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Proposed American National Standa	rd
For Power Tools	
	Safety Requirements for
	Portable
	Compressed-Air-Actuated
	Fastener Driving Tools

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20	Proposed American National Standard
21	For Power Tools
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23	Safety Requirements for
24	Portable
25	Compressed-Air-Actuated
26	Fastener Driving Tools
27	
28	Sponsor / Standards-Developer
29	International Staple, Nail and Tool Association (ISANTA)
30	Approved
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32	American National Standards Institute, Inc.
33	
34	Abstract
35 36 37 38 39 40 41 42 43 44 45 46 47	American National Standard for Power Tools - Safety Requirements for Portable, Compressed- Air-Actuated, Fastener Driving Tools, ANSI SNT-101-2015, sets forth safety requirements for tool manufacturers, owners, employers (including self-employed contractors), designers, safety professionals, supervisors, operators, purchasers, users and other persons concerned with or responsible for the safe design, construction, use, repair, and maintenance of these tools. The tools are powered by compressed air. The tools drive nails, staples and other fasteners, typically in the industrial size range. The covered tools are used for fastening applications that generally, but by no means exclusively, involve wood-to-wood connections as found in commercial and residential building construction (framing, sheathing, decking, flooring, insulation, finish work, factory-build units and components, and coverings for walls, ceilings and roofs, etc.); carton closure; and the manufacture of furniture, box-spring assemblies, containers (boxes, pallets, crating, etc.), cabinets, etc.

## 48 American National Standard

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## FOREWORD 94

[The information contained in this Foreword is not part of this American National 95 Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this

96 Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it

- 97 does not contain requirements necessary for conformance to the standard.]
- 98

99 The Safety Requirements for Portable, Compressed-Air-Actuated, Fastener Driving Tools contain safety 100 requirements for tool manufacturers, tool purchasers and tool operators, and is intended to provide 101 safeguards for persons and property from accidental hazards arising from the use of compressed-air-102 actuated fastening tools, often referred to as "nail guns" by users and operators. It is also intended to 103 assist government and other regulatory bodies in the development, promulgation and enforcement of 104 appropriate safety directives.

105

The sponsor for this standard is the International Staple, Nail and Tool Association (ISANTA). Consensus 106 107 for this standard was achieved by use of the ANSI Canvass Method. Information for this publication was 108 obtained from sources believed to be reliable and was considered technically sound at the time it was 109 developed. It should not be assumed that all acceptable safety requirements are contained in this 110 document or that different measures may not be required under certain circumstances or conditions.

111

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- 116 publication should not be referenced in any way that would imply otherwise. Suggestions for
- 117 improvement to this publication are welcome. They should be addressed to the International Staple, Nail
- 118 and Tool Association, 8735 West Higgins Road, Suite 300, Chicago, Illinois 60631-2738.
- 119

120 The following organizations were recognized as having an interest in safety requirements for power 121 fastening tools and were canvassed prior to, and participated in, the consensus process leading to the

- 122 approval of this standard:
- 123

Asphalt Roof Manufacturers Association

**Beck America** 

California Framing Contractors Association

**Consumer Product Safety Commission** 

Hilti Corporation

Home Depot Inc.

Illinois Tool Works, Inc.

Koki Holdings America Ltd.

Kyocera Senco Industrial Tools, Inc.

Leo DeBobes Safety Consultants

Mid-American Carpenters Regional Council

National Consumers League

National Framers Council

National Institute for Occupational Safety and Health

National Roofing Contractors Association

Power Tool Institute

Southern Carlson Inc. Stanley Black and Decker Inc. Techtronics Industries Co. Ltd. (Milwaukee Tool) Ted Gogoll The Center for Construction Research and Training Underwriters Laboratory, LLC United Union of Roofers, Waterproofers and Allied Workers Zonda Media-Journal of Light Construction 124 125 At the date of the April, 202X printing of this standard, the membership of ISANTA consisted of the 126 127 following companies: 128 Accent Building Materials Inc. Aims Leading industrial Factory **Beck America** Building Material Distributors, Inc. Falcon Fasteners Reg'd Geekay Wire Ltd. Guney Celik A.S. **Huttig Building Products** Inmax Sdn. Bhd. Illinois Tool Works Inc. Koki Holdings America Ltd. Kyocera Senco Industrial Tools, Inc. Makita U.S.A. Inc. Max USA Corp. Mid-Continent Steel & Wire National Nail Corporation Oman Fasteners LLC. Peace Industries PrimeSource Building Products Inc. Shanghai Yueda Nails Co. Ltd. Specialty Nail Co. Stanley Black & Decker Inc. Techtronic Industries Co. Ltd. Trafileria Punteria Ghezzi SAS Zhejiang Rongpeng IMP.&Exp.Co., LTD 129

