



The Engineering Design Cycle

Research the Need
Establishing Relevance

Once an initial web search for information regarding the need to solve a certain problem is complete, it's time to look at a broader range of sources to establish the relevance of the problem to society.



Gathering
Information
during the

*Research
the
Need*

phase of the
Engineering
Design
Cycle

Establishing Relevance



Are other successful
products already
developed to solve this
problem?

Where to Look:

- Trade Magazines (e.g. IEEE Spectrum)
- Company Web Pages/Annual Reports
- Market Research



Gathering
Information
during the

*Research
the
Need*

phase of the
Engineering
Design
Cycle

Establishing Relevance



MEMS Accelerometers

Analog Devices accelerometers and iSensor® MEMS accelerometer subsystems provide accurate detection while measuring acceleration, tilt, shock, and vibration in performance driven application. Our portfolio leads the industry in power, noise, bandwidth, and temperature specifications, and offers a range of MEMS sensor and signal conditioning integration on chip. Our MEMS-based Circuits from the Lab® reference designs have been built and tested by ADI experts to help you jumpstart your next system design.

Product Selection Table

• [MEMS Accelerometers](#)

Are other successful
products already
developed to solve this
problem?

Where to Look:

- Trade Magazines (e.g. IEEE Spectrum)
- Company Web Pages/Annual Reports
- Market Research



Gathering
Information
during the

*Research
the
Need*

phase of the
Engineering
Design
Cycle

Establishing Relevance



GRAND VIEW RESEARCH

[Industries](#) [Services](#) [About Us](#) [Insights](#) [Blogs](#)

[Home](#) » [Sensors & controls](#) » [Gas Sensors Market Analysis By Product \(Oxygen, Ca...](#)

Gas Sensors Market Analysis By Product (Oxygen, Carbon Dioxide, Carbon Monoxide, NOx), By Technology (Electrochemical, Semiconductor, Solid State, PID, Catalytic, Infrared), By End-Use (Medical, Building Automation & Domestic Appliances, Environmental, Petrochemical, Automotive, Industrial) And Segment Forecasts To 2020

Published: March 2014 | ISBN Code: 978-1-68038-083-5 | Report format

[Report Summary](#)

[Table of Contents](#)

[Segmentation](#)

[Research Methodology](#)

[Request Sample](#)

Industry Insights

Global gas sensors market size was estimated at USD 1.78 billion in 2013, and is expected to grow at a CAGR of 5.1% from 2014 to 2020. Technology innovation, primarily due to enhanced manufacturing processes and embedded electronics is expected to drive the gas sensors market. For example, in the automotive sector, hazardous emissions has led to the framing of legislations for emission control and created the need to monitor its concentration. CO and NOx sensing devices are deployed for this purpose, thus contributing to the global revenue growth.

Oxygen sensing products are deployed in automobiles for cabin air quality maintenance. Various types of combustible and toxic substances used in industrial processes such as H₂S (Hydrogen Sulfide), NO₂ (Nitrogen Dioxide), etc. pose high risk for workers in the vicinity. Therefore, it is important to continuously monitor concentration of these substances in industrial environments to avoid any mishaps. Demand for these devices in order to ensure occupational health and safety is on the rise across numerous industry verticals such as process and manufacturing industries. Increasing adoption of wireless and smart sensing technologies is expected to fuel the gas sensors industry demand over the

Where to Look:

- Trade Magazines (e.g. IEEE Spectrum)
- Company Web Pages/Annual Reports
- Market Research

Are other successful products already developed to solve this problem?



Gathering
Information
during the

*Research
the
Need*

phase of the
Engineering
Design
Cycle

Establishing Relevance

Carpal tunnel syndrome and its relation to occupation: a systematic literature review

Keith T. Palmer, E. Clare Harris and David Coggon

+ Author Affiliations

Correspondence to: Keith T. Palmer, MRC Epidemiology Resource Centre, Southampton General Hospital, Tremona Road, Southampton SO16 6YD, UK. Tel: +44 23 8077 7624; fax: +44 23 8070 4021; e-mail: ktp@mrc.soton.ac.uk

Abstract

Objectives To assess occupational risk factors for carpal tunnel syndrome (CTS), we conducted a systematic literature review.

