Engineering Databases on STN

Ursula Klemm – FIZ Karlsruhe

May 2009

Agenda

- Why searching non-patent literature (NPL)?
- Cluster searching on STN
- Going into details of the databases
- Search examples:
  - Automotive

Why searching Non-patent literature (NPL)

- Scientific Research
  - Pre-research background
    - state of the art, reviews
    - may not be patentable or patented, therefore not in the patent literature
  - Current awareness
  - Latest developments
- Patent related
    - prior art
    - potential licensees,
    - infringers
- Technological forecasting
- Competitor intelligence

Why searching Non-patent literature (NPL) (cont.)

- Resources are:
  - Journal articles
  - Books
  - On-going research at universities, theses
  - Publications within countries with low patent frequency
  - Research disclosure publications
  - Conference proceedings
  - Company reports
  - Grey literature
  - Open access sources (like internet)

Agenda

- Why searching non-patent literature (NPL)?
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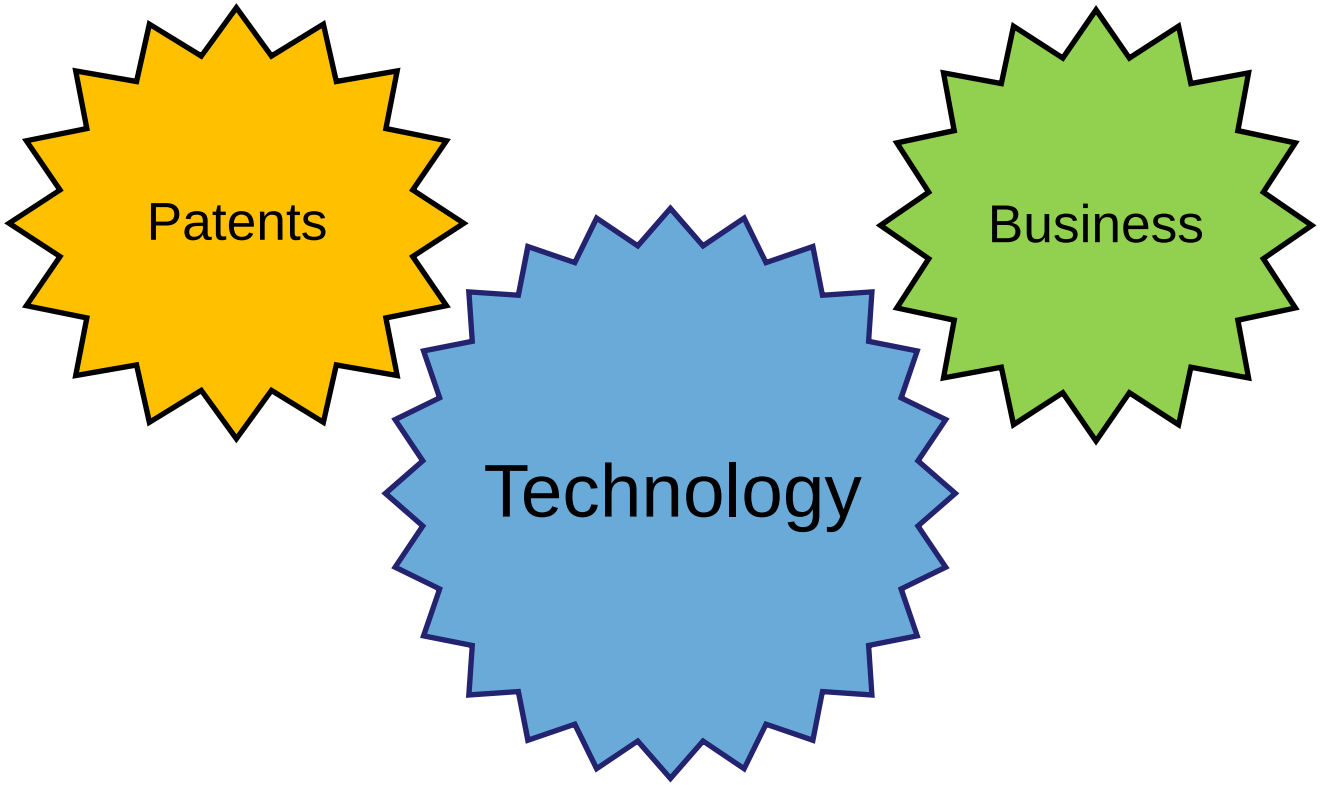
- Search examples:
  - Automotive

Database Cluster in Engineering and Materials

Name	Definition	No of Databases
AEROTECH	**Aerospace and Related Technology Cluster**	**21**
COMPUTER	Computer Science Cluster	19
CONSTRUCTION	Building and Construction Cluster	14
ELECTRICAL	**Electrical Engineering**	**25**
ENGINEERING	**Engineering and Technology Cluster**	**63**
ENVIRONMENT	Environment Cluster	58
FUELS	Energy Sources Cluster	29
GEOSCIENCE	Earth and Geo-sciences Cluster	25
MATERIALS	**Materials Science Cluster**	**45**
METALS	Metals Cluster	20
MOBILITY	**Mobility Engineering Cluster**	**05**
PETROLEUM	Petroleum Cluster	20
PHYSICS	Physics Cluster	17
POLYMERS	Polymer Science Cluster	23

Use HELP CLUSTER or DISPLAY CLUSTER to view more details. Or visit:
http://www.stn-international.com/clusters.html

ENGINEERING: composed of multiple database categories



ENGINEERING

63 databases:

1MOBILITY, 2MOBILITY, ABI-INFORM, AEROSPACE, ALUMINIUM, ANTE, APOLLIT, BIOENG, BIOTECHNO, CAPLUS, CEABA-VTB,CIN, **CIVILENG**, **COMPENDEX**, CONFSCI, COPPERLIT, CORROSION,DISSABS, **DKF**, ELCOM, **EMA**, ENCOMPLIT, ENCOMPLIT2, ENCOMPPAT, ENCOMPPAT2, ENERGY, ENVIROENG, EPFULL, FRFULL, GBFULL, GEOREF, HEALSAFE, IFIPAT, INIS, **INSPEC**, **INSPHYS**, ITRD, MDF, **MECHENG**, **METADEX**, NLDB, NTIS, OCEAN, **PASCAL**, PCTFULL, PIRA, POLLUAB, PROMT, RAPRA, RDISCLOSURE, SCISEARCH, TEMA, TRIBO, TULSA, TULSA2, USPATFULL, USPATOLD, USPAT2, WELDASEARCH, WPIDS, WPIFV, WPINDEX, WSCA

Database presented

Agenda

- Why searching non-patent literature (NPL)?
- Cluster searching on STN
- Going into details of the databases of your choice:
  - INSPEC, INSPYS, COMPENDEX, METADEX, EMA, CIVILENG, MECHNEG, DKF, MOBILITY, PASCAL
  - Value add and special STN features
  - Search example using thesaurus functionality
- Search examples

What Is Inspec?

- Multidisciplinary Database
  - –Physics
  - –Electrical & Electronics Engineering
  - –Computing & Control Engineering
  - –Information Technology
  - –Manufacturing, Production & Mechanical Engineering New 2004, 2005
- Wide range of cross-disciplinary topics

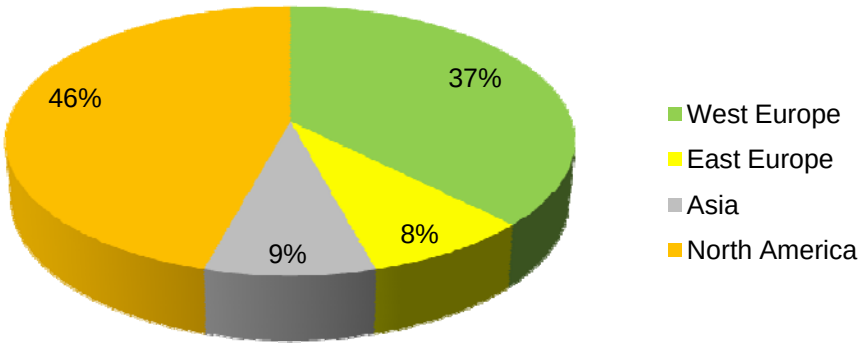
Inspec Database

- Over 10.5 million records (March 2009)
  - Over 640,000 added in 2008. 700,000 to be added in 2009
  - 93 countries covered
- 1969 to date
  - Optional Archive extends coverage back to 1898 and adds 873,699 records
- Over 4,000 journals and 3,000 other publications
  - Includes over 140 Open Access Journals
- Full text linking via DOIs
  - Up to 60% of current records
- Added Value Fields
  - Diverse indexing with thesaurus functionality
  - Element Terms
  - Enhanced titles

STN option:
FILE INSPEC
includes all data from 1898 onwards.
FILE 69INSPEC
contains data from 1969 onwards.

Countries covered

93 countries covered

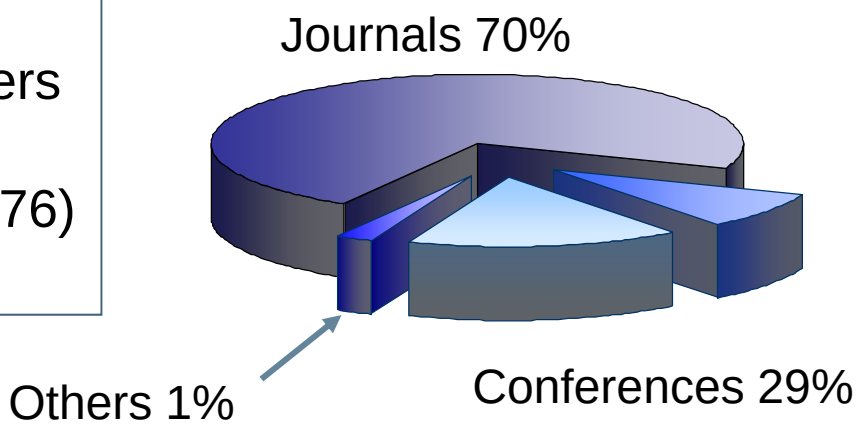


Document Types

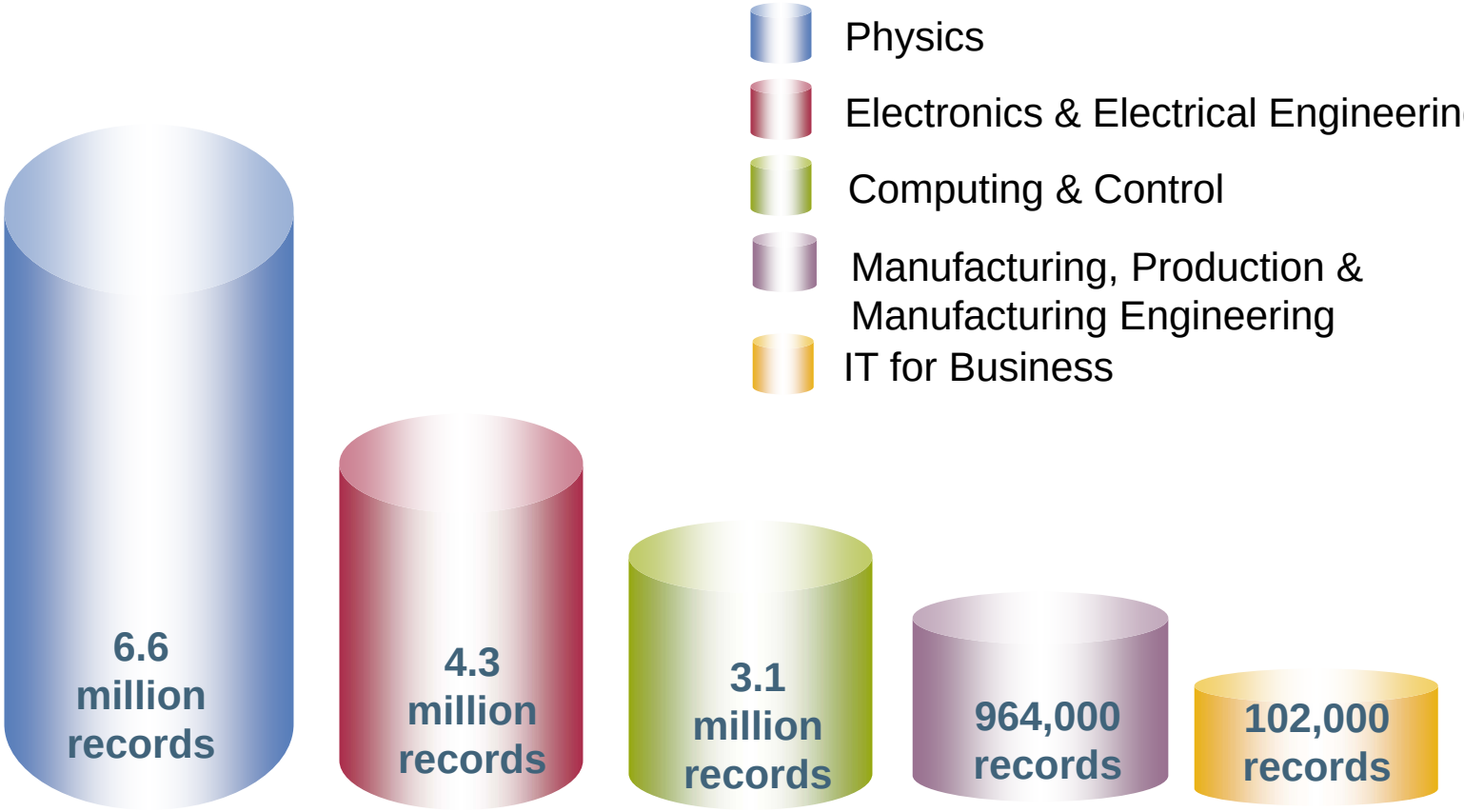
- Journal articles 70 %
- Conference proceedings 20 %
- Conference papers in Journals 9 %
- Others 1%

