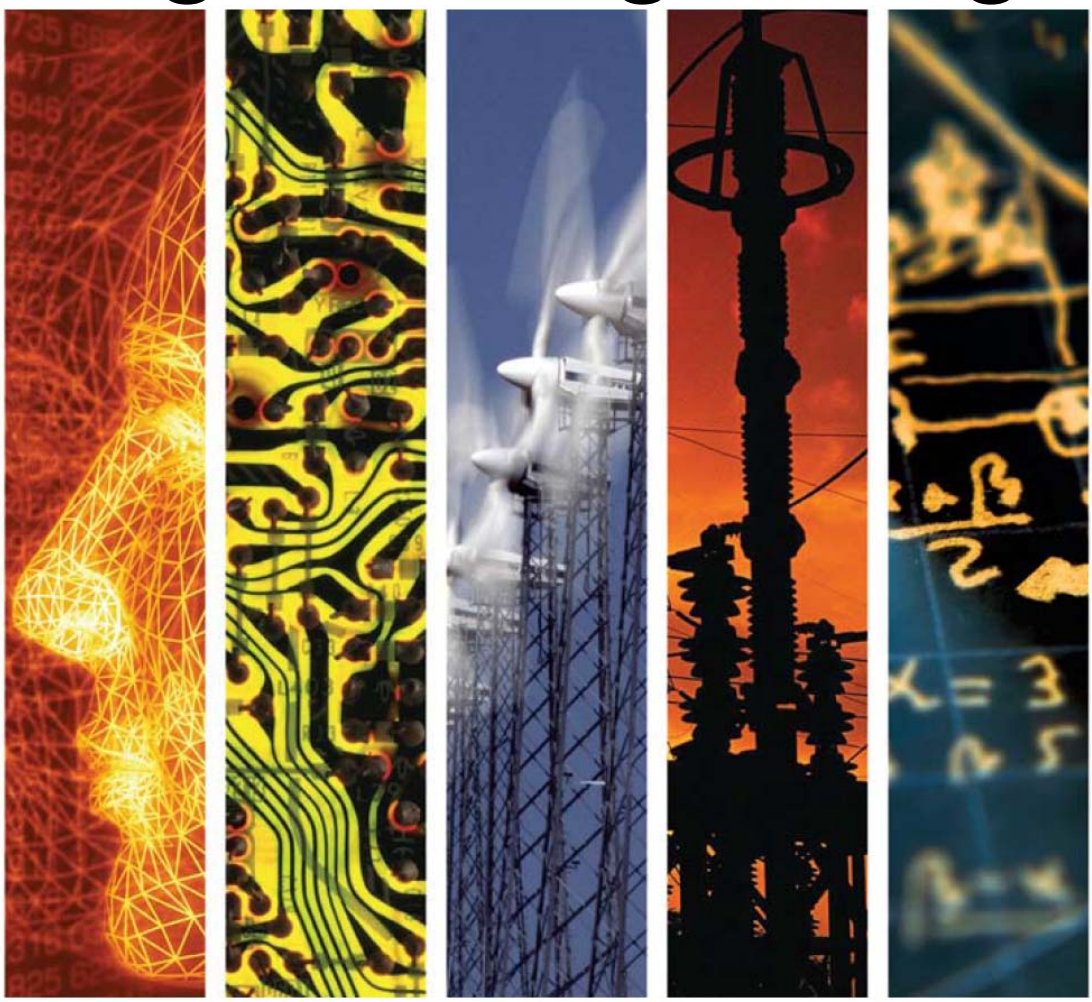
User Guide
Engineering Village



www.theiet.org/inspec

Inspec on Engineering Village™ — User Notes

Inspec and Inspec Archive Database Overviews

Inspec

Inspec is the world's leading English-language information service providing access to the world's scientific and technical papers in *physics, electrical engineering, electronics, communications, control engineering, computing, information technology,* and *manufacturing and production engineering*. It is a continuation of *Science Abstracts* first published by the Institution of Electrical Engineers in 1898. In addition to providing a comprehensive index to the literature from these disciplines, Inspec also has significant coverage in interdisciplinary areas such as *materials science, oceanography, nuclear engineering, geophysics, biomedical engineering* and *biophysics*.

The Inspec Database, which lies at the centre of this service, dates back to 1969, with over 5000 scientific and technical journals (online, print and open access) and more than 3000 conference proceedings and other publications scanned each year. The Database contains over 11 million bibliographic records, as of March 2010, and is growing at the rate of approximately 675,000 records each year.

Each record in the Inspec database contains an English-language title and descriptive abstract, together with full bibliographic details which include the journal or other publication title, the author's name and affiliation and the language of the original document. All of these may be searched, as well as Inspec's extensive range of subject classification and indexing systems, which are recognised as the standard of excellence in search aids throughout the industry. These include controlled index terms from the Inspec Thesaurus, numerical data indexing, chemical substance indexing and astronomical object indexing.

Full text linking is possible via Digital Object Identifiers (DOIs), which are present in 80% of current Inspec journal records.

In addition to finding information for research projects, it is possible to use the Inspec Database for:

- Current awareness
- New product information
- Technological forecasting
- Competitive intelligence
- Patent-related searching

Inspec Archive

The Inspec Archive Database contains the historical scientific records produced for the Science Abstracts series of journals during the period 1898 - 1968. The Science Abstracts series of journals were the precursor to the Inspec Database. Initially they were available only in printed format. The entire collection has been digitized and is available on Engineering Village.

Subject coverage for the Inspec Archive Database is:

- All aspects of physics (originally published as Physics Abstracts),
- Electrical and electronic engineering (introduced as a separate journal in 1903, and originally published as Electrical and Electronic Abstracts),
- Computing and control engineering (introduced as a separate journal in 1966, and published initially as Control Abstracts, later renamed to Computer and Control Abstracts).

The Inspec Archive contains:

- Over 873,700 records,
- Tables, graphs and figures from the original source document in many cases,
- The original value-added indexing and classifications,
- Enhancements in the form of the nearest equivalent current Inspec Thesaurus Terms and Inspec Classification Codes,
- Conference proceedings, books, journals, reports and dissertations,
- Longer abstracts than today varying in length from half a page to several pages including diagrams and complex mathematical proof because hard copy originals were less accessible.

The fully searchable electronic Inspec Archive Database is far more usable, flexible, durable and more readily available than the 176 volumes (and over 140,000 pages) of the printed Science Abstracts series of journals. It has never been easier to locate references to historic research or engineering breakthroughs from hundreds of scientists and engineers such as Albert Einstein, Guglielmo Marconi, Max Planck, Ernest Rutherford, and Marie Curie. Not only does the Inspec Archive Database give access to the work of famous scientists, it also gives access to the often forgotten works (sometimes known as "Sleeping Beauties") that may be of use in assessing the validity of current patents. An idea suggested decades ago that did not develop then, may be of relevance today.

Engineering Village™ Overview

Engineering Village™, an Elsevier Engineering Information product, provides access to multiple sources of important engineering content through one single interface, via combined database searching of all databases including de-duplication.

The Engineering Village Search interface has a number of search options. These are accessed via Tabs across the top of the screen. Using these it is possible to choose between “Easy Search”, “Quick Search”, “Expert Search” and “Thesaurus” options. Other tabs allow you to conduct a search for tagged records (via “Tags + Groups”), “Ask an Expert” and access a comprehensive help file.

All search options lead to a Search Results form with intuitive refinement options and the ability to link to full text, save the search and/or results, view, e-mail, print or download records (with a choice of formats) and set up alerts. Please note that you need to set up a free personal account in order to save searches, save records and create e-mail alerts.

Logging On

The Engineering Village™ login page may be found at http://www.engineeringvillage2.org

Help

An online help file is available. Click the “Help” tab on the top right hand side of the search screen for a comprehensive list of help topics, with a choice of output formats:

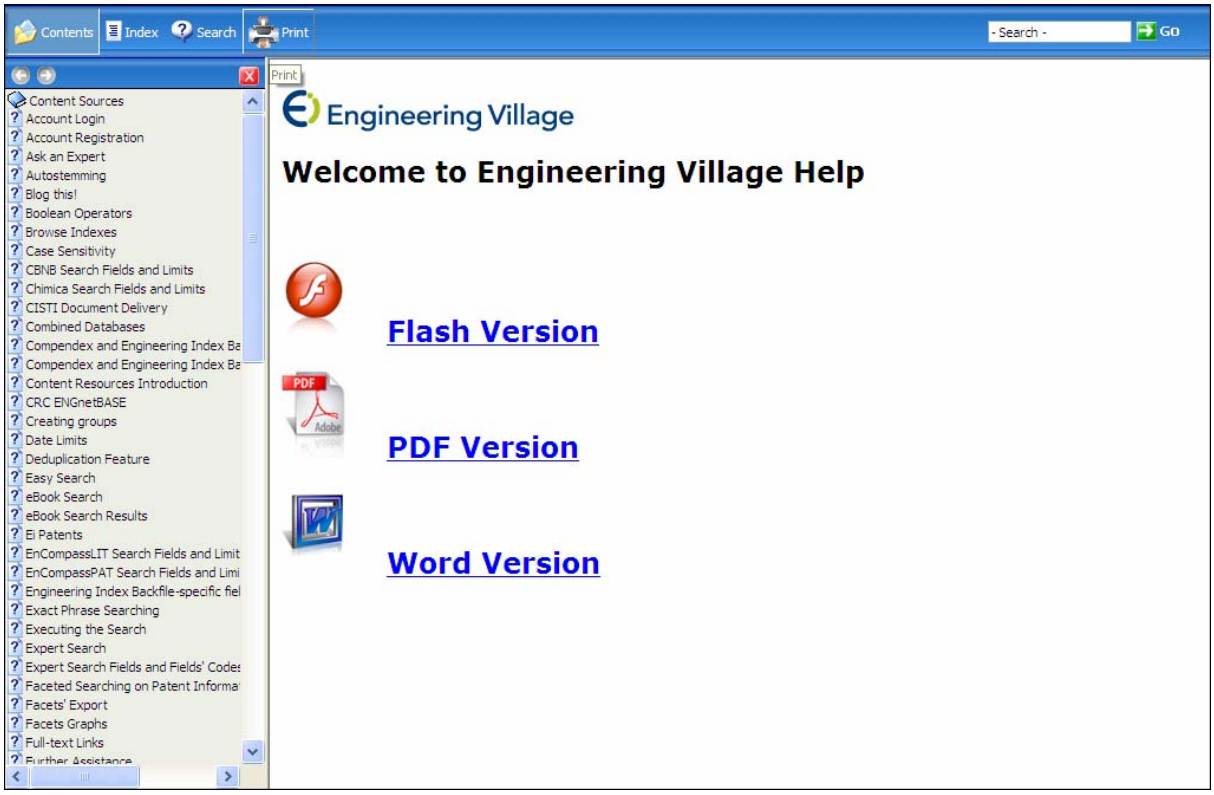


Fig1. Engineering Village - Help Screen

Easy Search

"Easy Search" is designed with new searchers in mind, or for those who want to carry out a simple search. There is a single dialogue box into which search terms are entered. Controlled terms, free text terms, author names etc. can all be searched. Boolean logic, wild cards and proximity operators can be used if desired. These are explained on p.23-24. By default, all fields are searched in all the databases for which a subscription is held.

