HEALTH AND SAFETY TRENDS IN HARDMETAL INDUSTRY

- Safety work at Sandvik
- Classification (who, how and why)
- Changes in classification
- Direct impact of changes
- Future scenarios
- Questions
SAFETY FIRST

Sandvik’s objective is zero harm to our people, the environment we work in, our customers and our suppliers.

WORLD-LEADING POSITIONS

IN THE FOLLOWING AREAS

- METAL CUTTING
- MINING AND ROCK TECHNOLOGY
- ADVANCED MATERIAL KNOWLEDGE
ENHANCING PRODUCTIVITY, PROFITABILITY AND SAFETY

ENGINEERING 23%
ENERGY 12%
AUTOMOTIVE 14%
AEROSPACE 6%
MINING 27%
CONSTRUCTION 12%
OTHERS 6%

Share of Group total 2016 revenues by customer segment excl. Mining Systems; consumer goods, chemicals and miscellaneous total 6%.

CONDUCTING SUSTAINABLE BUSINESS

TWO IMPACT AREAS – EIGHT DIMENSIONS

OUR OFFERINGS
The impact occurs outside of our operations

OUR OPERATIONS
The impact of our operations - everything we do to produce products and services

INNOVATION & PRODUCTIVITY
HEALTH & SAFETY
ENVIRONMENTAL IMPACT
USE, REUSE & RECYCLE
GOVERNANCE
PARTNERS
ENVIRONMENTAL FOOTPRINT
PEOPLE
SAFETY FOR ALL WORKPLACES

OUR TOP PRIORITY

- Vision: Zero workplace accidents.
- Preventative measures and efforts to change the corporate culture.
- Injury rate for 2016 all-time-low.

CLASSIFICATION
- WHO, HOW & WHY
POSSIBLE LEGAL IMPACTS BY CLASSIFICATION

- Legislation preventing exposure
- Legislation preventing industrial accidents
- Occupational Exposure Limits (OEL)
- Restrictions (prohibited uses)
- Authorisation/Permits
- Phase out of a substance
- Transportation

REACH SHIFTED RESPONSIBILITY

BEFORE REACH

AFTER REACH
CLASSIFICATION OF CHEMICALS

WHO

HOW

GHS (UN initiative 2003):
• Hazards communicated in the same way
• Chemicals have same hazards everywhere
• Hazards based on test data:
  – Physical
  – Toxicological
  – Ecotoxicological

GHS = Globally Harmonised System of Classification and Labelling of Chemicals
UN = United Nations

GHS IMPLEMENTATION
WWW.UNECE.ORG
SELF-CLASSIFICATION

COBALT
- CoRC
- CDI

HARDMETAL
- Tungsten Consortium
- ITIA

HARMONISED CLASSIFICATION

- European Commission
- ECHA
- National Competent Authorities (Agencies, Ministries, Institutes…)

CoRC = Cobalt REACH Consortium
CDI = Cobalt Development Institute
ITIA = International Tungsten Industry Association
ECHA = European Chemicals Agency

TTIP = Transatlantic Trade and Investment Partnership
CHANGES IN CLASSIFICATION

HARMONISED CLASSIFICATION

COBALT POWDER – PROPOSAL JANUARY 2017

- Resp. Sens. 1B  H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
- Skin Sens. 1   H317: May cause an allergic skin reaction
- Aquatic Chronic 4 H413: May cause long-lasting harmful effects to aquatic life

- Carc 1B  H350: May cause cancer (Specific Concentration Limit 0,01%)
- Muta 2  H341: Suspected of causing genetic defects
- Repr. 1B  H360f: May damage fertility
SELF-CLASSIFICATION

COBALT POWDER – DECEMBER 2013

- Resp. Sens. 1B H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
- Skin Sens. 1 H317: May cause an allergic skin reaction
- Aquatic Chronic 1 H410: Very toxic to aquatic life with long lasting effects
  - Aquatic Acute 1 H400: Very toxic to aquatic life
  - Carc 1B H350i: May cause cancer by inhalation

- Repr. 2 H361f: Suspected of damaging fertility. Specific effect: fertility impairment in males.
- Acute 1 H330: Fatal if inhaled (respirable particles)
- Acute 4 H302: Harmful if swallowed
- Eye Irrit. 2 H319: Causes serious eye irritation

2011 HARDMETAL POWDER – 25-30% COBALT

- Resp. Sens. 1B H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
- Skin Sens. 1 H317: May cause an allergic skin reaction
- Aquatic Chronic 1 H410: Very toxic to aquatic life with long lasting effects
  - Aquatic Acute 1 H400: Very toxic to aquatic life
  - Carc 2 H351: Suspected of causing cancer by inhalation