} 29 %

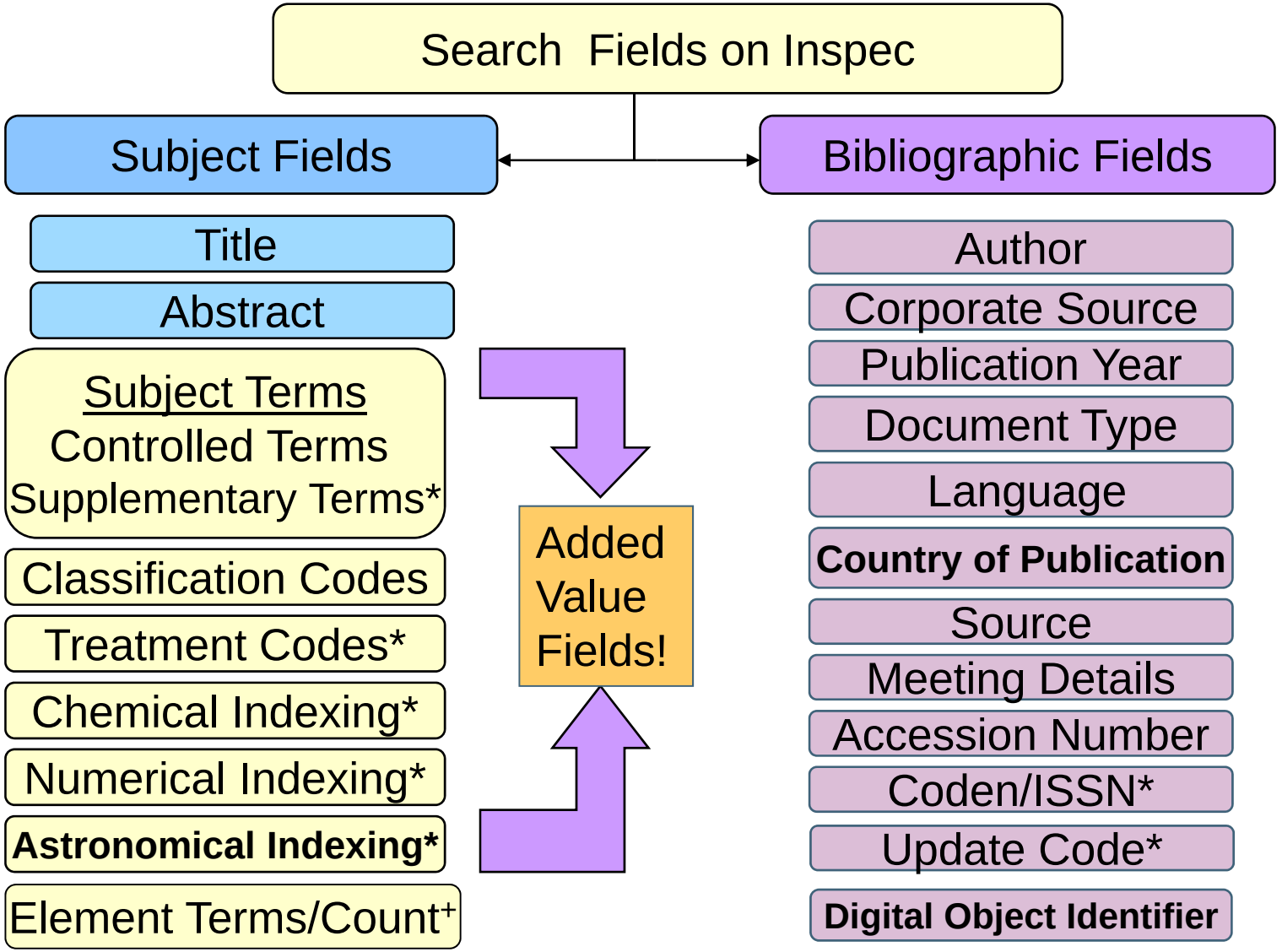
Others include:
- Books/Book Chapters
- Reports
- Patents (1968/9-1976)
- Dissertations



Inspec Database Subjects



Figures correct for 1898 to August 2006.



*These fields are not present within Inspec Archive Records, 1898 to 1968.

+STN features

Extended Title Examples

Didahdidit dit didah didahdit dahdit dah didididit dit dahdidahdit dahdahdah dahdidit dit! [Morse code program]

Soft targets [Internet security]

New service or bust? [broadband revenue]

Knowledge is power [bank enterprise content management]

A love/hate relationship [Google search engine]

Inspec Sample Record

L1 ANSWER 2 OF 23 INSPEC (C) 2009 IET on STN
AN 2008:10320431 INSPEC
TI Knowledge is power [nuclear power plant]
AU Gauthier, B.
SO InTech (Oct. 2008), vol.55, no.10, p. 46-8, 50, 52, 0 refs.
CODEN: INTCDD, ISSN: 0192-303X
Published by: Instrument Society of America, USA
DT Journal
TC Practical
CY United States
LA English
AB Nuclear plants use online monitoring for critical machinery. Electricite De France (EDF) has been operating electrical power plants in France to increase the safety and availability of traditional and nuclear power plants. The company installed monitoring systems on primary circuits and turbo-generators of nuclear power plants to detect and investigate possible incidents. EDF has thus acquired a large knowledge base describing the behavior of the main elements of a nuclear power plant: reactor coolant pumps, turbines, generators, inlet valves, internal structures, and reactors. One specific advantage of the system is its capacity to monitor a fleet of nuclear power plants. It provides a maintenance knowledge database that can compare equipment behavior in different nuclear power plants and support feedback loop applied to the fleet. This is especially important for aging plants in managing equipment related to the extended lifetime of nuclear installations. User-friendly analysis tools and user interface help facilitate the work of maintenance operators and remote experts. In addition to generic graphic tools adapted to vibration monitoring, the system provides dedicated tools for critical equipment monitoring in a nuclear power plant.
CC A2843F Fission reactor maintenance and outages; B8220B Nuclear reactors; B0160 Plant engineering, maintenance and safety; B7210B Computerised instrumentation; B8300 Power apparatus and electric machines; C7410B Power engineering computing; C7410H Computerised instrumentation; C6180 User interfaces; C6160 Database management systems (DBMS)
CT computerised monitoring; condition monitoring; database management systems; maintenance engineering; nuclear power stations; nuclear reactor maintenance; power apparatus; user interfaces
ST electrical power plant; nuclear power plant; equipment monitoring system; turbo-generator; large knowledge base acquisition; reactor coolant pump; inlet valve; turbine; user-friendly analysis tool; user interface; generic graphic tool

Extended title

Bibliographic information

English language abstract taken from original document if suitable. If necessary, abstract will be produced by Inspec.

Value-added indexing from Inspec and STN

Insphys Database

Additional File: INSPEC PHYS

- –Supplementary backfile database
- –Closed file 1979 to 1994
- – 613, 260 records that are not in Inspec

- **Coverage**: Worldwide literature on all fields of:
  - –Physics
  - –Astronomy
  - –Astrophysics and related area

- **Special emphasis:**
  - –Non-conventional literature
  - –East European literature

Contains only those records which are no included in INSPEC: Use both files for the mentioned coverage!!

What Is Compendex?

- Engineering Database, covers all engineering disciplines:
  - Chemical
  - Computing
  - Electrical
  - Civil
  - Mechanical

Compendex Database

- Over 8,8 million records (March 2009)
  - Over 650,000 records added annually (weekly with about 12,000 citations)
- 1969 to date
- Over 5,600 journals, books, reports, conference contributions and other non-conventional literature
  - Publications from over 55 countries
- Engineering Index Thesaurus (English / German edition)

