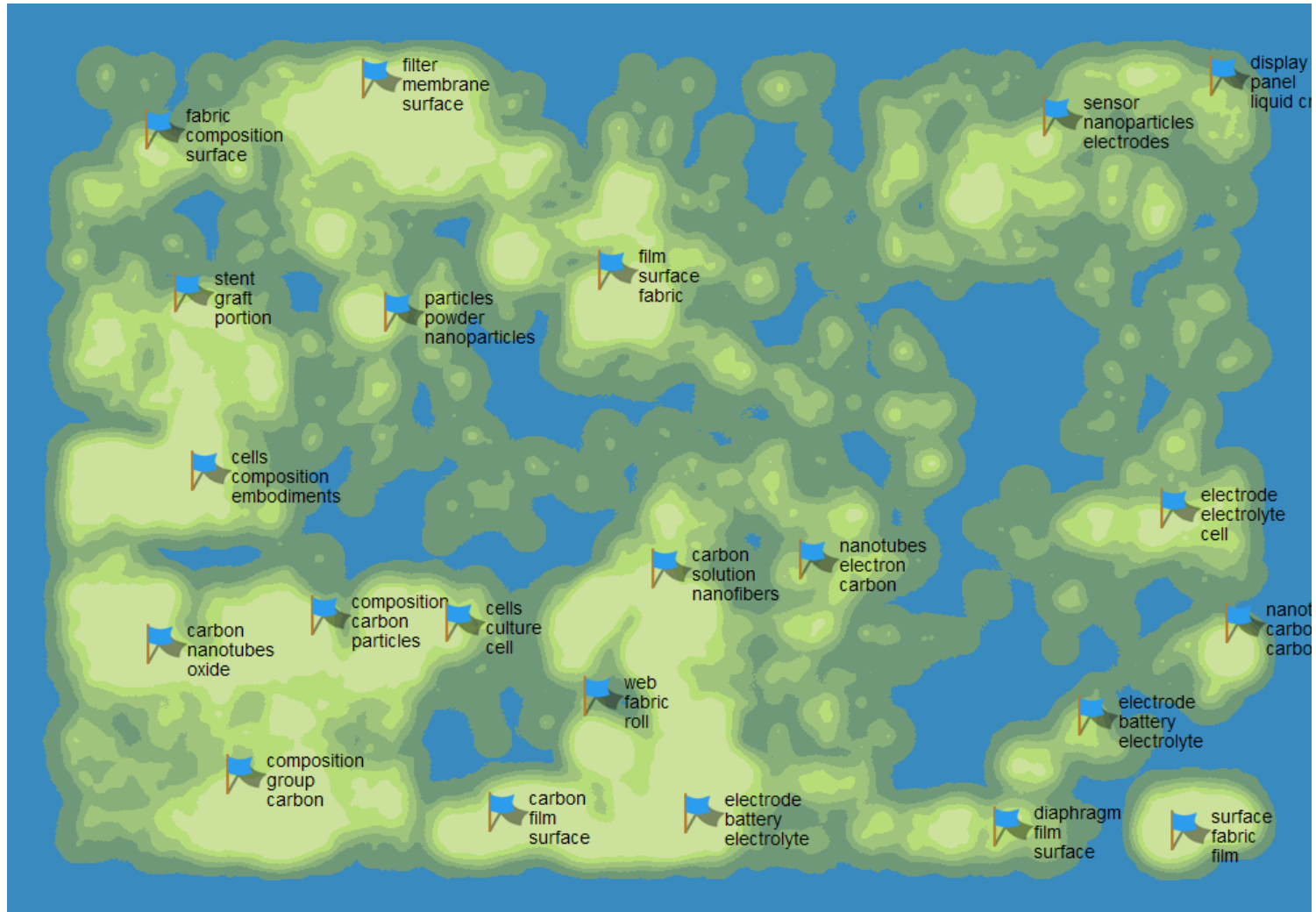
# NANOFIBERS FT (25754 PATENTS)