- STOT RE 1 H372: Causes damage to lungs through prolonged or repeated exposure by inhalation
SELF-CLASSIFICATION

2013 HARDMETAL POWDER – 25 – 30 % COBALT

• Resp. Sens. 1B  H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
• Skin Sens. 1  H317: May cause an allergic skin reaction
• Aquatic Chronic 1  H410: Very toxic to aquatic life with long lasting effects
• Aquatic Acute 1  H410: Very toxic to aquatic life
• Carc 1B  H350i: May cause cancer by inhalation

• Acute 2  H330: Fatal if inhaled (respirable particles)
• Acute 4  H302: Harmful if swallowed
• Eye Irrit. 2  H319: Causes serious eye irritation
• STOT RE 1  H372: Causes damage to lungs through prolonged or repeated exposure by inhalation

EU HARMONISED CLASSIFICATION

PROPOSAL FOR COBALT METAL – JANUARY 2017

<table>
<thead>
<tr>
<th>END POINT</th>
<th>CURRENT INDUSTRY CLASSIFICATION</th>
<th>PROPOSAL FROM AUTHORITY</th>
<th>PROPOSAL DIFFERS FROM SELF-CLASSIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinogenicity</td>
<td>Carc 1B  (Inhalation)</td>
<td>Carc 1B</td>
<td>Oral and skin routes of exposure</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Carc 1B inhalation GCL 0,1%</td>
<td>Carc 1B SCL 0,01%</td>
<td>SCL 0,01%</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>No mutagenicity</td>
<td>Muta 2</td>
<td>Muta 2 (Suspected mutagen)</td>
</tr>
<tr>
<td>Reproductive toxicity (fertility)</td>
<td>Repro 2  (Suspected human effect)</td>
<td>Repro 1B (Presumed human effect)</td>
<td>Change from Repro 2 to Repro 1B</td>
</tr>
</tbody>
</table>

GCL = Generic Concentration Limit
SCL = Specific Concentration Limit
DIRECT IMPACT OF CHANGES
CARCINOGEN DIRECTIVE AFFECTS ALSO USERS OF HARDMETAL

EU CARCINOGEN AND MUTAGEN DIRECTIVE

**EMPLOYER OBLIGATIONS**

- Substitution
- Technical measures
- Organisational measures
- Personal protective equipment

**OTHER OBLIGATIONS**

*EXAMPLES:*
- Health surveillance
- Record keeping 40 years
- Emergency plans
- Info to workers
### EU CARCINOGEN AND MUTAGEN DIRECTIVE

<table>
<thead>
<tr>
<th>Employer Obligations</th>
<th>Other Obligations</th>
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<td><strong>S</strong>ubstitution</td>
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<td>• <strong>H</strong>ealth surveillance</td>
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<td><strong>O</strong>rganisational measures</td>
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<td></td>
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</tbody>
</table>

### SANDVIK’S GLOBAL PROGRAM (1/2)

**Technical Measures, Procedure, Work Instructions**

- Risk assessment of process, equipment, material – participation & information to the ones affected
- Training to employees & contractors
- Documentation
- Must follow instructions, report risks
- Instructions - short-term high exposure & emergency situations
- Technical improvements
- Restricted areas
- Work clothes
- Laundry service
- Personal hygiene
- No eating, drinking, smoking
- Good order, incl. cleaning
SANDVIK’S GLOBAL PROGRAM (2/2)

EXPOSURE CONTROL, MEASUREMENTS, INSPECTIONS

- Internal exposure limits (air & urine)
- Regular measurements – since a long time
- Detailed instructions - results comparable
- Instructions - if person/homogenous group has too high levels
- Results reported and followed up regularly
- Health surveillance
- Internal team and inspections
- Changing behaviour – measuring + filming

FUTURE SCENARIOS
OCCUPATIONAL EXPOSURE LIMIT
FOR COBALT ALONE OR IN HARDMETAL

1978 US NIOSH: 0.1 mg/m³
1978 Sweden: 0.05 mg/m³
1993 US ACGIH: 0.02 mg/m³
2007 Denmark: 0.01 mg/m³
2011 Sweden: 0.02 mg/m³
2016 US ACGIH: 0.005 mg/m³
20XX Germany: 0.005 mg/m³
20XX France: 0.0025 mg/m³
20XX Germany: 0.00005 mg/m³

NEW INITIATIVE - HARDMETAL

PACT LIST - 13 APRIL 2017

• "Alloys Cobalt-tungsten carbide hard metals" added to PACT list
• RMOA is planned to be carried out
• No timeline announced

PACT = Public Activities Coordination Tool
RMOA = Risk Management Option Analysis
LOOKING INTO THE FUTURE

CLASSIFICATION - KEY TO COMING CHANGES
QUESTIONS?