Technical References: How to Find Them, Read Them, and Use Them

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Mechanical and Aerospace Engineering Department
Naval Postgraduate School
2 February, 2012

An afternoon in the library can save you a month in the laboratory… (author unknown)

- There is an *INCREDIBLE* amount of technical information already out there…examples just from Web of Science database
  - 23,000 journals
  - 23 million patents from 40 patent-issuing authorities
  - 110,000 conference proceedings
  - 700 million cited references
- Not spending time in the library can result in
  - Reinventing the wheel
  - Designing experiments or simulations that will not work
  - Not being able to compare your data with other recognized studies
- You want to <u>build</u> on what others have already done

Technical References: What are they?

- Technical Journals-serial publication of scientific or engineering articles
- Conference Proceedings-publication of papers or presentations from a technical conference
- Books or monographs-technical information in great depth about a given subject
- Patents-descriptions of technical ideas, processes, compositions, or systems that are legally protected
- Engineering Handbooks or Databases-compilations of technical data; e.g. material melting points, elastic constants, vapor pressures, steam tables, etc.
- Technical Reports-stand alone reports summarizing a technical study
- URL's-information found on the internet—use very carefully and sparingly

Technical References: What are they?

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- Technical Journals
  - core source of technical information for thesis or dissertation work
  - Peer reviewed and fully archived (quality *should* be high, can be traced back easily)
  - Studies upon which you can base your work and compare your results

- Conference Proceedings-
  - For some technical areas, core source of technical information for research
  - Some reviewed, some not
  - Quality more variable than journal articles, traceability can be more difficult
  - Generally shorter than journal articles, but can very current

- Books or monographs-technical information in great depth about a given subject
  - Can be very useful for going into details and derivations that will not be contained in journal articles or conference papers
  - You do not want to rely too heavily on just one—they are not a replacement for journal articles or conference papers

- Patents
  - More important for technological development work
  - Details highly variable (often intentionally general and/or vague)
  - Still important for answering the question of "Has somebody tried this before…?"

- Engineering Handbooks or Databases
  - Worth their weight in gold!—where you find many of the numbers that you need for calculations
  - Most of very high quality (but not all)
  - Reference librarian can be very helpful in finding and accessing these resources
- Technical Reports-stand alone reports summarizing a technical study
  - Can be very important for more DoD-applied research.
  - Great deal of good research at national laboratories and corporations is published this way—you won't find it on Web of Science
  - May or may not be technically reviewed
- URL's-information found on the internet—OK for a quick estimate or a starting place—don't want to end here…

Journal Articles and Conference Papers: Where do I find them?

NPS Home | About NPS | Academics | Administration | Library | Research | Technology | Services

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For further information, please see OUR Remote Access page.

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- InsideDefense NPS
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- JSTOR NPS
- LexisNexis Academic NPS
- LexisNexis PW Password Required NPS
- Project MUSE NPS
- ProQuest NPS
- SPIE Digital Library NPS
- Torpedo Ultra NPS
- Web of Knowledge NPS
- WorldCat NPS

BY TOPIC

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- Management & Economics
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- Operations Research
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Go to mobile site | Sign In | Marked List (0) | My EndNote Web | My ResearcherID | My Citation Aler

All Databases | Select a Database | Web of Science | Additional Resources

Search | Search History | Compound Marked List (0)

All Databases

Search

in Topic

Example: oil spill* mediterranean

AND in Author

Example: O'Brian C* OR OBrian C*

AND in Publication Name

Example: Cancer* OR Journal of Cancer Research and Clinical Oncology

Add Another Field >>

Search | Clear | Searches must be in English

Current Limits: (To save these permanently, sign in or register.)

Timespan

All Years

From 1898 to 2012 (default is all years)

