Environment, Safety and Health

ES&H Guideline

ESH-US-G-104
Power Tools

Please Note

1. This Guideline is specifically meant for use by companies and operations in the United States.
2. The Guideline (including the external references) is regularly updated by ES&H International. Please check that this is the current, up-to-date version before using any of the information below. Highlighted text indicates changes incorporated in the latest update.
3. Please refer to our disclaimer before using this Guideline.

Contents

1. Scope

This Guideline covers the requirements associated with power tools, including explosive tools, compressed air tools, cord and battery operated electrical tools, and petrol and diesel powered tools. It covers the storage, operation, inspection maintenance and safe operation of these tools, and the training and qualifications of persons operating such tools.
For general plant and machinery safety, refer ES&H Guideline ESH-US-G-057.
For testing of electrical equipment (including electrical power tools), refer ES&H Guideline ESH-US-G-099.

2. Objectives

To ensure that:

- All power tools are maintained in good working order at all times
- All power tools are used safely and only for the purpose for which they are intended.
- All personnel operating such tools are appropriately qualified and trained.

3. Definitions

Power Tools
For the purpose of this guideline this means any tool which is powered by means of explosives, compressed air, electricity (including batteries) petrol or diesel, and which has the potential to cause harm to personnel or to the environment.

4. Issues to be Addressed

The major issues addressed in this guideline are as follows:

4.1. Purchasing and Registration

All new power tools purchased shall be suitable for the intended task, and shall comply with the relevant ANSI or international standards. Refer ES&H Guideline ESH-US-G-021.

Purchasing specifications shall nominate required safety features, as applicable to the intended task(s).

All power tools shall be identified and registered. The register shall be used for the hazard identification and risk assessment process, and for scheduled maintenance and inspections.

4.2. Hazard Identification and Risk Assessment

The hazards associated with each type of tool shall be identified and the risks assessed and minimized (refer ES&H Guideline ESH-US-G-028). The hazards and assessed risks shall be documented.

The risk assessment shall take into consideration at least:

- The tasks for which the tools are expected to be used
- The working environment, layout and physical conditions when these tools are to be used (e.g. working at heights)
- Expected competence of persons who would operate the tools
- The procedures, work instructions and work practices for the tools
- Foreseeable abnormal conditions, break-down and emergencies (including abnormal weather conditions, power failures, power surges, etc)

Following the assessment, risk control measures in accordance with the hierarchy of controls (refer ES&H Guideline ESH-US-G-028) shall be implemented.

4.3. Storage of Power Tools and Associated Materials

Storage of power tools shall be in accordance with documented work instructions (refer ES&H Guideline ESH-US-G-054). This particularly applies to petrol, explosive and battery-operated tools.

Where required, Material Safety Data Sheets shall be available for stored materials such as petrol, explosives, etc for use with these tools (refer ES&H Guideline ESH-US-G-023).

4.4. Modifications and Inspections

Power tools shall not be modified unless an assessment in accordance with ES&H Guideline ESH-US-G-031 has been carried out.

Power tools shall be inspected on a regular basis, so that conditions which may lead to failure can be identified. The use of tools which are considered unsafe shall cease immediately and they shall be repaired or replaced. Records of all inspections, their outcome and actions taken shall be kept.

4.5. Operation of Power Tools

Controlled work instructions shall be issued to ensure all power tools are operated and maintained strictly in accordance with the legislative requirements, manufacturer's instructions and safe work practices. Persons operating such equipment must ensure it is used in the correct manner and only for the purpose for which it is intended.

Personnel operating power tools shall use the appropriate Personal Protective Equipment (refer ES&H Guideline ESH-US-G-052).

All persons operating power tools shall be adequately trained in the correct use of the tools and where required qualified and certificated.

4.6. Electrical Power Tools

Wherever possible, electrical power tools shall have the following safety features:

- A safety catch or switch to prevent accidental switching on of the tool;
- A 'soft start' to prevent kick-back on start-up;
- A safety clutch to disengage the tool if a kick-back occurs;
- An automatic switch-off mechanism which operates on contact with live mains conductors.

4.7. Control of Vibration

The vibration risk associated with hand-tools shall be identified and assessed (refer ES&H Guideline ESH-US-G-028). The assessment shall take into consideration at least the following:

- The vibration level;
- The frequency, direction and acceleration of the source of vibration; and
- The length of time workers are exposed to the vibration

Control measures to manage vibration may include:

- Speed adjustment to reduce vibration;
- Internal damping;
- Vibration-isolated handles (e.g. rubber or foam);
- Automatic shut-off when the toll is not in operation;
- Rotation of workers;
- Personal protective equipment such as vibration-absorbing gloves (refer ES&H Guideline ESH-US-G-052).