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174 175	1	Scope, Purpose, Units and Effective Date
176	1 1 Sc	one
177	1.1 50	
178	Tho re	aquirements of this standard apply to portable band-beld compressed-air-powered tools
170	for dri	iving factories such as nails and stanles into or through concrete fabric fiberboard
180	motal	nastic wood wood products cartons and other materials
181	metai	, plastic, wood, wood products, cartons, and other matchais.
182	1 2	Purpose
182	1.2	T di pose
18/	This s	tandard establishes safety requirements for the design construction use renair and
185	maint	enance of nortable hand-beld compressed-air-powered tools to guard against the injury
186	oftoo	lusers and hystanders. It provides guidelines to designers, manufacturers, owners
187	emple	vers (including self-employed contractors) supervisors, nurchasers, safety professionals
188	onera	tors and other persons concerned with or responsible for the safe use of these tools, and
180	accist	s in the promulgation of appropriate safety directives and safety training programs. There
190	are ac	Iditional safety requirements outside the scope of this standard including, but not limited
191		er compliance with instructions, applicable Occupational Safety and Health (OSHA)
192	regula	ations [Title 29 of the U.S. Code of Federal Regulations] industry standards, employer
193	policie	es, requirements specific to task, jobsite, and environment, and safe workplace practices
194	gener	ally, that should be considered, as applicable.
195	<u></u>	
196		
197	1.3	Units
198		
199	This s	tandard contains customary units as well as SI (metric) units. Requirements are based on
200	custo	mary units. SI units in the text have been directly (soft) converted from the customary
201	units.	
202		
203	1.4	Effective Date
204		
205	This s	tandard shall apply only to tools manufactured subsequent to the effective date of this
206	stand	ard. The effective date of this standardXXXXXXXXX, 202X is twelve months after its
207	appro	val by the American National Standards Institute.
208		
209		
210	2	Definitions
211		
212	2.1	activate (operating controls): To move or otherwise engage an operating control so that
213		it is in a state that allows the tool to be actuated or that satisfies one requirement for
214		the tool to be actuated
215		
216	2.2	actuate (tool): To cause movement of the tool component(s) intended to drive a
217		fastener

218					
219	2.3	actuation system: A trigger, workpiece contact and/or other operating control, used			
220		separa	arately or in some combination or sequence, to actuate the tool		
221		-			
222		2.3.1	automatic reversion actuation: An actuation mode capable of contact actuation		
223			or continual contact actuation and where the tool becomes inoperable if a		
224			trigger is depressed without operation of the workpiece contact within the		
225			manufacturer's stated trigger time-out period		
226					
227		2.3.2	contact actuation: An actuation mode which allows the tool to operate by		
228		-	operating the workpiece contact while the trigger is continually depressed and		
229			held		
230					
231		2.3.3	continual actuation: An actuation mode in which the driving operations are		
232			carried out for as long as the trigger remains in its operating position (for tools		
233			without a workpiece contact)		
234					
235		2.3.4	continual contact actuation: An actuation mode in which the driving operations		
236			continue as long as the trigger and the workpiece contact remain in their		
237			operating positions		
238			aber ann 8 bearing to		
239		2.3.5	full-sequential actuation: An actuation mode which allows single driving		
240			operations via the trigger after the workpiece contact has been operated.		
241			Further driving operations are only possible after the trigger and the workpiece		
242			contact have been returned to the non-driving position		
243					
244		2.3.6	selective actuation: An actuation system that allows discrete selection of two or		
245			more of the following actuation systems: single-sequential actuation, full-		
246			sequential actuation, contact actuation with automatic reversion, continual		
247			contact actuation or contact actuation		
248					
249		2.3.7	single actuation: An actuation mode in which the trigger has to be operated for		
250			each driving operation (for tools without a workpiece contact)		
251					
252		2.3.8	single-sequential actuation: An actuation mode which allows single driving		
253			operations via the trigger after the workpiece contact has been operated.		
254			Further driving operations are possible via trigger operation if the workpiece		
255			contact has remained in the operating position		
256					
257	2.4	air inle	t port: The opening on the tool to which the air hose is connected. usually by		
258		means	of a threaded fitting		
259			5		
260	2.5	coil na	iler: A nailer that drives fasteners from a collated coil of nails. The primary		
261		application of this tool is production applications			

262		
263	2.6	collating material: The material for joining together single fasteners in strips or coils
264		with adhesive, paper or plastic tape, plastic strap or wire
265		
266	2.7	distributor: Any retailer of products manufactured and/or sold by the tool
267		manufacturer including dealers, franchisees, or any other wholesale or retail outlet
268		
269	2.8	dual trigger: Trigger arrangement comprised of two triggers that work in conjunction
270		with each other such that both triggers require individual activation to actuate the tool
271		
272	2.9	employer: The person, firm or company that contracts, hires, or is responsible for the
273		personnel operating a tool. The employer is typically, though not necessarily, the owner,
274		renter, or borrower of the tool. The employer also could be the operator of the tool
275		
276	2.10	fastener: A staple, pin, brad, nail, or other fastening device that is designed and
277		manufactured for use in the tools within the scope of this standard
278		
279	2.11	heavy-duty_finish nailer: A finish nailer capable of driving:
280		
281		2.11.1 fasteners made from wire of 18 gauge (American Steel Wire Gauge) [0.0475-inch
282		nominal diameter (1.2 mm)] or heavier wire
283		
284		The primary application of this tool is production applications.
285	2.42	
286	2.12	neavy-duty stapler : A stapler capable of driving:
287		2.12.1. stanles having naminal thickness of 0.0218 inch (0.8 mm) or larger or
288		
209		2 12 2 staples having nominal width of 0 0475 inch (1.2 mm) or larger
290		
291		The primary application of this tool is production applications
292		The primary application of this tool is production applications.
293	2 1 3	iam: An obstruction in the fastener feed or drive area of a tool
294	2.15	jam. An obstruction in the fastener feed of anye area of a tool
295	2 14	light-duty tool: A tool designed to only drive fasteners meeting both of these
290	2.17	requirements:
297		requirements.
299		2 13 1 fasteners 1 inch (25.4 mm) or shorter (nominal length) and
300		
301		2.14.2 fasteners made from wire with:
302		
303		2.14.2.1 cross-sectional area less than 18 ASWG (American Steel Wire Gauge)
304		[0.0475-inch diameter (1.2 mm)]. or
305		