Adjust your search settings

Adjust your results settings

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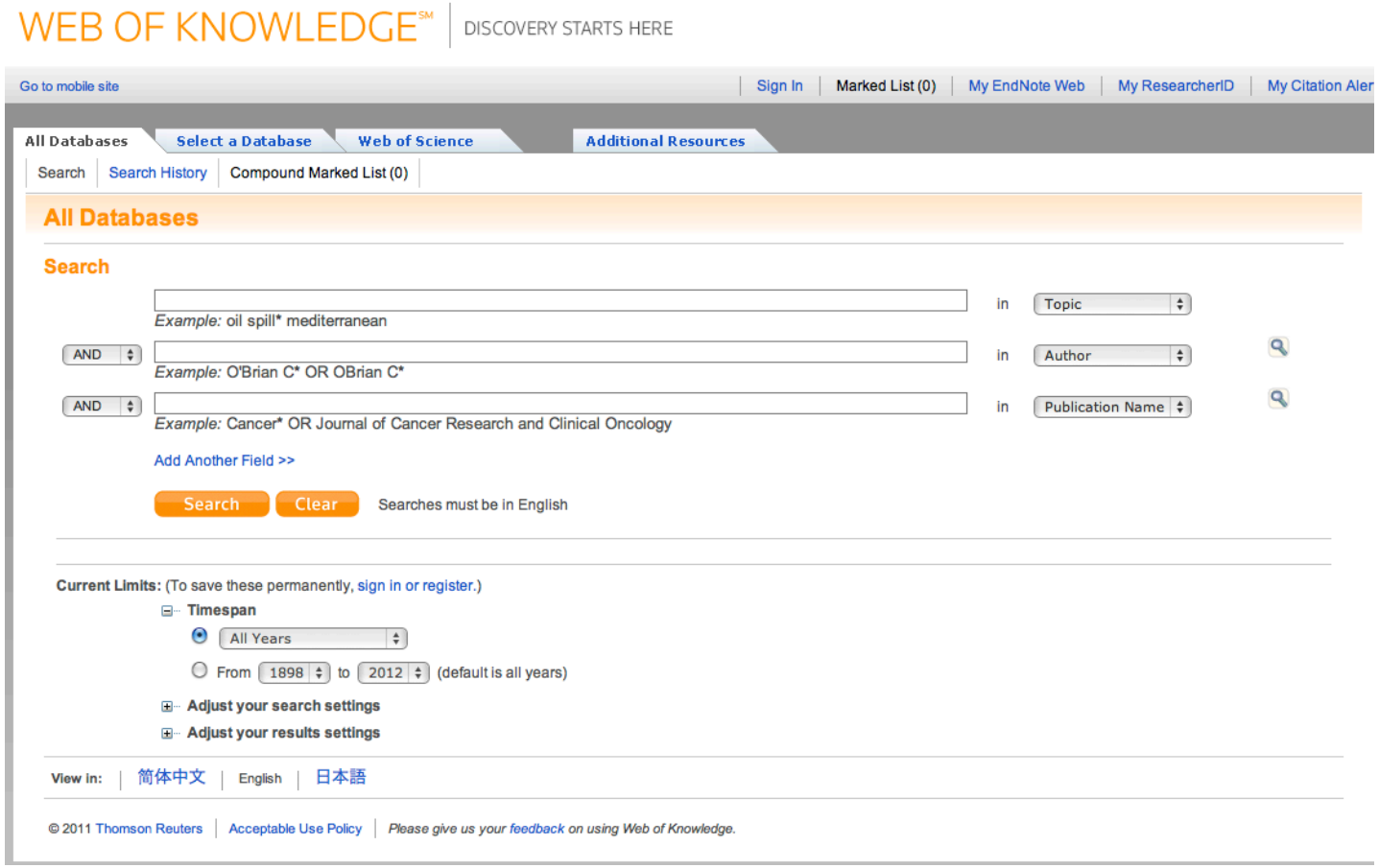
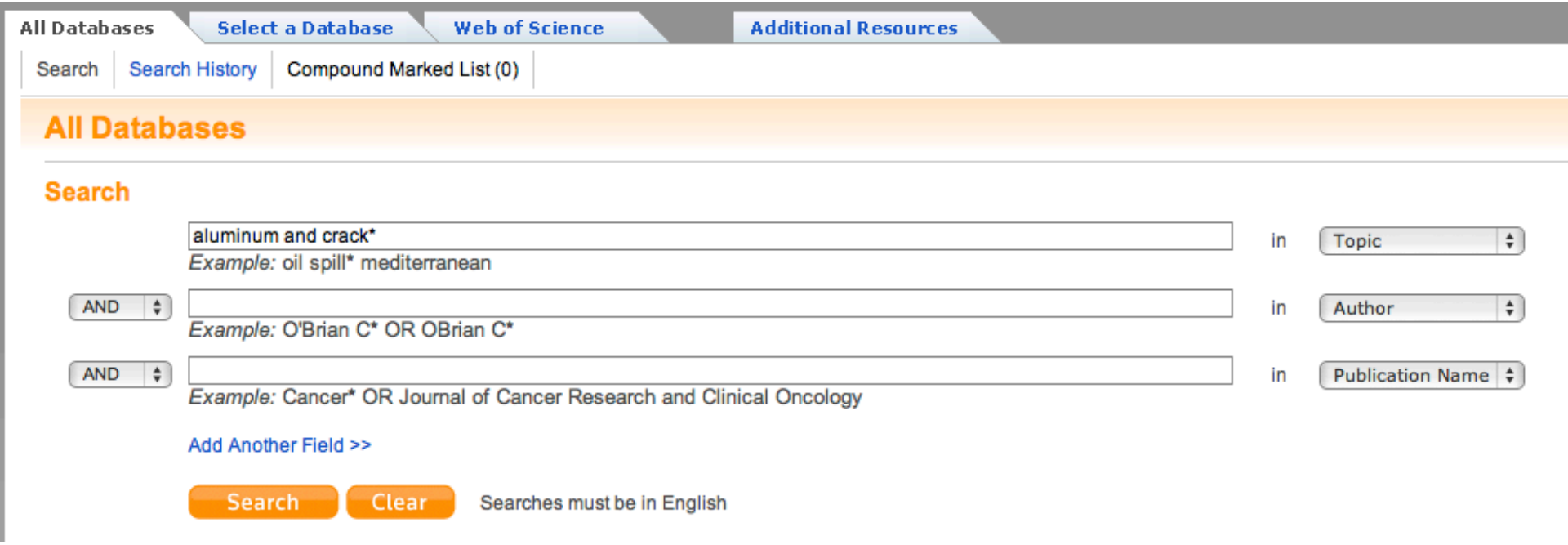
Journal Articles and Conference Papers: Using Web of Knowledge (WOK)



Kinds of searches:

- Topic—good place to start
- Author—have to know who you are looking for…
- Cited Reference—looking for other information related to a reference you already have

Journal Articles and Conference Papers: Using (WOK)→Topic Search Strategy 1



Type in key words into topic space:

- To combine items, you can use the AND operator or simply leave a blank
- * is the wild card→ crack or cracks or cracking, etc.
- Don't start too general…"aluminum" or "fluid" or "composite"—you'll get the whole house
- Don't start too specific…"aluminum AND 5083 AND fatigue AND corrosion"—you'll get the gasket of the stopper of the kitchen sink

Journal Articles and Conference Papers: Using (WOK)→Topic Search Strategy 1

Results Topic=(aluminum and crack*)
Timespan=All Years.
Search language=English Lemmatization=On

Scientific WebPlus View Web Results >>

Note: Alternative forms of your search term (for example, tooth and teeth) may have been applied, in particular for Topic or Title searches that do not contain quotation marks around the terms. To find only exact matches for your terms, turn off the "Lemmatization" option on the search page.

Results: **Approximately 10,195**

Page 1 of 1,020 Go

Sort by: Publication Date -- newest to oldest

Refine Results
Search within results for
Search

- Databases
- General Categories Refine
  - SCIENCE TECHNOLOGY
  - SOCIAL SCIENCES
  - ARTS HUMANITIES
- Subject Areas Refine
  - MATERIALS SCIENCE

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Citation Report feature not available. [?]

1. Title: **Propagation of short fatigue cracks in permanent and semi-solid mold 357 aluminum alloy**
Author(s): Brochu Myriam; Verreman Yves; Ajersch Frank; et al.
Source: INTERNATIONAL JOURNAL OF FATIGUE Volume: **36** Issue: **1** Pages: **120-129** DOI: **10.1016/j.ijfatigue.2011.08.009** Published: **MAR 2012**
Times Cited: **0** (from All Databases)
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2. Title: **Quantifying microstructurally small fatigue crack growth in an aluminum alloy using a silicon-rubber replica method**
Author(s): Jordon J. B.; Bernard J. D.; Newman J. C. Jr.
Source: INTERNATIONAL JOURNAL OF FATIGUE Volume: **36** Issue: **1** Pages: **206-210** DOI: **10.1016/j.ijfatigue.2011.07.016** Published: **MAR 2012**
Times Cited: **0** (from All Databases)
Get It! [View abstract]

Results Topic=(aluminum and crack* AND fatigue AND magnesium)
Timespan=All Years.
Search language=English Lemmatization=On

Scientific WebPlus View Web Results >>

Note: Alternative forms of your search term (for example, tooth and teeth) may have been applied, in particular for Topic or Title searches that do not contain quotation marks around the terms. To find only exact matches for your terms, turn off the "Lemmatization" option on the search page.