In which code domains are your patents

# CODE MAP (CPC)

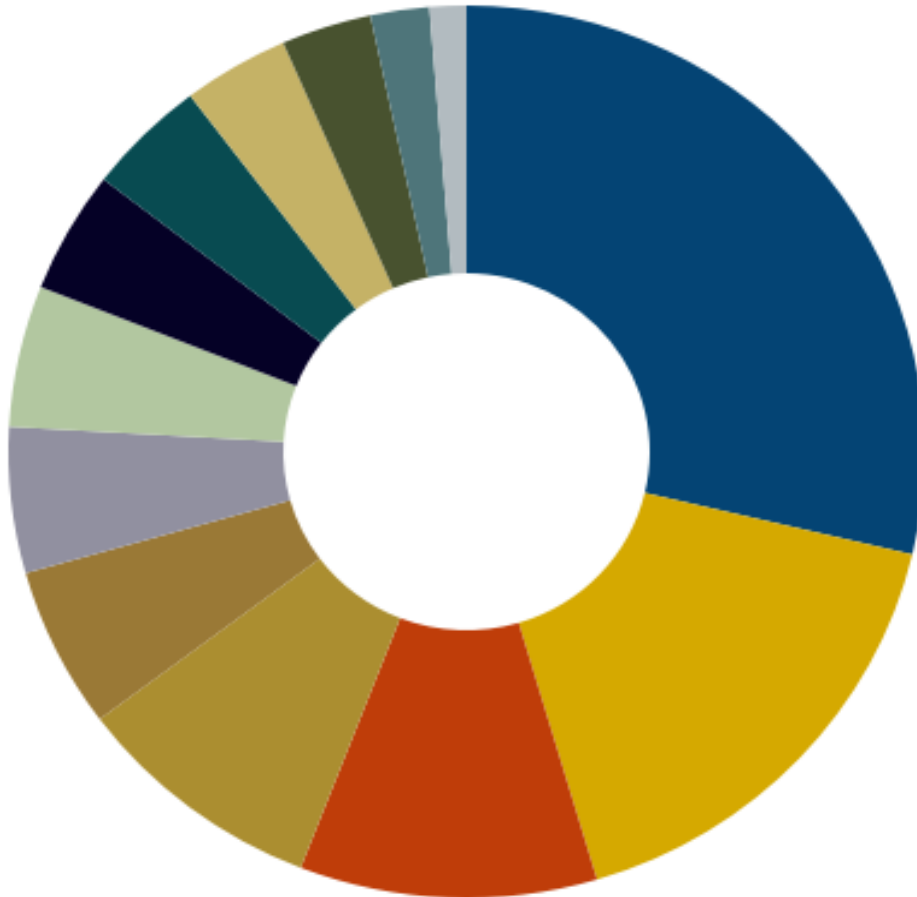
NANOFIBERS FT (25754 PATENTS)



Codes of patents on a landscape

# UNIT FIELD

NANOFIBERS FT (25754 PATENTS)