306 307			2.14.2.2	staples with nominal thickness less than 0.038 inch (1.0 mm) and with nominal width less than 0.050 inch (1.3 mm)
308				
309	2.15	maxim	um air pre	ssure: The maximum allowable pressure of the compressed air, as
310		specifie	ed by the r	nanufacturer, for operating a tool
311				
312	2.16	may: T	his word is	s understood to be permissive
313	a			
314	2.17	operati	ing control	: A control that separately, or as part of an actuation system, can
315		cause t	ne actuati	on of a tool
316	2.40			and a structure of the stand of the Plance Providence of the stand for the
317	2.18	produc	tion applic	cation: High volume, production-like applications, either at a facility,
318		manuta	acturing se	etting or on-site, such as, but not limited to, pallets, furniture,
319		manura	actured no	using, uphoistery, and sneatning and rooting
320 221	2 10	chall: T	Tho word "	(shall" is to be understood as denoting a mandatory requirement
321	2.19	Sildil. I	ine word	shall is to be understood as denoting a mandatory requirement
322	2 20	snocial	tools. Too	ls with different requirements due to application
323	2.20	эрсска	10013. 100	is with unreference requirements due to application
325		2 20 1	multi-blov	w tool: A fastener driving tool that drives a fastener with more than
326		2.20.1	one stroke	e of the driving element
327				
328		2.20.2	pinner: A	tool capable of driving predominantly headless fasteners meeting
329			both of th	ese requirements:
330				
331			2.20.2.1	2 inches (51 mm) in length or shorter (nominal length) and
332				
333			2.20.2.2	Cross-sectional area 23 ASWG (American Steel Wire Gauge) [0.0258
334				inch nominal diameter (0.64mm)] diameter or less.
335				
336			NOTE: Lar	ger gauge pinners are available but are not considered a special tool
337			with the s	ame exemptions as tools meeting these size criteria.
338				
339		2.20.3	single-blo	w tool: A fastener driving tool that drives a fastener with a single
340			stroke of t	the driving element
341				
342		2.20.4	special ap	plication tool: A tool without a workpiece contact whose fasteners are
343			formed or	clamped during application by devices such as integrated anvils or
344			self- conta	ained clinching anvils which prevents free flight of fasteners.
345				
346		2.20.5	tool with	but workpiece contact: Any tool that drives a fastener and which does
347			not have a	a workpiece contact.
348				

349 350 251	2.21	thickness (staple leg): The maximum dimension of staple-leg cross section measured parallel to staple-crown axis.		
252	<b>ว</b> วว	tool: A portable band held dovice for driving factoriars that is powered by compressed		
252	2.22	nir		
254		dii.		
255	2 22	trigger: A tool operating control activated manually by a tool operator		
355 356	2.23	trigger. A tool operating control activated mandally by a tool operator.		
357	2.24	trigger time-out period: For tools with automatic reversion; the duration of time a		
358		trigger can be depressed without operation of the workpiece contact before the tool		
359		becomes inoperable.		
360				
361 362 363		Note: Nothing in this definition prohibits a time-out period on the workpiece contact of more than 5 seconds.		
364	2 25			
365	2.25	width (staple leg): The maximum dimension of staple-leg cross section measured		
366		perpendicular to staple-crown axis.		
367				
368	2.26	workpiece: The object into which a fastener is intended to be driven by a tool.		
369				
370	2.27	workpiece contact: An operating control element or assembly on the tool intended to		
371		be activated by contact with the material to be fastened, before a fastening operation		
372		can be performed.		
373				
374	-			
375	3	Design and Construction		
376				
377	3.1	General		
378		Tools shall be designed and manufactured to comply with the following safety		
379		requirements and/or protective measures.		
380				
381		Note: Clause 3 does not represent a comprehensive set of considerations. It is		
382		recognized that additional generally accepted design principles, such as those presented		
383		in ISO 12100: 2010 may be incorporated.		
384				
385	~ ~			
386	3.2	Tool Operating Controls		
387				
388		3.2.1 Trigger		
389				
390		All tools shall be equipped with a trigger. All tools shall be designed so that the		
391		tool cannot be actuated when the trigger is in a released position (i.e., in an "off"		
392		position). The body of the tool shall be designed, and the trigger shall be located		
393		so as to minimize unintended activation. This protection can and generally is		

394 afforded by the surrounding structures of the tool. A need for a discrete trigger guard is not implied. 395 396 3.2.1.1 Fastener driving tools and workpiece contacts shall be designed in 397 such a way that the workpiece contact does not operate the trigger 398 399 system when the tool is set down in its intended resting position as specified by the manufacturer. 400 401 3.2.2 Workpiece Contact 402 403 In addition to the requirements of Clause 3.2.1, all tools, other than light-duty 404 405 tools and those excluded in Clause 3.2.4.2, shall be equipped with a workpiece contact. Such tools shall be designed so that the tool cannot be actuated unless 406 407 both the trigger and the workpiece contact have been activated. The purpose of 408 this requirement is to prevent actuation of the tool when only the trigger is 409 activated. The workpiece contact shall be designed so that it does not become deformed or inoperable under intended use. 410 411 3.2.2.1 To minimize the possibility of unintended actuation by accidentally 412 touching the workpiece with the edge or corner of the workpiece 413 414 contact, and therefore driving a fastener outside the workpiece surface, or while being transported, the external dimensions of the 415 workpiece contact (Figure 1) should not be greater than values 416 greater than shown in Table 1. 417 418



419

420

## Figure 1 -- Extended workpiece contact, examples for outer surface

## Table 1 -- Maximum External Dimensions "l" for Work Contact Element

Actuation Mode	Maximum Fastener Length			
	≤ 2.5 in	> 2.5 in ≤ 4.0 in	> 4.0 in ≤ 5.0 in	> 5.0 in
Full Sequential	1 1/4 in	1 1/4 in	1 1/4 in	5/8 in