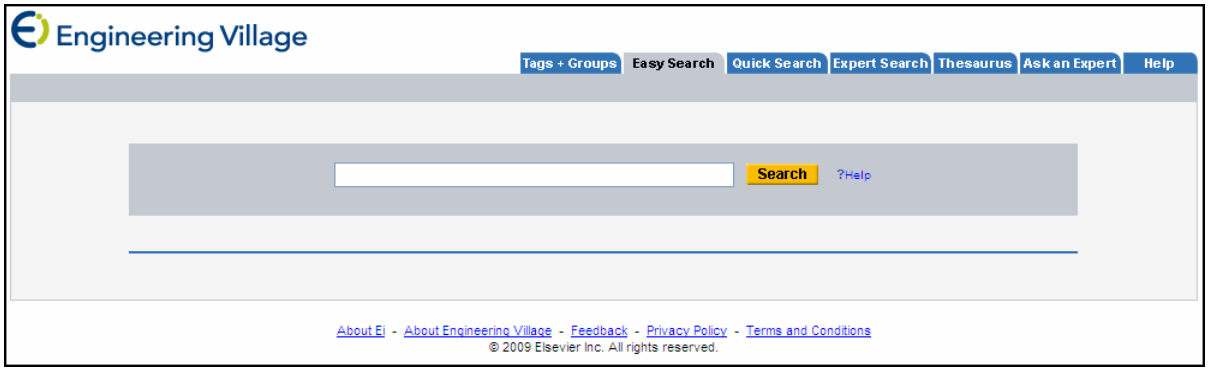


Fig2. Engineering Village - Easy Search Screen

Quick Search

"Quick Search" allows greater flexibility in searching than "Easy Search". It is possible to specify the fields to be searched via drop-down menus and to restrict the answer set using criteria such as time range, language of original document, etc. The "Browse Indexes" feature (for Author, Author Affiliation, Controlled Term, Source Title and Publisher) is available to assist in constructing a search. An example of its use to find Controlled Terms may be found on p.11. It is also possible to specify which database to search, if a subscription is held for more than one, via tick-boxes. Handy on-screen search tips may be found below the main search area. Contextual help is also available via the'**?**' to the right of Search, Limit By and Sort By features.

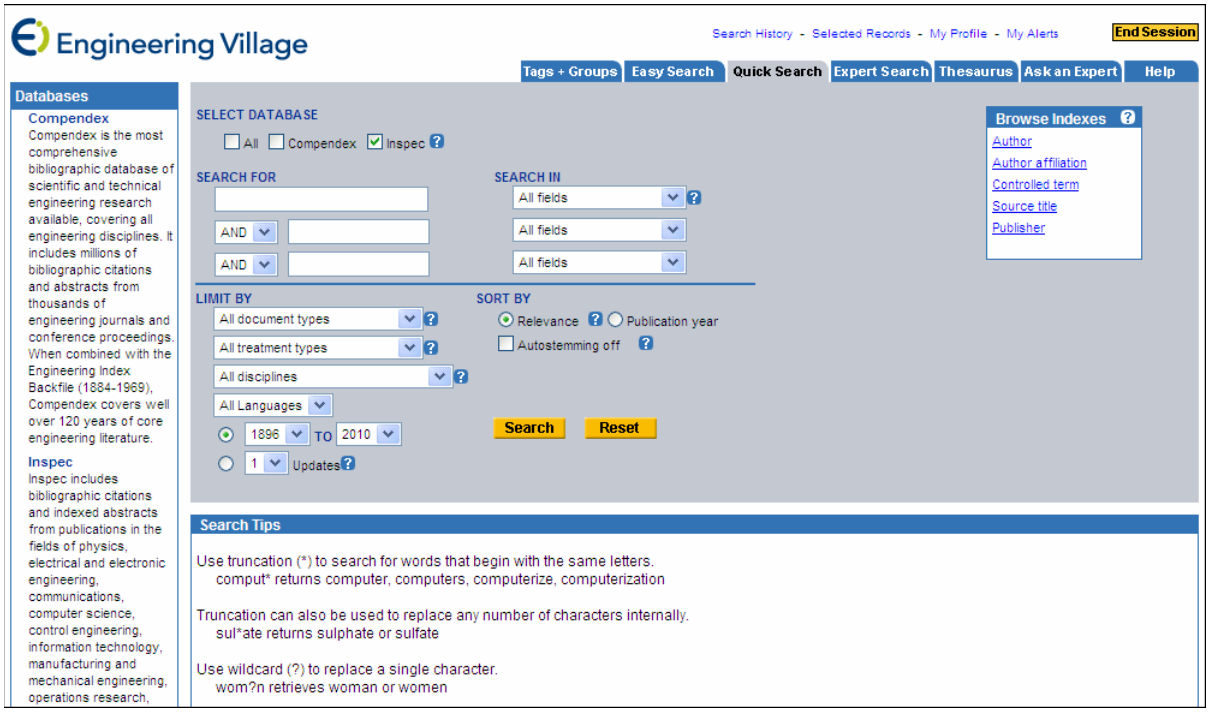


Fig3. Engineering Village - Quick Search Screen

Expert Search

"Expert Search" is the most powerful and flexible search option. It incorporates advanced Boolean logic and more search options than "Quick Search". Queries are constructed in the single dialog box using the Engineering Village command language. Searches can be easily restricted to particular time ranges or updates using pull down menus. As in "Quick Search" it is possible to specify which database to search, if a subscription is held for more than one. The "Browse Indexes" feature includes more options than in "Quick Search".

As in "Quick Search", on-screen search tips may be found below the main search area.

The Engineering Village command language is described on p.25.

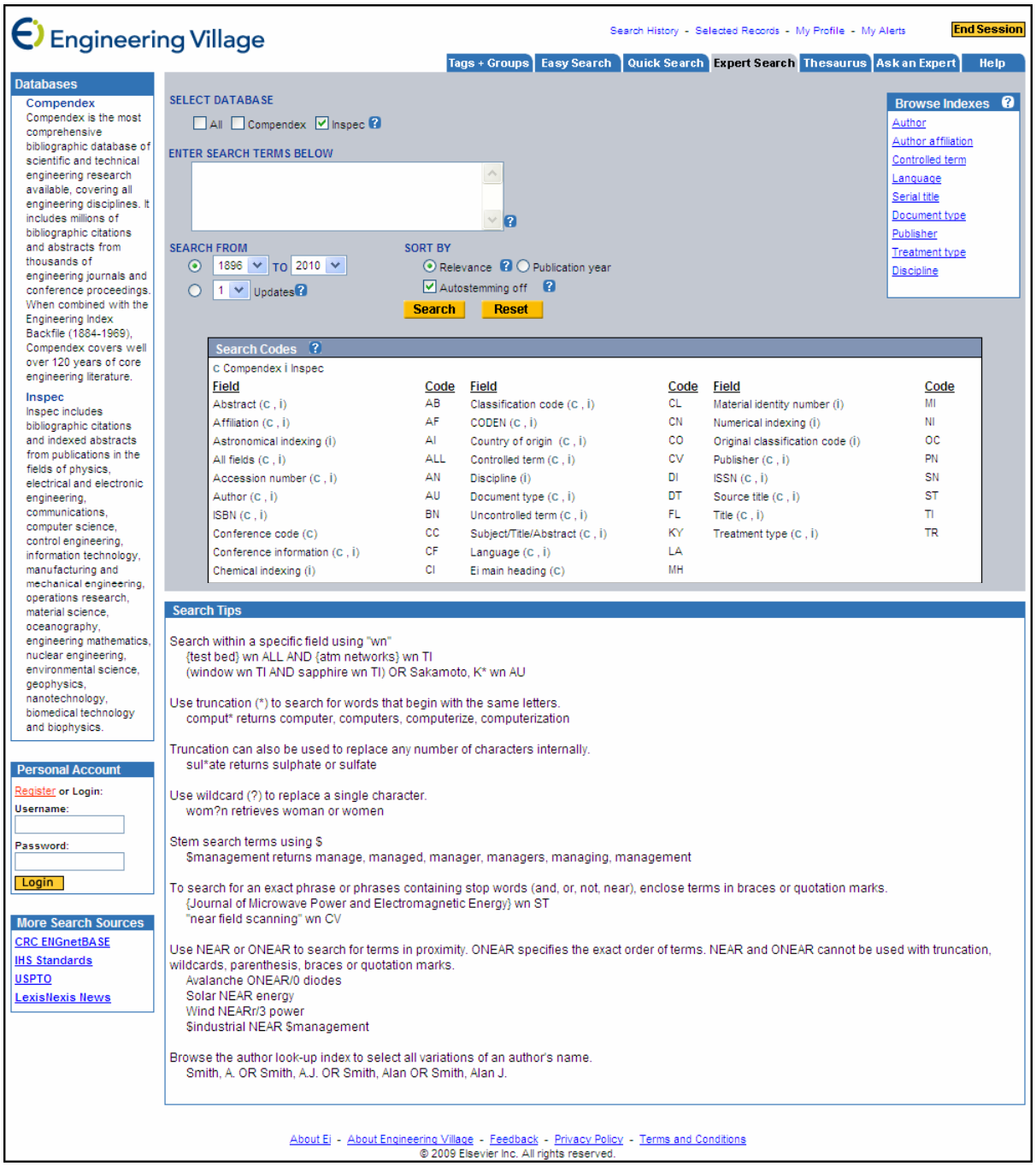


Fig4. Engineering Village - Expert Search Screen

Thesaurus

"Thesaurus" is a powerful search aid. From this page it is possible to browse and/or search for controlled terms.

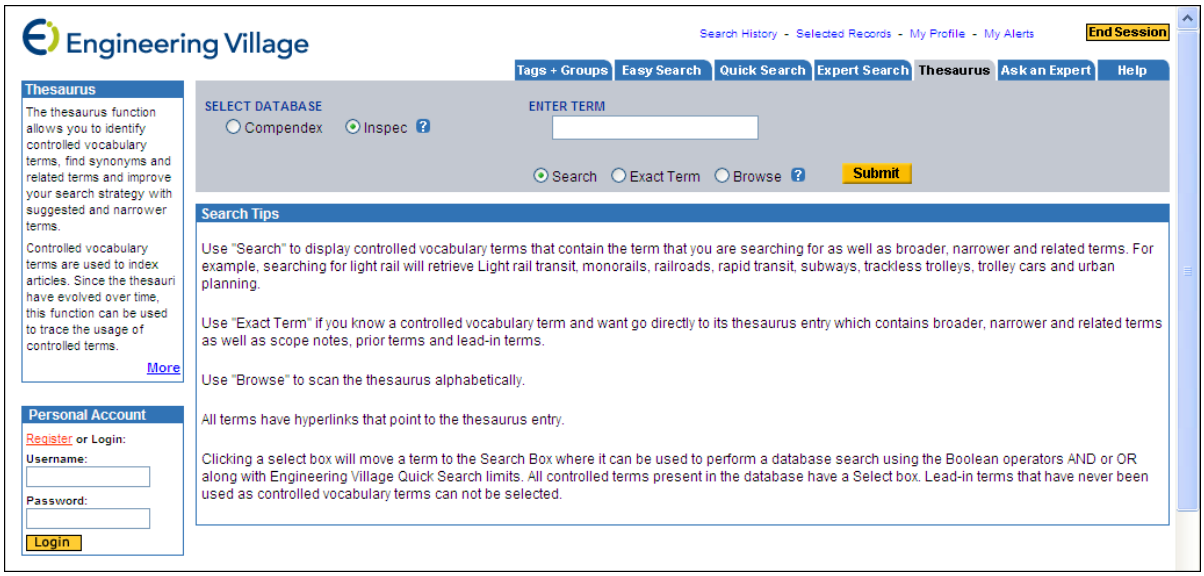


Fig5. Engineering Village – Initial Thesaurus Screen

Enter a search term in the box, select the Inspec Database so that the controlled terms are sourced from there, then select whether to:

Browse the thesaurus and produce a list of terms which contains both the search term and other controlled terms arranged alphabetically around it

Search the thesaurus to produce a list of terms which contains both the search term and any controlled terms that describe similar technology or

Exact term: search the thesaurus when you know a controlled term to produce a list containing the exact search term and any narrower terms, broader terms, related terms, scope notes, prior terms and lead-in terms (ie. non-preferred terms) that are associated with it

These options are illustrated on p.12-13. Within any of the thesaurus options, desired terms may be selected by checking the corresponding boxes. These terms are automatically input into a search box in the lower section of the screen, and can be combined using 'AND' or 'OR' Boolean logic. Various Limits can be imposed and Sort options for results are available:

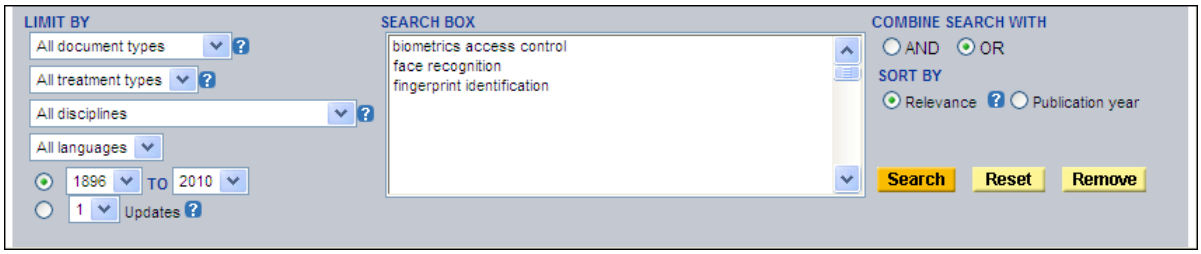


Fig6. Engineering Village - Thesaurus Search Box for Selected Controlled Terms

Search Results

All search options lead to a Search Results form with a number of refinement options, which vary according to the type of search. Each refinement category can be displayed as a chart by clicking the "Bar Graph" icon next to its title. Fig7. illustrates the Search Results screen from an Easy Search.

Fig7. Engineering Village – Search Results (Easy Search)

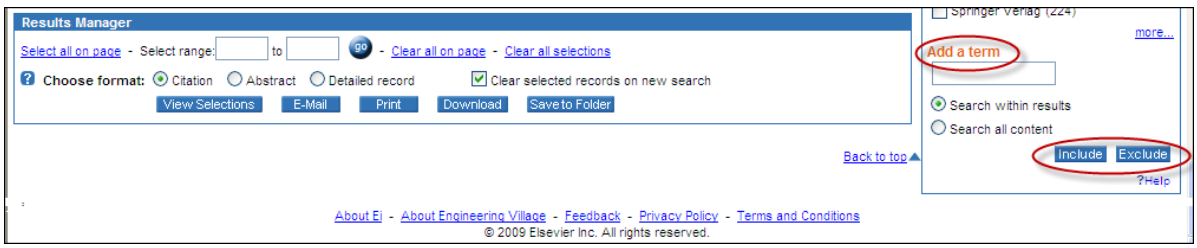
Refinement is straightforward. Simply click a box of particular interest (e.g. database = Inspec) to restrict to that choice. The screen automatically refreshes to offer further refinement options.

It is possible to restrict hits to those including a desired subject term (or Boolean expression), by entering it in the search box in the top-left of the screen and clicking Search button. The "Refine Search" button enables direct editing of the entire search expression used to produce the answer set.

"Quick Search", "Expert Search" and "Thesaurus" searches also offer the choice of **excluding** a search term or refinement set, by means of Include and Exclude buttons:

Fig8. Engineering Village – Search Results (Thesaurus Search)

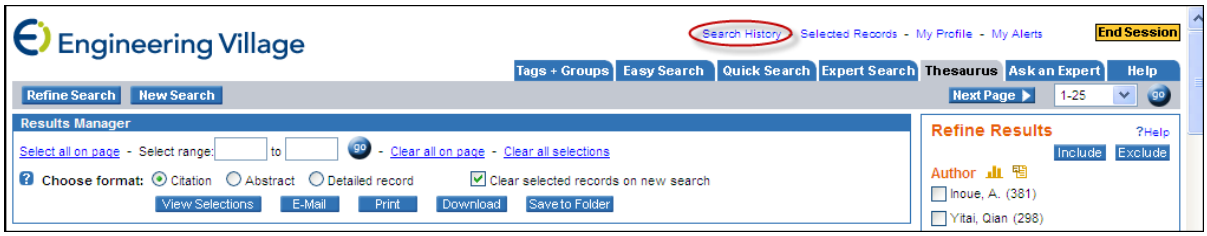
For these search tabs, the option to refine by subject term may be found at the bottom-right of the screen, again with the choice of Include and Exclude:



Search History

Search History is an important search and navigation tool. It allows you to review your current search strategy and to gradually build complex searches.

The Search History link may be found at the top of each Search Results screen:



The Search History form lists complete details of all search sets in your current session:

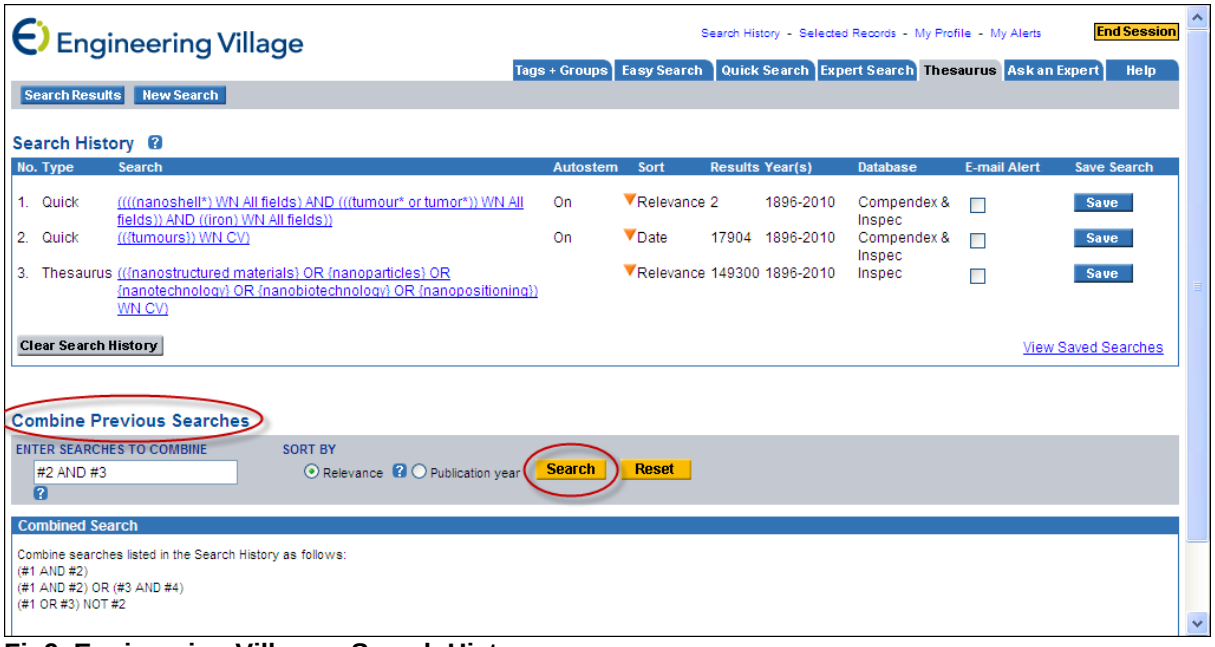


Fig9. Engineering Village – Search History

Clear on-screen instructions are provided for combining previous search sets by Boolean logic (AND, OR, NOT).

Each search is hyperlinked, making it easy to go back to the results of an earlier answer set.

Alerts can be created and recalled from within this screen. Please note that you need to set up a free personal account in order to save searches, save records and create e-mail alerts.

Inspec Sample Record

Accession number:	11118570
Title:	**Enhanced luminescence properties of YAG:Ce^{3+} nanophosphor prepared by flame spray pyrolysis**
Authors:	Jae Seok Lee[1] ; Kumar, P.[1] ; Gupta, S.[1] ; Myoung Hwan Oh[1] ; Ranade, M.B.[2] ; Singh, R.K.[1]
Author affiliation:	[1] Mater. Sci. & Eng., Univ. of Florida, Gainesville, FL, USA
Source title:	Journal of the Electrochemical Society
Abbreviated source title:	J. Electrochem. Soc. (USA)
Volume:	157
Issue:	2
Publication date:	Feb. 2010
Pages:	K25-9
Language:	English
ISSN:	0013-4651
CODEN:	JESOAN
Document type:	Journal article (JA)
Publisher:	Electrochemical Society Inc.
Country of publication:	USA
Material Identity Number:	DK34-2010-004
Abstract:	Cerium-doped $Y_3Al_5O_{12}$ (YAG):Ce^{3+} nanophosphor particles were synthesized using flame spray pyrolysis (FSP) from urea-added nitrate liquid precursor with different molar ratios of yttrium to aluminum. The effect of urea and Y:Al molar ratio in the liquid precursor on the crystallinity and luminescence properties of YAG:Ce^{3+} nanophosphors was studied. The cubic YAG structure was obtained after heat-treatment of as-prepared particles. The addition of urea leads to a higher flame temperature and helps in the formation of crystalline phase during FSP. A higher molar concentration of Al in the liquid precursor helped in better incorporation of the dopant atom in the lattice and also promoted the formation of YAG phase. Well-dispersed spherical particles with an estimated size of 50 nm were obtained by the process. The YAG:Ce^{3+} nanophosphors synthesized using urea and excess aluminum in liquid precursor showed better crystallinity and higher luminescence intensity.
Number of references:	28
Inspec controlled terms:	cerium - heat treatment - luminescence - nanostructured materials - nanotechnology - phosphors - yttrium compounds
Uncontrolled terms:	enhanced luminescence property - nanophosphor preparation - flame spray pyrolysis - urea-added nitrate liquid precursor - crystallinity - heat treatment - crystalline phase - molar concentration - well-dispersed spherical shaped particles - $Y_3Al_5O_{12}:Ce^{3+}$
Inspec classification codes:	A7855H Photoluminescence in other inorganic materials - A8140G Other heat and thermomechanical treatments - A8116 Methods of nanofabrication and processing - A7865P Optical properties of other inorganic semiconductors and insulators (thin films/low-dimensional structures) - B4220M Phosphors
Chemical indexing:	Y3Al5O12:Ce/ss Y3Al5O12/ss Al5O12/ss O12/ss Al5/ss Y3/ss Al/ss Ce/ss O/ss Y/ss Ce/el Ce/dop
Treatment:	Experimental (EXP)
Discipline:	Physics (A); Electrical/Electronic engineering (B)
DOI:	10.1149/1.3262609
Database:	Inspec

Inspec Archive Sample Record

Accession number:	1951A04074
Title:	**On the motion of particles in general relativity theory**
Authors:	Einstein, A.; Infeld, L.
Source title:	Canadian Journal of Mathematics
Abbreviated source title:	Can. J. Math. (Canada)
Volume:	1
Issue:	3
Publication date:	1949
Pages:	209-241
Document type:	Journal article (JA)
Country of publication:	Canada
Abstract:	An earlier derivation of the equations of motion from the field equations [*Ann.Math.*,**41**>, 455 (1940)] is re-examined to meet the criticism that the approximation procedure employed did not ensure that the field equations were soluble to an arbitrary high approximation. A new system of successive approximation is developed in which field quantities are expanded in terms of an arbitrary parameter λ, and it is shown that integrability at any stage of the approximation can be ensured by introducing certain dipole terms. These terms are removed after the total field has been calculated to the required degree of approximation, and the removal process gives 3*p* differential equations defining the motion of the *p* particles to the degree of approx. considered.
Inspec controlled terms:	general relativity
Inspec classification codes:	A0400 Relativity and gravitation
Inspec original controlled terms:	general
Inspec original classification codes:	530.1-Fundamentals-Physics
Discipline:	Physics (A)
Database:	Inspec
	Copyright 2004, IEE

Both the Inspec and Inspec Archive records are shown using the Detailed Record display. They can also be displayed in the shorter Abstract format which includes fewer indexing fields.