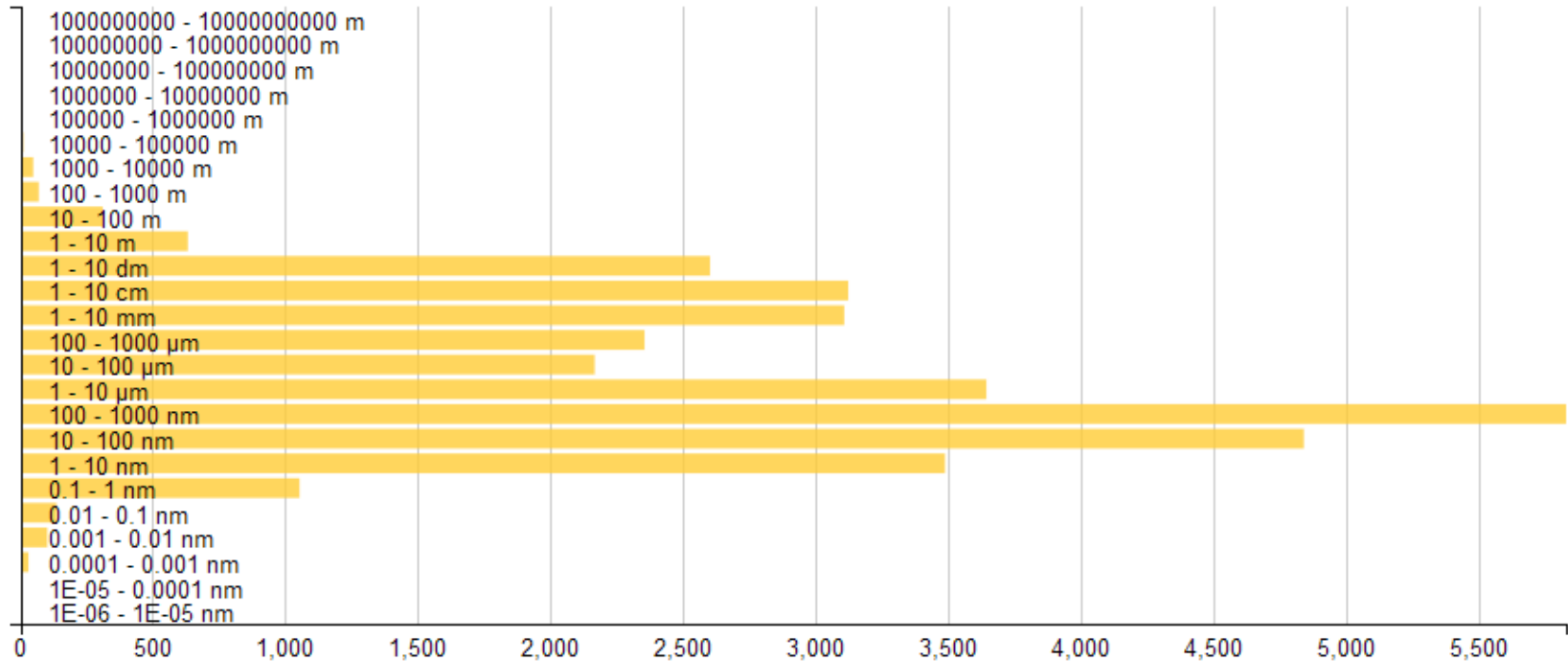


- Size (8198 patents, 29%)
- Time (4773 patents, 17%)
- Voltage (2997 patents, 10%)
- Pressure (2536 patents, 9%)
- Volume Flow Rate (1670 patents, 6%)
- pH (1508 patents, 5%)
- Frequency (1464 patents, 5%)
- Power (1265 patents, 4%)
- Speed (1214 patents, 4%)
- Temperature (1071 patents, 4%)
- Viscosity (910 patents, 3%)
- Current (592 patents, 2%)
- Others (370 patents, 1%)

Which units are mentioned

# SIZE (M)

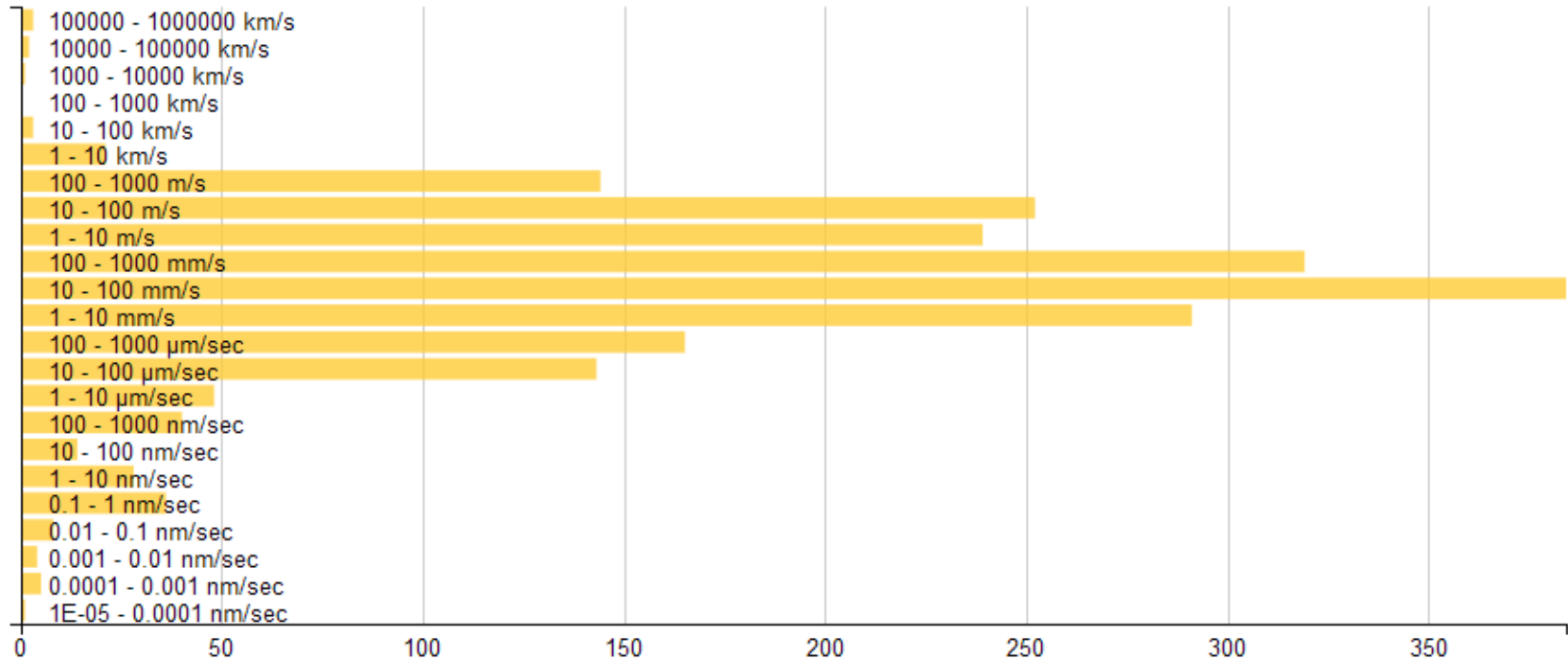
NANOFIBERS FT (25754 PATENTS)