Single Sequential	1 1/4 in	1 1/4 in	1 1/4 in	5/8 in
Contact	5/8 in	5/8 in	Combination Not Allowed	Combination Not Allowed
Selective	5/8 in	5/8 in	Combination Not Allowed	Combination Not Allowed
Contact With Automatic Reversion	5/8 in	5/8 in	Combination Not Allowed	Combination Not Allowed
Continual Contact with Automatic Reversion	5/8 in	5/8 in	Combination Not Allowed	Combination Not Allowed
Continual Contact	5/8 in	5/8 in	Combination Not Allowed	Combination Not Allowed

423 NOTE: Specialty fastener application tools may be allowed a wider contact when required to

424 accommodate for the fastener size.

e.g. Concrete pinner w/steel washer, cap staplerTable 2 -- Permitted actuation modes for fastener driving tools that require extended workpiece contact

Maximum length of the fastener	Permitted Actuation Mode	Required Operating Force for Workpiece Contact
>4.0 in	full sequential actuation single sequential actuation	$\geq$ 30% of the tool weight*
≤ 4.0 in > 2.5 in	full sequential actuation single sequential actuation contact actuation selective actuation contact actuation with automatic reversion	Tools capable of only sequential actuation $> 30\%$ of the tool weight*
≤ 2.5 in	full sequential actuation single sequential actuation contact actuation selective actuation contact actuation with automatic reversion continual contact actuation with automatic reversion continual contact actuation	Tools capable of any mode of contact actuation ≥ 60% of the tool weight*

\* With maximum mass of fasteners

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All tools, other than light-duty tools, heavy-duty staplers <u>used for production</u> applications and coil nailers <u>used for production applications</u>, shall be manufactured with an actuation system meeting the requirements of singlesequential actuation, full-sequential actuation, selective actuation, or contact actuation with automatic reversion.

3.2.3 Actuation System Options permitted in Table 2

<sup>425</sup> 426

439		3.2.3.1	Tools m	anufactured with selective actuation shall be shipped with
440			their act	tuation system set as single-sequential actuation, full-
441			sequent	ial actuation, neutral or off. One or more of the selections
442			shall be	single-sequential actuation or full-sequential actuation.
443				
444			Tools ha	iving an actuation mode selector shall be designed and
445			construc	cted to that changes of the actuation mode shall be
446			intentio	nal and shall be clearly identifiable and visible to the
447			operato	r.
448				<u> </u>
449		3.2.3.2	Certain a	pplications and certain users may require different actuation
450		0.2.012	system o	ntions for nurnoses of functionality and utility. In such cases
451			other act	ruation systems may be available and must comply with the
452			Permitte	d Actuation Modes based only on the maximum length of the
453			fastener	in Table 2 Means for making such other actuation systems
454			available	include but are not limited to the following:
454			available	include, but are not innited to, the following.
455			2 7 2 7 1	Actuation system is provided with but not installed on the
450			5.2.5.2.1	tool. Such actuation system is in addition to the actuation
457				system manufactured with the tool to most the
438				requirements of Clause 2.2.2
439				requirements of clause 5.2.5.
400				Actuation system is offered as a conversion ention
401			5.2.5.2.2	Actuation system is onered as a conversion option.
402				Actuation system is manufactured and chinned as part of the
403			5.2.5.2.5	Actuation system is manufactured and snipped as part of the
464				tool, in response to an order from a production application
465				customer.
466		2222	Taala ini	ten ded te dui o festences inte bend confesse cost as start or
467		3.2.3.3	TOOIS IN	tended to drive fasteners into hard surfaces such as steel or
468			concrete	e shall be designed with only single sequential or full
469			sequent	all actuation modes. Contact force to operate the tool shall
470			be 1.25	times or more of the tool weight including the maximum
471			weight d	of the fasteners but minimum 11.24 lbf.
472				
473		3.2.3.4	For tool	s manufactured with automatic reversion the duration of the
474			trigger t	ime-out period shall be no longer than 5 seconds.
475				
476	3.2.4	Other Fool Ope	rating Cont	roi Options
477				
478		3.2.4.1	Manufa	cturers may offer additional actuation system options for
479			product	ion applications, beyond those specified in Clause 3.2.3, for
480			any tool	model shipped directly to a production application customer
481			upon re	quest to meet a specific need.
482				

483	3.2.4.2	For tools,	other than light-duty tools, it might not be practical to meet
484		the requir	ements of Clause 3.2.2 and for those tools, a workpiece
485		contact is	not required, provided the requirements of either Clause
486		3.2.4.2.1,	3.2.4.2.2 or 3.2.4.2.3 are met.
487			
488		3.2.4.2.1	The tool is offered with a dual trigger option and the tool
489			is designed to only drive fasteners meeting the
490			requirements of Clause 2.14.2 or 2.20.2.
491			
492		3.2.4.2.2	The tool is equipped with a self-contained clinching
493			anvil(s.) (Examples include, but are not limited to, carton
494			closing staplers, sisal/bedding tools with fixed anvils,
495			carton pliers.)
496			
497		3.2.4.2.3	The same degree of safety as provided by Clause 3.2.2 can
498			be demonstrated or is obtained by other means (Examples
499			may include palm nailers, hardwood flooring tools, multi-
500			blow metal hardware nailers, etc.)
501			
502	3.2.5 Direction of Disc	harged Air a	ind Lubricants
503			
	The real shall be deed a		And the second stand to be a second to be all the advanted to be a first sub-
504	The tool shall be design	ed such that	discharged air or lubricants shall be directed <u>away from the</u>
505	user during operation.	This can be a	achieved by methods such as using exhaust deflectors.
506			
507	3.2.6 Ergonomics		
508			
509	3.2.6.1	Handle De	esign
510			
511	The tool	handle shall	be designed considering the following ergonomic
512	principle	s:	
513	-	- the space b	between the handle and the magazine shall be sufficient to
514	a	ccommodate	e the operator's grasp;
515	-	- the space b	between the handle and the magazine and the length of
510	h	andle behind	d the trigger shall accommodate the wearing of work gloves;
516		the bandle	and trigger shall have no operational preference to right-
516 517	-	- the handle	
516 517 518		and or left-h	and operation.
516 517 518 519	– h	and or left-h	and operation.
516 517 518 519 520	– h: To allow	and or left-h	up of the tool while moving between working areas without
516 517 518 519 520 521	– h To allow operating	the picking of the trigger	up of the tool while moving between working areas without , the grasping length immediately behind the trigger shall be