For general requirements related to vibration, refer ES&H Guideline ESH-US-G-118.

5. Responsibilities

The following personnel should typically assume the primary responsibility for the activities covered by this guideline:

- Line Managers
- Engineering Manager
- Maintenance Manager
- Operations Personnel
- Maintenance Personnel
- Engineering Personnel
- Any other person using power tools

6. Related ES&H Guidelines

ESH-US-G-021	Procurement
ESH-US-G-023	Material Safety Data Sheets
ESH-US-G-028	Hazard and Risk Management
ESH-US-G-031	Management of Change
ESH-US-G-052	Personal Protective Equipment
ESH-US-G-054	Storage and Warehousing
ESH-US-G-057	Plant and Machinery Safety
ESH-US-G-099	Testing of Electrical Equipment
ESH-US-G-118	Control of Workplace Vibration

7. External References

This section includes references to external (i.e. not controlled by the company or the organization) references specifically related to the issues covered by this Guideline. These include acts, regulations, directives, management system standards, ANSI standards, international standards and publications.

Please Note
Click on any of the links below to access the relevant web site and gain access to the required documentation, as referenced below.

7.1. Acts and Regulations

OSHA (Occupational Safety and Health Administration)
http://www.osha.gov
Occupational Safety and Health Act of 1970 - Section 6 (as amended September 1998)

OSHA Regulations (Standards - 29 CFR) 1910 - Occupational Safety and Health Standards
Subpart P - Hand and Portable Powered Tools and Other Hand-Held Equipment
1910.241 - Definitions
1910.242 - Hand and Portable Powered Tools and Equipment, General
1910.243 - Guarding of Portable Powered Tools
1910.244 - Other Portable Tools and Equipment
Subpart R - Special Industries
1910.265 - Sawmills
1910.266 - Logging Operations
1910.269 - Electric Power Generation, Transmission, and Distribution
Subpart S - Electrical
1910.334 - Use of Equipment

OSHA Regulations (Standards - 29 CFR) 1915 - Occupational Safety and Health Standards for Shipyard Employment
Subpart C - Surface Preparation and Preservation
1915.34 - Mechanical Paint Removers
Subpart H - Tools and Related Equipment
1915.131 - General Precautions

1915.132 - Portable Electric Tools
1915.133 - Hand Tools
1915.134 - Abrasive Wheels
1915.135 - Powder Actuated Fastening Tools.

OSHA Regulations (Standards - 29 CFR) 1917 - Marine Terminals
Subpart C - Cargo Handling Gear and Equipment
1917.51 - Hand Tools

OSHA Regulations (Standards - 29 CFR) 1918 - Safety and Health Regulations for Longshoring
Subpart G - Cargo Handling Gear and Equipment Other Than Ship's Gear
1918.69 - Tools

OSHA Regulations (Standards - 29 CFR) 1926 - Safety and Health Regulations for Construction
1926 Subpart I - Tools - Hand and Power
1926.300 - General Requirements
1926.301 - Hand Tools
1926.302 - Power-Operated Hand Tools
1926.303 - Abrasive Wheels and Tools
1926.304 - Woodworking Tools
1926.305 - Jacks-Lever and Ratchet, Screw, and Hydraulic
1926.306 - Air receivers
1926.307 - Mechanical Power-Transmission Apparatus

EPA (Environment Protection Agency)
http://www.epa.gov
CFR Title 40 - Protection of Environment
Subchapter E - Pesticide Programs (Parts 150-189)
Part 170 - Worker Protection Standard

MSHA (Mine Safety and Health Administration)
http://www.msha.gov
Federal Mine Safety & Health Act of 1977 (as amended by the Federal Mine Safety and Health Amendments Act of 1977) (as amended by the Mine Improvement and New Emergency Response Act of 2006, June 2006)

MSHA Regulations (Standards - 30 CFR)
Part 7 - Testing by Applicant or Third Party
Subpart D - Multiple-Shot Blasting Units (7.61 to 7.72)
Part 33 - Dust Collectors for use in Connection with Rock Drilling in Coal Mines
Subpart A - General Provisions
Subpart B - Dust-Collector Requirements
Subpart C - Test Requirements
Part 57 - Safety and Health Standards-Underground Metal and Nonmetal Mines
Subpart K - Electricity
57.12033 - Hand-held Electric Tools
Subpart M - Machinery and Equipment
57.14116 - Hand-held Power Tools
Part 77 - Mandatory Safety Standards, Surface Coal Mines and Surface Work Areas of Underground Coal Mines
Subpart E - Subpart E - Safeguards for Mechanical Equipment

77.402 - Hand-held Electric Tools
Subpart K - Ground Control
77.1012 - Jackhammers, Operation, Safeguards.