Results: **135**

Page 1 of 14 Go

Sort by: Publication Date -- newest to oldest

Refine Results
Search within results for
Search

- Databases
- General Categories Refine
  - SCIENCE TECHNOLOGY
- Subject Areas Refine
  - MATERIALS SCIENCE
  - METALLURGY METALLURGICAL ENGINEERING
  - ENGINEERING

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Create Citation Report

1. Title: **Propagation of short fatigue cracks in permanent and semi-solid mold 357 aluminum alloy**
Author(s): Brochu Myriam; Verreman Yves; Ajersch Frank; et al.
Source: INTERNATIONAL JOURNAL OF FATIGUE Volume: **36** Issue: **1** Pages: **120-129** DOI: **10.1016/j.ijfatigue.2011.08.009** Published: **MAR 2012**
Times Cited: **0** (from All Databases)
Get It! [View abstract]

2. Title: **Fracture Surface Facets and Fatigue Life Potential of Castings**
Author(s): Tiryakioglu Murat; Campbell John; Nyahumwa Christian
Source: METALLURGICAL AND MATERIALS TRANSACTIONS B-PROCESS METALLURGY AND MATERIALS PROCESSING SCIENCE Volume: **42** Issue: **6** Pages: **1098-1103** DOI: **10.1007/s11663-011-9577-3** Published: **DEC 2011**
Times Cited: **1** (from All Databases)
Get It! [View abstract]

You can typically handle 50-100 items in a results list…more than that and you will glaze over before making it to the end!

Journal Articles and Conference Papers: Using (WOK)→Topic Search Strategy 2

All Databases | Select a Database | Web of Science | Additional Resources

Search | Search History | Compound Marked List (0)

All Databases

Search

aluminum and crack* in Topic

Example: oil spill* mediterranean

AND [ ] in Author

Example: O'Brian C* OR OBrian C*

AND [ ] in Publication Name

Example: Cancer* OR Journal of Cancer Research and Clinical Oncology

Add Another Field >>

Search | Clear | Searches must be in English

Results Topic=(aluminum and crack*)
Timespan=All Years.
Search language=English Lemmatization=On

Note: Alternative forms of your search term (for example, tooth and teeth) may have been applied, in particular for Topic or Title searches that do not contain quotation marks around the t
the "Lemmatization" option on the search page.

Results: **Approximately 10,195** Page 1 of 1,020 Go

Refine Results

Search within results for
5083 Search

Databases

General Categories Refine

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1. Title: **Propagation of short fatigue cracks in permanent and semi-solid mold 357 aluminum alloy**
Author(s): Brochu Myriam; Verreman Yves; Ajersch Frank; et al.
Source: INTERNATIONAL JOURNAL OF FATIGUE Volume: **36** Issue: **1** Pages: **120-129** DOI: **10.1016/j.ijfatigue.2011.08.009**
Times Cited: **0** (from All Databases)
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- Start pretty general
- Refine at multiple levels by adding more specific, topic search terms, e.g. "5083" is a particular kind of aluminum alloy

Journal Articles and Conference Papers: Using (WOK)→Topic Search Strategy 2

Results: **72** Page 1 of 8 Go Sort by: Publication

Refine Results
Search within results for
weld* Search
▶ Databases
▼ General Categories Refine
☐ SCIENCE TECHNOLOGY
▼ Subject Areas Refine
☐ MATERIALS SCIENCE
☐ METALLURGY METALLURGICAL ENGINEERING

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1. Title: **Effect of microstructural feature on the tensile properties and vibration fracture resistance of friction stirred 5083 Alloy**
Author(s): Huang Kuo-Tsung; Lui Truan-Sheng; Chen Li-Hui
Source: JOURNAL OF ALLOYS AND COMPOUNDS Volume: **509** Issue: **27** Pages: **7466-7472** DOI: **10.1016/j.jallcom.2011.04.080** Published: **JUL 7 2011**
Times Cited: **1** (from All Databases)
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2. Title: **The Effects of Electrode Force on the Mechanical Behaviour of Resistance Spot-Welded 5083-O Aluminium Alloy Joints**
Author(s): Hassanifard S.; Zehsaz M.; Tohgo K.
Source: STRAIN Volume: **47** Supplement: **1** Pages: **E196-E204** DOI: **10.1111/j.1475-1305.2008.00554.x** Published: **JUN 2011**
Times Cited: **0** (from All Databases)
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Results: **34** Page 1 of 4 Go Sort by: Pu

Refine Results
Search within results for
Search
▶ Databases
▼ General Categories Refine
☐ SCIENCE TECHNOLOGY
▼ Subject Areas Refine
☐ MATERIALS SCIENCE
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☐ SCIENCE TECHNOLOGY OTHER TOPICS
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1. Title: **The Effects of Electrode Force on the Mechanical Behaviour of Resistance Spot-Welded 5083-O Aluminium Alloy Joints**
Author(s): Hassanifard S.; Zehsaz M.; Tohgo K.
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Times Cited: **0** (from All Databases)
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2. Title: **Effect of laser-arc hybrid welding on fracture and corrosion behaviour of AA6061-T6 alloy**
Author(s): Zhang Da-Quan; Jin Xin; Gao Li-Xin; et al.
Source: MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING Volume: 5
DOI: **10.1016/j.msea.2010.12.021** Published: **MAR 15 2011**
Times Cited: **0** (from All Databases)
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3. Title: **Weld Metal Grain Refinement of Aluminium Alloy 5083 through Controlled Additions of Ti and B**
Author(s): Schempp Philipp; Schwenk Christopher; Rethmeier Michael; et al.
Source: MATERIALS TESTING Volume: **53** Issue: **10** Pages: **604-609** Published: **2011**
Times Cited: **0** (from All Databases)
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Use a refining process:

- Refine further by looking for items related to welding
- We went from 10,000→34 references…I can work with that!