Which size units are used

# SPEED (M/S)

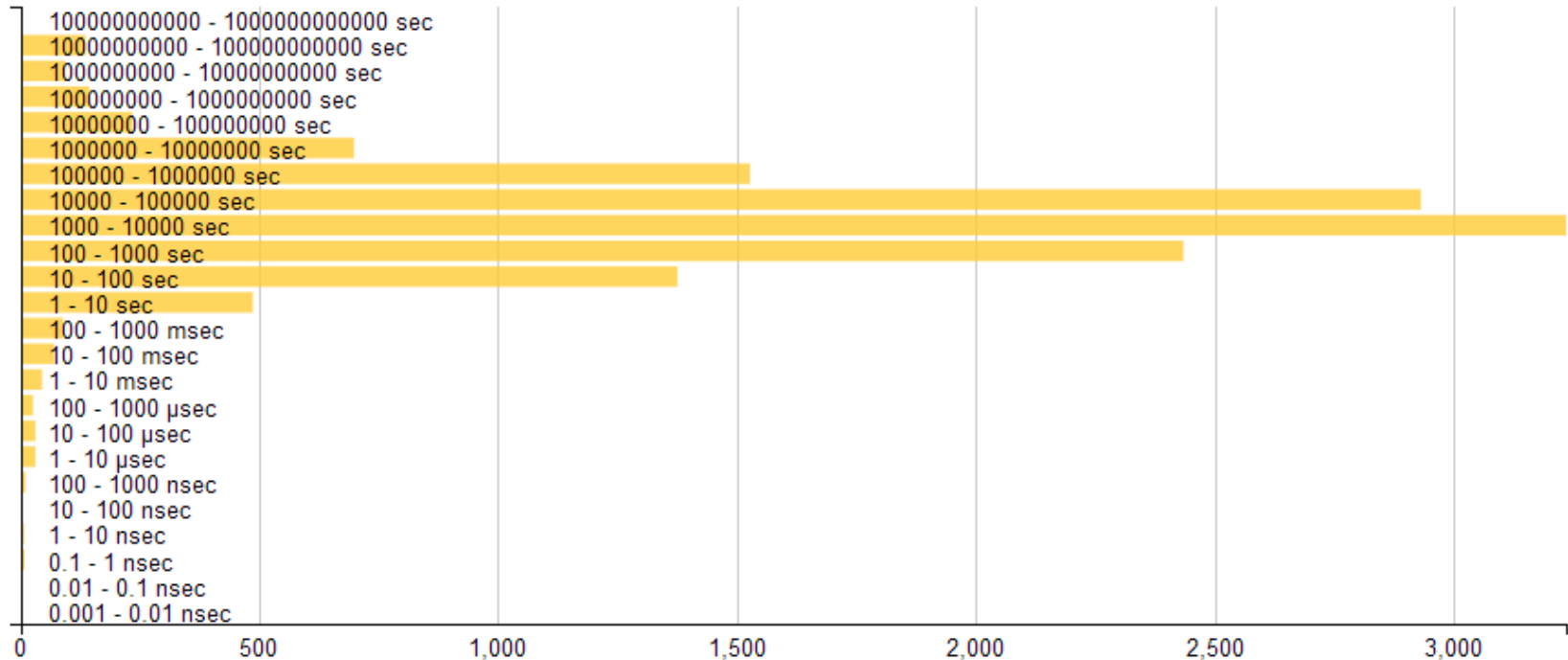
NANOFIBERS FT (25754 PATENTS)