Database has been reloaded and enhanced in Feb. 2009

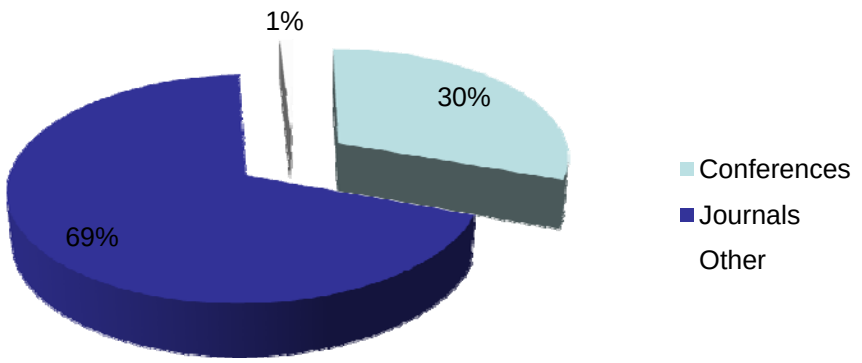
Document Types

- Journal articles 69 %
- Conference proceedings
- Conference papers in Journals

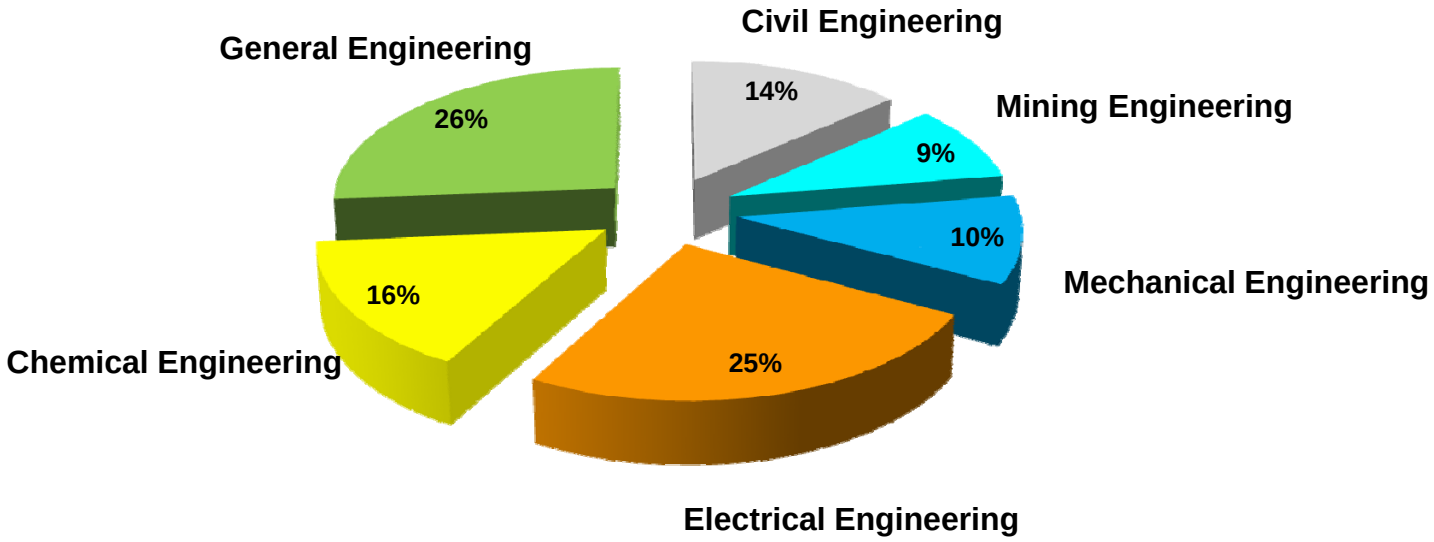
} 30 %

- Others 1%

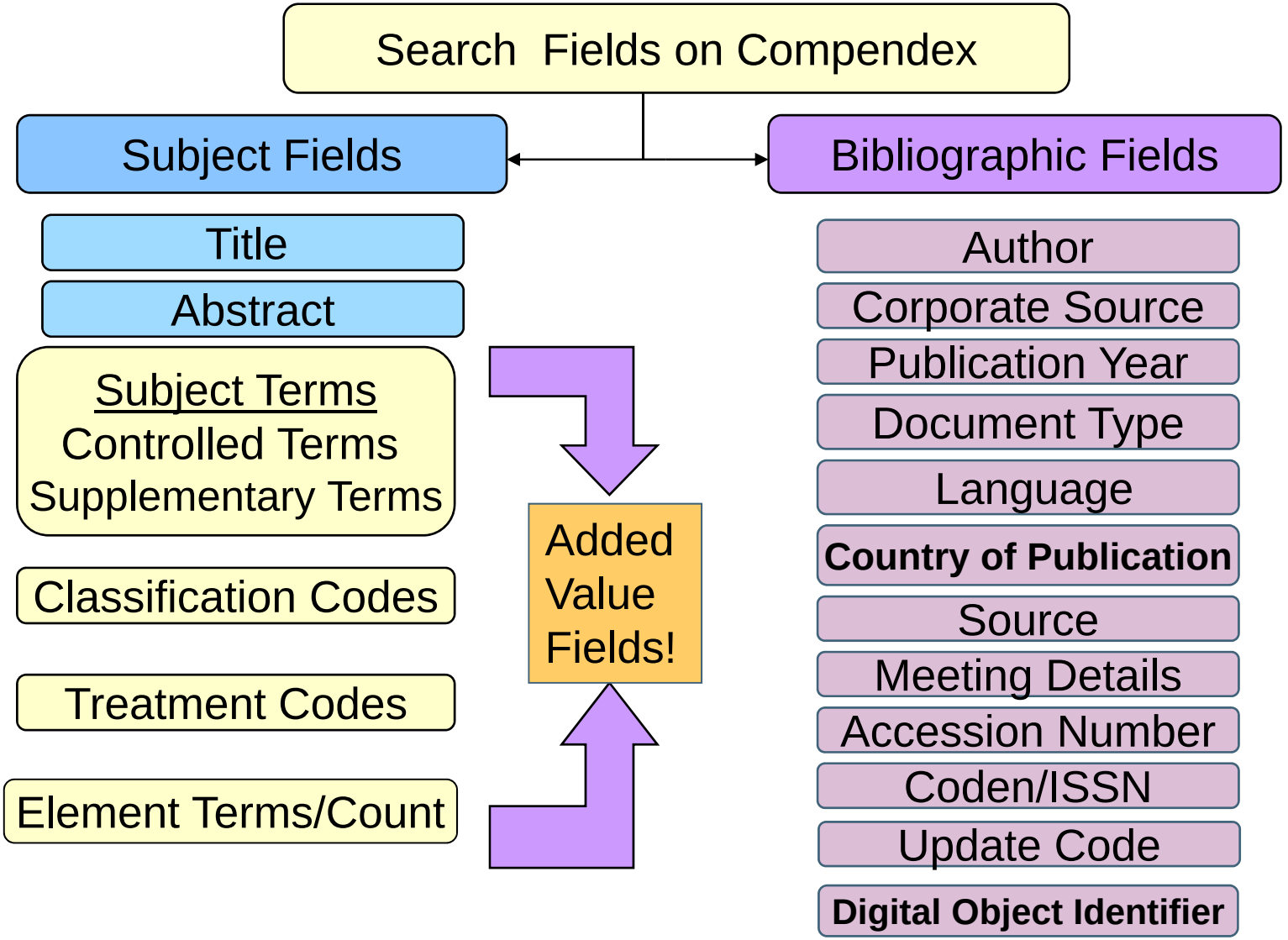
Others include:
- Books/Book Chapters
- Reports



Compendex Subject Coverage



March 2009


Search Fields on Compendex
Subject Fields
Bibliographic Fields
Title
Abstract
Subject Terms
Controlled Terms
Supplementary Terms
Classification Codes
Treatment Codes
Element Terms/Count
Added Value Fields!
Author
Corporate Source
Publication Year
Document Type
Language
Country of Publication
Source
Meeting Details
Accession Number
Coden/ISSN
Update Code
Digital Object Identifier

Compendex Sample Record

```
L5      ANSWER 1 OF 3938 COMPENDEX COPYRIGHT 2009 EEI on STN  Full-text
AN      2007-4710935419   COMPENDEX
TI      An overview of positive-electrode materials for advanced lithium-ion
        batteries
AU      Ohzuku Tsutomu; Brodd Ralph J.
CS      Ohzuku Tsutomu (Department of Applied Chemistry, Graduate School of
        Engineering, Osaka City University (OCU), Sugimoto 3-3-138, Sumiyoshi,
        Osaka, 558-8585 (JP)); Brodd Ralph J. (Broddarp of Nevada, Inc., 2161
        Fountain Springs Dr, Henderson, NV 89074 (US))
        EMAIL: ohzuku@a-chem.eng.osaka-cu.ac.jp
SO      Journal of Power Sources11tn International Meeting on Lithium Batteries
        (6 Dec 2007) Volume 174, Number 2, pp. 449-456, 81 refs.
        CODEN: JPSODZ  ISSN: 0378-7753
        DOI: 10.1016/j.jpowsour.2007.06.154
        Published by: Elsevier
PUI     S037877530701289X
CY      Netherlands
DT      Journal; Article; (Literature Review, Bibliography); Theoretical
LA      English
SL      English
ED      Entered STN: 4 Jan 2009
        Last updated on STN: 4 Jan 2009
AB      Positive-electrode materials for lithium and lithium-ion batteries
        are briefly reviewed in chronological order. Emphasis is given to
        lithium insertion materials and their background relating to the "birth"
        of lithium-ion battery. Current lithium-ion batteries
        consisting of LiCoO2 and graphite are approaching a critical limit in
        energy densities, and new innovating materials are needed in order to
        continue the advance of lithium-ion batteries. In particular, the
        recent trends on material researches for advanced lithium-ion
        batteries, such as layered lithium manganese oxides, lithium
        transition metal phosphates, and lithium nickel manganese oxides with or
        without cobalt, are described. Trials on new applications of lithium
        insertion materials for high-power lithium-ion batteries as well
        as hybrid capacitors leading for 12 V lead-free accumulators are also
        highlighted. .COPYRGT. 2007 Elsevier B.V. All rights reserved.
CC      702.1.1 Primary Batteries; 704.1 Electric Components; 804.1 Organic
        Compounds; 804.2 Inorganic Compounds
CT      *Cathodes; Capacitors; Lithium batteries; Lithium compounds; Phosphates
ST      Energy densities; Lithium insertion materials; Lithium ion batteries;
        Lithium nickel manganese oxides
ET      Co*Li*O; Co sy 3; sy 3; Li sy 3; O sy 3; LiCoO; Li cp; cp; Co cp; O cp
```

Bibliographic information

Full-text delivery via direct Chemport link to the publisher!

Value-added indexing from Elsevier and STN

Journal of Power Sources
Volume 174, Issue 2, 6 December 2007, Pages 449-456
13th International Meeting on Lithium Batteries

doi:10.1016/j.jpowsour.2007.06.154
Cite or Link Using DOI

An overview of positive-electrode materials for advanced lithium-ion batteries

Tsutomu Ohzuku[a], , and Ralph J. Brodd[b]

[a]Department of Applied Chemistry, Graduate School of Engineering, Osaka City University (OCU), Sugimoto 3-3-138, Sumiyoshi, Osaka 558-8585, Japan

[b]Broddarp of Nevada, Inc., 2161 Fountain Springs Dr., Henderson, NV 89074, USA

Available online 28 June 2007.

Abstract

Positive-electrode materials for lithium and lithium-ion batteries are briefly reviewed in chronological order. Emphasis is given to lithium insertion materials and their background relating to the "birth" of lithium-ion battery. Current lithium-ion batteries consisting of $LiCoO_2$ and graphite are approaching a critical limit in energy densities, and new innovating materials are needed in order to continue the advance of lithium-ion batteries. In particular, the recent trends on material researches for advanced lithium-ion batteries, such as layered lithium manganese oxides, lithium transition metal phosphates, and lithium nickel manganese oxides with or without cobalt, are described. Trials on new applications of lithium insertion materials for high-power lithium-ion batteries as well as hybrid capacitors leading for 12 V lead-free accumulators are also highlighted.

CSA on STN

Lifescience

- Aqualine
- Aquascience
- Bioeng
- Healthafe
- Lifescience
- Lisa
- Ocean
- Polluab
- Confscience

Technology

Materials	High Tech	Engineering
Aluminium	Ante	**Civileng**
Cerab	Aerospace	Environeng
Corrosion	Compuab	**Mecheng**
Copperlit	Elcom	
Ema		
Matbus		
Metadex		

Producer: ProQuest

Benefits: Indexed by a common list of controlled vocabulary

Author e-mails, published URLs

What Is Metadex?

- The only comprehensive source for
  - –Metalls
  - –Alloys

Properties
Manufacturing
Applications
Development

- Subject coverage:

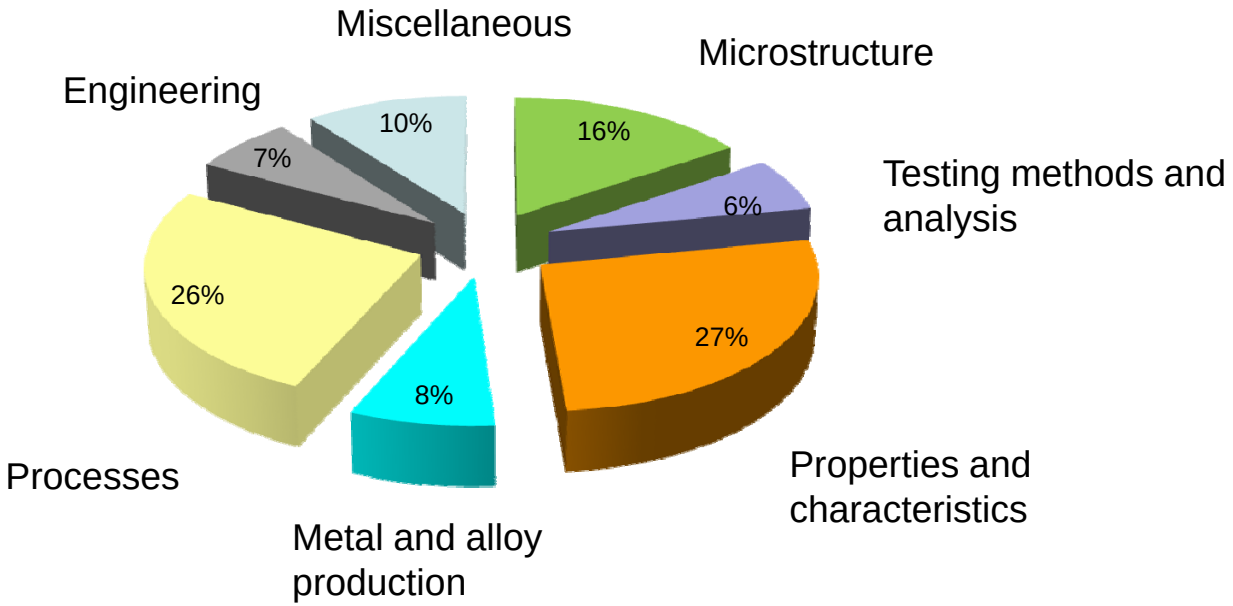
Steel
Microstructure
Strength
Refining
Casting
Coatings
Heat Treatment
Metal Matrix Composites