Hyperlinks

Each record in the detailed format offers you a number of hyperlinks that enable you to explore various fields within your search. These include links from **Author(s)**, **ISSN, CODEN, Material Identity Number, Inspec Controlled Terms, Uncontrolled Terms,** and **Classification Codes.** Clicking on a link, for example, an author, selects all records by this author available on the database.

Searching Inspec Subject Fields

Inspec Controlled Terms

The Inspec Thesaurus is a subject key to the Inspec database which serves as a powerful search aid. The 2010 edition contains 18,400 terms of which some 9,600 terms are preferred indexing terms *(*ie. controlled terms*)*. Each Inspec record is typically assigned several Thesaurus terms. These are searchable in the Controlled Terms field.

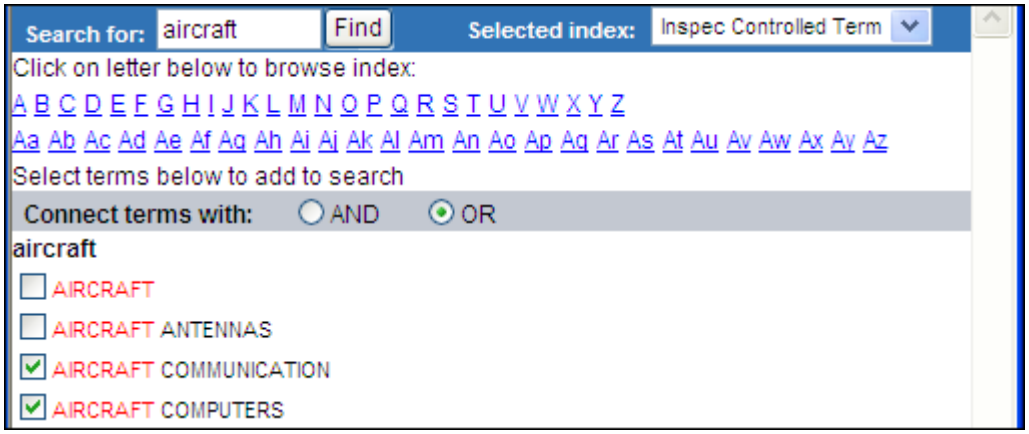
A typical entry for a Thesaurus term and its associated terms is shown below:

Subject	aircraft control
Date of Introduction (DI)	January 1989
Prior Term(s) (PT)	aerospace
	aircraft
Classification Code(s) (CC)	C3360L aerospace control
Used for (UF)	helicopter control
More Specific (Narrower) Term(s) (NT)	aircraft landing guidance
More General (Broader) Term(s) (BT)	aerospace control
	aircraft
Top Term(s) (TT)	automation
	computer applications
	vehicles
Related Term(s) (RT)	aircraft computers
	aircraft instrumentation
	attitude control
	avionics
	instrument landing systems
	microwave landing systems

Scope Notes, History and Date of Deletion may also be present in the hierarchy.

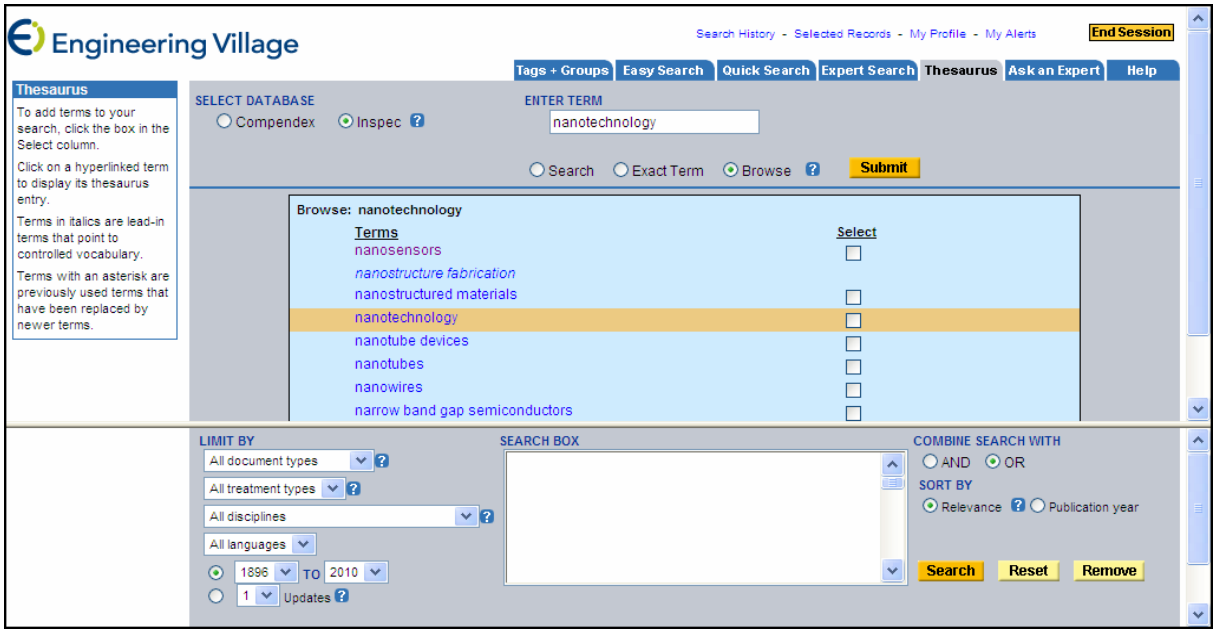
To find suitable controlled terms, use the Thesaurus tab (recommended) or, alternatively, click on the Controlled Term link in the “Browse Indexes” box in the “Quick Search” and “Expert Search” options.

Within **“Browse Indexes”**, enter a term in the search box and click “Find” to produce an alphabetical list of terms which *start with* the search string entered (aircraft, in the example below).
Click one or more tick-boxes to add terms to the relevant search screen. NB Tick-boxes are not given for non-preferred terms.

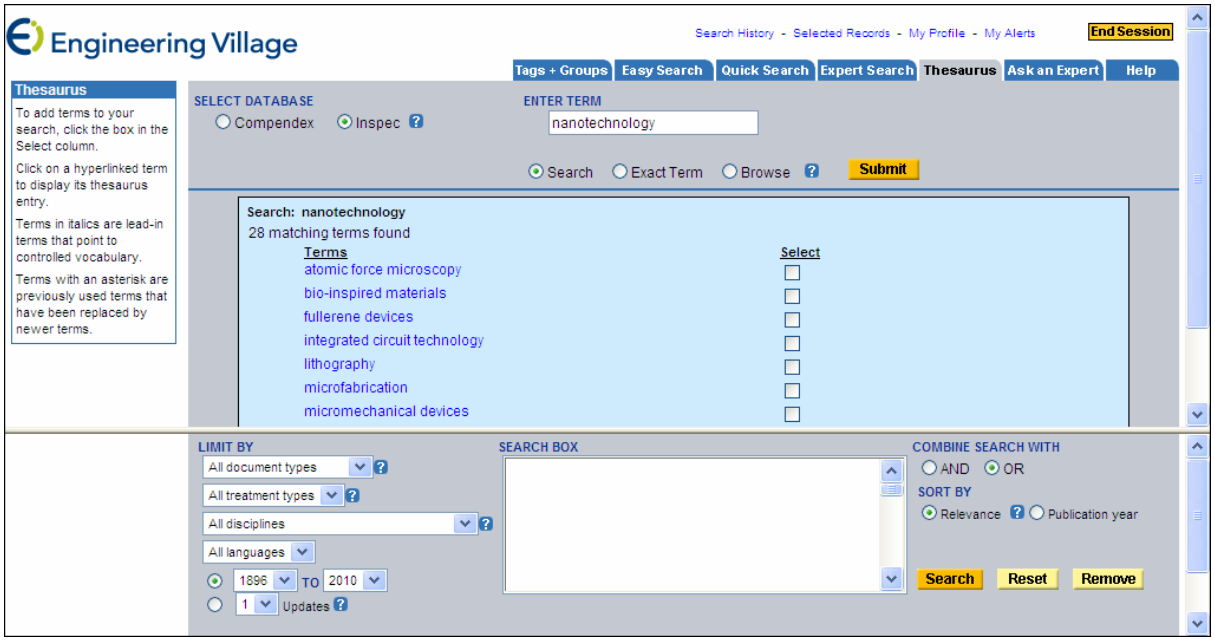


Within the "**Thesaurus"** tab (Fig.5), there are 3 options for exploring a subject of interest.

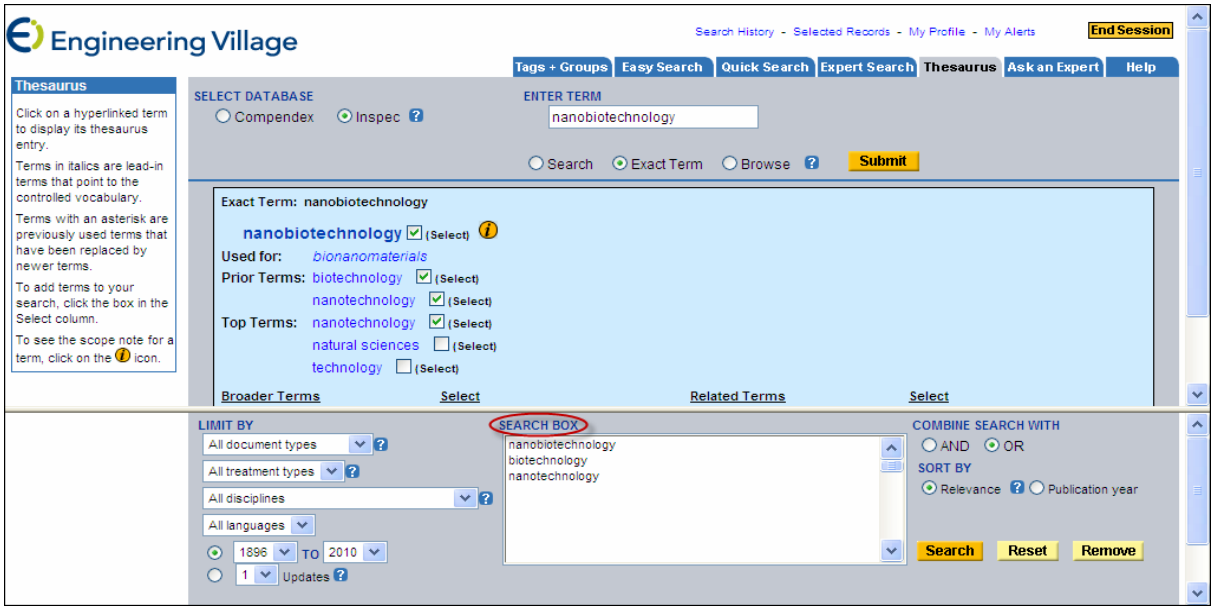
Browse will produce a list of terms which contains both the search term and other controlled terms arranged alphabetically around it, e,g.