Which speed units are used

# TIME (SECONDS)

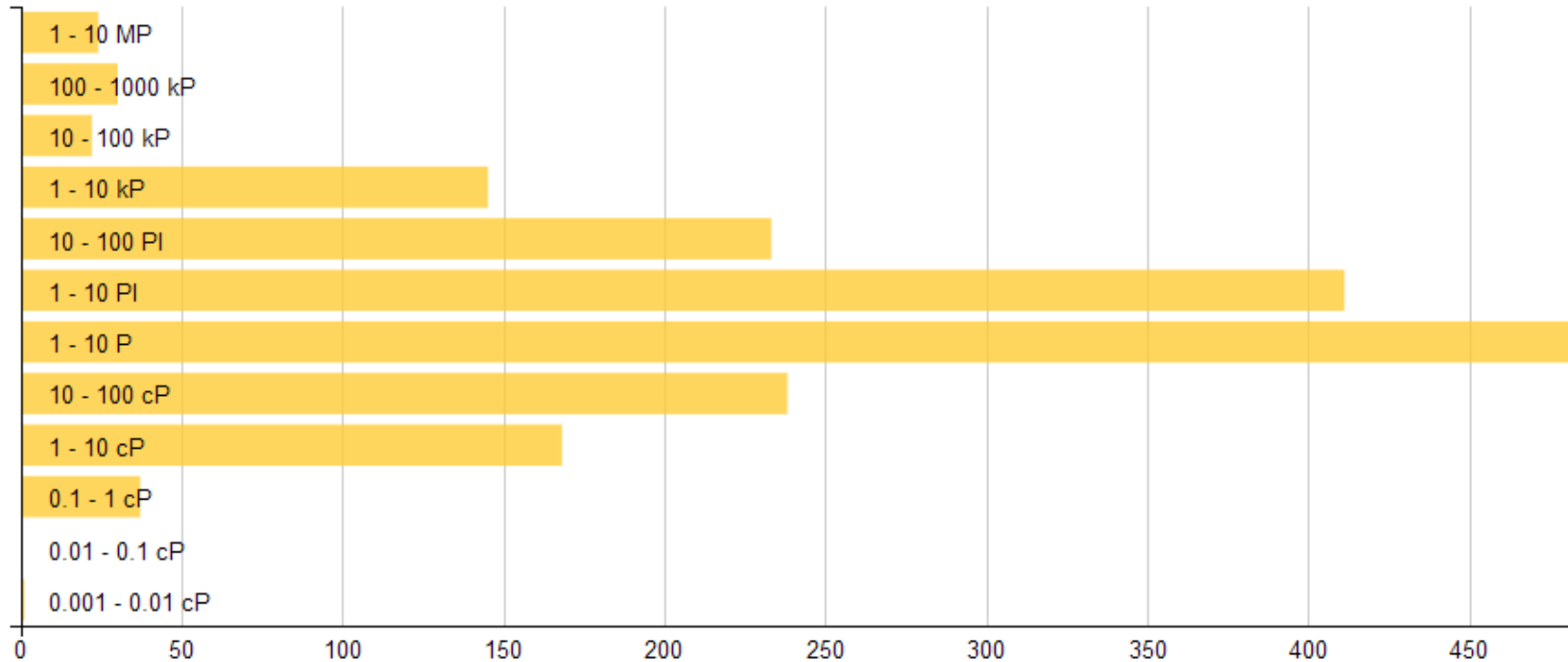
NANOFIBERS FT (25754 PATENTS)



Which time units are used

# VISCOSITY (PI)

NANOFIBERS FT (25754 PATENTS)