Nonferrous metals
Corrosion
Extracting and Smelting
Blast Furnaces
Machining
Welding
Testing and Analysis
Environmental and Safety Issues

Metadex Database

- Over 2,06 million records (Jan 2009)
  - Updated montly with about 3,500 citations
- 1966 to date
- Journals, conference contributions, books, reports, and other non-conventional literature
- Speciality: Alloy Indexing Thesaurus
- **Companion files:**
  - EMA: Engineering materials
  - MATBUS: techno-commercial developments in metals and materials
  - MDF: numeric data on ferrous and non-ferrous alloys

Metadex Subject Coverage



March 2009

Metadex Sample Record

```
L8   ANSWER 1 OF 7  METADEX  COPYRIGHT 2009 CSA on STN  Full-text
AN   2005(10):34-24499  METADEX
TI   Electroless Cu-plated Ni3Sn4 alloy used as anode material for lithium
     ion battery.
AU   Cheng, Xin-Qun (Department of Applied Chemistry, Harbin Institute of
     Technology, Harbin 150001, PR China ); Shi, Peng-Fei
     mailto: chengxq@hit.edu.cn
SO   Journal of Alloys and Compounds (20050405), volume 391, 1-2, pp. 241-244,
     Diffraction Patterns, Photomicrographs, Graphs
     Published by: Elsevier Science SA, P.O. Box 564, Lausanne 1, CH-1001, URL:
     http://www.elsevier.com. 20050405
     ISSN: 0925-8388
DT   Journal
CY   Switzerland
LA   English
AB   The rechargeable Li-ion battery is an important energy source for many
     portable appliations. Carbon materials are currently used as anode
     materials, with a theoretical capacity of 372 mAh/g. The need for smaller
     and lighter products demands larger catacities, and that promotes the
     search for new materials. Sn-based alloys are a new kind of anode material
     for lithium ion battery because of their high specific capacity.
     Ni3Sn4 alloy was prepared by high-energy ball-milling and was electroless
     plated with copper to form a composite. The powder X-ray diffraction (XRD)
     pattern showed that the ball-milled alloy was composed of Ni3Sn4 and a
     small amount of SnO and Ni. Scanning electron microscope (SEM) observation
     showed that Cu electroless-plated on the surface of Ni3Sn4 alloy were
     particles. The electrochemical performance of Cu-plated alloy was superior
     to that of ball-milled one. Due to the formation of solid electrolyte
     interphase (SEI) and the reduction of the oxide, the coulombic efficiency
     was 46% for the first cycle. But the efficiency keep over 99% in the
     following 100 cycles, and the specific capacity was stable. The Cu-plated
     Ni3Sn4 alloy will be a promising anode material for lithium ion battery.
CC   34 Chemical and Electrochemical Properties
CT   Lithium batteries; Electrode materials; Anodes; Intermetallics; Nickel
     compounds; Stannides; Electroless copper plating; Surface structure;
     Efficiency; Electrochemistry; COPPER (PURE); ELECTROLESS PLATING; NICKEL
     ALLOYS (50 TO 99 NI); BATTERIES;
ALI  Ni sub 3 Sn sub 4
CCA  CPD  Intermetallic compounds
ET   Li; Sn; Ni*Sn; Ni sy 2; sy 2; Sn sy 2; Ni3Sn; Ni cp; cp; Sn cp; O*Sn; SnO;
     O cp; Ni; Cu; Cu; Ni*Sn; Ni sy 2; sy 2; Sn sy 2; Ni3Sn; Ni cp; cp; Sn cp;
     Ni; Sn
```

Bibliographic information

Value-added indexing from CSA and STN including alloy indexing and element terms.

Engineering databases: Overview

INSPEC	COMPENDEX	METADEX
• Physics • Electrical & electronic engin. • Computing & control engin. • Information technology • Manufacturing, production & mechanical engineering	• Chemical engineering • Computing • Electrical engineering •Mechanical engineering •Civil engineering	• Metalls & alloys: –Properties –Manufacturing –Applications –Development
• Journals • Grey literature, dissertations • Reports, books, standards • Conference proceedings	• Journals • Reviews, books, reports • Conference proceedings	• Journals, conference reports • Reports, books, patents • Conference proceedings
• Classification codes • Controlled terms, words •Supplementary terms • Chemical index, phys. prop. • Element terms • Thesauri (CT, PHP)	• Classification codes • Controlled terms, words • Supplementary terms • Element terms • Thesauri (CT, CTDE)	• Classification codes • Controlled terms, words • Alloy index • Element Terms

Engineering databases: Overview(2)

EMA	MECHENG	CIVILENG
• Development, processing, production of : –Ceramic materials –Composit materials –Polymeric materials •For engineering users	• Mechanical & transportation engineering: – Aircraft –Automotive –Robots u.a.	• Civil engineering: –Buildings –Highways & roads –Railways & mass transit –Water ways u.a.
• Journals • Reports, books, dissertations • patents • Conference proceedings	• Journals • Reports • books • Conference proceedings	•Journals • Reports • books • Conference proceedings
• Classification codes • Controlled terms • Element terms	• Classification codes • Controlled terms	• Classification Codes • Controlled Terms

Engineering databases: Overview(3)

DKF	1MOBILITY	PASCAL
• Motor vehicle design • Construction • Manufacturing	• Technology for self-propelled vehicles for: –Land –Sea –Air –Space	• Medical, Pharmaceutical and Psychological Sciences •Life Sciences, Biology •Engineering Sciences •Physics and Mathematics •Earth and Space •Chemical Sciences
•Grey literature >50% •Journals, • Reports, dissertations • Conference proceedings	• Journals, • Books • Conference proceedings	•Journal articles •Conference proceedings •Dissertations, books •Reports
• Classification codes • Controlled Terms • Supplementary Terms	• Controlled terms • Supplementary terms	•Classification codes • Controlled terms •CT and CC in EN, FR, DE, ES

Agenda

- Why searching non-patent literature (NPL)?
- Cluster searching on STN
- Going into details of the databases:
  - INSPEC, INSPYS, COMPENDEX, METADEX, EMA, CIVILENG, MECHENG, DKF, MOBILITY, PASCAL
  - Value add and special STN features
  - Search example using thesaurus functionality
- Search examples

Multiple STN search tools allow enhanced precision in engineering queries

- **Controlled terminology thesauri**
  - –INSPEC Thesaurus, EI Thesaurus, (CA Lexicon)
- **Numeric property searching**
  - –Preferred unit systems, Physical Property Thesaurus
- **Chemical Indexing**
  - –INSPEC Chemical Indexing, **Element Terms**, (CAS REGISTRY)
- **Alloy Indexing**
  - –METADEX Alloy Indexing and Alloy Classification

Multiple STN search tools allow enhanced precision in engineering queries (cont.)

- **Special content fields**
  - –Controlled terms and supplementary terms
  - –Classification codes and treatment codes

- **Left and right hand truncation**

- **(T) proximity search**

- **SET spellings, SET plurals, SET abbreviations**

- **Crossfile / multifile search strategies**

Search example using special content fields

Search Question:
What research has recently been reported on developments of organic light emitting diodes (OLED) for display devices?

Evaluating the variety of controlled and non-preferred terms across multiple databases opens up possibilites for additional free-text search terms.

Identify OLED terms in INSPEC

- Sometimes it's easy to locate terms in a thesaurus – as long as there are associated terms present.

```
=> FIL INSPEC; E OLED/CT
E#   FREQUENCY     AT      TERM
--   ---------     --      ----
E1           0      1      OLDROYD/CT
E2           0      2      OLDROYD FLUIDS/CT
E3           0      2  --> OLED/CT
E4           0      2      OLFACTION/CT
E5           0      2      OLIGOMERS/CT

=> E E3+ALL
E13          0    -->  OLED/CT
E14       4913     USE  organic light emitting diodes/CT
********** END **********
```

Identify OLED terms in INSPEC (cont.)

```
=> E E14+ALL
E15          467   BT3  emission/CT
E16         1580    BT2  light emitting devices/CT
E17         5866    BT2  optoelectronic devices/CT
E18         2596   BT3  diodes/CT
E19        10683   BT3  semiconductor devices/CT
E20        12476    BT2  semiconductor diodes/CT
E21        17232     BT1  light emitting diodes/CT
E22         4913      -->  organic light emitting diodes/CT
                       DA   January 2003
E23            0       UF   OLED/CT
E24            0       UF   polymer LED/CT
E25         1277       RT   LED displays/CT
E26        18172       RT   conducting polymers/CT
E27        14673       RT   electroluminescence/CT
E28           13       RT   flexible displays/CT
E29          564       RT   flexible electronics/CT
E30         3062       RT   molecular electronics/CT
E31       265191       RT   organic compounds/CT
E32        13811       RT   organic semiconductors/CT
E33        17232       PT   light emitting diodes/CT
E34        21948       CC   B4260D/CT
E35        23140       CC   B7260/CT
E36        14453       CC   E1780/CT
E37        20353       CC   E3644N/CT
********** END **********
```

BT= Broader terms
DA= Date of introduction of descriptor
UF= Allowed property name
RT= Related terms

Related classifications

Classifications in INSPEC

```
=> E B4260D/CC
E1         6645      B4260/CC
E2         6645      B4260 ELECTROLUMINESCENT DEVICES/CC
E3        21948 --> B4260D/CC
E4        21948      B4260D LIGHT EMITTING DIODES/CC

=> E E1780/CC
E13       65235      E1710/CC
E14       65235      E1710 ENGINEERING MATERIALS/CC
E15       14453 --> E1780/CC
E16       14453      E1780 PRODUCTS AND COMMODITIES/CC

=> E E3644N/CC
E25         496      E3644L/CC
E26         496      E3644L COMMUNICATIONS EQUIPMENT MANUFACTURING/CC
E27       20353 --> E3644N/CC
E28       20353      E3644N OPTOELECTRONICS MANUFACTURING/CC
```

Identify OLED terms in COMPENDEX

- Other times it requires more patience, or relying on terms derived from other databases

```
=> FIL COMPENDEX; E OLED/CT 5
E#   FREQUENCY    AT TLANG   TERM
--   ---------    -- -----   ----
E38         17               OLE/CT
E39          2               OLECULAR STRUCTURE/CT
E40          0           --> OLED/CT
E41          1               OLEFIN/CT
E42          1               OLEFIN HYDROGENATION/CT

=> E ORGANIC LED/CT 5
E#   FREQUENCY    AT TLANG   TERM
--   ---------    -- -----   ----
E43          1               ORGANIC IODINE/CT
E44         78    15  EN     ORGANIC ION EXCHANGERS/CT
E45          0           --> ORGANIC LED/CT
E46       2448               ORGANIC LIGHT EMITTING DIODES (OLED)/CT
E47          1               ORGANIC LIQUID LASERS/CT
```

Identify OLED terms in COMPENDEX(cont.)

```
=> E LIGHT EMITTING DIODES/CT 5
E#   FREQUENCY    AT TLANG   TERM
--   ---------    -- -----   ----
E48          1               LIGHT EMISSION DETECTION/CT
E49          1               LIGHT EMITTING/CT
E50      21808    44  EN --> LIGHT EMITTING DIODES/CT
E51          1               LIGHT EMITTING TUBES/CT
E52          1               LIGHT EMMITTING DIODES/CT

=> E E50+ALL
. . .
E81      12384        BT1  EN Semiconductor diodes/CT
E82          0             DE Halbleiterdioden/CT
E83      21808         -->  EN Light emitting diodes/CT
E84          0             DE Leuchtdioden/CT
                     DA   EN January 1993
                          DE Januar 1993
E85         14           UF   EN LED/CT
E86         14                DE LED/CT
E87          0           UF   EN Semiconductor diode light emitters/CT
E88          0                DE Halbleiterleuchtdioden/CT
E89       2317           OLD  EN Semiconductor diodes, Light emitting/CT
E90          0                DE Halbleiterdioden, Lumineszenz-/CT
E91      15108           RT   EN Display devices/CT
E92          0                DE Anzeigegeraete/CT
E93       6129           RT   EN Integrated optoelectronics/CT
E94          0                DE integrierte Optoelektronik/CT
E95          0           CC   EN 714.2/CT
E96          0           CC   EN 741.1/CT
```

BT= Broader terms
DA= Date of introduction of descriptor
UF= Allowed property name
RT= Related terms
OLD= Old term
Terms in English and German

Related classifications

Combine identified terms into a single search statement


```
=> FIL INSPEC COMPENDEX

=> S (OLED OR (ORGAN?(A)(LIGHT?(W)EMIT? OR LED OR ELECTROLUM?)))/ST,CW
L1        6808 FILE INSPEC
L2        5593 FILE COMPENDEX

TOTAL FOR ALL FILES
L3       12401 (OLED OR (ORGAN?(A)(LIGHT?(W) EMIT? OR LED OR ELECTROLUM?)))/ST,
               CW

=> S L3 OR E14
L4        6808 FILE INSPEC
L5        5593 FILE COMPENDEX

TOTAL FOR ALL FILES
L6       12401 L3 OR "ORGANIC LIGHT EMITTING DIODES"/CT

=> S L6 AND PY>=2008
L7         993 FILE INSPEC
L8        1387 FILE COMPENDEX

TOTAL FOR ALL FILES
L9        2380 L6 AND PY>=2008
```

Use SET MSPEPS ON to get individual file results

To increase precision, we will limit to cases indexed in the Supplementary Terms and / or Controlled Words. Use Controlled Words (/CW) field to capture all variations.