Search will produce a list of terms which contains both the search term and any controlled terms that describe similar technology, e.g.



Exact term will search the thesaurus when you know a controlled term to produce a list containing the exact search term and any narrower terms, broader terms, related terms, scope notes, prior terms and lead-in terms (ie. non-preferred terms) that are associated with it, e.g. (next page)



Within any of these options, the terms themselves are hyperlinked; click on them directly for any broader terms, narrower terms, related terms, prior terms and scope notes.

Within any of the three thesaurus options, select the terms to be searched by checking the corresponding boxes. These terms are automatically input into a search box in the lower section of the screen and can be combined using 'AND' or 'OR' Boolean logic. Various Limits can be imposed and Sort options for results are available. Non-preferred terms have no tick-box and therefore cannot be searched as controlled terms. However, they are hyperlinked and may be clicked to reveal the preferred term.

As an additional approach to using the "Thesaurus" tab, start with a **trial search** using the most relevant keyword for your topic (e.g. asynchronous motors); order the resulting records by relevance; examine controlled terms displayed in the abstract format or detailed format for the most relevant records. An example of the Controlled Terms display in a typical record is shown below:

Inspec controlled terms: capacitor motors - frequency control - induction motors - machine control - machine windings - power factor

NB If a recently introduced term is used, search results will be automatically limited to records indexed from the date of introduction of that term onwards. Click on the yellow "*i*" symbol for date of introduction, scope notes and suggested classification codes for expanding search.

Within **Inspec Archive**, both the Controlled Terms originally applied to the records and the nearest equivalent modern Inspec Controlled Terms, which have been retrospectively applied, are available for searching.

Within an Inspec record on Engineering Village the controlled terms are hyperlinked.

Controlled Terms may be searched directly in the Controlled Term drop-down in "Quick Search" and by command language in Quick Search" or "Easy Search". Please see p.25 for further details.

The Inspec Thesaurus is also available as an XML file for loading in-house. Please see:

http://www.theiet.org/publishing/inspec/products/range/aids.cfm

Inspec Classification

The Inspec Classification is a powerful search tool that enables you to limit your search to predetermined sections of the Inspec database.

The Inspec Classification is divided into five sections, outlined in Table 1.

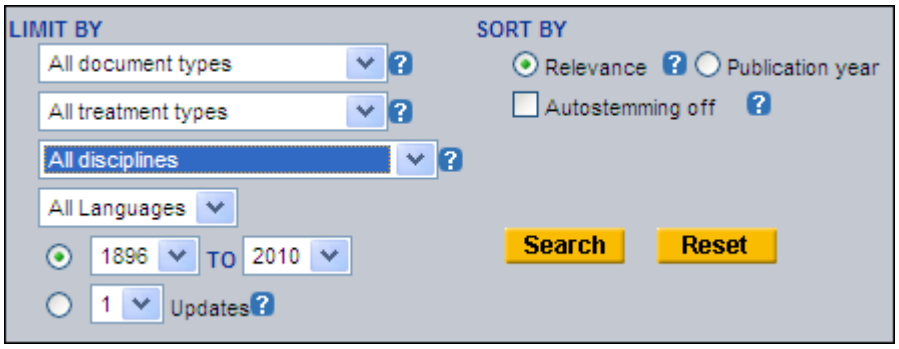
A – Physics	**B - Electrical Engineering & Electronics**
A0 General A1 The physics of elementary particles & fields A2 Nuclear physics A3 Atomic & molecular physics A4 Fundamental areas of phenomenology A5 Fluids, plasmas & electric discharges A6 Condensed matter: structure, thermal & mechanical properties A7 Condensed matter: electronic structure, electrical, magnetic, & optical properties A8 Cross-disciplinary physics & related areas of science & technology A9 Geophysics, astronomy & astrophysics	B0 General topics, engineering mathematics & materials science B1 Circuit theory & circuits B2 Components, electron devices & materials B3 Magnetic & superconducting materials & devices B4 Optical materials & applications, electro-optics & optoelectronics B5 Electromagnetic fields B6 Communications B7 Instrumentation & special applications B8 Power systems & applications
C - Computers & Control	**D - Information Technology**
C0 General & management topics C1 Systems & control theory C3 Control technology C4 Numerical analysis & theoretical computer topics C5 Computer hardware C6 Computer software C7 Computer applications	D1 General & management aspects D2 Applications D3 General systems & equipment D4 Office automation - communications D5 Office automation - computing
E – Mechanical and Production Engineering	
E0 General topics in manufacturing & production engineering E1 Manufacturing & production E2 Engineering mechanics E3 Industrial sectors	

Table1. Outline of the Inspec Classification

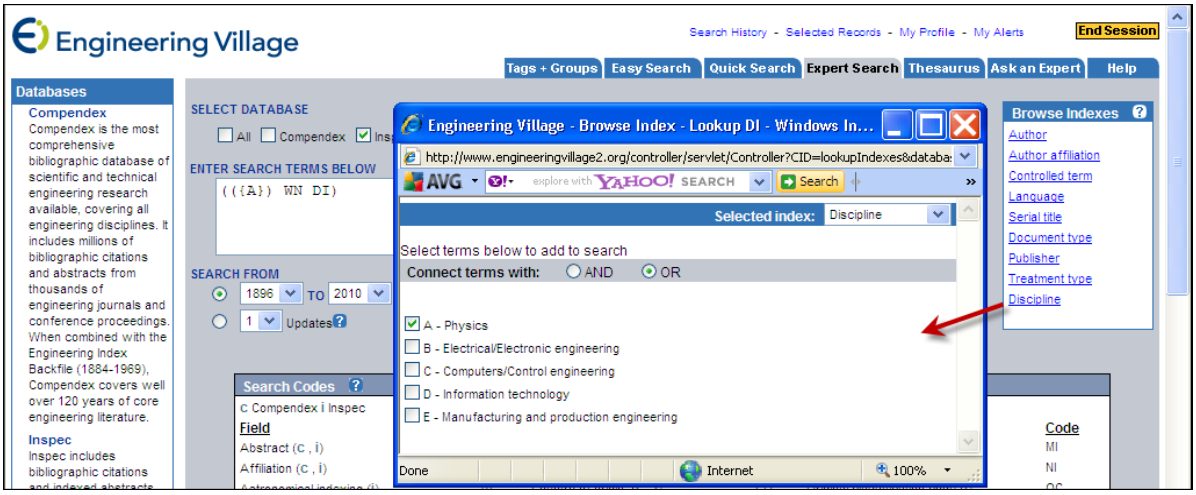
Codes begin with

A Physics
B Electrical & Electronic Engineering
C Computing and Control
D Information Technology for Business
E Manufacturing and Production Engineering

In “Quick Search” it is possible to limit the search results to a classification section, such as A – Physics, using the All Disciplines drop-down in the Limit By section:



In “Expert Search”, use the Discipline link from the Browse Indexes box and tick the desired section(s):



More specific classifications can be searched in the “Expert Search” option using command language. A typical portion from the Inspec Classification follows:

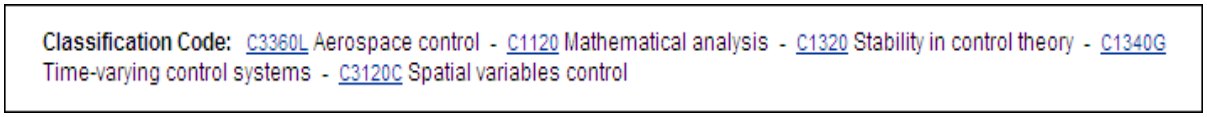
B5210	**Electromagnetic wave propagation** (inc. diffraction, scattering and reflection)
B5210C	Radiowave propagation
B5210E	Light propagation
B5210H	Electromagnetic wave propagation in plasma

Use truncation with command language to retrieve more specific Classification Codes. For example, B5210 WN CL will retrieve only records that deal with electromagnetic wave propagation in general, whereas B5210* WN CL will also retrieve all records that deal with radiowave propagation, plus light propagation and electromagnetic wave propagation in plasma.

At least one Classification Code is assigned to the main subject matter of each record, and additional codes may be assigned for subsidiary subjects. Codes are always assigned to the most specific level possible and can be assigned from one or more of the five sections of the Database depending upon the subject matter of the original document. Cross-classification is common between sections of the database.

Use search results from a **trial search** and view the Classification Codes in the retrieved records for relevant Classification Codes to refine your search.

An example of the Classification Codes display in a typical record is shown below:



NB If a recently introduced Classification Code is used, search results will be automatically limited to records classified from that date onwards.

Within **Inspec Archive**, the Original Classifications and the nearest equivalent modern Inspec Classifications, which have been retrospectively applied to the records, are available for searching.

Within an Inspec record on Engineering Village, Classification Codes are hyperlinked.

The Inspec Classification is also available as an XML file for loading in-house. Please see:

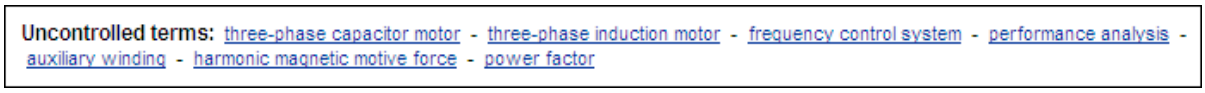
http://www.theiet.org/publishing/inspec/products/range/aids.cfm

Alternatively contact your local Inspec Helpdesk for details.

Uncontrolled Terms

Inspec Uncontrolled Terms are words or phrases expressing significant concepts, both explicit and implicit, in the original document. The terms used are not selected from an authority list or Thesaurus, but are freely chosen by Inspec's subject specialists from the title, abstract and other text of the document. The terms are **not** standardised, either in spelling or terminology, and there is no restriction on the number of words in a term. The benefit of Inspec Uncontrolled Terms is that they cover new technologies that do not yet have a Thesaurus Term or they cover concepts outside the normal scope of the Inspec Thesaurus yet which are key to the subject matter of the document.

A typical display of Uncontrolled Terms in an Inspec record is as follows:



Inspec Uncontrolled Terms should be searched to obtain records specifically on the topic of interest if a Thesaurus term does not yet exist for your topic. A search of the term in the title and/or abstract fields might otherwise retrieve passing or negative references to the topic.

Take note of the following points in preparing search strategies:

- Chemical formulae, rather than English names, appear in this field for inorganic compounds (for example 'CO' rather than 'carbon monoxide')
- Organic compound names, rather than formulae, are used (as is the case in many of the original documents)
- Acronyms and full names (for example 'CAD' or 'computer-aided design') are both equally likely to appear
- Proprietary names (for example IBM PC/AT) are indexed where an article reviews a product or discusses aspects of its use; however in many scientific experiments, the precise type of instrument used may be of only incidental interest, and in this case the information would not be indexed.

Within an Inspec record on Engineering Village, Uncontrolled Terms are hyperlinked.