7.2. Compliance Directives and Rules

OSHA (Occupational Safety and Health Administration)
http://www.osha.gov

- CPL 02-01-038 - Enforcement of the Electric Power Generation, Transmission, and Distribution Standard, June 2003
- CPL 2-1.19 - Logging Operations, Inspection Procedures and Interpretive Guidance. (1995, March 17)
- CPL 2-1.22 - Logging Operations, Inspection Procedures and Interpretive Guidance Including Twelve Previously Stayed Provisions. (1996, September 27)
- STD 1-13.2A - Explosive Actuated Fastening Tools. (1985, December 9)
- STD 1-23.2 - 29 CFR 1910.401-1910.441, Subpart T — Commercial Diving Operations. (1978, October 30)

7.3. Management System Standards

http://www.iso.ch/iso/en/ISOOnline.frontpage

ISO 9001-2008	Quality Management Systems - Requirements (Sections 6.3, 7.4 and 7.6)
ISO 14001-2004	Environmental Management Systems - Requirements with Guidance for Use (Section 4.4.6)

http://www.ilo.org/public/english/protection/safework/index.htm

ILO-OHS-2000	Guidelines on Occupational Health and Safety Management Systems (Section 3.10)

http://bsonline.techindex.co.uk

OHSAS 18001-1999	Occupational Health and Safety Management Systems - Specification (Sections 4.3.1 and 4.4.6)

7.4. ANSI Standards

Please Note
This section includes ANSI Standards and other standards available from ANSI; however, not all standards are available online from the ANSI web site.
http://web.ansi.org

ANSI A10.3-2006	Safety Requirements for Powder-Actuated Fastening Systems
ANSI A10.3-70	Safety Requirements for Explosive-Actuated Fastening Tools (Incorporated by Reference - 29 CFR, 1910.6)
ANSI B165.1-2005	Power Driven Brushing Tools – Safety Requirements for Design, Care and Use (revision and redesignation of ANSI/ABMA B165.1-1991 (R2000)): 8/5/2005
ANSI B175.1-1991	Safety Requirements for Gasoline-Powered Chain Saws (Incorporated by Reference - 29 CFR, 1910.6)
ANSI B175.2-2000	Power Tools - Hand-Held and Backpack, Gasoline-Engine-Powered Blowers

ANSI B175.3-2003	Outdoor Power Equipment - Grass Trimmers and Brushcutters - Safety Requirements (revision of ANSI B175.3-1997): 7/9/2003
ANSI B65.4-2002 (R2007)	Safety standard - Three-knife trimmers, including rotary, and single- and multiple-knife trimmers (reaffirmation of ANSI B65.4-2002): 1/22/2007
ANSI B7.1-1964	Safety Code for the Use, Care, and Protection of Abrasive Wheels (Incorporated by Reference - 29 CFR, 1910.6 and 29 CFR 1915.5)
ANSI B7.1-70	Safety Code for the Use, Care and Protection of Abrasive Wheels (Incorporated by Reference - 29 CFR, 1910.6)
ANSI B71.1-2003	Outdoor Power Equipment - Walk-Behind Mowers and Ride-On Machines with Mowers - Safety Specifications (revision of ANSI/OPEI B71.1-1998): 9/29/2003 (Incorporated by Reference - 29 CFR, 1910.6)
ANSI B71.3-2005	Outdoor Power Equipment - Snow Throwers – Safety Specifications (revision of ANSI/OPEI B71.3-1995): 12/15/2004
ANSI B71.4-2004	Standard for Outdoor Power Equipment -Commercial Turf Care Equipment - Safety Specifications (revision and redesignation of ANSI/OPEI B71.4-1999): 2/24/2004
ANSI C33.2-56	Safety Standard for Transformer-Type Arc Welding Machines (Incorporated by Reference - 29 CFR, 1910.6)
ANSI Z136.1-2007	Safe Use of Lasers (revision of ANSI Z136.1-2000): 3/16/2007
ANSI/AHAM AC-2-2006	Method for Sound Testing of Portable Household Electric Room Air Cleaners
ANSI/ASME B94.35-1972 (R2005)	Drill Drivers - Split-Sleeve, Collet-Type (reaffirmation of ANSI B94.35-1972 (R1995)): 2/7/2005
ANSI/NSF 143-2006 (i1)	Environmentally Preferable Products: Hard Surface Cleaners
ANSI/OPEI B71.1-1998	Consumer Turf Care Equipment - Walk-Behind Mowers and Ride-On Machines with Mowers - Safety Specifications
ANSI/UL 123-2007	Standard for Oxy-Fuel Gas Torches (new standard): 12/20/2007
ANSI/UL 1447-2008	Standard for Safety for Electric Lawn Mowers (revision of ANSI/UL 1447-2006): 11/26/2008
ANSI/UL 1448-2001 (R2006)	Standard for Safety for Electric Hedge Trimmers (reaffirmation of ANSI/UL 1448-2001): 7/6/2006
ANSI/UL 147-2006	Standard for Hand-Held Torches for Fuel Gases (revision of ANSI/UL 147-2005)
ANSI/UL 1776-2005	Standard for Safety for High-Pressure Cleaning Machines (revision of ANSI/UL 1776-2004): 8/1/2005
ANSI/UL 60745-1-2007	Hand-Held Motor-Operated Electric Tools - Safety - Part 1: General Requirements (identical national adoption and revision of ANSI/UL 60745-1-2005): 7/31/2007
ANSI/UL 60745-1-200x	Standard for Safety for Hand-Held Motor-Operated Electric Tools - Safety - Part 1: General Requirements (revision of ANSI/UL 60745-1-2004): 4/22/2005