Journal Articles and Conference Papers: Using (WOK) Looking at the Results

6. Title: **FAILURE INVESTIGATION OF A 500 GALLON LIQUID NITROGEN STORAGE TANK**
Author(s): Wilkowski Gery; Shim Do-Jun; Brust Bud; et al.
Editor(s): Wiersma BJ; Bezensek B; Brongers MPH; et al.
Conference: **ASME Pressure Vessels and Piping Division/K-PVP Conference** Location: **Bellevue, WA** Date: **JUL 18-22, 2010**
Sponsor(s): **ASME, Pressure Vessels & Piping Div**
Source: PROCEEDINGS OF THE ASME PRESSURE VESSELS AND PIPING CONFERENCE 2010, VOL 6, PTS A AND B Book Series: **PRESSURE VESSEL AND PIPING DIVISION OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS** Pages: **139-144** Published: **2010**
Times Cited: **0** (from All Databases)
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7. Title: **Fatigue behaviour of friction stir welds without neither welding flash nor flaw in several aluminium alloys**
Author(s): Uematsu Y.; Tokaji K.; Shibata H.; et al.
Source: INTERNATIONAL JOURNAL OF FATIGUE Volume: **31** Issue: **10** Pages: **1443-1453** DOI: **10.1016/j.ijfatigue.2009.06.015** Published: **OCT 2009**
Times Cited: **6** (from All Databases)
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8. Title: **Fatigue crack propagation behavior of friction stir welded 5083-H32 and 6061-T651 aluminum alloys**
Author(s): Kim Sangshik; Lee Chang Gil; Kim Sung-Joon
Source: MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING Volume: **478** Issue: **1-2** Pages: **56-64** DOI: **10.1016/j.msea.2007.06.008** Published: **APR 15 2008**
Times Cited: **2** (from All Databases)
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9. Title: **Optimising FSW process parameters to minimise defects and maximise fatigue life in 5083-H321 aluminium alloy**
Author(s): Lombard H.; Hattingh D. G.; Steuwer A.; et al.
Conference: **International Conference on Crack Paths** Location: **Parma, ITALY** Date: **SEP, 2006**
Sponsor(s): **European Struct Integr Soc; Univ Parma**
Source: ENGINEERING FRACTURE MECHANICS Volume: **75** Issue: **3-4** Pages: **341-354** DOI: **10.1016/j.engfracmech.2007.01.026** Published: **FEB-MAR 2008**
Times Cited: **29** (from All Databases)
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10. Title: **Fatigue crack propagation behavior of friction stir welded 5083-H32 Al alloy**
Author(s): Hong Seongjin; Kim Sangshik; Lee Chang Gil; et al.
Source: JOURNAL OF MATERIALS SCIENCE Volume: **42** Issue: **23** Pages: **9888-9893** DOI: **10.1007/s10853-007-1630-x** Published: **DEC 2007**
Times Cited: **2** (from All Databases)
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Key information:

- Title
- Authors
- Date
- Source
- Times cited—can be a good indication of impact of a particular article

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Optimising FSW process parameters to minimise defects and maximise fatigue life in 5083-H321 aluminium alloy

Author(s): Lombard, H (Lombard, H.)[1,2]; Hattingh, DG (Hattingh, D. G.)[2]; Steuwer, A (Steuwer, A.)[1,3]; James, MN (James, M. N.)[1]

Source: ENGINEERING FRACTURE MECHANICS **Volume:** 75 **Issue:** 3-4 **Pages:** 341-354 **DOI:** 10.1016/j.engfracmech.2007.01.026 **Published:** FEB-MAR 2008

Times Cited: 25 (from Web of Science)

Cited References: 16 [view related records] Citation Map

Conference: International Conference on Crack Paths **Location:** Parma, ITALY **Date:** SEP, 2006
Sponsor(s): European Struct Integr Soc; Univ Parma

Abstract: This paper presents a systematic approach to optimising FSW process parameters (tool rotational speed and feed rate) through consideration of frictional power input. Frictional power governs the tensile strength and the fatigue life in this 5083-H321 alloy through its effect on plastic flow processes in the thermo-mechanically affected zone (TMAZ) of the weld. Although, a close relationship therefore exists between tensile strength and fatigue performance, this arises from their joint dependence on the occurrence of certain defect types that are apparently specific to certain strain hardened aluminium alloys that are FS welded. These defects are related to plastic flow processes and have a strong influence on crack paths in FS welded 5083-H321 alloy. Weld residual stresses have been extensively measured using synchrotron X-ray diffraction strain scanning and are governed by heat input into the weld. There is no clear relationship between peak values of residual stresses and fatigue performance. The work indicates that rotational speed is the key parameter governing tool torque, temperature, frictional power and hence tensile strength and fatigue performance. (C) 2007 Elsevier Ltd. All rights reserved.

Accession Number: WOS:000252231800006

Document Type: Article; Proceedings Paper

Language: English

Author Keywords: friction stir welding; process optimisation; tool speed; tool feed; tool pitch; energy input; fatigue life; weld defects

KeyWords Plus: FRICTION STIR WELDS; MODEL; TOOL

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E-mail Address: mjames@plymouth.ac.uk

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Source: Engineering fracture mechanics [0013-7944] Lombard, H yr:2008 vol:75 iss:3-4 pg:341 -354