Methods We identified relevant primary research from two major reviews in the 1990s and supplemented this material by a systematic search of the MEDLINE and EMBASE biomedical databases from the start of the electronic record to 1 January 2005. Reports were obtained and their bibliographies checked for other relevant publications. From each paper, we abstracted a standardized set of information on study populations, exposure contrasts and estimates of effect.

Results Altogether, we summarized 38 primary reports, with analyses based either on a comparison of job titles (22) or of physical activities in the job (13) or both (3). We found reasonable evidence that regular and prolonged use of hand-held vibratory tools increases the risk of CTS >2-fold and found substantial evidence for similar or even higher risks from prolonged and highly repetitious flexion and extension of the wrist, especially when allied with a forceful grip. The balance of evidence on keyboard and computer work did not indicate an important association with CTS.

Is there a critical need for this product to address the health and well-being of society?

Where to Look:

- Introduction/Background in Scientific/Peer-Reviewed Literature
- Reliable Government Organizations
- Reputable NGOs (Non-Government Organizations)



Gathering
Information
during the

*Research
the
Need*

phase of the
Engineering
Design
Cycle

Establishing Relevance

The screenshot shows the NHTSA (National Highway Traffic Safety Administration) website. The header includes the NHTSA logo, a 'Subscribe' button, and navigation tabs for 'Driving Safety', 'Vehicle Safety', 'Research', 'Data', and 'Laws'. A left sidebar lists various topics with arrows pointing to the right. The main content area is titled 'Pedestrians' and features a large image of a family (a man, a woman, and a child) walking across a crosswalk. Below the image, there is a paragraph of text.

NHTSA
NATIONAL HIGHWAY TRAFFIC
SAFETY ADMINISTRATION

Subscribe

Driving Safety Vehicle Safety Research Data Laws

Driving Safety Home →
Aggressive Driving →
Bicycles →
Child Safety at Parents Central →
Disabled Drivers →
Distracted Driving at Distraction.gov →
Drowsy Driving →
Enforcement & Justice Services →
Impaired Driving →
Motorcycles →
Occupant →

Pedestrians

EVERYONE IS A PEDESTRIAN

Everyone has different preferences when it comes to transportation, but there's one that all road users share — everyone is a pedestrian. Unfortunately, pedestrians were one of the few groups of road users to experience an increase in fatalities in the United States in

Is there a
critical
need for
this
product to
address
the health
and well-
being of
society?

Where to Look:

- Introduction/Background in Scientific/Peer-Reviewed Literature
- Reliable Government Organizations
- Reputable NGOs (Non-Government Organizations)



Gathering
Information
during the

*Research
the
Need*

phase of the
Engineering
Design
Cycle

Establishing Relevance



Is there a critical need for this product to address the health and well-being of society?

Where to Look:

- Introduction/Background in Scientific/Peer-Reviewed Literature
- Reliable Government Organizations
- Reputable NGOs (Non-Government Organizations)



Gathering
Information
during the

*Research
the
Need*

phase of the
Engineering
Design
Cycle

Establishing Relevance



GRAND VIEW RESEARCH

[Industries](#) [Services](#) [About Us](#) [Insights](#) [Blogs](#)

[Home](#) » [Sensors & controls](#) » [Gas Sensors Market Analysis By Product \(Oxygen, Ca...](#)

Gas Sensors Market Analysis By Product (Oxygen, Carbon Dioxide, Carbon Monoxide, NOx), By Technology (Electrochemical, Semiconductor, Solid State, PID, Catalytic, Infrared), By End-Use (Medical, Building Automation & Domestic Appliances, Environmental, Petrochemical, Automotive, Industrial) And Segment Forecasts To 2020