Supplementary Terms (/ST)

(aka Free Term Indexing, Identifiers or Uncontrolled Indexing)

- Single words or phrases from title & abstract (or from full article text) to show **all significant concepts** of document.
- Includes
  - inorganic formulae
  - organic compound names
  - acronyms or full names
  - manufacturer/brand names
  - British & US English
- Benefit
  - Index for new technologies, etc that do not yet have a Thesaurus entry.

Consider further refinement of terms or removal of duplicate references


```
=> DUP REM L9
PROCESSING IS APPROXIMATELY  18% COMPLETE FOR L9
PROCESSING IS APPROXIMATELY  37% COMPLETE FOR L9
PROCESSING COMPLETED FOR L9
L10        1857 DUP REM L9 (523 DUPLICATES REMOVED)
                ANSWERS '1-993' FROM FILE INSPEC
                ANSWERS '994-1857' FROM FILE COMPENDEX

=> SORT L10 1-993 OCC
PROCESSING COMPLETED FOR L10
L11         993 SORT L10 1-993 OCC

=> D OCC
L11   ANSWER 1 OF 993  INSPEC  (C) 2009 IET on STN
      FORMAT           COUNT
      PY               1
      CT               4
      ST               7

=> D L10 OCC
L10   ANSWER 1 OF 1857  INSPEC  (C) 2009 IET on STN    DUPLICATE 1
      FORMAT           COUNT
      PY               1
      CT               4
```

Use SET DUPORDER FILE to get individual file results

You may SORT the individual answer sets by occurrence count of hit terms or other fields and re-use the L-number for further refinement in the individual file.

Display results

```
=> D L11 ALL

L11   ANSWER 1 OF 993  INSPEC  (C) 2009 IET on STN
AN    2009:10435910  INSPEC  Full-text
TI    Organic Light Emitting Materials and Devices XII
SO    Proceedings of the SPIE - The International Society for Optical
      Engineering (2008), vol.7051
      CODEN: PSISDG, ISSN: 0277-786X
      Published by: SPIE - The International Society for Optical Engineering,
      USA
      Conference: Organic Light Emitting Materials and Devices XII, San Diego,
      CA, USA, 10 Aug. 2008
DT    Conference; Conference Proceeding; Journal
CY    United States
LA    English
AB    The following topics are dealt with: organic light emitting materials and devices;
processing; degradation; device physics; displays; interfaces; transport; OLED; solid
state lighting; charge injection; solar cells; and organic lasers.
CC    A0130C Conference proceedings; A4270J Optical polymers and other organic
      optical materials; A4272 Optical sources and standards; A4255R Lasing
      action in other solids; A8630J Photoelectric conversion; solar cells and
      arrays; B0100 General electrical engineering topics; B4260D Light
      emitting diodes; B7260 Display technology; B4320G Solid lasers; B4110
      Optical materials; B8530B Light sources; B8420 Solar cells and arrays
CT    charge injection; LED displays; light sources; optical materials; organic
      compounds; organic light emitting diodes; solar cells; solid lasers
ST    organic light emitting materials; organic light emitting
      devices; degradation; device physics; displays; interfaces; charge
      injection; transport; OLED; solid state lighting; solar cells; organic
      lasers
```

Search example using special content fields (2)

Search Question:

What research has been reporting on development of organic light emitting diodes (OLED) for display devices using laser deposition in the 345-360 nm range?

We will leverage the physical properties thesaurus and numeric indexing in INSPEC.

Identify physical properties in /PHP

```
=> FIL INSPEC

=> E WAVELENGTH/PHP 5
E#   FREQUENCY    AT     TERM
--   ---------    --     ----
E97          0     2     WATT/PHP
E98          0     2     WAVE NUMBER/PHP
E99     204345     3 --> WAVELENGTH/PHP
E100         0     2     WB/M**2/PHP
E101         0     2     WEBERS PER SQUARE METRE/PHP

=> E E99+ALL
E102    204345   -->  WAVELENGTH/PHP
                      FQS  /WVL
                      INSPEC UNIT M (METRE)
                      CGS UNIT CM
                      ENG UNIT NM
                      FPS UNIT FT
                      MKS UNIT M
                      SI UNIT M
                      STN UNIT NM
E103         0     UF   KAYSER/PHP
E104         0     UF   WAVE NUMBER/PHP
********** END **********
```

EXPAND in the Physical Properties (/PHP) Thesaurus.

Use /PHP to determine preferred and alternate unit systems, as well as associated units.

STN unit systems can be customized to your preference

- CGS – The centimeter-gram-second system
- ENG – Customary U.S. engineering units
- FPS – The foot-pound-second system
- MKS – The meter-kilogram-second system
- SI – Systeme Internationale (International System), based on the MKS system
- STN – Customary units based on the SI system

Use SET UNITS ALL=MKS to convert all units to meter-kilogram-second system
.

Possibility to customize individual units of measure on STN

- STN accepts conventional numbers (e.g., 100), floating point and exponential notation (e.g., 1.0E+20)

```
=> S 3.45E-07-3.60E-07/WVL
L13      25542 3.45E-07 M - 3.60E-07 M /WVL

=> D UNIT WVL
WVL                DEFAULT:    M
WVL                CURRENT:    M

=> SET UNIT WVL=NM
SET COMMAND COMPLETED

=> S 345-360/WVL
L14      25542 345 NM - 360 NM /WVL

=> S L11 AND L14
L15         993 S L11
L16           7 L15 AND L14
```

Use HELP SET UNIT and HELP DISPLAY UNIT for more information.

Use SET UNITS ALL= to return to default unit system.

Combine search query with property restriction.

Display results

AN 2009:10471231 INSPEC
TI Effects of diamond-like carbon in TPD-Alq3 doped PVK organic light-emitting devices
AB Effects of an ultrathin (1 nm) diamond-like carbon (DLC) layer in single-layer organic light-emitting devices (OLEDs) that consist of ITO/(TPD-Alq3 doped PVK)/Al were investigated. DLC layers deposited by using Nd:YAG laser at laser wavelengths of 355 nm were high in sp3 content and resistivity (DLCUV) while that of 1064 nm laser were lower in sp3 content and resistivity (DLCIR), as characterized by Raman spectroscopy and resistivity measurements. Although emission were obtained for all the devices, only the device of ITO/DLCUV/(TPD-Alq3 doped PVK)/Al exhibited enhanced current density and brightness with lower turn-on voltage as compared to a standard device. Devices of ITO/D and ITO/(TPD-Alq3 doped PVK)/DLCUV/Al showed po characteristics but failed at higher applied vo performance of device with high resistivity/sp3 mechanisms of barrier reduction by sufficiently thin insulating layer which increase the probability of tunneling of carriers at ITO and PVK interface. [All rights reserved Elsevier].

Properties are generally reported and cannot be tied to a particular subject.

Display results (cont.)

```
CC    B4260D Light emitting diodes; B7260B Display materials; B0520H Pulsed
      laser deposition; B2550B Semiconductor doping; B2530F
      Metal-insulator-semiconductor structures
CT    aluminium; current density; diamond-like carbon; electrical resistivity;
      indium compounds; organic light emitting diodes; organic
      semiconductors; pulsed laser deposition; Raman spectra; semiconductor
      doping; semiconductor-insulator boundaries; thin films; tunnelling
ST    diamond-like carbon film effects; TPD-Alq3 doped PVK organic
      light-emitting devices; ITO-DLC-TPD-Alq3 doped PVK-Al; Nd:YAG laser
      wavelength; Raman spectroscopy; resistivity measurements; current
      density; carrier tunneling; thin insulating layer; barrier reduction
      mechanisms; pulsed laser deposition; wavelength 355 nm; wavelength 1064
      nm; ITO-C-Al
CHI   InSnO-C-Al int, InSnO int, Al int, In int, Sn int, C int, O int, InSnO
      ss, In ss, Sn ss, O ss, Al el, C el
PHP   wavelength 3.55E-07 m; wavelength 1.064E-06 m
ET    C*Al; C-Al; C*Al*O*Sn; C sy 4; sy 4; Al sy 4; O sy 4; Sn sy 4; SnO; Sn
      cp; cp; O cp; SnO-C-Al; In*O*Sn; In sy 3; sy 3; O sy 3; Sn sy 3; InSnO;
      In cp; Al; In; Sn; O; Nd
```

In addition to physical property INSPEC has chemical and element terms indexing.

Element Terms (/ET)

- Complex chemical formulas in the title or abstract often contain special characters,e.g.

(,) , [,] , + , - , ° , ² , % , : , .

- Upper- and lower-case letters often are also included.

Co, CO, Hf, HF

- A *character-string-recognition algorithm* scans the title and abstract data for special characters or strings and place them in a separate index field /ET during the file loading process.

Element Terms (/ET) (cont.)

This algorithm recognizes and analyzes:

- *chemical formulas*
- *material descriptions*
- *alloys* and *eutectic systems*
- *nuclear reactions*, *isotopes*
- *material dopings*

A checklist of allowed terms is used to prevent irrelevant terms from being mistaken for legitimate chemical symbols, e.g.

CPU (central processing unit) is not a legitimate chemical formula; is not a carbon, phosphorus, uranium compound.

ET field entries:

BA cp	compounds
Sy 3	systems, **n**=3 (**n**>=2 metals, semimetals)
Fe is, 56FE	isotopes
In, ip, in 2	ions neagtive or positive
P doping, Si:P, doped materials	materials dopings, e.g. **P doping of silicon**
element1* element2	elements in Hill order, eg. **AS*Ga**
58Fe t, p r	nuclear reachtions, eg. **r**=reaction, **t**=target

Examples for COMPENDEX and INSPEC


```
=> FILE COMPENDEX

=> EXPAND BA(IN/ET
E1              1      BA(I-II)/ET
E2              1      BA(II)/ET
E3              2 --> BA(IN/ET
E4              1      BA(IN 1/3SN/ET
E5              1      BA(IN 2/3MO/ET
E6              1      BA(IN 2/3W/ET
E7              1      BA(IN0.5SB/ET
E8              1      BA(IN0.5TA/ET
E9              1      BA(IN0.67CE0.33)OY/ET
E10             1      BA(IN0.67ZR0.33)OY/ET
E11             1      BA(IN1/3PB/ET
E12             2      BA(IN2/3MO/ET

=> SEARCH E9
L1              1 "BA(IN0.67CE0.33)OY"/ET
```

Parentheses are searchable!