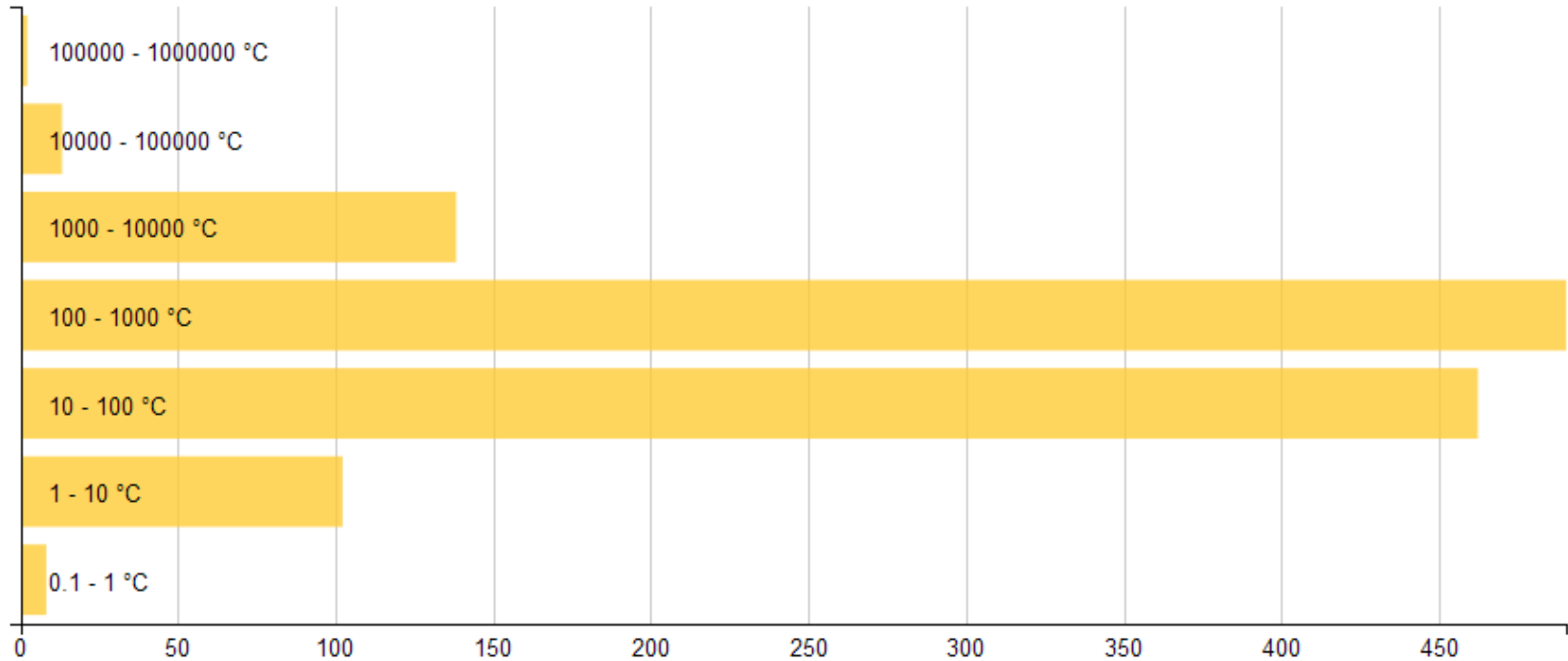


Which viscosity units are used



# TEMPERATURE (CELSIUS)

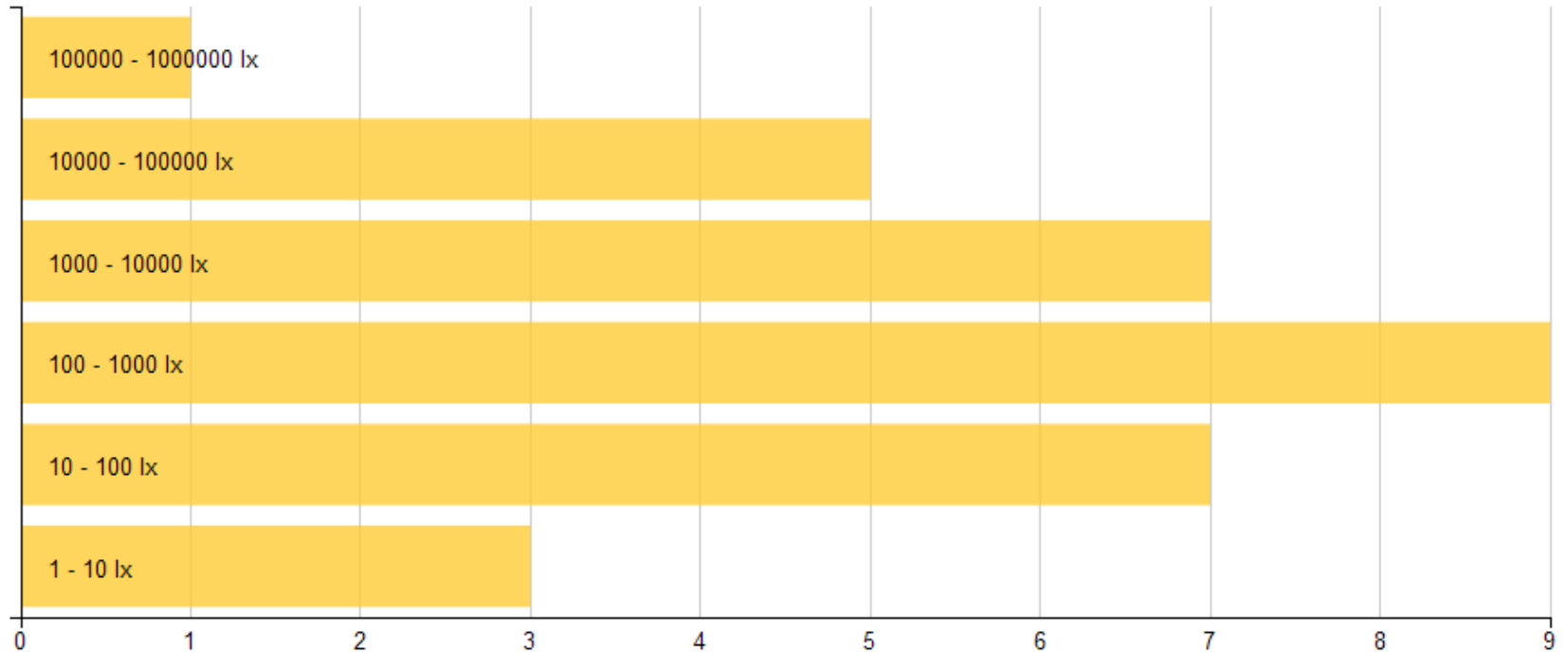
NANOFIBERS FT (25754 PATENTS)