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*Year *(required)*	2008
Page Number(s)(required)*	341-354
ISSN/ISBN (International Standard Serial/Book Number)	0013-7944
Accession Number (if known)	
Article Author	Lombard,
*Article Title *(required)*	Optimising FSW process parameters to minimise defects and maximise fatigue life in
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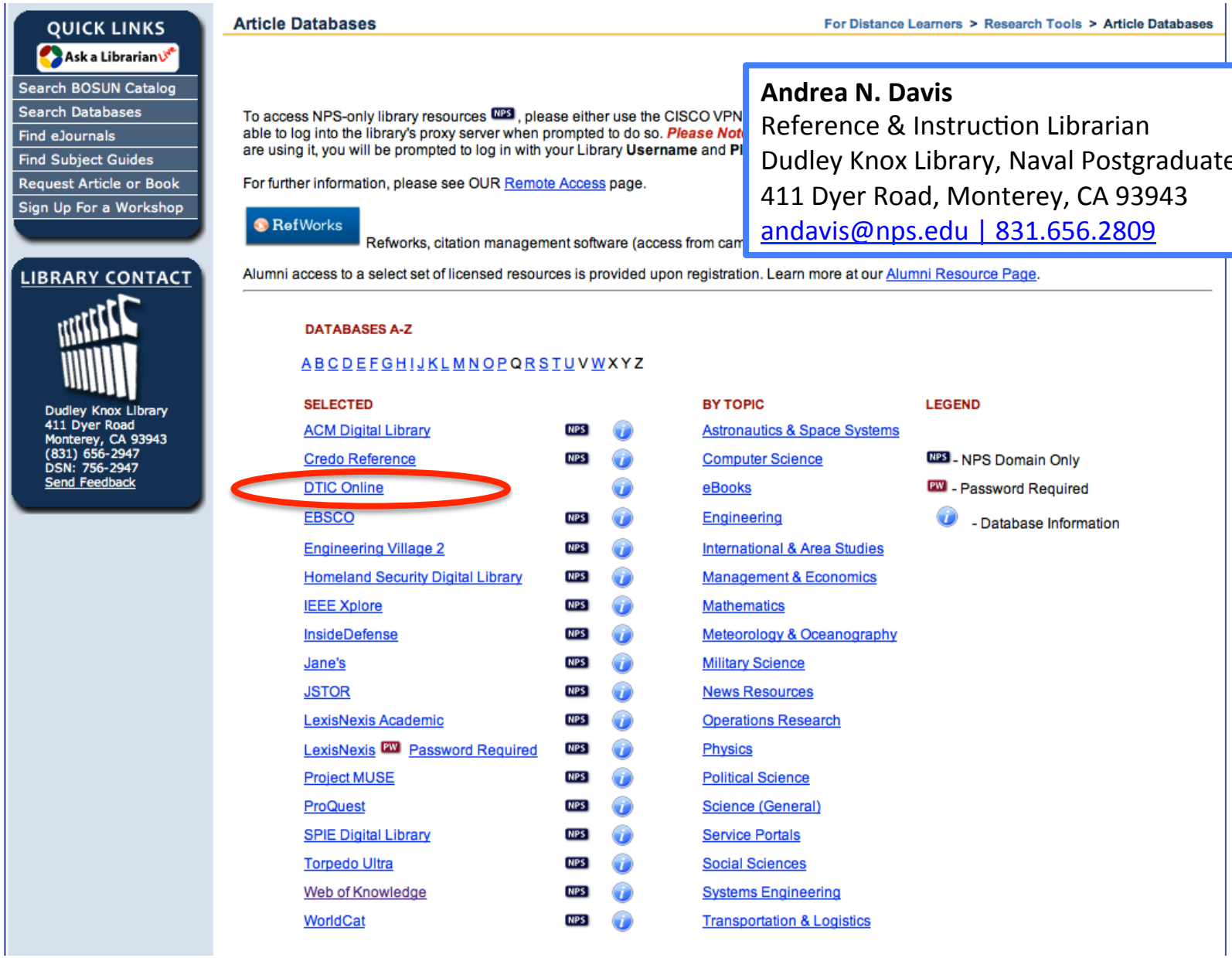

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are using it, you will be prompted to log in with your Library **Username** and **P**

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LEGEND

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aluminum AND fatigue | New Search | Refine Search

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Search: **Full Record: aluminum AND fatigue** yielded **1,209** results from 73,476 found.

1097 more results found.
Add

My Clippings (0) | Clear Clippings | Alerts | Print | Email Results | Collection Status | Preferences | Help

Results **1** – **10** of 112 | Sort by: Rank | Limit to: All Publishers | 1 2 3 4 5

All Results (112) | DoD Pubs (95) | Federal (248) | Articles (125) | Tech Transfer (233) | Tech Reports (477) | Science (126)

Clusters

- All Results (112)
- Topics
  - Report Number (23)
  - Research (18)
  - National Science Foundation (8)
  - Structures (7)
  - Process (6)
  - More...
- Authors
- Publications
- Publishers
  - US Government Accountability Office (36)
  - NSF Publications Database (31)

1 **2006FLCAwards**

mizes the corrosion of **aluminum**, zinc, and other ... for pre- and post-treatment of **aluminum** surfaces. ..... extremely flexible, and does not readily **fatigue**.
Federal Labs

2 **FLC Newslink -May/June 2004**

dium, **aluminum** and silicon. It is the only hand- ... **Aluminum** alloy verification is of particular interest to NASA .... onstrated with no signs of wear or **fatigue**.
Federal Labs

3 **2010 FLC Awards**

zinc, manganese and **aluminum**, that can give .... lines, where high f
Federal Labs

4 **NewsLink - July-Augusy 2000 Vol. 16, No. 7**

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How to read a paper…

- A typical master's thesis has between 40-50 references…do you have 50-100 hours to spending on reading???
- There is a method (probably more than one) to "reading" a journal article
- Suggested Method
  - Start with the abstract (you probably already did this before you downloaded the article)
  - The go straight to <u>the conclusions</u>!
  - If interesting, then look at the data that support the conclusions
  - If still interested, then read the methods section
  - Then, and only then, should you bother with the introduction.
  - You will want to read end-to-end and <u>study</u> only your most important papers

Discuss your approach with your thesis advisor… they have read quite a few papers and probably have some advice on the topic.

How to read a paper…parts of the paper

- Abstract-one/two paragraph summary of the whole article
- Conclusions-AKA "the gist"
  - What did the authors find?
  - What did they think was important to know from their study?
- Results, figures, plots
  - The data behind the conclusions…it's OK to think critically about these results—do they support the conclusions?
  - Can you mentally connect the data to the conclusions?
- Methods
  - The HOW of the paper: design for the experiment, details of the simulation, pressures and temperatures used, etc.
  - Really helpful if you are trying to do something similar
  - N.B. not everyone is good about putting all of these details in a technical paper (theses and dissertations are generally more expansive
- Discussion
  - The scientifically/technologically "meaty" portion of the paper
  - What do the results mean?
  - How do they compare with what others have found?
  - Is there a new way to think about a phenomena based on the data?
- Introduction
  - Motivation for study (often pretty skimpy in a journal article)
  - Previous work/references—really valuable! You may have missed key references in your literature search. References from papers that you read can really help