ANSI/UL 60745-2-1-2006	Hand-Held Motor-Operated Electric Tools - Safety - Part 2-1: Particular Requirements for Drills and Impact Drills (revision of ANSI/UL 60745-2-1-2004): 11/2/2006
ANSI/UL 60745-2-12-2008	Standard for Safety for Hand-Held Motor-Operated Electric Tools - Safety - Part 2-12: Particular Requirements for Concrete Vibrators (revision of ANSI/UL 60745-2-12-2005): 10/17/2008
ANSI/UL 60745-2-14-2007	Standard for Hand-Held Motor-Operated Electric Tools - Safety - Part 2-14: Particular Requirements for Planers (revision of ANSI/UL 60745-2-14-2006): 6/29/2007
ANSI/UL 60745-2-17-2006	Hand-Held Motor-Operated Electric Tools - Safety - Part 2-17: Particular Requirements for Routers and Trimmers (revision of ANSI/UL 60745-2-17-2004): 11/2/2006
ANSI/UL 60745-2-19-2005	Standard for Safety for Hand-Held Motor-Operated Electric Tools - Safety - Part 2-19: Particular Requirements for Jointers (national adoption with modifications):11/23/2005
ANSI/UL 60745-2-2-2006	Hand-Held Motor-Operated Electric Tools - Safety - Part 2-2: Particular Requirements for Screwdrivers and Impact Wrenches (revision of ANSI/UL 60745-2-2-2004): 11/2/2006
ANSI/UL 60745-2-3-2008	Hand-Held Motor-Operated Electrical Tools - Safety - Part 2-3: Particular Requirements for Grinders, Polishers and Disk-Type Sanders (revision of ANSI/UL 60745-2-3-2007): 8/22/2008
ANSI/UL 60745-2-4-2006	Hand-Held Motor-Operated Electric Tools - Safety - Part 2-4: Particular Requirements for Sanders and Polishers Other Than Disk Type (revision of ANSI/UL 60745-2-4-2004): 11/2/2006
ANSI/UL 60745-2-5-2008	Standard for Safety for Hand-Held Motor-Operated Electric Tools - Safety - Part 2-5: Particular Requirements for Circular Saws (revision of ANSI/UL 60745-2-5-2007): 10/17/2008
ANSI/UL 60745-2-6-2006	Safety for Hand-Held Motor-Operated Electric Tools - Safety - Part 2-6: Particular Requirements for Hammers (revision of ANSI/UL 60745-2-6-2004): 9/1/2006
ANSI/UL 60745-2-8-2006	Hand-Held Motor-Operated Electric Tools - Safety - Part 2-8: Particular Requirements for Shears and Nibblers (revision of ANSI/UL 60745-2-8-2004): 11/2/2006
ANSI/UL 60745-2-9-2006	Hand-Held Motor-Operated Electric Tools - Safety - Part 2-9: Particular Requirements for Tappers (revision of ANSI/UL 60745-2-9-2004): 11/2/2006
ANSI/UL 745-2-30-2006	Standard for Safety for Particular Requirements for Staplers (new standard): 5/5/2006
ANSI/UL 745-2-31-2006	Standard for Safety for Particular Requirements for Diamond Core Drills (new standard): 5/5/2006
ANSI/UL 745-2-3-2006	Standard for Safety for Particular Requirements for Grinders, Polishers and Disk-Type Sanders (new standard): 11/6/2006
ANSI/UL 745-2-36-2006	Standard for Safety for Particular Requirements for Hand Motor Tools (new standard): 5/5/2006