Examples for COMPENDEX and INSPEC (cont.)


```
=> D ALL

L1   ANSWER 1 OF 1  COMPENDEX  COPYRIGHT 2007 EEI on STN
AN   1994(39):1456  COMPENDEX
TI   Local structure and oxide-ion motion in defective perovskites.
AB   Macroscopic thermodynamic and transport properties of
     disordered materials are determined largely by their local
     structure, which may differ substantially from long-range
     crystalline symmetry. In order to better understand local
     structure and ionic motion in highly disordered perovskite
     oxides, we have investigated several cubic perovskites using
     high-temperature oxygen-17 NMR in conjunction with other
     experimental techniques.Materials we have studied include
     Ba(In0.67Zr0.33)Oy, Ba(In0.67Ce0.33)Oy, (La0.5Ba0.5)
    (Co0.7Cu0.3Oy, and (La0.6Sr0.4) (Co0.6Sr0.4) Co0.8Cu0.2)Oy.....
CT   *Perovskite; Nuclear magnetic resonance; Crystal structure;
     Crystal symmetry; Crystal defects; .....
ET   Ba*In*O*Zr; Ba sy 4; sy 4; In sy 4; O sy 4; Zr sy 4;
     Ba(In0.67Zr0.33)Oy; Ba cp; cp; In cp; Zr cp; O cp; Ba*Ce*In*O;
     Ce sy 4; Ba(In0.67Ce0.33)Oy; Ce cp; Ba*La; Ba sy 2; sy 2;
     La sy 2; La0.5Ba0.5; La cp; Co*Cu*O; Co sy 3; sy 3; Cu sy 3;
     O sy 3; Co0.7Cu0.3Oy; Co cp; Cu cp; La*Sr; Sr sy 2; La0.6Sr0.4;
     Sr cp; Co*Sr; Co sy 2; Co0.6Sr0.4; (Co0.8Cu0.2)Oy; C
```

Search for Ge-Si with 30%<=Ge<50%


```
=> FILE INSPEC

=> S Ge*Si/ET AND (Ge0.3? OR Ge.3? OR Ge0.4? OR Ge.4?)/ET
         17155 GE*SI/ET
           152 GE0.3?/ET
             1 GE.3?/ET
            61 GE0.4?/ET
             1 GE.4?/ET
L2         156 GE*SI/ET AND (GE0.3? OR GE.3? OR GE0.4? OR GE.4?)/ET

=> D TI ST CHI PHP ET

L1    ANSWER 1 OF 156  INSPEC  (C) 2007 IET on STN
AN    2007:9415869  INSPEC
TI    Nanoscale mechanisms of misfit dislocation propagation in undulated
ST    nanoscale mechanisms; misfit dislocation propagation; undulated
      Si1-xGex/Si(100) epitaxial thin films; stress field; in-situ transmission
      electron microscopy annealing; finite element calculations; misfit
      dislocations; dislocation velocities; finite element model; surface
      geometry; dislocation kink dynamics; 30 nm; 480 C; 2.0 GPa;
      Si0.7Ge0.3-Si; Si
CHI   Si0.7Ge0.3-Si int, Si0.7Ge0.3 int, Ge0.3 int, Si0.7 int, Ge int, Si int,
      Si0.7Ge0.3 bin, Ge0.3 bin, Si0.7 bin, Ge bin, Si bin, Si el; Si sur, Si
      el
PHP   size 3.0E-08 m; temperature 7.53E+02 K; pressure 2.0E+09 Pa
ET    Si; Ge*Si; Ge sy 2; sy 2; Si sy 2; Si1-xGex; Si cp; cp; Ge cp;
      Ge0.3-Si; Ge; Si0.7Ge; Si0.7Ge0.3; C
```

Files with Element Terms (/ET)

- **ALUMINIUM** Aluminium Industry Abstracts (1968-)
- **CERAB** Ceramic Abstracts (1976-)
- **COMPENDEX** Ei COMPENDEX File (1970-)
- **EMA** Engineered Materials Abstracts File (1986-)
- **ENERGY** DOE ENERGY file (1974-)
- **INIS** International Nuclear Information System (1970-)
- **INSPEC** The Database for Physics, Electronics and Computing (1898-)
- **MATBUS** Materials Business File (1983-)
- **METADEX** METADEX File (1966-)

Agenda

- Why searching non-patent literature (NPL)?
- Cluster searching on STN
- Going into details of the databases
- Search examples:
  - Automotive

Search example Automotive

Search Question:
Searching for regenerative brakes in hybrid electric vehicles (HEVs)

Search in Patent and non-patent literature:
Patents are searched in WPINDEX, Non-patent literature is searched in DKF, 1MOBILITY, INSPEC, COMPENDEX, MECHENG and PASCAL

Search example Automotive: Patent search WPINDEX


```
=> FIL WPINDEX

=> SET SFIELDS BI BIEX

=> QUE (?HYBRID? AND (CAR? OR VEHICLE?)) OR PHEV OR HEV
L1    QUE (?HYBRID?/BI,BIEX  AND (CAR?/BI,BIEX OR
VEHICLE?/BI,BIEX)) OR PHEV/BI,  BIEX OR HEV/BI,BIEX

=> QUE (X21-A01D OR X22-P04A)/MC
X21-A01D HYBRID VEHICLE
X22-P04A HYBRID-ELECTRIC
L2   QUE (X21-A01D OR X22-P04A)/MC

=> QUE B60K0006-20+NT/IPC
L3   QUE B60K0006-20+NT/IPC
```

SET SFIELDS to BI and BIEX to search also in the **member level** of WPINDEX

Enlarge your search using **Derwent Manual Codes**. Use MC Thesaurus to get text information.

Use **IPC**: **Thesaurus** available!

Search example Automotive: Patent search WPINDEX (2)


```
=> QUE (B60K0006-2? OR B60K0006-3? OR B60K0006-4? OR
B60K0006-5?)/EPC
L4   QUE (B60K0006-2? OR B60K0006-3? OR B60K0006-4? OR B60K0006-
5?)/EPC

=> QUE 180/065.200/NCL
L5   QUE 180/065.200/NCL
           (180065200/NCL)

=> QUE REGENERATIV? (W) BRAK?
L6   QUE REGENERATIV?/BI,BIEX (W) BRAK?/BI,BIEX

=> QUE (X21-A03C)/MC
X21-A03C ELECTRODYNAMIC
L7   QUE (X21-A03C)/MC
```

Use **ECLA**: no online Thesaurus available but PDF link!
(ICO also available but not used in this ex.)

Use **NCL**: online Thesaurus available in CAPLUS and USPATFULL

Search example Automotive: Patent search WPINDEX (3)


```
=> QUE (B60L0007-10 OR H02P0003-14)/IPC
L8   QUE (B60L007-10 OR H02P0003-14)/IPC

=> QUE (B60L0007-1? OR H02P0003-14)/EPC
L9   QUE (B60L007-1? OR H02P0003-14)/EPC

=> QUE (303/152.000 OR 318/376.000)/NCL
L10  QUE (303/152.000 OR318/376.000)/NCL
           (303152000 OR 318376000/NCL)

=> S L1 AND L6
L11        572 L1 AND L6

=> S L1-5 AND L6-10
L12       1036 (L1 OR L2 OR L3 OR L4 OR L5) AND (L6 OR L7 OR L8
OR L9 OR L10)
```

Important: Keyword search only retrieves 567 answers, while the combined search with classifications retrieves 1096!

Search example Automotive: Patent search WPINDEX (4)


```
=> D FULL
L12  ANSWER 1 OF 1096  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
AN   2009-F79475 [20]   WPINDEX
TI   Braking control apparatus for hybrid vehicle, has control unit
     changing allocation with pressurization braking force by pressurizing
     unit, and regenerative-braking force by motor generator based on
     deviation of estimated deceleration
DC   T01; X21
IN   TSUMORI C
PA   (TOYT-C) TOYOTA JIDOSHA KK
CYC  1
PI   JP 2009051383   A  20090312 (200920)* JA  17[7]
ADT  JP 2009051383 A JP 2007-220865 20070828
PRAI JP 2007-220865       20070828
IPCI B60K0006-00 [I,C]; B60K0006-445 [I,A]; B60L0007-00 [
     [I,A]; B60T0008-17 [I,A]; B60T0008-17 [I,C]; B60W001
     B60W0010-08 [I,C]; B60W0010-18 [I,A]; B60W0010-18 [I,C]; B60W0010-30
     [I,A]; B60W0010-30 [I,C]; B60W0020-00 [I,A]; B60W0020-00 [I,C]
FCL  Main:      B60T0008-17 C (ZHV)
     Secondary: B60K0006-20 320; B60K0006-20 370; B60K0006-20 380;
                B60K0006-445; B60L0007-14
FTRM 3D246; 5H115; 3D246/AA09; 3D246/BA02; 3D246/DA01; 3D246/EA05; 3D246/GA05;
     3D246/HA01.A; 3D246/HA03.A; 3D246/HA93.A; 3D246/JA03; 3D246/JB05;
     3D246/LA52.Z; 5H115/PA01; 5H115/PC06; 5H115/PG04; 5H115/PI16; 5H115/PI29;
     5H115/PO06; 5H115/PO17; 5H115/PU08; 5H115/PU25; 5H115/PV09; 5H115/QE10;
     5H115/QI04; 5H115/QI15; 5H115/RB22; 5H115/TO26
```

Sure that IPC, ECLA, NCL and MC are sufficient?
Use the **Japanese FI- and F-terms** in addition! Japanese automakers are leading in this area!

Search example Automotive: Patent search WPINDEX (4)


```
=> D FULL
L12  ANSWER 1 OF 1096  WPINDEX COPYRIGHT 2009       THOMSON REUTERS on STN
AN   2009-F79475 [20]   WPINDEX
TI   Braking control apparatus for hybrid vehicle, has control unit
     changing allocation with pressurization braking force by pressurizing
     unit, and regenerative-braking force by motor generator based on
     deviation of estimated deceleration
DC   T01; X21
IN   TSUMORI C
PA   (TOYT-C) TOYOTA JIDOSHA KK
CYC  1
PI   JP 2009051383   A  20090312 (200920)*
ADT  JP 2009051383 A JP 2007-220865 2007082
PRAI JP 2007-220865       20070828
IPCI B60K0006-00 [I,C]; B60K0006-445 [I,A]; B60L0007-00 [I,C]; B60L0007-14
     [I,A]; B60T0008-17 [I,A]; B60T0008-17 [I,C]; B60W0010-08 [I,A];
     B60W0010-08 [I,C]; B60W0010-18 [I,A]; B60W0010-18 [I,C]; B60W0010-30
     [I,A]; B60W0010-30 [I,C]; B60W0020-00 [I,A]; B60W0020-00 [I,C]
FCL  Main:      B60T0008-17 C (ZHV)
     Secondary: B60K0006-20 320; B60K0006-20 370; B60K0006-20 380;
                B60K0006-445; B60L0007-14
FTRM 3D246; 5H115; 3D246/AA09; 3D246/BA02; 3D246/DA01; 3D246/EA05; 3D246/GA05;
     3D246/HA01.A; 3D246/HA03.A; 3D246/HA93.A; 3D246/JA03; 3D246/JB05;
     3D246/LA52.Z; 5H115/PA01; 5H115/PC06; 5H115/PG04; 5H115/PI16; 5H115/PI29;
     5H115/PO06; 5H115/PO17; 5H115/PU08; 5H115/PU25; 5H115/PV09; 5H115/QE10;
     5H115/QI04; 5H115/QI15; 5H115/RB22; 5H115/TO26
```

=> HELP JPC

...

Definitions and hierarchy for Japanese FI and F Term classifications are available in English at the JPO IPDL web site

http://www5.ipdl.inpit.go.jp/pmgs1/pmgs1/pmgs_E

Search example Automotive:

* * F-term List * *

This screen shows the F-term list of the theme "3D246".