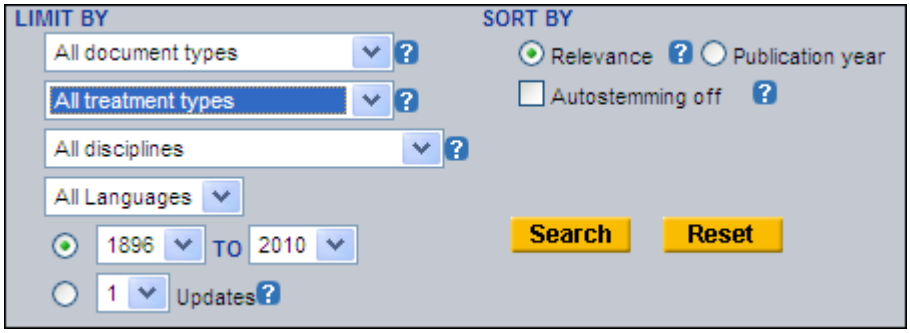
Treatment Types

Treatment Types are assigned by Inspec to indicate the approach taken to a subject by the author of a source document. A record may have more than one Treatment Type assigned to it.

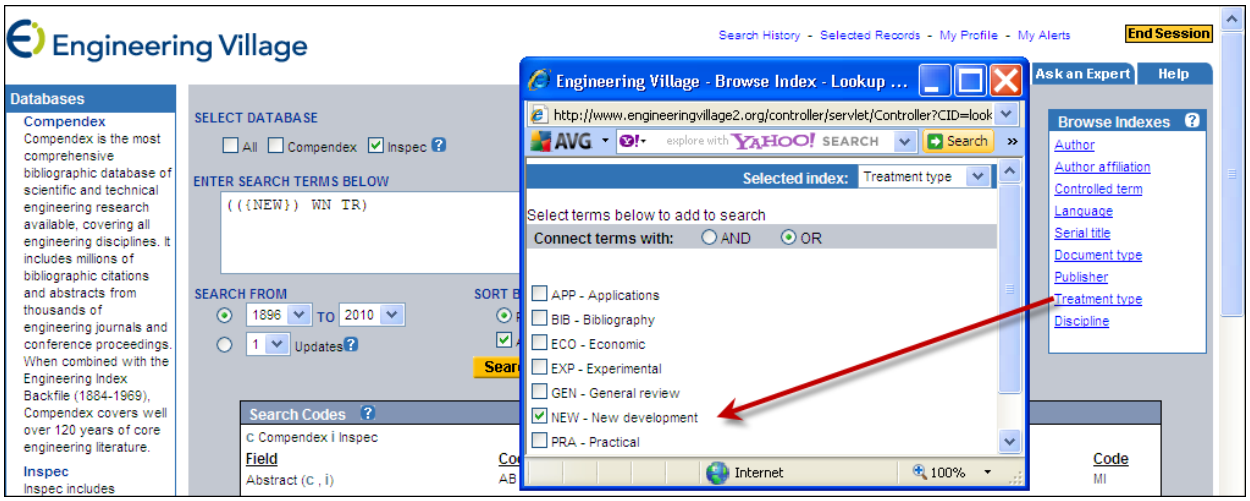
Treatment Type	Treatment Code
Applications	APP
Bibliography	BIB
Economic	ECO
Experimental	EXP
General or Review	GEN
New Development	NEW
Practical	PRA
Product Review	PRO
Theoretical or Mathematical	THR

Table2. Treatment Types and Codes

In “Quick Search” it is possible to limit the search results to a Treatment Type, such as New Development, using the Treatment Type drop-down in the Limit By section:



In “Expert Search” use the Treatment Type link from the Browse Indexes box and tick the desired treatment code(s):



Chemical Indexing

Inspec's Chemical Indexing (CI) is a controlled indexing system that is available only in "Expert Search". Introduced in 1987 for inorganic substances and material systems, it is designed to overcome a number of problems that arise in searching for chemical substances in the title, abstract or uncontrolled terms. These include:

- Non-stoichiometric compounds or alloys that may be represented in several ways, e.g. GaAlAs or $Ga_xAl_{1-x}As$.
- Chemical formulae that have the same spellings as common English words (e.g. GaP (Gallium Phosphide) spells the word gap).
- Chemicals that have the same letters and are differentiated by the use of upper and lower case (e.g. Co (cobalt) or CO (carbon monoxide)).

Role indicators

Each chemical substance which is significant for the record is assigned one of three basic role indicators:

Role	Definition	Examples
el	Element	Si; He; Fe
bin	Binary (two components)	GaAs; He-Ne laser; FeMn alloy
ss	System (three or more components)	H_2SO_4; He-Ne-Ar laser; GaAlAs

Table3. Basic Role Indicators

Some substances may be assigned additionally one or more special roles which are of significance to solid-state physics. These are:

int	Interface system
sur	Surface or substrate
ads	Adsorbate
dop	Dopant

Table4. Special Roles

The system automatically assigns the appropriate basic role and breaks the substances into their components.

Examples of Chemical Substance Indexing:

H_2SO_4	H2SO4/ss SO4/ss H2/ss O4/ss H/ss S/ss O/ss
P doped Si	Si:P/bin Si/bin P/bin Si/el P/el P/dop
Cu-Al alloy	CuAl/bin Cu/bin Al/bin
Si-Au interface	Si-Au/int Si/int Au/int Si/el Au/el
GaAlAs	GaAlAs/ss Ga/ss Al/ss As/ss
$Ga_xAl_{1-x}As$	GaAlAs/ss Ga/ss Al/ss As/ss

Search Tips:

When searching for a substance with a precise formula (e.g. H_2SO_4), it is best to search directly for the substance using the appropriate role, in this case '*ss*'. See Table5 for a list of such substances.

However, when searching for substances in which the order of elements is variable or not precisely known (as in the case of semiconductors, alloys or mixtures), it is necessary to consider all possible variations of the formulas searched and it is therefore better to search for the individual components of the substance, and to combine them with the **NEAR operator** (see p.23 for explanation of operators).

Al2O3	BrO3	Fe2O4	MoO4	P2O7	TaO3
Al5O12	ClO3	Fe3O4	NbO3	P4O12	TiO3
AsO4	CO3	Fe5O12	Nb2O5	SeO3	VO3
As2O3	CrO3	Ga5O12	Nb2O7	SeO4	VO4
Bi2O3	CrO4	GeO2	NO2	SiO2	V2O5
BO3	Cr2O3	GeO3	NO3	SiO4	WO3
BO4	Cr2O7	IO3	PO3	SO3	WO4
B2O3	FeO3	MgO3	PO4	SO4	ZrO3
B3O6	Fe2O3	MnO4	P2O5	S2O3	

Table5. Chemical substances which can be searched directly

Chemical Search Examples

Search Topic	Search Statement
Element in any role	si WN CI
Element with special role (e.g. dopant)	si-dop WN CI si/dop WN CI
Specific compound, alloy or mixture:	
HgCdTe	hg-ss near10 cd-ss near10 te-ss WN CI hg/ss near10 cd/ss near10 te/ss WN CI
$In_{0.36}Ga_{0.64}$ interface	in0.36-int near10 ga0.64-int WN CI in0.36/int near10 ga0.64/int WN CI
FeMn alloy	fe-bin near10 mn-bin WN CI fe/bin near10 mn/bin WN CI
He-Ne laser	he-bin near10 ne-bin WN CI he/bin near10 ne/bin WN CI
Compound with precise formula (e.g. H_2SO_4)	h2so4-ss WN CI h2so4/ss WN CI
Groups of compounds (e.g. niobates)	nbo3-ss WN CI nbo3/ss WN CI

Table6. Chemical Search Examples

NB. Chemical Indexing searching is only available in “Expert Search”.

Numerical Data Indexing

Numerical data indexing (NI) overcomes problems due to the variety of ways in which authors may express a particular value. For example, to find all the references to power stations generating at 27.5 MW, values may be expressed as 27.5 MW, 27500 kW, 27 megawatts, 27 MWatt, etc., making it difficult to achieve comprehensive retrieval.

Inspec's numerical data indexing standardises the format:

power of 25 megawatts:	power 2.5E+07 W
temperature of 100° C	temperature 2.73E+02

Values are expressed in floating point exponential format, e.g., 1.8E+04 for 18,000 and 9.5E-01 for 0.95. Each numerical index term has the following format:

Quantity Value (to Value) Unit where:

- **quantity** represents the physical quantity, e.g., temperature, wavelength;
- **unit** is of the SI type, e.g. metre (M), hertz (Hz), kelvin (K).
- **value** is the actual value or range expressed in floating point format

Table8 lists numerical quantities and their standard units.

Numerical Search Examples

Quantity	Search Type	Numerical Value	Search Statement
Temperature	exact value	4K	{temperature 4.0e+00} WN NI “temperature 4.0e+00” WN NI
Size	exact value	60mm	{size 6.0E-02 m} WN NI “size 6.0e-02 m” WN NI
Pressure	range	10 to 40 GPa	{pressure 1.0e+10 to 4.0E+10} WN NI “pressure 1.0e+10 to 4.0E+10” WN NI
Frequency	range	10 kHz to 10 MHz	{frequency 1.0e+04 to 1.0e+07} WN NI “frequency 1.0e+04 to 1.0e+07” WN NI

Table7. Numerical Search Examples

NB Before 1987 numerical values in the form represented by the author (e.g. If the numerical indexing was 6.0E+02m the value in the Uncontrolled Indexing could be 600m, 6000 cm, 60,000 mm etc.) are often included in the Uncontrolled Indexing. Search this information to expand a numerical data search (e.g. ((600 ONEAR m) OR 600m) WN FL) retrieves records where a value of 600 m is mentioned).

Quantity	Unit	Quantity	Unit
age	yr	loss	dB
altitude	m	magnetic flux density	T
apparent power	VA	mass	kg
bandwidth	Hz	memory size	Byte
bit rate	bit/s	noise figure	dB
Byte rate	Byte/s	picture size	pixel
capacitance	F	power	W
computer execution rate	IPS	pressure	Pa
computer speed	FLOPS	printer speed	cps
conductance	S	radiation absorbed dose	Gy
current	A	radiation dose equivalent	Sv
depth	m	radiation exposure	C/kg
distance	m	radioactivity	Bq
efficiency	percent	reactive power	VAr
electrical conductivity	S/m	resistance	ohm
electrical resistivity	ohmm	size	m
electron volt energy	eV	stellar mass	Msol
energy	J	storage capacity	bit
frequency	Hz	temperature	K
gain	dB	time	s
galactic distance	pc	velocity	m/s
geocentric distance	m	voltage	V
heliocentric distance	AU	wavelength	m
		word length	bit

Table8. Quick Guide to Numerical Quantities and Their Units

Astronomical Object Indexing

Astronomical Object designations (AI) have been indexed in a separate field since 1995. This allows named or numbered objects to be retrieved more efficiently. The designations are of the following types:

- **Name-based acronyms**. For example, LMC is an acronym for the Large Magellanic Cloud. Objects in constellations, such as R Sct, appear with the IAU-approved three-letter abbreviation for the constellation.

- **Catalogue-based acronyms**. A designation containing an acronym for the catalogue followed by the catalogue entry number. This number may be sequential, such as NGC 204, or it may represent an approximate location in the sky, usually in terms of right ascension and declination (such as PSR 1913+16) or Galactic coordinates (such as G 345.01+1.79).

- **Positional information only**. For example, 013022+30233.

Note: Inspec follows the guidelines produced by the International Astronomical Union.
A thesaurus-type document entitled "Nomenclature of Astronomical Catalogue Designations" is available upon request from Inspec.