Which temperature units are used

# ILLUMINATION (LX)

NANOFIBERS FT (25754 PATENTS)

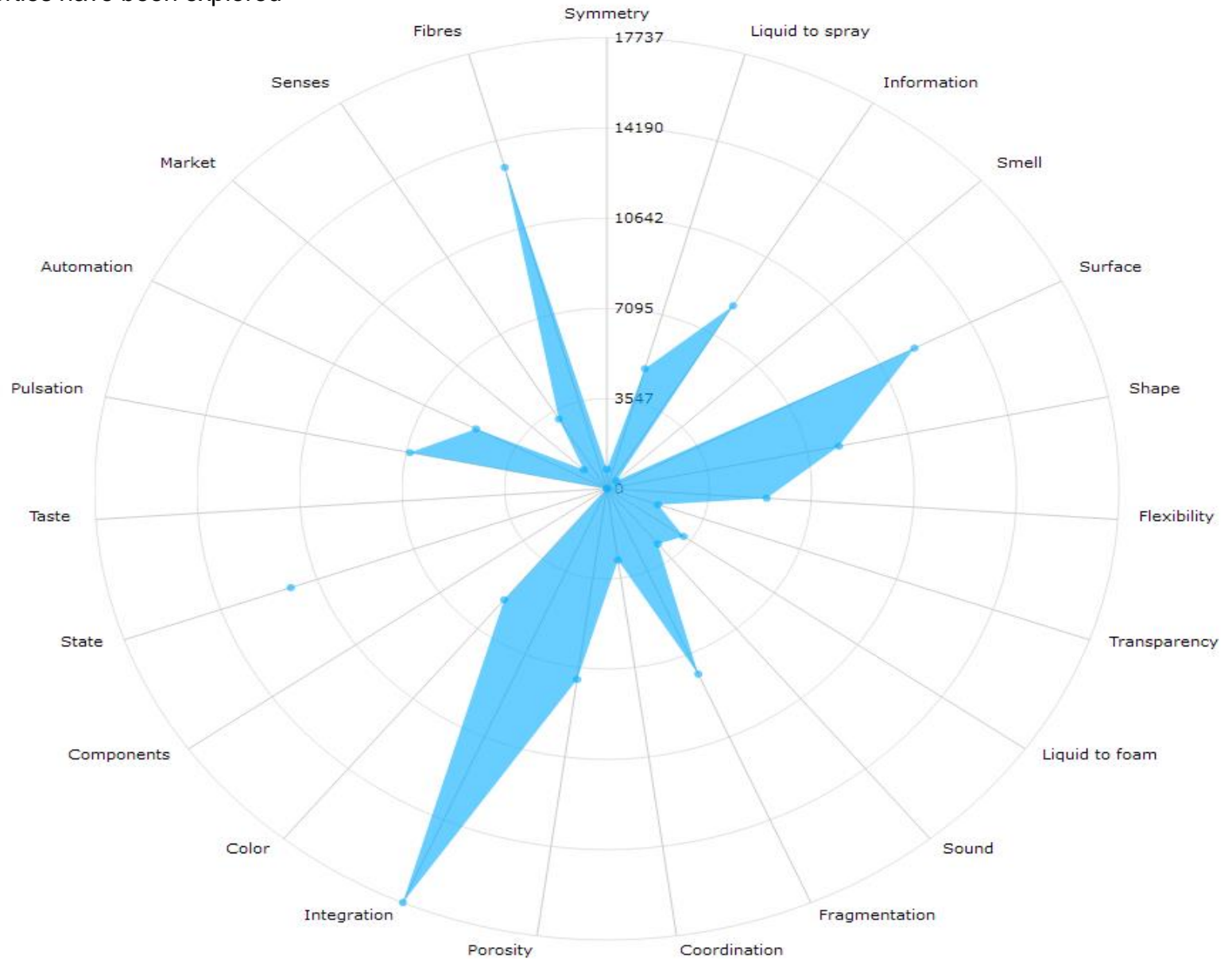


Which illumination units are used

# EVOLUTIONARY POTENTIAL

NANOFIBERS FT (25754 PATENTS)

Which properties have been explored





# SELF

NANOFIBERS FT (25754 PATENTS)

**auto** • autocatalytic • autofluorescence • autogenous • autograft • autografts

autograph • autoimmune • **autologous** • autonomous • autonomously • autopore • autosorb

**self** • self-align • self-aligned • self-assemble • self-assembled

self-assembles • self-assemblies • **self-assembling** • **self-assembly**

**self-cleaning** • self-complementary • self-contained • self-crosslinking • self-discharge

self-expanding • self-generated • **self-healing** • self-heating • self-improve • self-improvement

self-improving • self-limiting • self-lubricating • **self-made** • **self-organization** • self-organize

**self-organized** • self-organizing • self-powered • self-quenching • **self-renewal** • self-repair • self-repairing

self-standing • self-sterilizing • **self-supported** • **self-supporting**

What is done automatically or by itself?