How to read a paper…Summarizing and Scoring a Paper

- You don't have time to read a bad paper twice!
- Discipline yourself to summarize every paper you read
  - Only need 3-4 bullets
  - Write key conclusions, concerns, notes to yourself, anything that's helpful to YOU later on…
- Score every paper
  - Use whatever scale you like (1-10, 5 stars, etc.)
  - 1-deposit in recycle bin—if you did a good search, you shouldn't have too many of these
  - 3-looked relevant but not really related to what you are doing –OR- related but not a good paper
  - 5-Decent paper, somewhat relevant but not really core to your research
  - 7-good paper with strong relevance to what you are doing
  - 9-10 you must read and know this paper thoroughly. You will refer back to it several times during your research
- Develop a "top ten" list
  - A typical master's thesis might have 40-50 references
  - 10 you will know really well
  - Many others are important, but not in your "top ten"
    - References required for thorough literature review
    - Paper that contains basic references for methods you are using in your research
    - Paper contains parameters that you need for your calculations
  - A "top ten" paper might
    - Be a key reference for the problem you are studying (often highly cited)
    - Describe in detail the methods that you are using
    - Be a key comparison point for your data, e.g. they studied corrosion in liquid lead, you are studying the corrosion of the same alloy in liquid bismuth

How to read a paper…Summarizing and Scoring a Paper

5/10

1.) Synchrotron x-ray applied to 7xxx aluminum, found spatial variability in stress
2.) neutrons might be as useful

3.) Good starting reference paper

Synchrotron X-ray residual strain scanning of a friction stir weld

P J Webster[1]*, L Djapic Oosterkamp[2], P A Browne[1], D J Hughes[1], W P Kang[1], P J Withers[3] and G B M Vaughan[4]
[1]Institute for Materials Research, Division of Civil and Environmental Engineering, University of Salford, UK
[2]R&D Materials Technology, Hydro Aluminium a.s., Norway
[3]Manchester Materials Science Centre, University of Manchester, UK
[4]ESRF, Grenoble, France

Abstract: Synchrotron X-ray strain scanning has been used to determine the residual stress distribution over the cross-sectional area of a friction stir weld across an I-section made of extruded aluminium alloy type AA 7108 in the T79 condition. Measurements were made using the 311 reflection and a wavelength of about 0.35 Å. The dominant longitudinal residual stress field is tensile within and to just outside the friction band where the field drops steeply. Further out there are regions of balancing compression falling to near zero at the outer edges of the sample. The longitudinal residual stresses vary within the range from −60 to 140 MPa. The transverse residual stresses are generally weaker but show a more marked through-thickness variation below the friction band. The residual stress maps show detailed features which are related to the heat flow from crown to root faces and differences between the advancing and retreating sides. The results demonstrate that synchrotron strain scanning is a practicable technique for determining non-destructively internal and through-surface residual strains in light element components. The synchrotron technique complements and extends the range at present covered by neutron and X-ray diffraction methods and is capable of substantial development.

Keywords: residual stress, friction stir weld, synchrotron, X-rays, strain scanning, aluminium alloy

NOTATION

d_{hkl} lattice spacing of *hkl* planes
d_{0hkl} unstrained lattice spacing of *hkl* planes
δd_{hkl} change in the lattice spacing of *hkl* planes
E Young's modulus
Q scattering vector
ε residual strain
θ Bragg angle

residual stress distribution across a friction stir weld in an extruded aluminium alloy type AA 7108. Destructive mechanical and traditional X-ray diffraction techniques had already been tried but with very limited success.

1.1 Friction stir welding

Friction stir welding (FSW) has been developed over the last few years [1, 2] and is well suited to joining aluminium alloys of low fusion weldability. In FSW, a rotating tool,

How do I use the references once I've found them?

- Technical references serve three main goals in thesis/ dissertation research
  - Frame and support the introduction
  - Provide details for your methods
  - Provide discussion points and comparisons for your discussion of your research results
- You are starting with a big stack of summarized and scored (>5) references
- You want to end with a visual and textual summary of the collection
  - What are the key clusters of work that you have found
  - Who are the dominant authors in the area?
  - Are there any critical references?
  - Where does your work fit into what others have done/are doing?
  - Where are the gaps in the literature?

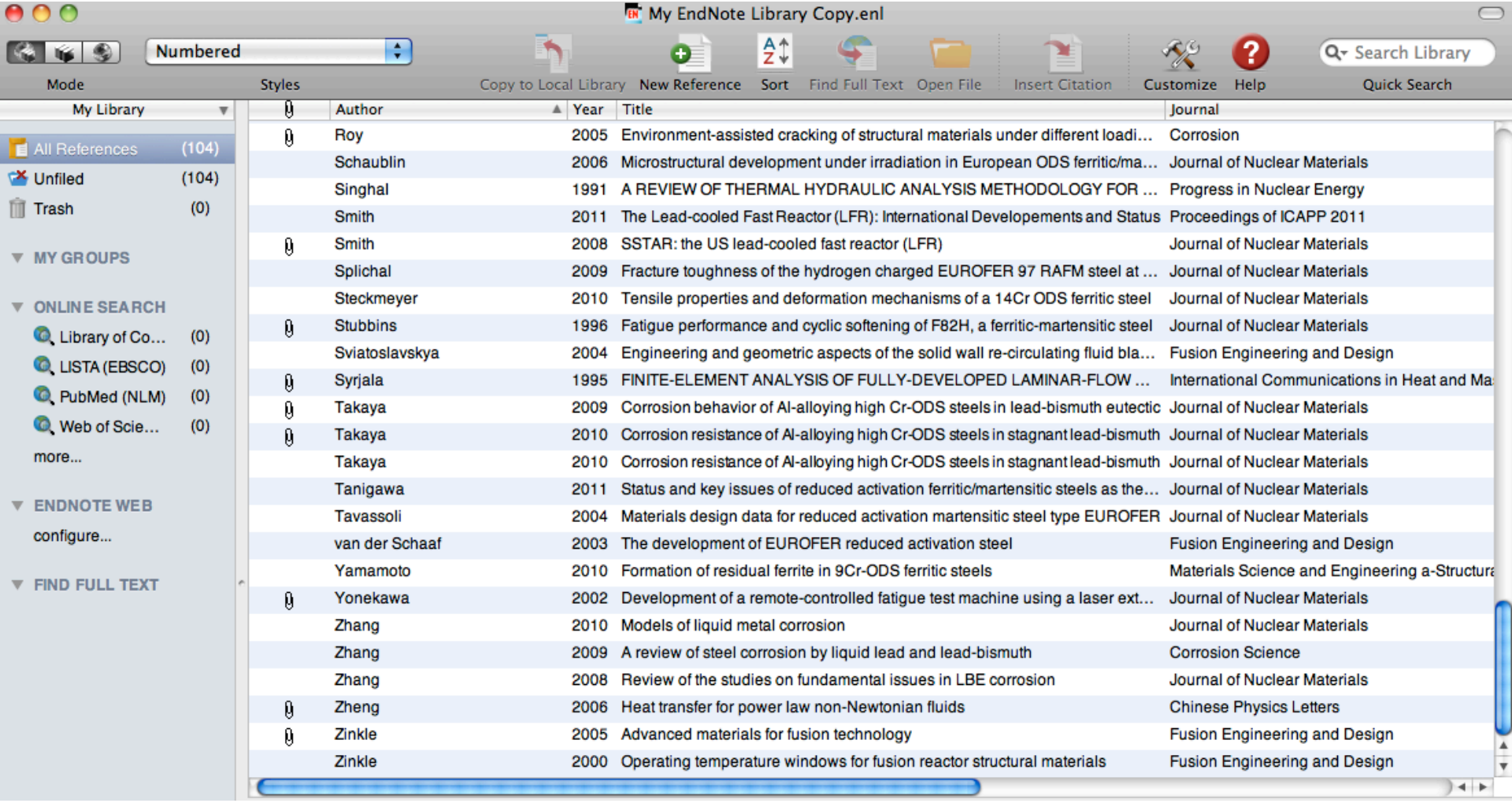
How do I use the references once I've found them?: Methods for Distilling the Results