Published: March 2014 | ISBN Code: 978-1-68038-083-5 | Report format

[Report Summary](#)

[Table of Contents](#)

[Segmentation](#)

[Research Methodology](#)

[Request Sample](#)

Industry Insights

Global gas sensors market size was estimated at USD 1.78 billion in 2013, and is expected to grow at a CAGR of 5.1% from 2014 to 2020. Technology innovation, primarily due to enhanced manufacturing processes and embedded electronics is expected to drive the gas sensors market. For example, in the automotive sector, hazardous emissions has led to the framing of legislations for emission control and created the need to monitor its concentration. CO and NOx sensing devices are deployed for this purpose, thus contributing to the global revenue growth.

Oxygen sensing products are deployed in automobiles for cabin air quality maintenance. Various types of combustible and toxic substances used in industrial processes such as H₂S (Hydrogen Sulfide), NO₂ (Nitrogen Dioxide), etc. pose high risk for workers in the vicinity. Therefore, it is important to continuously monitor concentration of these substances in industrial environments to avoid any mishaps. Demand for these devices in order to ensure occupational health and safety is on the rise across numerous industry verticals such as process and manufacturing industries. Increasing adoption of wireless and smart sensing technologies is expected to fuel the gas sensors industry demand over the

Where to Look:

- Market Research
- Trade Magazines
- Introduction/Background in Peer Reviewed Literature

Is there compelling evidence for a profitable market for this product/design?



Gathering
Information
during the

*Research
the
Need*

phase of the
Engineering
Design
Cycle

Establishing Relevance



Is there compelling evidence for a profitable market for this product/design?

Where to Look:

- Market Research
- Trade Magazines
- Introduction/Background in Peer Reviewed Literature



Gathering
Information
during the

*Research
the
Need*

phase of the
Engineering
Design
Cycle

Establishing Relevance

Carpal tunnel syndrome and its relation to occupation: a systematic literature review

Keith T. Palmer, E. Clare Harris and David Coggon

+ Author Affiliations

Correspondence to: Keith T. Palmer, MRC Epidemiology Resource Centre, Southampton General Hospital, Tremona Road, Southampton SO16 6YD, UK. Tel: +44 23 8077 7624; fax: +44 23 8070 4021; e-mail: ktp@mrc.soton.ac.uk

Abstract

Objectives To assess occupational risk factors for carpal tunnel syndrome (CTS), we conducted a systematic literature review.

Methods We identified relevant primary research from two major reviews in the 1990s and supplemented this material by a systematic search of the MEDLINE and EMBASE biomedical databases from the start of the electronic record to 1 January 2005. Reports were obtained and their bibliographies checked for other relevant publications. From each paper, we abstracted a standardized set of information on study populations, exposure contrasts and estimates of effect.

Results Altogether, we summarized 38 primary reports, with analyses based either on a comparison of job titles (22) or of physical activities in the job (13) or both (3). We found reasonable evidence that regular and prolonged use of hand-held vibratory tools increases the risk of CTS >2-fold and found substantial evidence for similar or even higher risks from prolonged and highly repetitious flexion and extension of the wrist, especially when allied with a forceful grip. The balance of evidence on keyboard and computer work did not indicate an important association with CTS.

Where to Look:

- Market Research
- Trade Magazines
- Introduction/Background in Peer Reviewed Literature

Is there compelling evidence for a profitable market for this product/design?



Establish the Relevance

Research the Need

An initial web search (or if you are old-fashioned, flipping through recent issues of trade or popular science magazines) provides a good foraging opportunity for proper keywords, potential pitfalls, and possible relevance of the design problem.

The second major step in gathering information must clearly **Establish the Relevance** of the problem to producing a marketable AND competitive product as well as addressing a valid need in society.