# MODIFIER

NANOFIBERS FT (25754 PATENTS)

## Increase

concentration (463)  
conductivity (342)  
density (231)  
diameter (303)  
difficult (269)  
efficiency (359)  
efficient (262)  
electrical conductivity (226)  
**fiber (478)**  
layer (218)  
material (334)  
mechanical property (292)  
**nanofiber (498)**  
particle (312)  
performance (334)  
porosity (230)  
property (347)  
resistance (302)  
solution (238)  
stable (248)  
strength (326)  
**surface area (602)**  
**temperature (884)**  
time (277)  
water (395)

## Decrease

agent (385)  
atmosphere (141)  
**cost (328)**  
**diameter (407)**  
expensive (145)  
**fiber (393)**  
fiber diameter (188)  
impurity (186)  
**material (238)**  
**nanofiber (271)**  
need (177)  
**particle (313)**  
polymer (182)  
pore size (129)  
**pressure (434)**  
problem (147)  
production cost (141)  
**size (230)**  
substrate (128)  
**temperature (216)**  
thickness (145)  
time (176)  
viscosity (133)  
**water (354)**  
weight (132)

## Change or stabilize

agent (102)  
cell (44)  
conjugates (23)  
dispersion (31)  
electrode (49)  
fiber (47)  
gold nanoparticle (26)  
high voltage electrostatic  
potential (54)  
kv (31)  
nanofiber (45)  
**nanoparticle (74)**  
native qds (23)  
particle (51)  
ph (52)  
physical properties in the face  
(37)  
pressure (33)  
record of the results (23)  
shape (23)  
solution (25)  
steady growth (23)  
structural integrity (34)  
structure (32)  
substantial fiber efficiency without loss  
(25)  
**temperature (133)**  
triple-stranded complexes (23)

What is being increased, decreased or stabilised

# INCREASES VS APPLICANTS

NANOFIBERS FT (25754 PATENTS)



Who or what versus who or what

# DECREASES VS APPLICANTS

NANOFIBERS FT (25754 PATENTS)



Who or what versus who or what



# STABILIZES VS APPLICANTS

NANOFIBERS FT (25754 PATENTS)



Who or what versus who or what

# VALUE EQUATION

NANOFIBERS FT (25754 PATENTS)

$$\text{Value} = P - (H + I + C)$$

## Performance

cell  
concentration  
conjugates  
density  
dispersion  
electrode  
gold nanoparticle  
high voltage  
electrostatic potential  
kv  
layer  
mechanical  
property  
nanoparticle  
native qds  
particle  
performance  
ph  
physical properties in the  
face  
pore size  
record of the results  
resistance  
shape  
solution  
steady growth  
strength  
structural integrity  
structure  
surface area  
thickness  
triple-stranded complexes  
viscosity

## Harm

agent  
atmosphere  
bead-free  
defect-free  
eco-friendly  
environmental-friendly  
environmentally-  
friendly  
environment-  
friendly  
fiber  
fiber diameter  
free  
halogen-free  
label-free  
liquid-free  
metal-free  
moisture-free  
need  
needle-free  
nozzle-free  
oxygen-free  
pollution-free  
polymer  
polymer-free  
pressure  
problem  
serum-free  
solvent-free  
substantial fiber efficiency  
without loss  
substrate  
template-free

## Interface

auto  
autogenous  
autograft  
autografts  
autoimmune  
autologous  
conductivity  
easy to control  
easy to form  
easy to handle  
easy to implement  
easy to obtain  
easy to  
operate  
easy to produce  
easy to realize  
easy to use  
impurity  
porosity  
property  
self  
self-assemble  
self-  
assembled  
self-  
assembling  
self-  
assembly  
self-cleaning  
self-discharge  
self-healing  
self-supporting  
size  
weight

## Cost

cost  
efficiency  
efficient  
expensive  
production cost

What are the values mentioned in your patents

Thank you for your attention!

*doc. Ing. Petr Lepšík, Ph.D.*

*petr.lepsik@tul.cz*