523	
524	3.2.6.2 <u>Second handle</u>
525	Fastener driving tools loaded with the maximum quantity and size of specified
526	fasteners weighing more than 13.2 lb shall be supplied with a second handle
527	which can be fitted by the user. The strength of a removable handle and the
528	nature of fixing it shall be appropriate to the intended principal use. The
529	additional handle shall be able to support the weight of the tool with maximum
530	specified fasteners by a factor of 1.5. The additional handle shall be so designed
531	to allow left-hand and right-hand operation
532	
533	3.2.6.3 Suspension device
534	Tools weighing more than 5.5 lb (without fasteners) and used in a production
535	environment shall be designed with provisions for mounting a suspension device
536	such as a hanger. These provisions shall be able to support a weight of 1.5 times
537	the weight of the tool, loaded with the maximum weight of fasteners.
538	
539	
540	3.3 Mechanical safety
541	3.3.1 Protection against points and edges of fasteners
542	Fastener driving tools shall be designed in such a way as to prevent injuries caused by
543	the projecting points or edges of fasteners, for example by a protection cover.
544	Exceptions are permissible at the location of the nose if there are technological reasons
545	for such exceptions, for example, on fastener driving tools designed for driving fasteners
546	through holes of punched metal sheets in which the fastener points are used as a
547	locator.
548	3.3.2 Prevention of unintended ejection of fasteners
549	3.3.2.1 Prevention of unintended ejection of fasteners during
550	connection/disconnection of the energy supply system
551	3.3.2.1.1 Connection of the fastener driving tool to the energy supply
552	system shall not cause a driving operation by the tool.
553	3.3.2.1.2 Disconnection of the fastener driving tool from the energy
554	supply system shall make the tool incapable of a driving
555	operation.
556	3.3.2.1.3 Pneumatic tools shall be designed to allow the fitting of a
557	quick release coupler.

558			3.3.2.2	Prevention of accidental trigger operation
559 560			The desig	on of fastener driving tools and the placement of the trigger shall be oprevent unintentional operation, for example, when the tool is placed
561 562			<u>on, picke</u>	d up from or moved across, a work surface.
563			3.3.2.3	Prevention of slipping of fasteners from hard or slippery surfaces
564			<u>Tools, wi</u>	th workpiece contacts designed to normally push against surfaces like
565 566			steel, cor the faste	ncrete or plastic shall be designed in such a way that the likelihood of ner to slip from the surface is reduced to a minimum.
567				
568	3.4	Marking		
569		-		
570		3.4.1	All <u>inforr</u>	nation required to be marked on the tool shall be marked visibly, legibly
571			and inde	libly. Markings shall be located so as to withstand normal wear and tear
572			througho	but the expected life of the tool. Markings shall include the following
573			informat	ion:
574			~	
575			3.4.1.1	Manufacturer's or distributor's identity
576			2442	
577			3.4.1.2	Model number
578			2442	
579			3.4.1.3	Serial number of date code
580			2 4 1 4	
581			3.4.1.4	Maximum all pressure
583			3/15	Specifications of fasteners which can be used in the tool to include
584			5.4.1.5	minimum and maximum diameter. length and characteristics such as
585				gauge and angle
586				Page and angle
587			3.4.1.6	Interchangeable magazines shall be marked on the magazine (if the
588				magazine changes the recommended fasteners for the product) in
589				such a way that the appropriate fasteners can be identified.
590				, , , , , , , , , , , , , , , , , , , ,
591		3.4.2	The princ	tiples of ANSI Z535.1, American National Standard for Safety Colors,
592			ANSI Z53	5.3, American National Standard for Criteria for Safety Symbols, and
593			ANSI Z53	5.4, American National Standard for Product Safety Signs and Labels,
594			related to	o color, configuration, format and signal word shall be used as
595			guideline	s for safety messages.
596				
597		3.4.3	All tools	shall be marked with the following safety warnings, or equivalent,
598			unless th	e design of the tool requires otherwise:
599				