ANSI/UL 745-4-36-2006	Standard for Safety for Particular Requirements for Battery Operated Hand Motor Tools (new standard): 5/5/2006
ANSI/UL 82-2007	Standard for Safety for Electric Garden Appliances (revision of ANSI/UL 82-2002): 2/5/2007
ANSI/UL 987-2007	Standard for Safety for Stationary and Fixed Electric Tools (revision of ANSI/UL 987-2006): 11/5/2007
DIN 11004-1	Garden and landscape work; shredders for vegetational waste; safety requirements and testing
DIN 7434	Hand tools for live working at voltages up to 1000 V - Extension bars (with male/female driving squares)
DIN 7436	Hand tools for live working at voltages up to 1000 V - Tee handle square drives
DIN 7437	Hand tools for live working at voltages up to 1000 V - Screwdrivers for slotted head screws
DIN 7438	Hand tools for live working at voltages up to 1000 V - Screwdrivers for cross-recessed head screws
DIN 7439	Hand tools for live working at voltages up to 1000 V - Keys with handle for hexagon socket screws
DIN 7440	Hand tools for live working at voltages up to 1000 V - Socket single hexagon tee wrenches
DIN 7445	Hand tools for live working at voltages up to 1000 V - Spin-type socket wrenches
DIN 7446	Hand tools for live working at voltages up to 1000 V - Single-headed, open-ended engineers' wrenches
DIN 7447	Hand tools for live working at voltages up to 1000 V - Single-end, deep offset box wrenches
DIN 7448	Hand tools for live working at voltages up to 1000 V - Square drive hexagon socket
DIN 7449	Hand tools for live working at voltages up to 1000 V - Ratchet handles
DIN EN 12418	Masonry and stone cutting-off machines for job site - Safety; English version of DIN EN 12418
DIN EN 12853	Food processing machinery - Hand-held blenders and whisks - Safety and hygiene requirements; English version of DIN EN 12853
DIN EN 13862	Floor cutting-off machines - Safety; English version of DIN EN 13862
DIN EN 1454	Portable, hand-held, internal combustion cutting-off machines - Safety
DIN EN 1550	Safety of machine tools - Safety requirements for the design and construction of work-holding chucks
DIN EN 28662-1	Hand-held portable power tools; measurement of vibrations at the handle; part 1: general (ISO 8662-1:1988)
DIN EN 792-1	Hand-held non-electric power tools - Safety requirements - Part 1: Assembly power tools for non-threaded mechanical fasteners; English version of DIN EN 792-1
DIN EN 792-10	Hand-held non-electric power tools - Safety requirements - Part 10: Compression power tools; English version of DIN EN 792-10
DIN EN 792-11	Hand-held non-electric power tools - Safety requirements - Part 11: Nibblers and shears; English version of DIN EN 792-11

DIN EN 792-12	Hand-held non-electric power tools - Safety requirements - Part 12: Small circular, small oscillating and reciprocating saws; English version of DIN EN 792-12
DIN EN 792-13	Hand-held non electric power tools - Safety requirements - Part 13: Fastener driving tools; English version of DIN EN 792-13
DIN EN 792-2	Hand-held non-electric power tools - Safety requirements - Part 2: Cutting-off and crimping power tools; English version of DIN EN 792-2
DIN EN 792-3	Hand-held non-electric power tools - Safety requirements - Part 3: Drills and tappers; English version of DIN EN 792-3
DIN EN 792-4	Hand-held non-electric power tools - Safety requirements - Part 4: Non-rotary percussive power tools; English version of DIN EN 792-4
DIN EN 792-5	Hand-held non-electric power tools - Safety requirements - Part 5: Rotary percussive drills; English version of DIN EN 792-5
DIN EN 792-6	Hand-held non-electric power tools - Safety requirements - Part 6: Assembly power tools for threaded fasteners; English version of DIN EN 792-6
DIN EN 792-8	Hand-held non-electric power tools - Safety requirements - Part 8: Sanders and polishers; English version of DIN EN 792-8
DIN EN 792-9	Hand-held non-electric power tools - Safety requirements - Part 9: Die grinders; English version of DIN EN 792-9
DIN EN 847-1	Tools for woodworking - Safety requirements - Part 1: Milling tools and circular saw blades (including Corrigendum AC:1997)
JIS C 1511:1979	Vibration level meters for hand tools
SS-EN 1454	Portable, hand-held, internal combustion cutting-off machines - Safety
SS-EN 28 662-3	Hand-held portable power tools - Measurement of vibration at the handle - Part 3: Rock drills and rotary hammers
SS-EN 28 662-5	Hand-held portable power tools - Measurement of vibration at the handle - Part 5: Pavement breakersand hammers for construction work
SS-EN 50144-1	Safety of hand-held electric motor operated tools - Part 1: General requirements
SS-EN 50144-2-1	Safety of hand-held electric motor operated tools- Part 2-1: Particular requirements for drills
SS-EN 50144-2-1 C1	Safety of hand-held electric motor operated tools- Part 2-1: Particular requirements for drills
SS-EN 50144-2-10	Safety of hand-held electric motor operated tools- Part 2-10: Particular requirements for jig saws
SS-EN 50144-2-11	Safety of hand-held electric motor operated tools- Part 2-11: Particular requirements for sabre saws and double blade reciprocating saws
SS-EN 50144-2-14	Safety of hand-held electric motor operated tools- Part 2-14: Particular requirements for planers
SS-EN 50144-2-15	Safety of hand-held electric motor operated tools- Part 2-15: Particular requirements for hedge trimmers
SS-EN 50144-2-2	Safety of hand-held electric motor operated tools- Part 2-2: Particular requirements for screwdrivers and impact wrenches