(Remarks)
(Not Translation)

3D246	BRAKE SYSTEM OR ADJUSTABLE BRAKING POWER
	B60T7/12-8/1769;8/32-8/96

Viewpoint	F-term										FI Cover Range
AA	AA00	AA01	AA02	AA03		AA05	AA06		AA08	AA09	AA10	B60T7/12-8/1769;B60T8/8/96
	USE	. Four, or more, wheel drive vehicles	. . Mechanical distribution of driving power, e.g. centre differential gears	. . Motor drive of parts of wheels only		. Front-wheel drive vehicles	. Rear-wheel-drive vehicles		. Electric vehicles	. Hybrid vehicles	. Hydraulic drive vehicles	
		AA11	AA12	AA13	AA14	AA15		AA17	AA18			
		. Bicycles or tricycles	. Coupled vehicles	. Heavy vehicles or multi-axle vehicles	. Industrial Vehicles	. . Agricultural vehicles		. Railway vehicles	. Aircraft			
BA	BA00	BA01	BA02	BA03		BA05	BA06		BA08			
	TYPE OF BRAKE	. Mechanical brakes	. Hydraulic brakes	. Pneumatic brakes		. combined brakes	. . Air-over-hydraulic brakes		. Electric brakes			
CA	CA00	CA01	CA02	CA03	CA04	CA05						
	NUMBER OF	. Single	. Two systems	. . Piping for	. . Cross	. More than two						

Search example Automotive: Patent search WPINDEX (5)

AB JP 2009051383 A UPAB: 20090401
NOVELTY - The apparatus has an acceleration sensor (201) that detecting actual deceleration generated in a vehicle. A main electronic control unit (ECU) (112) estimates the deceleration generated in the vehicle based on a damping operating quantity of a brake pedal (11). The ECU changes allocation with the pressurization braking force by the pressurizing unit, and the regenerative-braking force by the motor generator based on a deviation of the estimated deceleration from real deceleration. The ECU estimates decreased part of master cylinder pressure in the master cylinder.
USE - Braking control apparatus for a hybrid vehicle. Can also be used for an electric vehicle.
ADVANTAGE - The apparatus provides highly accurate braking force control, and improves the drivability of the hybrid vehicle. The apparatus suppresses the master cylinder pressure by the operating the pressurizing unit. The apparatus freely controls the torque of a hydraulic brake.
DESCRIPTION OF DRAWINGS - The drawing shows a block diagram of a braking control apparatus for a hybrid vehicle.'(Drawing includes non-English language text)'
Brake pedal (11)
Brake booster (12)
Master cylinder (13)
Main electronic control unit (112)
Acceleration sensor (201)
FS EPI
MC EPI: T01-J07D1; X21-A01D1; X21-A01F; X21-A03C

Search example Automotive: Patent search WPINDEX (6)


```
=> ANA L12 PC PC.B PRC
L13          ANALYZE L12 1- PC PC.B PRC :       66 TERMS

=> D PC TOP10
L13          ANALYZE L12 1- PC PC.B PRC :       66 TERMS

TERM #    # OCC   # DOC   % DOC PC PC.B PRC
------ -------- ------ ------ --------------
     1      955    645  62.26 JP/PC
     2      711    457  44.11 US/PC
     6      360    277  26.74 DE/PC
     7      293    186  17.95 EP/PC
     9      190    153  14.77 WO/PC
    10      182    117  11.29 KR/PC
    11      173    139  13.42 CN/PC
    16       71     48   4.63 CA/PC
    18       61     37   3.57 GB/PC
    20       35     35   3.38 FR/PC
```

Most patent publications for this topic are published in Japan, followed by the US and Germany!

Search example Automotive: NPL citations in INPAFAMDB


```
=> FIL INPAFAMDB

=> S (REGENERATIV? (S) (BREMS? OR BRAK?))/REN
L14          32 (REGENERATIV? (S) (BREMS? OR BRAK?))/REN

=> S L14 AND ?HYBRID?
L15           9 L12 AND ?HYBRID?

=> D REN 1-2
 L15   ANSWER 1 OF 9       INPAFAMDB COPYRIGHT 2009 EPO/FIZ KA on STN
REN   MAHSHID AMIRABADI ET AL:  "Fuzzy Control of a Hybrid Power Source for
      Fuel Cell Electric Vehicle using Regenerative Braking Ultracapacitor"
      12TH INTERNATIONAL POWER ELECTRONICS AND MOTION CONTROL CONFERENCE, IEEE,
      PI, 1. August 2006 (2006-08-01), Seiten 1389-1394, XP031009112 ISBN:
      978-1-4244-0120-8 (SEA, Cat: X)
...
L15   ANSWER 2 OF 9       INPAFAMDB COPYRIGHT 2009 EPO/FIZ KA on STN
...
REN  Hybrid Electric Vehicle Program-Components, Regenerative Braking,
      http://www.hev.doe.gov/components/regen.html, Aug. 1999, 1 pp. (APP)
...
```

Citations in INPAFAMDB are also a useful search tool for NPL!

Citation of internet source!

Search example Automotive: Search NPL - DKF


```
=> FIL DKF

=> ? COST

STN International Fees and Prices, Effective Jan 1, 2009

    DKF File                              Euro
    --------                             -------
    Connect Hour Fee (per hour) .         185,00
    SDI Search Fee (monthly). . .           7,26
    SDI PACKAGE Component Fee  1)           7,26
    SDI PACKAGE Component Frequency: monthly

    Display Fee (per answer)
     - ALL, IALL, DALL, BIB, IBIB           3,26
     - AU, AV, CS, ISN, JT, ON, SO          3,26
     - IND, Trial, SAM, SCAN, ABS           FREE
     - AB, AN, CC, CT, CY, DT, ED,
       LA, PY, SH, ST, TI . . . .           FREE
```

Start the NPL in file **DKF**, a database specialized in the field of automotive engineering.

Note that the display of TI, AB and IND is free, this can be used for **translation** of search terms and **relevance check** of your answer set.

Search example Automotive: Search NPL – DKF (2)


```
=> S (HYBRID? AND VEHICLE#)/TI
          2464 HYBRID?/TI
         15641 VEHICLE#/TI
L13        913 (HYBRID? AND VEHICLE#)/TI

=> D TI 1-10
L13   ANSWER 1 OF 913  DKF  COPYRIGHT 2009 DKF
TI    Electric energy storage systems for future hybrid vehicles
      Elektrische Energiespeichersysteme fuer zukuenftige Hybridfahrzeuge.

...
=> S REGENERATIVE(W)BRAK?/TI
L14          39 REGENERATIVE(W)BRAK?/TI

L14   ANSWER 1 OF 39  DKF  COPYRIGHT 2009 DKF on STN
TI    Regenerative braking strategy for hybrid electric vehicles based on
      regenerative torque optimization control
      Regenerative Bremsstrategie fuer Elektrohybridfahrzeuge auf Grundlage
        der optimierten Regelung des regenerativen Drehmoments.
```

Since DKF contains only German abstracts, your keyword search needs to include German search terms! However, **titles are available in English and German**, this can be used to translate your search query.

Search example Automotive: Search NPL – DKF (3)


```
=> QUE (?HYBRID?  AND (?FAHRZEUG? OR AUTO? OR KFZ OR
VEHICLE?)) OR PHEV OR HEV
L15  QUE (?HYBRID?  AND (?FAHRZEUG? OR AUTO? OR KFZ OR VEHICLE?))
OR PHEV OR HEV

=> QUE (REGENERATIV? (W) (BREMS? OR BRAK?)) OR NUTZBREMS?
OR HILFSKRAFTBREMS?
L16  QUE (REGENERATIV? (W) (BREMS? OR BRAK?)) OR NUTZBREMS? OR
HILFSKRAFTBREMS?

=> S L15 AND L16
L17          140  L15 AND L16

=> D 1-3 TI AB IND
```

Search with your improved search query!

Check your answers for relevance using free display fields and formats.

Search example Automotive: Search NPL – DKF (4)


```
L17   ANSWER 2 OF 140  DKF  COPYRIGHT 2009 DKF on STN
TI    Hybrid einmal anders - Bosch entwickelt ein hydrostatisch
      regeneratives Bremssystem fuer Nutzfahrzeuge
      Bosch develops a hydrostatic regenrative braking system for commercial
      vehicles.
AB    Die Bremsenergierueckgewinnung ist besonders bei schweren Fahrzeugen
interessant. Geschickt im Fahrzeug umverteilt, kann der zum wieder Anfahren
erforderliche Energiebedarf deutlich reduziert werden. Dazu sind nicht in
jedem Fall ein Generator und Batterien erforderlich, wie unlaengst bei der
Bosch Tochter Rexroth bewiesen wurde. Die Hydraulikspezialisten stellten
einen Versuchstraeger vor, der die Bremsenergie hydraulisch
zwischenspeichert. Zwei Varianten des sogen
Waehrend sich das HRB parallel fuer Lkw mit
Antrieb eignet, ist das HRB seriell fuer Lk

AN    200809223778   DKF
SH    Nutzfahrzeuge; Alternative Kraftstoffe, nichtkonventionelle Antriebe
CC    TAD Lastkraftwagen, Lieferwagen, Wohnmobile
      YDD Elektrische Fahrzeugantriebe, Elektrohybridantriebe
CT    LASTKRAFTWAGEN; HYBRIDANTRIEB; BREMSE; ENERGIERUECKGEWINNUNG;
      ENERGIESPEICHER
```

Search with your improved search query!

Check your answers for relevance using free display fields and formats.

Search example Automotive: Search NPL – Other relevant databases


```
=> FIL 1MOBILITY INSPEC COMPENDEX MECHENG PASCAL

=> SET MSTEPS ON

=> S L15 AND L16
FILE '1MOBILITY'
LEFT TRUNCATION IGNORED FOR FILE '1MOBILITY‘
L18         194 L15 AND L16

FILE 'INSPEC'
L19         205 L15 AND L16

FILE 'COMPENDEX'
L20         197 L15 AND L16

FILE 'MECHENG'
L21         133 L15 AND L16
```

Expand your non-patent search to other relevant databases.

SET MSTEPS ON, to view details of your multifile search.

Left truncation is not available in all files. However, it will just be ignored in these files and the search runs to completion.

Search example Automotive: Search NPL – Other relevant databases (2)


```
FILE 'PASCAL'
L22          53 L15 AND L16

TOTAL FOR ALL FILES
L23         782 L15 AND L16

=> SET DUPORDER FILE
SET COMMAND COMPLETED

=> DUP REM
ENTER L# LIST OR (END):l17 l18 l21 l19 l20 l22

L24         724 DUP REM L17 L18 L21 L19 L20 L22 (198 DUPLICATES REMOVED)
                ANSWERS '1-140' FROM FILE DKF
                ANSWERS '141-325' FROM FILE 1MOBILITY
                ANSWERS '326-407' FROM FILE MECHENG
                ANSWERS '408-578' FROM FILE INSPEC
                ANSWERS '579-710' FROM FILE COMPENDEX
                ANSWERS '711-724' FROM FILE PASCAL
```

SET DUPORDER FILE before duplicate removal to keep answers in file order.

With the order of the L numbers you can specify the order in which the answers will be kept.

Search example Automotive: Search NPL – DKF


```
=> D ALL 1 FROM EACH

L24   ANSWER 1 OF 724  DKF  COPYRIGHT 2009 DKF on STN
AN    200806221580   DKF     ON  0806DKF221580     Full-text
TI    Regenerative braking strategy for hybrid electric vehicles based
      on regenerative torque optimization control
      Regenerative Bremsstrategie fuer Elektrohybridfahrzeuge auf
      Grundlage der optimierten Regelung des regenerativen Drehmoments.
AU    Wang, F.; Zhuo, B.
CS    Shanghai Jiao Tong University,CN
SO    Proc.of the Institution of Mech.English Part D; 222(2008)4; p. 499-513, pp.
      15, Zeichng./drwgs. 2, Diagr. 21, Tab. 2, Reference 12; Original bei/available
      from DKF
      CODEN: PIMED
DT    Zeitschrift; Journal
CY    China; China
LA    Englisch; English
AB         Vorstellung einer Verteilungsstrategie des regenerativen Drehmoments ( Regenerative
Torque Distribution - RTD ) mit dem Ziel der Rueckgewinnung und Speicherung von so viel wie
moeglich Bremsenergie bei Hybridfahrzeugen. Fuer das Ausrollen wird eine emulierte ...

SH    Alternative Kraftstoffe, nichtkonventionelle Antriebe; Ladungswechsel,
      Gemischbildung, Verbrennung, Katalysator; Fahrmechanik, Fahrdynamik
CC    YDD Elektrische Fahrzeugantriebe, Elektrohybridantriebe
      VLK Kraftstoffverbrauch
      TP Fahrmechanik ( auch Fahrzeugaerodynamik )
CT    ELEKTROHYBRIDANTRIEB; ENERGIERUECKGEWINNUNG; BREMSMOMENT
ST    RUECKGEWINNUNG DER BREMSENERGIE
```

Display results in preferred format. One answer from each file is displayed as an example.

Chinese publication from a Chinese university.