- Put micro-summaries on power point slides
- Make a series of Venn diagrams
- Excel spreadsheet
- Write micro-summaries on post-it notes or 3x5 cards

What's a micro-summary??
Examples…

Tran, 2006, applied laser peening to aluminum welds with fatigue
Peyre, 2001, applied laser peening to stainless steel—one of the first
Hatamleh, 2009, laser peening applied to AA2095, also FSW
Zucchi, 2001, MIG and FS welding comparison for AA5083
Searles, 2001, stress corrosion cracking in AA5083—key reference
Ogoucha, 2008, sensitization of AA5083-has thermal treatment data
Goswami, 2010, TEM study of sensitization in AA5083
Tan, 2010, thermomechanical processing to lessen SCC in AA5083
Fonda, 2009, FSW of AA5456
Jones, 2004, TEM study of stress corrosion crack propagation in AA5083—great paper!

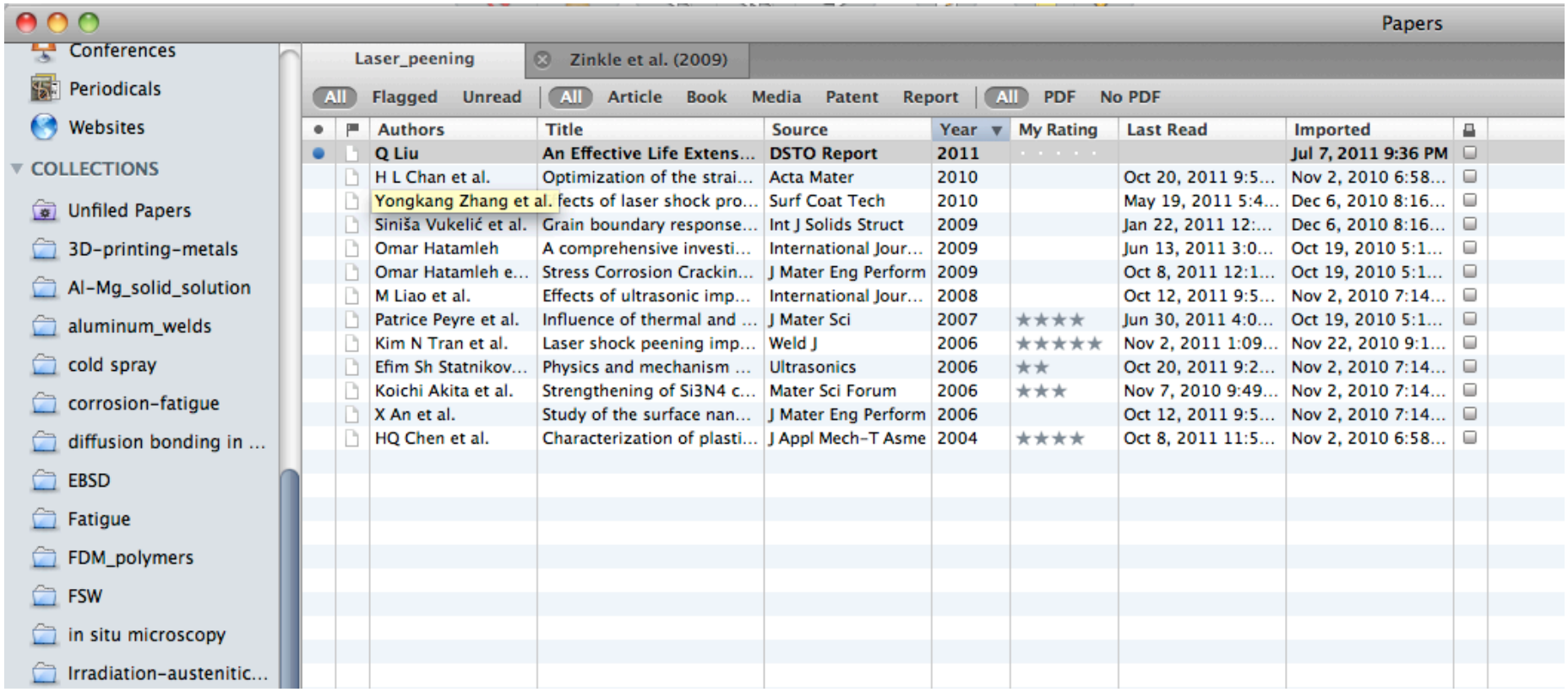
How do I use the references once I've found them?: Methods for Distilling the Results



You can use any one of a number of software products (free and commercial for storing and organizing your references…

courtesy CDR B.W. Baker

How do I use the references once I've found them?: Methods for Distilling the Results



You can use any one of a number of software products (free and commercial for storing and organizing your references…

How do I use the references once I've found them?: Methods for Distilling the Results

