Well-being through work

FIOH in a nutshell
Promoting occupational health and safety as a part of good living

Kirsi Jussila, Sirkka Rissanen and Hannu Rintamäki
The Finnish Institute of Occupational Health is

- An independent public law institution
- A research institute in the administrative sector of the Ministry of Social Affairs and Health

Board of Directors 2015-2017

- The Ministry of Social Affairs and Health
- The Ministry of Employment and the Economy
- Labour market organizations

Clients

- Workplaces, citizens, government officials, occupational health services (OHS), occupational health & safety personnel, parties engaged in development and trainers
FIOH is an expert in well-being at work

The basis of our operations
• Research-based knowledge
• Co-operative development
• Proven effectiveness
• Comprehensive, creative solutions
• Active impact
• Swift reaction
• Future orientation
International collaboration in Arctic and cold research

• ANOHS: Arctic Network on Occupational Health and Safety
  • Preparatory phase August 2016-December 2017
  • To be discussed in UArctic congress
• International research and development projects
• ISO (International Organization for Standardization)
  • ISO TC159/SC5/WG1 (Ergonomics, Thermal environment)
  • CEN TC 162 WG 4 (Protective clothing against foul weather, wind and cold)
  • ISO/TC67/SC8/WG1 (Petroleum industry, Arctic operations)
• ICOH (International Commission on Occupational Health)
  • Thermal Factors Scientific Committee
• UArctic (University of the Arctic)
• Arranging conferences and meetings
• Professional networks with practically all institutes related with work in the cold
Seven decades of research-driven expertise on work in the Arctic

- Maintain the ability to work in the cold
- Personal protective equipment (PPE)
- Optimal shift work systems
- Coping with prolonged light and darkness
- Prevention of musculoskeletal disorders
- Effective work practices for safety-critical industries
- Support for psychosocial stress
- Analysis of psychophysiological measures
- Assessment of seafarers’ physical capacity and strain as well as medical fitness for their duties

Unique laboratory facilities

- **Climatic chambers** with whole body vibration, wind tunnel, thermal manikins
- **Accredited laboratories** for testing PPE, and Notified body no. 0403
- **Diverse equipment** for the measurement of human responses both in a laboratory and in real life
Human Performance and Health in Thermal Environments

Thermal environment
- Ambient temperature
- Radiative temperature
- Air velocity
- Humidity

Cold protection
- Thermal insulation
- Water vapour resistance
- Air permeability
- Compatibility with PPE

Body heat balance
- Core and shell temperatures
- Heat production and heat loss
- Comfort, discomfort
- Health and injuries

Working capacity
- Stress
- Strain
- Recovery

Working capacity
- Health and injuries
Laboratory of Physiology

Facilities and equipment

- two climatic chambers (-40 ... 65°C)
- wind tunnel (-45 ... 60°C, laminar wind 10 m/s)
- immersion pools
- laboratory of physical performance
- extensive instrumentation for measuring human thermal, neuromuscular, cardiovascular, respiratory and energetic responses, working capacity and recovery

Tasks

- laboratory and real life assessment of body heat balance
  - effects of ambient conditions, work, clothing, PPE and individual factors
- laboratory and real life assessment of physical performance and recovery
Laboratory of Clothing

Facilities and equipment

• Climatic chamber (-40...35°C) with wind (0...10 m/s, possibility even up to 20 m/s)
• Two thermal manikins: standing/walking and sitting
• Physical hand, foot and head thermal models
• Whole body vibration
• Measurements of textile properties:
  • thermal resistance, air permeability, water vapour resistance, resistance to water penetration, thickness

Tasks

• laboratory and real life assessment and development of protective clothing
• compatibility of clothing and personal protective equipment
FIOH has accredited laboratories for testing personal protective equipment (Notified body 0403)

- Diving suits, immersion suits, lifejackets, protective clothing and gloves, safety and protective shoes, eye and face protectors, hearing protectors, respiratory protective devices, Protective devices against fall from a height

Testing and certification of cold protective clothing

Testing and certification of survival suits
Research and Development Projects Related to Arctic Work and Cold Protection

Running projects
- Smart Clothing 2.0 2017-2018
- SmartPro - Smart protective solutions for industrial safety and productivity in the cold, Saféra, 2015-2018
- Functionality of respiratory protective devices in the cold, Finnish Work Environment Fund, 2016-2018
- Development of food processing industry work environment – HKScan Kariniemi, FWEF, 2016-2017

Recent Projects
- MineHealth: Sustainability of miners’ well-being, health and work ability in the Barents region – a common challenge, ENPI, (2012-2014)
- MatkaSuTu: Protection and safety of tourist worker and traveller (2010-2012)
- Mast and pole workers: physical strain in summer and winter
- Casualty protection and evacuation at sea (2009)
- Quality and safety of outdoor touristic services in Lapland in winter
- Musculoskeletal problems in food processing industry
- Heat balance of infants sleeping outdoors
- UTCI (Universal Thermal Climate Index)
Needs, ideas and visions on Arctic collaboration

• The development of Arctic occupational health and safety would be benefitted from a stronger and focused collaboration of Arctic region’s research institutions.

• The ANOSH could facilitate at least the following activities:
  • Dissemination of information
  • Joint seminars and workshops to develop the ideas of Arctic occupational health and safety
  • Courses on special topics of Arctic occupational health and safety
  • Teaching material and information to teachers and teacher educators for all levels of schools
  • Joint articles, both popular and scientific
  • Joint research/development projects
  • Exchange of researchers
  • Mutual customer services.
Contact Information

Kirsti Jussila, Specialist Research Scientist
• protective clothing
• kirsti.jussila@ttl.fi, phone +358 30 474 6089

Hannu Rintamäki, Research Professor, retiring 1.1.2018
• thermophysiology
• hannu.rintamaki@ttl.fi, phone +358 30 474 6096

Sirkka Rissanen, Specialist Research Scientist
• manual performance, protective garments, thermal strain
• sirkka.rissanen@ttl.fi, phone +358 30 474 6095

Juha Oksa, Senior Research Scientist
• working capacity and physical strain
• juha.oksa@ttl.fi, phone +358 30 474 6094

Satu Mänttäri, Research Scientist
• muscular strain and recovery, thermal strain
• satu.manttari@ttl.fi, phone +358 30 474 6093
Thank you!

Like us on Facebook and follow us on Twitter

facebook.com/tyoterveyslaitos
twitter.com/tyoterveys and twitter.com/fioh