Search example Automotive: Search NPL – 1MOBILITY


```
L24  ANSWER 141 OF 724  1MOBILITY  COPYRIGHT 2009 SAE on STN DUPLICATE 10
AN   2008:3955  1MOBILITY  Full-text
DN   11-16-4-41
TI   Hybrid Innovations for Hydraulic Braking
AU   Fritz, Darlene(SAE International)
SO   (2008 Jun 01) Off-highway Engineering, Volume 16, Number 4; p. 41 (3
pages).
     SAE International, Warrendale, Pennsylvania, USA.
     ISSN: 1074-6919.
CY   United States
DT   Journal
FS   SAE
LA   English
AB       Exploring new technologies for recovering kinetic energy from
braking.
CC   Land or Sea
CT   Electrohydraulics; Energy recovery; Off-road Vehicles; Hydrostatic
     drives; Lift trucks; Regenerative braking; Vehicles
```

SAE International: American **S**ociety of **A**utomotive **E**ngineers

Search example Automotive: Search NPL – INSPEC


```
L24   ANSWER 408 OF 724  INSPEC  (C) 2009 IET on STN   DUPLICATE 1
AN    2009:10449337  INSPEC  Full-text
TI    Lead-acid batteries for micro- and mild-hybrid applications
AU    Valenciano, J. (Exide Technol., R&D Centre, Azuqueca de Henares, Spain),
      Fernandez, M. (Exide Technol., R&D Centre, Azuqueca de Henares, Spain),
      Trinidad, F. (Exide Technol., R&D Centre, Azuqueca de Henares, Spain),
      Sanz, L. (Exide Technol., R&D Centre, Azuqueca de Henares, Spain)
SO    Journal of Power Sources (15 Feb. 2009), vol.187, no.2, p. 599-604, 10
      refs.
      CODEN: JPSODZ, ISSN: 0378-7753
      Doc.Number: S0378-7753(08)02181-2
      Published by: Elsevier Sequoia S.A, Switzerland
DT    Journal
TC    Practical; Experimental
CY    Switzerland
LA    English
AB          Car manufactures have announced the launch in coming months of vehicles with reduced
emissions due to the introduction of new functions like stop-start and regenerative braking.
Initial performance request of automotive lead-acid batteries are becoming more and more
demanding and, in addition to this, cycle life with new accelerated ageing profiles are being
proposed in order to determine the influence of the new functions on the expected battery life.
…
CC    B8520B Automobile electronics; B8410E Secondary cells
CT    automotive electronics; lead acid batteries
ST    spiral wound valve regulated lead acid battery; hybrid applications;
      automotive batteries; flooded SLI battery; depth of discharge cycling
      conditions; high temperature behaviour; engine compartment
ET    DoD; D cp; cp; C
```

Practical, Experimental publication!!

Search example Automotive: Search NPL – COMPENDEX


```
L24     ANSWER 579 OF 724 COMPENDEX COPYRIGHT 2009 EEI on STNDUPLICATE 44
AN      2005-289199412   COMPENDEX  Full-text
TI      Energy management strategies for vehicular electric power systems
AU      Koot Michiel; de Jager Bram; Steinbuch Maarten; Kessels J.T.B.A.; van
        den Bosch P.P.J.; Heemels W.P. Maurice H.
CS      Koot Michiel; de Jager Bram; Steinbuch Maarten (Dynamics and Control
        Technology Group, Department of Mechanical Engineering, Technische
        Universiteit Eindhoven, 5600 MB Eindhoven (NL)); Kessels J.T.B.A.; van
        den Bosch P.P.J. (Control Systems Group, Department of Electrical
        Engineering, Technische Universiteit Eindhoven, 5600 MB Eindhoven (NL));
        Heemels W.P. Maurice H. (Embedded Systems Institute, 5600 MB Eindhoven
        (NL))
        EMAIL: M.W.T.Koot@tue.nl; A.G.de.Jager@wfw.wtb.tue.nl;
        M.Steinbuch@tue.nl; J.T.B.A.Kessels@tue.nl; P.P.J.v.d.Bosch@tue.nl;
        Maurice.Heemels@embeddedsystems.nl
SO      IEEE Transactions on Vehicular Technology (May 2005) Volume 54, Number
        3, pp. 771-782, 33 refs.
        CODEN: ITVTAB  ISSN: 0018-9545
        DOI: 10.1109/TVT.2005.847211
        Published by: Institute of Electrical and Electronics Engineers Inc.
CY      United States
DT      Journal; Article; Theoretical
LA      English
SL      English
ED      Entered STN: 4 Jan 2009
        Last updated on STN: 4 Jan 2009
```

Research Group at a Dutch university, including contact information.

Search example Automotive: Search NPL – COMPENDEX (2)

AB In the near future, a significant increase in electric power consumption in vehicles is expected. To limit the associated increase in fuel consumption and exhaust emissions, smart strategies for the generation, storage/retrieval, distribution, and consumption of electric power will be used. Inspired by the research on energy management for hybrid electric vehicles (HEVs), this paper presents an extensive study on controlling the vehicular electric power system to reduce the fuel use and emissions, by generating and storing electrical energy only at the most suitable moments. For this purpose, both off-line optimization methods using knowledge of the driving pattern and on-line implementable ones are developed and tested in a simulation environment. Results show a reduction in fuel use of 2%, even without a prediction of the driving cycle being used. Simultaneously, even larger reductions of the emissions are obtained. The strategies can also be applied to a mild HEV with an integrated starter alternator (ISA), without modifications, or to other types of HEVs with slight changes in the formulation. .COPYRGT. 2005 IEEE.

CC 612.1 Internal Combustion Engines, General; 661.2 Automotive Engine Components; 662.1 Automobiles; 702.1 Electric Batteries; 921.5 Optimization Techniques; 921.6 Numerical Methods

CT *Electric vehicles; Algorithms; Braking; Dynamic programming; Electric batteries; Electric power supplies to apparatus; Energy management; Fuel consumption; Internal combustion engines; Mathematical models; Optimization; Quadratic programming; Starters

ST Fuel reduction; Hybrid electric vehicles (HEVs); Regenerative braking; Vehicular electric power system

Very precise Supplementary Terms!

Search example Automotive: Search NPL – MECHENG


```
L24   ANSWER 326 OF 724  MECHENG  COPYRIGHT 2009 CSA on STN DUPLICATE 4
AN    2009009407   MECHENG  Full-text
DN    200901-60-0000935
TI    Regenerative Braking for Diesel Hybrid City Bus Based on Fuzzy
      Logic Control
AU    Guo, Jin-Sheng; Wang, Jia-Ming; Yang, Lin; Zhuo, Bin
      eMail: yanglin@sjtu.edu.cn
CS    Institute of Automotive Electronics Technology, Shanghai Jiaotong
      University, Shanghai 200240, China
SO    Shanghai Jiaotong Daxue Xuebao (Journal of Shanghai Jiaotong University),
      volume 42, number 8, pp. 1344-1348, Aug. 2008, 20080800
      Published by: Shanghai Jiaotong University, Number 1954 Huashan Rd.,
      Shanghai, 200030, China, [shjt@chinajournal.net.cn]
      ISSN: 1006-2467
DT    Journal
LA    Chinese
OS    Metadex; Engineered Materials Abstracts; Engineered Materials Abstracts;
      Engineered Materials Abstracts; Civil Engineering Abstracts; Computer &
      Information Systems Abstracts; Electronics & Communications Abstracts;
      Solid State & Superconductivity Abstracts
AB    A regenerative braking strategy based on fuzzy logic control was put forward based on
vehicle control strategy for integrated starter/generator(ISG) diesel hybrid city bus. The
strategy follows the principle of fuzzy control, determining the braking torque distribution
...
CC    60 Design Principles, Theory, and Analysis
CT    Buses (vehicles); Braking; Strategy; Fuzzy control; Fuzzy logic;
      Regenerative; Diesel; Diesel fuels; Logic; Fuzzy; Variance; Brakes; Fuzzy
      set theory; Starters; Simulation; Torque; Pedals; Disc brakes
```

Publication from a Chinese university including email contact!

Search example Automotive: Search NPL – PASCAL


```
L24   ANSWER 711 OF 724  PASCAL  COPYRIGHT 2009 INIST-CNRS. ALL RIGHTS
      RESERVED. on STN
AN    2008-0530005   PASCAL   Full-text
CP    Copyright .COPYRGT. 2008 INIST-CNRS. All rights reserved.
TIEN  Thermoelectrics as elements of hybrid-electric vehicle thermal energy
      systems
      Industrial and commercial applications of smart structures technologies
      2008 : 10-11 March 2008, San Diego, California, USA
AU    HEADINGS Leon; WASHINGTON Gregory; JAWORSKI Christopher M.
      DAVIS L. Porter (ed.); HENDERSON Benjamin Kyle (ed.); MCMICKELL M. Brett
      (ed.)
CS    The Ohio State University, 201 W. 19 th  Avenue, Columbus, OH 43110,
      United States
      SPIE, United States (org-cong.); American society of mechanical
      engineers, United States (org-cong.); Intelligent Materials Forum, Mito
      Kagaku Gijutsu Kyokai, Japan (org-cong.); Jet Propulsion Laboratory,
      United States (org-cong.); National Science Foundation, United States
      (org-cong.)
SO    Proceedings of SPIE - The International Society for Optical Engineering,
      (2008), 6930, 69300C.1-69300C.12, 16 refs.
      Conference: Industrial and commercial applications of smart structures
      technologies, San Diego CA (United States), 2008
      ISSN: 0277-786X
      ISBN: 978-0-8194-7116-1
DT    Journal; Conference
BL    Analytic
CY    United States
LA    English
```

Conference Proceeding.

Search example Automotive: Search NPL – PASCAL

AV INIST-21760, 354000172871870070
AB Despite vast technological improvements, the traditional internal combustion powered vehicle still achieves only 25-30% efficiency, with the remainder lost primarily as heat. While the load leveling offered by hybrid-electric vehicle technology helps to improve this overall efficiency, part of the efficiency gains are achieved by making new systems such as regenerative braking viable. In a similar fashion, thermoelectric (TE) energy recovery has long been considered for traditional vehicles with mixed results, but little has been done to consider thermoelectrics in the framework of the unique energy systems of hybrid vehicles. Systems that may not have been viable or even possible with traditional vehicles may offer improvements to system efficiency as well as emissions, vehicle durability, passenger comfort, and cost. This research describes a simulation developed for evaluating and optimizing thermoelectric energy recovery systems and results for four different system configurations. Two novel system configurations are presented which offer the potential for additional benefits such as emissions reduction that will soon be quantified. In addition, a test setup is presented which was constructed for the testing and validation of various thermoelectric recovery systems. Actual test performance was near the expected theoretical performance and supported the conclusions reached from the computer simulations.
CC 001D03F13; Applied sciences; Electronics; Microelectronics, Solid state devices
001B00A30C; Physics
001D17; Applied sciences
CT Intelligent system; Thermoelectric effect; Thermoelectric properties; Hybrid vehicle; Electric vehicle; Thermal energy; Energy recovery; Durability; Comfort

Search example Automotive: Search NPL – Analyze country coverage


```
=> ANA L24 CY
L25          ANALYZE L24 1- CY :       25 TERMS

=> D TOP15
L25          ANALYZE L24 1- CY :       25 TERMS

TERM #    # OCC   # DOC   % DOC CY
------ ------- ------ ------ ---------------
     1     357    357  52.97 UNITED STATES/CY
     2      62     62   9.20 UNITED KINGDOM/CY
     3      43     43   6.38 JAPAN/CY
     4      38     38   5.64 CHINA/CY
     5      35     35   5.19 GERMANY, FEDERAL REP
     6      29     29   4.30 SWITZERLAND/CY
     7      14     14   2.08 ITALY/CY
     8       7      7   1.04 FRANCE/CY
     9       6      6   0.89 AUSTRALIA/CY
    10       6      6   0.89 BELGIUM/CY
    11       5      5   0.74 GERMANY/CY
    12       5      5   0.74 KOREA, DEMOCRATIC PEOPLE'S REPUBLIC OF/CY
    13       5      5   0.74 KOREA, REPUBLIC OF/CY
    14       4      4   0.59 NETHERLANDS/CY
    15       3      3   0.45 AUSTRIA/CY
```

Analysing the country of publication most publications are coming from the US, followed by UK, JP and CN

Summary

- STN is a host with a great variation of specialized databases for searching engineering information in addition to patent searching!

- STN offers a big number of materials and engineering databases with:
  - Unique content (CT, ST, ET field)
  - Unique search and display possibilities