Astronomical Object Search Examples

Search Examples	Search Statement	Search Hints
Markarian galaxies	Mrk* WN AI	*before 1995:* (mrk OR mkn) WN FL OR markar?an[1] WN FL
X-ray source which starts '3A 0322'	3a 0322* WN AI	search for the string as indicated
Objects with positional designations	1608* WN AI	retrieves objects in both hemispheres

Table9. Astronomical Object Search Example

[1] markarian or markaryan

Search Operators

The Engineering Village Search operators can be used in both Inspec and Inspec Archive.

Boolean Operators

These are used to link search terms or fields. Depending on the operators used, your search will be broadened or narrowed.

OR operator finds records that contain at least one or more of the search terms. It is used to broaden a search.

computers OR networks

Finds records where the search field contains at least one of the words *computers* or *networks*.

AND operator finds records that contain all of the search terms and thus is used to narrow a search.

computers AND networks

Finds records where the search field contains both the word *computers* and the word *networks*.

NOT operator finds records that contain one term but not another. It is used to narrow a search by excluding specific terms.

computers NOT networks

Finds records where the search field contains the word *computers* but not the word *networks*.

Proximity Operators

When searching for words in a record, proximity operators can be used to specify how close together, and in what order the words should appear.

NEAR operator specifies that the search terms can be in any order.

E.g.1 traffic NEAR/0 *light*

The search field must contain both *traffic* and *light*. They must be adjacent to each other (i.e. separated by 0 other words), but can be in any order (i.e. traffic light or light traffic).

E.g.2 computer NEAR/3 diode

The search field must contain both the words *computer* and *diode.* They can be separated by up to 3 other words, but they can appear in any order (e.g. a diode used in computer applications, or a computer based diode).

If no number of words is specified, 4 is assumed. *laser NEAR diode* is the same as *laser NEAR/4 diode*

***ONEAR* operator** specifies that the search terms must be in order.

E.g.1 computer ONEAR/2 networks

The search field must contain both the words *computer* and networks. They can be separated by up to 2 other words, but they must appear in the order in which they are typed in the search statement *(e.g.* computer *neural networks* and *computer communication networks* would be retrieved; *networks for a computer* would not*).*

NB The NEAR/ONEAR commands *cannot* be used in conjunction with truncation, wildcards, parenthesis (braces) or quotes, but *can* be used in conjunction with stemming.

Phrases

To search for an exact phrase or phrases containing system words (and, or, not, near), enclose terms in braces or quotation marks. e.g. {health and safety}, “near field scanning”. Without the braces or quotation marks, the terms would be searched in the same sentence or search field.

Truncation

Unlimited truncation “ * ” serves as a substitute for zero or more characters. Left, right and internal use of “ * “ are allowed.

*electr**

Finds records where the search field contains words such as *electrical, electricity, electronic, electronics*, etc.

**sorption*

Finds records where the search field contains words such as *adsorption, absorption, desorption.*

h*emoglobin

Finds records where the search field contains words such as *hemoglobin, haemoglobin, hemidemiphosphorylmontotremoglobin, etc.*

Wildcards

The wildcard symbol “?” can be used to substitute a single character.

wom?n

Finds records where the search field contains words such as *woman* and *women*.

col?r

Finds records where the search field contains *color*, however *colour* will not be found.

Multiple wildcards can be used.

t??th

Finds records where the search field contains words such as tooth, teeth, truth, tenth etc.

NB Wildcards cannot be used within quotation marks or parenthesis (braces). Neither can they be used in conjunction with the NEAR/ONEAR proximity operator.

Stemming

Stemming can be used to find variations of a word using the word-root as the stemming basis.

In “Easy Search” and “Quick Search”, unless the searcher specifies that they do not wish to employ stemming, by checking the “Autostemming Off” box, search terms are automatically stemmed.

In “Expert Search” the “ $ “ symbol is used.

$management

Finds records where the search field contains words such as *managing, managed, manager, manage, managers,* etc.

NB Stemming *cannot* be used within quotation marks or parenthesis (braces). Neither can it be used in conjunction with wildcards or truncation. However, it *can* be used with NEAR/ONEAR proximity.

Command Line Syntax

Instead of using the form search options, Engineering Village commands may be entered directly into one search box using “Easy Search” and Expert Search”. This provides for greater flexibility in searching. For example, you can specify which field you wish to search ***within*** (**WN**) as follows:

aircraft WN ky

Searches for the word aircraft in the Subject (Controlled Term, Uncontrolled Term), Title & Abstract fields.

CA WN dt

Looks in the in the Documentation Type field to find records which are sourced from conference papers (articles).

eco WN tr

Searches for papers to which the Treatment Type “*economic”* has been assigned

Field	**Code**	**Field**	**Code**	**Field**	**Code**
All fields	All	CODEN	CN	Material Identity Number	MI
Abstract	AB	Conference Code	CC	Numerical Indexing	NI
Accession Number	AN	Conference Information	CF	Publisher	PN
Astronomical Indexing	AI	Controlled Term	CV	Serial Title	ST
Author	AU	Discipline	DI	Subject/Title/Abstract	KY
Author Affiliation	AF	Document Type	DT	Title	TI
Chemical Indexing	CI	ISBN	BN	Treatment Type	TR
Classification Code	CL	ISSN	SN	Uncontrolled Term	FL
Original Classification Code (Inspec Archive)	OC	Language	LA		

Table10. Command Line Search Codes Available in Expert Search

Case Sensitivity

Engineering Village is not case-sensitive. Queries may be entered in any case, or a mixture.

Subject Search Examples

Example 1 Use of iron nanoshells in treatment of tumours

This example illustrates the use of Inspec Controlled Terms, Uncontrolled Terms and Classifications.

The Search Method was derived using “Quick Search” (Fig.3) and “Thesaurus” (Fig.5), but the Search Statement may be entered into the search box of “Expert Search” (Fig.4) to achieve the same results. In either case, sets are combined using the Search History link (Fig.9).

Concept	Search Method	Set	Search Statement	Hits Apr 2010
Nanoshells and tumours and iron	Type one concept into each search box, with “All fields” and AND operator selected (see Fig.10 on p.29).	#1	Nanoshell* and (tumour* or tumor*) and iron	1
Tumours	Browse #1 record in Abstract format and examine the Inspec Controlled Terms (see Fig.11). There is a term for **Tumours.** Click the link to search it.	#2	"tumours” WN CV	17904
Cellular biophysics	Identify related terms. Click on the “Thesaurus” tab. Enter Tumours in search box and select Exact Term (see Fig.12). **Cellular Biophysics** is a related term. Tick the box to select it. Click its hyperlink to see narrower terms. Tick their boxes and click Search.	#3	("cellular biophysics" OR "cellular effects of radiation" OR "cellular transport") WN CV	65984
Nanoparticles	**Nanoparticles** was an Inspec Controlled Term in the #1 record. Search it as an Exact Term in “Thesaurus”. Previous term was **Nanostructured Materials.** Click its hyperlink to see narrower terms. Tick desired boxes and click Search.	#4	("nanostructured materials" OR "nanobelts" OR "nanocomposites" OR "nanofibres" OR "nanoparticles" OR "nanoporous materials" OR "nanotubes" OR "nanowires") WN CV	156642
Nanotechnology	**Nanotechnology** was an Inspec Controlled Term in the #1 record. Search it as an Exact Term in “Thesaurus”. Useful narrower terms include **nanobiotechnology** and **nanopositioning**. Tick desired boxes and click Search.	#5	("nanotechnology" OR "nanobiotechnology" OR "nanopositioning") WN CV	46664

Continued…

Nanoshells	**Nanoshells** was an Uncontrolled Term in the #1 record. Search it in the Subject/Title/Abstract drop-down (Fig.13).	#6	nanoshell* WN KY	522
A8783	Classification Code **A8783: Nanotechnology applications in biomedicine** was used in the #1 record. Click on the hyperlink to search it.	#7	A8783 WN CL	8221
Combined concepts	Within the Search History form, combine nanoshell concepts by OR; link with tumours using AND logic.	#8	(#2 OR #3) AND (#4 OR #5 OR #6 OR #7)	4153
Synonyms for iron	Refine the hit set with synonyms for iron in the default fields. There are several ways of doing this including a) entering the combined search statement into the Search History form; b) Clicking the "Refine Search" button and adding the terms to the end of the query (Fig.14)	#9	#8 and (iron or fe or ferric or ferrous)	461
Limit to Practical references	Use "Browse Indexes" for Treatment Type in "Expert Search" to produce #10; combine with #9 in Search History.	#10	#9 and (PRA WN TR)	241

Search Method Screen-shots:

Fig.10 - Set 1 Method

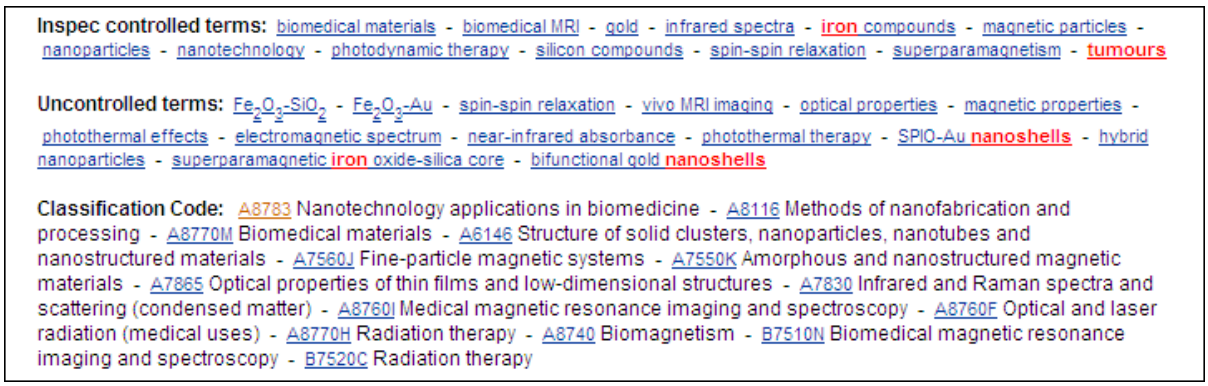


Fig.11- Set 1 Indexing Display

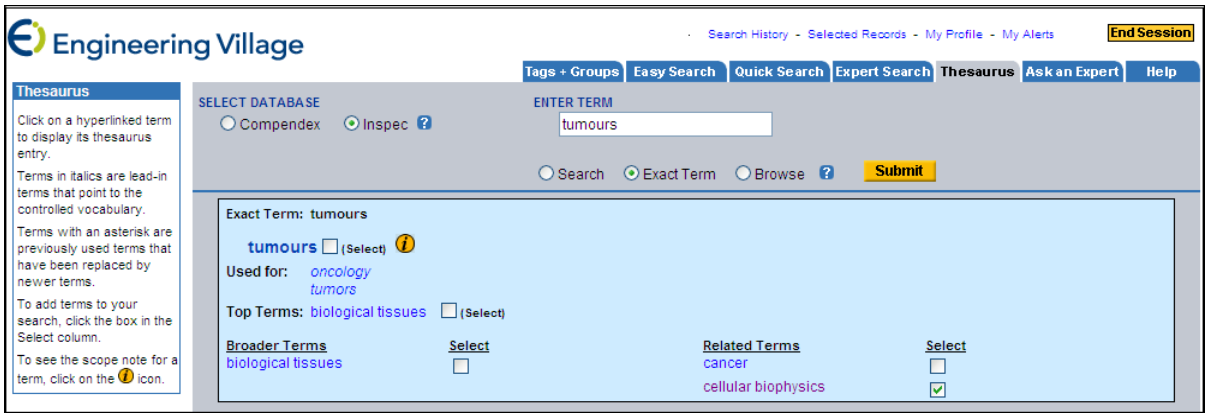


Fig.12 – Thesaurus Exact Term Search

Fig.13 - Set 6 Method

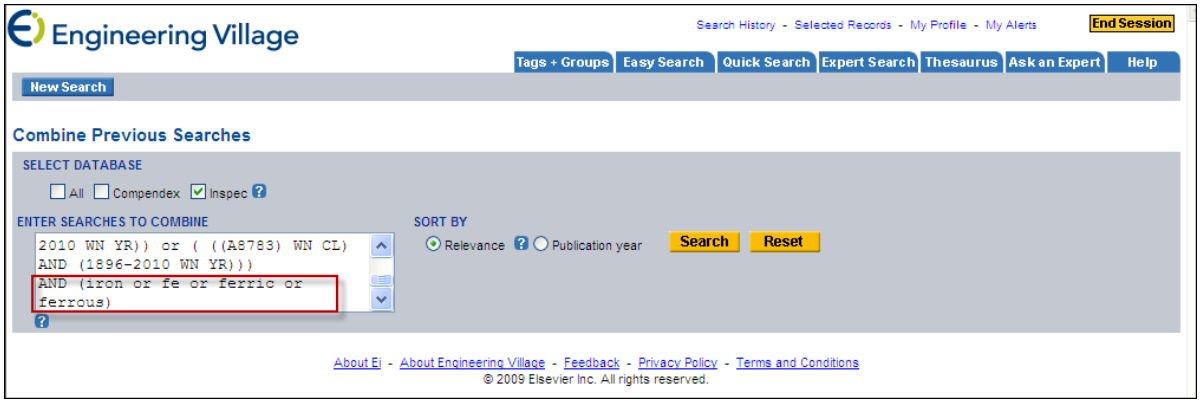


Fig.14 – Use of "Refine Search" button

Example 2 Relative energy efficiency of fluorescent and LED lamps

This example illustrates the use of Controlled Terms combined with Uncontrolled Terms, demonstrating the greater flexibility of "Expert Search" compared with "Quick Search".

Recall the advice (p.17) that Inspec Uncontrolled Terms should be searched to obtain records specifically on the topic of interest if a Thesaurus term does not yet exist for your topic. A good solution for a relatively new Controlled Term might therefore be to search the term in **both** the Controlled Terms and Uncontrolled Terms field. This cannot be done in "Quick Search", where the choice is between the Inspec Controlled Terms drop-down and the Subject/Title/Abstract drop-down, which might give false hits (owing to passing or negative references) in the abstract field.

In this example, use of "Quick Search" gives more hits than "Expert Search"; however, the additional references index only fluorescent or LED lamps, but not both.

Concept	Set	"Quick Search"	Hits April 2010	"Expert Search"	Hits April 2010
Fluorescent lamps, LED lamps and energy efficiency	#1	Type one concept into each search box, selecting "All fields" with AND operator (Fig.15) NB To search for phrases you must turn Autostemming **Off**.	4	("fluorescent lamps" and "led lamps" and "energy efficiency") WN ALL (NB ALL is the default if you do not specify a field)	4
B8215	#2	Classification Code **B8215: Energy Conservation** occurred in several hits. Click the link or search with the Classification Code option in "Quick Search".	4104	B8215 WN CL	4104
Energy Conservation	#3	**Energy conservation** is a Controlled Term. To search it in Unclassified Terms also, use Subject/Title/Abstract option (Fig.16)	35670	(energy conservation WN CV) or (energy conservation WN FL) or (energy conservation WN TI) NB Autostemming turned **on**	20915
Fluorescent lamps	#4	**Fluorescent lamps** is a Controlled Term. To search it in Unclassified Terms also, use Subject/Title/Abstract option, in this case with * truncation after lamp.	6737	(fluorescent lamp* WN CV) or (fluorescent lamp* WN FL) or (fluorescent lamp* WN TI) NB Autostemming turned **on**	5093
LED lamps	#5	**LED lamps** and **light emitting diode** are also Controlled Terms. Use a separate search box for each, with OR operator and Subject/Title/Abstract option. Truncate lamp and diode with * (Fig.17)	31273	(LED lamp* WN CV) or (LED lamp* WN FL) or (LED lamp* WN TI) or (light emitting diode* WN CV) or (light emitting diode* WN FL) or (light emitting diode* WN TI) NB Autostemming turned **on**	28444
Combine concepts	#6	Within the Search History form, combine answer sets as shown for "Expert Search".	17	(#2 OR #3) AND #4 AND #5	9

“Quick Search” Screen-shots:

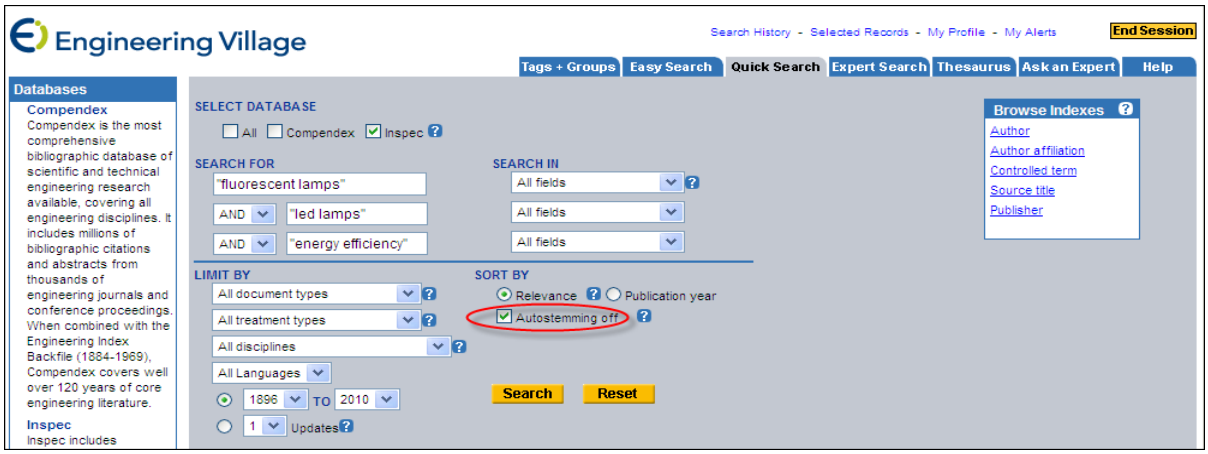


Fig.15 – Combination of Phrase-Searching and Autostemming Off *in “Quick Search”*

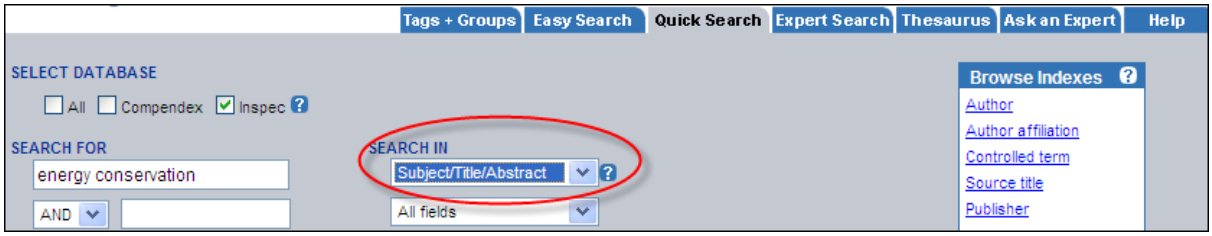


Fig.16 – Subject Searching in “Quick Search”

Fig.16 – Subject Searching with OR operator in “Quick Search”

Bibliographic Searching Examples

Field	Label	Search Hints/ Notes	Examples	Search statement
Accession Number	AN	Unique number assigned to each record entering the Inspec Database.	Six millionth record on database	6000000 WN AN
Author	AU	Surname, Initial.Initial. Browse through the Author index display then select and search (preferred to searching directly).	T.G. Trippe	(Trippe,T.G. or Trippe,T.*) WN AU
Author Affiliation	AF	Search for the name of the organisation or town. Use for searching reports.	Aston University AT&T IEEE reports	Aston WN AF at t WN AF (ieee or (instit* ONEAR electr* ONEAR engineer*)) WN AF
CODEN	CN	Assigned to journal records. NB Can change over the lifetime of a journal.	APOPAI (Applied Optics)	apopai WN CN
Conference Information	CF	Conference title. Conference location. Conference year.	IBC Conference Amsterdam 1996	ibc WN CF Amsterdam WN CF 1996 WN CF
Country of Publication	CO	Search for the country of publication.	France	France WN CO
Document Type	DT	Search directly or browse through the Document Type index display in “Expert Search”. Use limit facilities in “Quick Search”.	journal articles	ja WN DT

Continued…

ISSN	SN	Assigned to serials (e.g. journals, annual conferences etc). NB Can change over the lifetime of a journal.	0003-6935	0003-6935 WN SN
Journal Name (serial title)	ST	Browse through the Serial Title index then select and search (preferred to searching directly).	Electronics letters	electronics letters WN ST
Language	LA	Search directly or browse through the Language index display in “Expert Search”. Use limit facilities in “Quick Search”.	French	French WN LA
Material Identity Number	MI	Allows identification of all papers from a specific issue of a publication. Can be used to produce a table of contents.	BN60-2010-001	BN60-2010-001 WN MI
Report Number	RN	Use adjacency operators.	ANSI/IEEE Std 802.11, 1999 Edition	(ansi ieee near/3 1999) WN RN
Start Page	SP	First page of a journal reference. Useful for retrieving a known reference.	1201	1201 WN SP
Updates		Limit answer set to 1,2,3 or 4 most recent weekly updates using “Limit By” facility in “Quick Search” or “Search From” facility in “Expert Search”.		
Year	YR	Sort, or limit, answer set by publication date. Search directly to retrieve references from a known year.	2000	2000 WN YR

Engineering Village Search Fields — Alphabetical Guide

Field Name	Field Code	Search Statement *
Abstract	AB	Gold wn AB
Accession Number	AN	7100000 wn AN
All Fields	ALL	semiconductor wn ALL
Astronomical Object Indexing (1995-)	AI	"rz cas" wn AI
Author	AU	bohm wn AU
Author Affiliation	AF	ibm wn AF
Chemical Indexing (1987-)	CI	(he/bin near ne/bin) wn CI
Classification Code	CL	b7230* wn CL
CODEN	CN	ULTRD6 wn CN
Conference Information	CF	prague wn CF
Controlled Term	CV	biological wn CV
Country of Origin	CO	china wn CO
Digital Object Identifier	DOI	10.1117/12.706552 wn DOI
Discipline	DI	DI A wn DI
Document Type	DT	MR wn DT
ISBN	BN	3-540-00199-9 wn BN
ISSN	SN	0304-3991 wn SN
Language	LA	german wn LA
Material Identification Number	MI	"H792-2007-003" wn MI
Numerical Data Indexing (1987-)	NI	"frequency 3.0E+09 hz" wn NI
Original Classification Code	OC	automobilism wn OC
Publisher	PN	IOP wn PN
Report Number	RN	npl coem 34 wn RN
Serial Title	ST	IET wn ST
Start Page	SP	1201 wn SP
Subject/Title/Abstract	KY	{physical chemistry} wn KY
Title	TI	avionics wn TI
Treatment Type	TR	PRA wn TR
Uncontrolled Term	FL	digital wn FL
Year of Publication	YR	2000 wn YR

* These search statements do not work in “Quick Search”, which uses drop-down options. If the appropriate drop-down is available, enter the search string without the WN operator and field code.