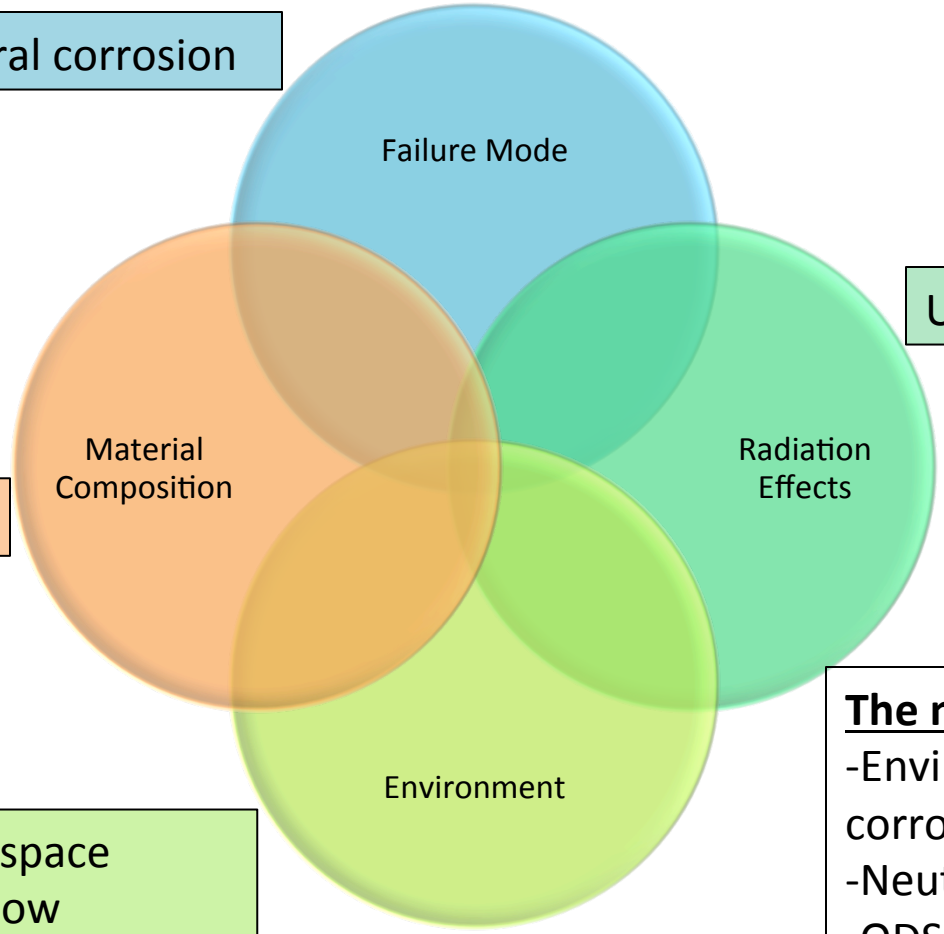
			CDR Baker Literature Survey Summary Updated: 1/26/2012
Author	**Title**	**Rating**	**Key point Summary**
Hwang	SCC Corrosion Eval 2008	4	- Not just on ODS, but also F/M steels (T 91 and T92 alloys, Ni alloys and ODS) ODS – MA956; SCPWR another possible use of ODS; - Good description of SCC test (SSRT w/u-bend) but not done on ODS; done on F/M steels; results not clear for ODS; discussion of oxide layer thickness
Kimura	Recent Progress 2007	5	- Materials: F82H and JLF-1 - SCC of ODS discussed but not clear; SSRT test discussed; concluded SCC less than for ASS - Conclusion: Couple RAF w/ODS steel; rad dmg is f(x) steel choice
Hoseman	Corrosion ODS Pb-Bi 2008	4	Corrosion of Alloys (PM2000, MA956, 12YWT, 14YWT, MA957) in LBE by measuring oxide layers - Depends on Al content - Depends on grain size - PM2000 appears to be best (thin oxide layer with no selective oxidation)
Takaya	Corrosion Resistance Al alloy 2010	2	- Measuring oxide layer thickness to determine corrosion impact - Measure impact of adding Al to ODS
Takaya	Corrosion Behavior Al alloy 2009	3	- This is the preceder to the other Takaya article - Same approach, exposed in LBE, measure oxide layer - Conclusion: Cr content and Al content important not just Cr
Isselin	Effect Al on Corrosion ODS 2010	2	- Uses Nitric acid, similar to decladding in fuel reprocessing - Process: measure current density vs. potential to measure corrosion - 2 ODS steels compared to Inconel, Hasteloy, 316 SS
Narita	Water Corrosion Resistance ODS 2007	3	- 2 ODS Steels (9Cr 12Cr) compared to ASS and MSS - Process: measure weight loss to estimate corrosion - Conclusion: resistance not just due to Cr
Roy	EAC Structural Materials	4	- Conclusion: expressed as % of YS; effect of temp; effect of notch; effect of pH - Alloys: HT9, EP823, 422 - Constant load test and SSR test - Good process
Miwa	SCC F82H	3	- Conclusion: Predict when each type of SCC occurs - SSRT testing - Variables: heat treat, CW, radiation - Look for SCC in water w/DO

Corrosion | Radiation | Temperature | Material Composition | CFD | Reactor Designs | Experimental Process

Excel spread sheet courtesy CDR B.W. Baker

Dissertation Venn Diagram

Creep, general corrosion



Unirradiated

Cu, Al Alloy, High Cr

Biomaterials, space applications, low temperature, water

<u>The nexus:</u>
-Environmentally assisted corrosion
-Neutron radiation
-ODS Steel
-Fusion reactor/breeder reactor

<u>Dissertation Concept</u>:
Characterization and analysis of environmentally assisted corrosion of ODS steel for reactor applications

courtesy CDR B.W. Baker

How do I use the references once I've found them?: Writing a literature summary…

- At this point you should have
  - Reviewed, summarized, and scored papers
  - Coherent "clusters of knowledge"
- The task now is to
  - Organize the clusters of knowledge into a meaningful flow
  - Remove clusters that are not fully relevant from your summary
  - Write the clusters of knowledge into individual or series of paragraphs
  - Integrate into one, flowing literature summary
  - You should reference as you go along, but don't worry too much about the formatting at this point (Brewer, JMR, 2010) will do fine
- At the end of this process, you will have a basic working draft for most of the introduction to your thesis!