SS-EN 50144-2-2 C1	Safety of hand-held electric motor operated tools- Part 2-2: Particular requirements for screwdrivers and impact wrenches
SS-EN 50144-2-4	Safety of hand-held electric motor operated tools- Part 2-4: Particular requirements for sanders
SS-EN 50144-2-5	Safety of hand-held electric motor operated tools- Part 2-5: Particular requirements for circular saws and circular knives
SS-EN 50144-2-6	Safety of hand-held electric motor operated tools- Part 2-6: Particular requirements for hammers
SS-EN 50144-2-7	Safety of hand-held electric motor operated tools- Part 2-7: Particular requirements for spray guns
SS-EN 50144-2-8	Safety of hand-held electric motor operated tools- Part 2-8: Particular requirements for sheet metal shears and nibblers
SS-EN 50144-2-9	Safety of hand-held electric motor operated tools- Part 2-9: Particular requirements for tappers

7.5. International Standards

http://www.iso.ch/iso/en/ISOOnline.frontpage

IEC 60335-2-67 Ed. 3.1 en:2005	Household and similar electrical appliances - Safety - Part 2-67: Particular requirements for floor treatment and floor cleaning machines, for industrial and commercial use
IEC 60335-2-68 Ed. 3.1 en:2005	Household and similar electrical appliances - Safety - Part 2-68: Particular requirements for spray extraction appliances, for industrial and commercial use
IEC 60335-2-69 Ed. 3.1 b:2005	Household and similar electrical appliances - Safety - Part 2-69: Particular requirements for wet and dry vacuum cleaners, including power brush, for industrial and commercial use
IEC 60335-2-72 Amd.1 Ed. 2.0 en:2005	Amendment 1 – Household and similar electrical appliances - Safety - Part 2-72: Particular requirements for automatic machines for floor treatment for commercial and industrial use
IEC 60335-2-91 Ed. 3.0 b:2008	Household and similar electrical appliances - Safety - Part 2-91: Particular requirements for walk-behind and hand-held lawn trimmers and lawn edge trimmers
IEC 60745-2-1 Ed. 2.1 b:2008	Hand-held motor-operated electric tools Safety - Part 2-1: Particular requirements for drills and impact drills
IEC 60745-2-11 Ed. 2.1 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-11: Particular requirements for reciprocating saws (jig and sabre saws)
IEC 60745-2-12 Ed. 2.1 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-12: Particular requirements for concrete vibrators
IEC 60745-2-13 Ed. 2.0 b:2006	Hand-held motor-operated electric tools - Safety - Part 2-13: Particular requirements for chain saws