600 601		3.4.3.1	Read and understand tool labels and manual. Failure to follow warnings could result in DEATH or SERIOUS INJURY.
602			-
603		3.4.3.2	Operators and others in work area MUST wear safety glasses with
604			side shields.
605			
606		3.4.3.3	Keep fingers AWAY from trigger when not driving fasteners to avoid
607			accidental discharge.
608			
609		3.4.3.4	Know and understand what trigger system you are using. Check
610			manual for triggering options.
611			
612		3.4.3.5	NEVER point tool at yourself or others in work area.
613			
614		3.4.3.6	NEVER use oxygen or other bottled gases. Explosion may occur.
615			
616	3.4.4	All tools s	hall be marked with the following safety symbols. Alternate symbols
617		evaluated	in accordance with ANSI Z535.3 and meeting that criteria are
618		acceptabl	e.
619			
620		3.4.4.1	Annex A Symbol 1, Read Tool Manual.
621			
622		3.4.4.2	Annex A Symbol 2, Wear Eye Protection.
623			
624		3.4.4.3	Annex A Symbol 3, Personal Injury.
625			
626	3.4.5	There are	two annexes in this standard related to marking. Annex A and Annex B
627		are inforn	native and do not present mandatory requirements.
628			
629	3.4.6	Tools mai	nufactured with selective actuation, or which can be converted to
630		another a	ctuation system, shall be marked to indicate the actuation system
631		selected.	Color is an acceptable means of marking.
632			
633	3.5 Over Pre	ssure	
634			
635	3.5.1	Tool Body	
636			
637		The press	ure vessel of the tool shall be designed to withstand, for a period of
638		two minu	tes without rupturing, hydrostatic pressure of five (5) times the

639		maximum air pressure when applied to the air inlet port and with all vents from
640		the vessel closed. <sup>1</sup>
641		
642	3.5.2	Fully Assembled Tool
643		
644		The tool shall be designed so that it does not self-actuate while pressurized, for a
645		period of two minutes, by a power source of at least 1.5 times (+ 5 % – 0 %) the
646		maximum air pressure or 200 psig (13.8 bar), whichever is greater.
647		
648	3.6 Modifie	d Tools
649		
650	Tools shall n	ot be modified unless authorized in tool manual or approved in writing by tool
651	manufacture	r. Modified or altered tools shall comply with this standard.
652		
653		
654	4 Tool Op	eration
655		
656	4.1 Responsi	bility
657		
658	The employe	er, tool owner and tool operator <sup>2</sup> are responsible for the safe use of the tool by, at
659	a minimum:	
660		
661	4.1.1	Choosing the correct tool to perform the task based on the application and
662		<u>material.</u>
663		
664	4.1.2	Ensuring that the manufacturer's tool operating/safety instructions are
665		available to operators.
666		
667	4.1.3	Allowing only persons who have read and understood the tool operating/safety
668		instructions to operate the tool.
669		
670	4.1.4	Training the operator in the safe use of the tool as described in the instruction
671		manual, including the requirements of Clause 7.
672		
673	4.1.5	Selecting an appropriate tool actuation system from options available under
674		Clause 3.2.3 and Clause 3.2.4, taking into consideration the work applications for
675		which the tool is used and the proficiency of the tool operator. Only a
676		professional or experienced user should use the contact actuating system. An

<sup>&</sup>lt;sup>1</sup> Hydrostatic pressure testing is safer than testing with compressed air. The **tool** usually must be modified to achieve the test pressure by preventing pressure loss through fluid leakage. This modification typically involves removing **trigger** and valve mechanisms and plugging openings.

<sup>&</sup>lt;sup>2</sup> In the case where the **tool** operator is the **tool** owner, or is not working for an **employer**, the **tool** operator assumes the responsibilities of the **employer**.

677 678 679 680 681			inexperienced user should select a sequential actuating system. Use a sequential actuating system when precision fastener placement is desired. Use a sequential actuating system when user is working in a tight space or when in an awkward position where it is difficult to control recoil.
682 683 684 685 686		4.1.6	Allowing tool use only when the tool operator and all other personnel in the work area are wearing appropriate eye protection equipment according to Clause 4.2.1, and when required, other appropriate personal protective equipment such as head, hearing and foot protection equipment.
687 688		4.1.7	Ensuring the tool is in good working condition.
689 690		4.1.8	Establishing work procedures for <u>fastener driving tool</u> operations.
691 692	4.2	Persor	nal Protective Equipment
693 694		4.2.1	Eye Protection Devices
695 696 697 698 699 700			Eye protection devices shall conform to the requirements of ANSI Z87.1, <i>American National Standard for Occupational and Educational Personal Eye and</i> <i>Face Protection Devices</i> , for impact resistance, with sideshields. They shall be marked with Z87+, and provide protection against flying particles both from the front and side.
701 702		4.2.2	Head Protection
703 704 705			Head protection shall conform to ANSI Z89.1, "American National Standard for Industrial Head Protection."
706 707		4.2.3	Hearing Protection
708 709 710 711			Hearing protection shall have a Noise Reduction Rating (NRR) determined in accordance with US Environmental Protection Agency rules that is appropriate for the noise exposure <sup>3</sup> .
712 713		4.2.4	Foot Protection

The NIOSH and OSHA limit for impulse noise is 140 decibels: above this level a single exposure can cause instant damage to the ear.

NIOSH recommends that an 8-hour exposure should not exceed 85 dBA and a one-second exposure should not exceed 130 dBA without using hearing protection.

<sup>&</sup>lt;sup>3</sup> OSHA's standard for exposure to continuous noise levels (29 CFR 1926.52) addresses both the noise level and the duration of exposure. In this standard, workers exposed for 15 minutes at 115 A-weighted decibels (dBA) have the same exposure as workers exposed for 8 hours at 90 dBA.