IEC 60745-2-14 Amd.1 Ed. 2.0 b:2006	Hand-held motor-operated electric tools - Safety - Part 2-14: Particular requirements for planers
IEC 60745-2-14 Ed. 2.0 en:2003	Hand-held motor-operated electric tools - Safety - Part 2-14: Particular requirements for planers
IEC 60745-2-14 Ed. 2.1 b:2006,	Hand-held motor-operated electric tools - Safety - Part 2-14: Particular requirements for planers
IEC 60745-2-15 Ed. 2.0 b:2006	Hand-held motor-operated electric tools - Safety - Part 2-15: Particular requirements for hedge trimmers
IEC 60745-2-16 Ed. 2.0 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-16: Particular requirements for tackers
IEC 60745-2-17 Ed. 2.0 en:2003	Hand-held motor-operated electric tools - Safety - Part 2-17: Particular requirements for routers and trimmers
IEC 60745-2-18 Ed. 1.1 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-18: Particular requirements for strapping tools
IEC 60745-2-19 Ed. 1.0 b:2005	Hand-held motor-operated electric tools - Safety - Part 2-19: Particular requirements for jointers
IEC 60745-2-2 Ed. 2.1 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-2: Particular requirements for screwdrivers and impact wrenches
IEC 60745-2-20 Ed. 1.1 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-20: Particular requirements for band saws
IEC 60745-2-21 Ed. 1.1 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-21: Particular requirements for drain cleaners
IEC 60745-2-4 Ed. 2.1 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-4: Particular requirements for sanders and polishers other than disk type
IEC 60745-2-5 Ed. 3.0 en:2003	Hand-held motor-operated electric tools - Safety - Part 2-5: Particular requirements for circular saws and circular knives
IEC 60745-2-6 Ed. 2.2 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-6: Particular requirements for hammers
IEC 60745-2-8 Ed. 2.1 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-8: Particular requirements for shears and nibblers
IEC 60745-2-9 Ed. 2.1 b:2008	Hand-held motor-operated electric tools - Safety - Part 2-9: Particular requirements for tappers
IEC 60825-1 Ed. 2.0 b:2007	Safety of laser products - Part 1: Equipment classification and requirements
ISO 11393-1:1998	Protective Clothing for Users of Hand-Held Chain-Saws - Part 1: Test Rig Driven by a Flywheel for Testing Resistance to Cutting by a Chain-Saw
ISO 11393-2:1999	Protective Clothing for Users of Hand-Held Chain-Saws - Part 2: Test Methods and Performance Requirements for Leg Protectors
ISO 11393-3:1999	Protective Clothing for Users of Hand-Held Chain-Saws - Part 3: Test Methods for Footwear

ISO 11393-5:2001	Protective Clothing for Users of Hand-Held Chain-Saws - Part 5: Test Methods and Performance Requirements for Protective Gaiters
ISO 11393-6:2007	Protective clothing for users of hand-held chain-saws - Part 6: Test methods
ISO 11681-1:2004	Machinery for forestry - Portable chain-saw safety requirements and testing - Part 1: Chain-saws for forest service
ISO 15744:2002	Hand-Held Non-Electric Power Tools - Noise Measurement Code - Engineering Method (Grade 2)
ISO 17080:2005	Manually portable agricultural and forestry machines and powered lawn and garden equipment - Design principles for single-panel product safety labels
ISO 17249:2005	Safety footwear with resistance to chain saw cutting
ISO 18652:2005	Building construction machinery and equipment - External vibrators for concrete
ISO 19452/Cor1:2008	Building construction machinery and equipment - Pedestrian-controlled vibratory (percussion) rammers - Terminology and commercial specifications
ISO 20643:2005	Mechanical vibration - Hand-held and hand-guided machinery - Principles for evaluation of vibration emission
ISO 21628:2008	Gardening machinery - Powered material-collecting systems – Safety
ISO 3767-2:1991	Tractors, Machinery for Agriculture and forestry, Powered Lawn and Garden Equipment - Symbols for Operator Controls and Other Displays - Part 2: Symbols for Agricultural Tractors and Machinery
ISO 3767-3:1995	Tractors, Machinery for Agriculture and forestry, Powered Lawn and Garden Equipment - Symbols for Operator Controls and Other Displays - Part 3: Symbols for Powered Lawn and Garden Equipment
ISO 3767-4:1993	Tractors, Machinery for Agriculture and forestry, Powered Lawn and Garden Equipment - Symbols for Operator Controls and Other Displays - Part 4: Symbols for forestry Machinery
ISO 6104:2005	Superabrasive products - Rotating grinding tools with diamond or cubic boron nitride - General survey designation and multilingual nomenclature
ISO 6534:2007	Forestry machinery - Portable chain-saw hand-guards - Mechanical strength
ISO 7182:1984	Acoustics - Measurement at the Operators Position of Airborne Noise Emitted by Chain Saws'
ISO 7917:1987	Acoustics - Measurement at the Operators Position of Airborne Noise Emitted by Brush Saws'
ISO 8662-1:1988	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 1: General
ISO 8662-10:1998	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 10: Nibblers and Shears
ISO 8662-11:1999	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 11: Fastener Driving Tools (Amendment 1 Issued, 2001)
ISO 8662-12:1997	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 12: Saws and Files with Reciprocating Action and Saws with Oscillating or Rotating Action

ISO 8662-13:1997	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 13: Die Grinders
ISO 8662-14:1996	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 14: Stone-Working Tools and Needle Scalers
ISO 8662-2:1992	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 2: Chipping Hammers and Riveting Hammers
ISO 8662-3:1992	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 3: Rock Drills and Rotary Hammers (Amendment 1 Issued, 1999)
ISO 8662-4:1994	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 4: Grinders
ISO 8662-5:1992	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 5: Pavement Breakers and Hammers for Construction Work
ISO 8662-6:1994	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 6: Impact Drills
ISO 8662-7:1997	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 7: Wrenches, Screwdrivers and Nut Runners with Impact, Impulse or Ratchet Action
ISO 8662-8:1997	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 8: Polishers and Rotary, Orbital and Random Orbital Sanders
ISO 8662-9:1996	Hand-Held Portable Power Tools - Measurement of Vibrations at the Handle - Part 9: Rammers
ISO 9207:1995	Manually Portable Chain-Saws with Internal Combustion Engine - Determination of Sound Power Levels - Engineering Method (Grade 2)
ISO/TR 22520:2005	Portable hand-held forestry machines - A-weighted emission sound pressure levels at the operators station - Comparative data in 2002
ISO/TR 22521:2005	Portable hand-held forestry machines – Vibration emission values at the handles - Comparative data in 2002
ISO/TR 27609:2007	Vibration in hand-held tools – Vibration measurement methods for grinders - Evaluation of round-robin test

7.6. Publications

OSHA (Occupational Safety and Health Administration)
http://www.osha.gov

- A Guide for Protecting Workers from Woodworking Hazards
- Hand and Power Tools OSHA Publication 3080 (1998, Revised)
- Hand and Powered Portable Tools Checklist. OSHA's Small Business Outreach Training Program Self-Inspection Checklists (1997, May)
- Mechanical saws
- Safety and Health Topics page on Hand and Power Tools
- Working Safely with Chainsaws Fact Sheet

NIOSH (National Institute for Occupational Safety and Health)
http://www.cdc.gov/niosh

- 78-198a - Powder Actuated Fastening Tools: Safe Practices For Employees

- 78-198b - Powder Actuated Fastening Tools: Employer's Safety Training Guide
- 90-112 - Engine Turret Lathe Safety Guide
- 96-118 - NIOSH Alert: Preventing Carbon Monoxide Poisoning From Small Gasoline-Powered Engines And Tools
- 96-118a - Preventing Carbon Monoxide Poisoning From Small Gasoline-Powered Engines And Tools (Fact Sheet)
- 96-122 - Control Of Wood Dust From Shapers
- 96-123 - Control Of Wood Dust From Automated Routers
- 96-124 - Control Of Wood Dust From Large Diameter Disc Sanders
- 96-125 - Control Of Wood Dust From Random Orbital Hand Sanders
- 96-126 - Control Of Wood Dust Orbital Hand Sanders
- 96-127 - Control Of Wood Dust From Table Saws
- Control of Wood Dust from Automated Routers. No. 96-123
- Control of Wood Dust from Horizontal Belt Sanders. No. 96-121
- Control of Wood Dust from Large Diameter Disc Sanders. No. 96-124
- Control of Wood Dust from Orbital Hand Sanders. No. 96-126
- Control of Wood Dust from Random Orbital Hand Sanders. No. 96-125
- Control of Wood Dust from Shapers. No. 96-122
- Control of Wood Dust from Table Saws. No. 96-127
- Easy Ergonomics - a Guide to Selecting Hand Tools

EPA (Environment Protection Agency)
http://www.epa.gov

- Lawn and Garden (Small Gasoline) Equipment
- Statement Of Principles For Small Handheld Gasoline Engines

National Institute for Environmental Health and Safety
http://www.niehs.nih.gov/odhsb/manual/home.htm

- Powered Industrial Trucks, Mowers, Tractors, Etc.

American Petroleum Institute
http://api-ec.api.org/newsplashpage/index.cfm

- Spark Ignition Properties of Hand Tools

ASME (American Society of Mechanical Engineers)
http://www.asme.org/catalog/

- Cutter And Tool Grinding Machines, 1994)

NASD (National Agricultural Safety Database)
http://www.cdc.gov/nasd/index.html

- Agricultural Engineering Safety Lesson Plan: Power Tool Safety
- Chain Saw Safety
- Control of Wood Dust From Automated Routers
- Control of Wood Dust From Large Diameter Disc Sanders
- Control of Wood Dust From Orbital Hand Sanders
- Control of Wood Dust From Random Orbital Hand Sanders
- Control of Wood Dust From Shapers
- Control of Wood Dust From Table Saws
- No Riders on Farm and Lawn Equipment

- Operating a Blower Safely
- Operating the Cut-Off Saw Safely
- Operating the Edger Safely
- Power Lawn Mowers
- Power Tool Safety
- Safe Use of Hand Held Tools
- Tree Trimming Safety
- Using Hedge Trimmers Safely
- Using Horticultural Hand Tools Safely
- Using String Trimmers Safely
- Using the Jackhammer Safely

ILO (International Labour Organization)
http://www.ilo.org/public/english/protection/safework/index.htm

- Safe Design and Use of Chain Saws, 1978

End of Document