714			<u>Appropria</u>	te footwear for the task being performed should be used, such as non-
715			skid safety	y shoes or footwear meeting the applicable requirements of ASTM F
716			<u>2413.</u>	
717				
718				
719	4.3	Faster	ner Driving	Tool Work Procedures
720				
721		4.3.1	Before sta	rting work, test <u>the tool</u> according to the tool manual.
722				
723		4.3.2	Before sta	rting work check the trigger setting (if selectable). Select appropriate
724			trigger set	ting or actuation system based on application and operator training
725			and profic	iency.
726				
727		4.3.3	<u>Broken or</u>	malfunctioning tools must be immediately removed from service,
728			tagged an	d removed from the worksite.
729				
730		4.3.4	Properly n	naintain compressor: Drain daily and set to lowest pressure setting
731			which will	do the job.
732				
733				
734	5	Tool Mai	ntenance	
735				
736		5.1 Resp	onsibility fo	or Proper Tool Maintenance
737				
738		5.1.1 F	Responsibili	ity
739				
740			The emplo	over, tool owner and tool operator <sup>4</sup> :
741				
742			5.1.1.1	Are responsible for ensuring that tools are kept in safe working order
743				as described in the tool operating/safety instructions.
744				
745			5.1.1.2	Are responsible for ensuring that only qualified personnel shall repair
746				the tool.
747			_	
748			5.1.1.3	Are responsible for ensuring that manufacturer's tool maintenance
749				instructions are available to personnel performing maintenance.
750				
751			5.1.1.4	Are responsible for ensuring that tools that require repair are
752				removed from service and that tags and physical segregation are used
753				as a means of control.
754				

<sup>&</sup>lt;sup>4</sup> In the case where the **tool** operator is the **tool** owner, or is not working for an **employer**, the **tool** operator assumes the responsibilities of the **employer**.

755 756		5.1.1.5	Are responsible for ensuring that tools do not have any safety features disabled and are not modified without manufacturer's prior
757			authorization.
758			
759	5.2 Repa	air Parts and	d Accessories
760			
761	Tools shall be	e repaired o	r equipped only with parts or accessories that are supplied or
762	recommende	d by the to	ol manufacturer, or with parts or accessories that perform equivalently
763	to those supp	lied or reco	ommended by the tool manufacturer.
764			
/65	6 Tool Main	tononco In	structions
/00	6 TOOLIVIAI	itenance in	structions
768	6 1 Responsil	sility	
769	0.1 Responsi	Jiily	
770	611	The tool r	nanufacturer or distributor shall make available written information on
771	0.1.1	the prope	er maintenance instructions to follow for each tool. Such instructions
772		are tradit	ionally provided in the form of printed booklets, but other media may
773		be used.	
774			
775	6.1.2	The emplo	over, tool owner and tool operator <sup>5</sup> are responsible for:
776			
777		6.1.2.1 e	nsuring that the tool maintenance instructions are available to the
778		appropria	ate personnel.
779			
780		6.1.2.2 pr	oper maintenance of all tools in their possession.
781			
782	6.2 Cont	ents	
783	624	<b>T</b> I	
784	6.2.1	ine princ	pies of ANSI 2535.6, American National Standard for Product Safety
/85 786		rolated to	on in Product Manuals, Instructions, and Other Collateral Materials,
/80 797			uidelines for safety messages
788		useu as g	undermes for safety messages.
789	622	The tool r	naintenance instructions shall include the following:
790	0.2.2		
791		6.2.2.1	Instruction to keep the tools safe by regular maintenance.
792			
793		6.2.2.2	A list of the maintenance operations that the user shall carry out.
794			

<sup>&</sup>lt;sup>5</sup> In the case where the **tool** operator is the **tool** owner, or is not working for an **employer**, the **tool** operator assumes the responsibilities of the **employer**.

795	6.2.2.3	Frequency of maintenance, for instance, after a specified time of	
796 		operation, a specified number of cycles/operations or a stated	
797		number of times per year.	
798	<b>C D D A</b>		
799	6.2.2.4	instructions on now the user is to perform regular maintenance tasks.	
800		In the stimula for behavior of an entire d	
801	6.2.2.5	Instructions for lubrication, if required.	
802	6 2 2 6	Instructions for closering a jam	
803	0.2.2.0	instructions for clearing a jam.	
804 805	6227	Common signs that ropair or maintenance is needed	
805	0.2.2.7	common signs that repair of maintenance is needed.	
800	6778	Tool conditions that require tool to be taken out of service	
807	0.2.2.0	Tool conditions that require tool to be taken out of service.	
800	6229	What maintenance and repairs may be done by employer, tool owner	
810	0.2.2.5	or tool user and what must be done by authorized manufacturer's	
811		representative	
812		representative.	
813	6 2 2 10	Only qualified personnel shall repair the tool and shall use parts as	
814	0.2.2.10	described in Clause 5.2.	
815			
816	6.2.2.11	Tool Operating/Safety Instructions as described in Section 7.	
817			
818			
819			
820	7 Tool Operating/Safet	y Instructions	
821			
822	7.1 Development		
823			
824	The tool manufacturer sh	nall develop instructions for each tool regarding the tool's safe	
825	operation taking into cor	nsideration Sections 4, 5 and 6. The information provided by the	
826	manufacturer is an impo	rtant but not exclusive basis for safe use of the tool. Other bases for	
827	safe use of the tool inclue	de, but are not limited to, user compliance with instructions, applicable	
828	Occupational Safety and	Health (OSHA) regulations [Title 29 of the U.S. Code of Federal	
829	Regulations], industry sta	andards, employer policies, and safe workplace practices. The	
830	instructions should provi	de sufficient information for the end user to perform an initial risk	
831	assessment. Such instruc	ctions are traditionally provided in the form of printed booklets, but	
832	other media may be used	d. These instructions may be produced as a single item (manual, etc.) or	
833	may be produced as a se	t of items that together include the required information. The	
834	principles of ANSI Z535.6	related to design and location of product safety messages in	
835	instructions may be used	as guidelines for safety messages.	
836			
837	Each fastener driving too	I shall be accompanied by operating instructions drawn up by the	
838	manufacturer or <u>its</u> authorized representative.		

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The op operat contin	perating instructions shall include a description of the correct use o cor's instruction shall state that any other use is forbidden. Fastene ual contact actuation or contact actuation shall only be used for pr	of the tool. The er driving tools with roduction applications.
The op	perating instructions shall include:	
a)	name and address of the manufacturer	
b)	model number of the tool	
c)	information stating whether the tool is designed to drive fastener like steel and concrete	rs into hard surfaces
d)	minimum and maximum operating pressures	
, e)	explanations of any symbols marked on the tool	
, - 0		

- f) correct mode of connection to the air supply 851
- g) action to be taken in the event of operational difficulties such as jamming and 852 rectification of such difficulties 853
- h) diagram showing the parts or construction of the fastener driving tool 854
- i) specification of the fasteners which can be used, which include minimum and maximum 855 856 diameter, length, and fastener characteristics, such as gauge and angle.
- 857

839 840

841

842 843 844

845

846

847

848

849

850

- 858 In addition, the instructions and warnings stated in Section 7.4 shall be given with all fastener
- driving tools unless the manufacturer determines they are not relevant to a particular fastener 859 driving tool. Words of equivalent meaning may be used. 860
- 861 862

869

880

- 7.2 Provision
- 863 864 The tool manufacturer or distributor shall provide the instructions described in Clause 7.1 with 865 each tool. Tools sold or otherwise delivered into the workplace, typically to an employer, shall be accompanied by these instructions. 866
- 867 7.3 Replacement 868

The tool manufacturer or distributor shall make additional tool operating/safety instructions 870 available to requesting employers and requesting operators. 871

- 872 873 7.4 Contents
- 874
- Instructions on the following subject matter shall be included: 875
- 876 7.4.1 Actuation systems 877 878
- Availability of different actuation system options 879 7.4.1.1
- How to obtain different actuation system options 7.4.1.2 881

882			
883		7.4.1.3	How to operate different actuation system options
884			
885		7.4.1.4	How to determine the actuation system selected
886			
887	7.4.2	Flammabl	e Atmospheres
888			
889		Do not op	erate tool in explosive atmospheres, such as in the presence of
890		flammable	e liquids, gases or combustible dust.
891			
892	7.4.3	Contac	t with Electric Power
893			
894		Do not op	erate tool where contact with electric power is possible. The tool is
895		not insula	ted from coming into contact with electric power.
896			
897	7.4.4	Tool modi	fication
898			
899		The tool s	hall not be modified unless authorized in the tool manual or approved
900		in writing	by the tool manufacturer. Modifications may reduce the effectiveness
901		of safety r	neasures and increase the risks to the operator and/or bystander.
902			
903	7.4.5	Tool main	tenance
904			
905		Refer to th	ne tool maintenance instructions for detailed information on the
906		proper ma	aintenance of a tool.
907			
908	7.4.6	Recomme	nded fasteners and accessories
909			
910		7.4.6.1	Use only fasteners made or recommended by the tool manufacturer,
911			or fasteners that perform equivalently to those recommended by the
912			manufacturer.
913			
914		7.4.6.2	Use only accessories made or recommended by the tool
915			manufacturer, or accessories that perform equivalently to those
916			recommended by the manufacturer.
917			
918		7.4.6.3	Use only lubrication made or recommended by the tool manufacturer
919			or lubricant that performs equivalently to that recommended by the
920			manufacturer.
921			
922			
923	7.4.7	Personal F	Protective Equipment
924			
925		7.4.7.1	Appropriate personal protective equipment is to be worn.

7.4.7.2	Eye prote	ction				
	7.4.7.2.1	A written warning intended for the tool operator that eye				
		protection equipment in accordance with Clause 4.2.1				
		must be worn by the operator and other people in the				
		work area.				
	7.4.7.2.2	A written warning intended for the employer that the				
		employer is responsible to enforce the use of eye				
		protection equipment by the tool operator and all other				
		personnel in the work area.				
7.4.8 Inspect	t tool befor	e operating to:				
7.4.8.1	Establish	use of proper power source as set forth in Section 8.				
7.4.8.2	Determin	Determine that tool is in proper working order. Always check the tool				
	before us	before use for missing, broken, misconnected or worn parts.				
7.4.8.3	Determine actuation system. If using this tool in selective actuation					
	mode, alv	vays ensure it is in the correct actuation setting.				
7.4.8.4	Check for	misalignment or binding of moving parts and any other				
	condition	that may affect tool operation.				
7.4.8.5	Ensure the	at safety labels are not missing. Do not use a tool with				
	missing o	r damaged safety warning label(s).				
7.4.9 Operat	ing controls	s				
7.4.9.1	A tool tha	t is not in proper working order must not be used. Tags and				
	physical s	egregation shall be used for control.				
7.4.9.2	Do not re	move, tamper with, or otherwise cause tool operating				
	controls t	o become inoperable.				
7.4.9.3	Do not op	erate tool if any portion of the tool operating controls is				
	inoperabl	e, disconnected, altered, or not working properly.				
7.4.10 Tool ha	andling					
	0					
	7.4.7.2 7.4.8 Inspect 7.4.8.1 7.4.8.2 7.4.8.3 7.4.8.3 7.4.8.4 7.4.8.5 7.4.9 Operat 7.4.9.1 7.4.9.1 7.4.9.2 7.4.9.3 7.4.9.3	7.4.7.2 Eye prote 7.4.7.2.1 7.4.7.2.1 7.4.7.2.2 7.4.8 Inspect tool before 7.4.8 Inspect tool before 7.4.8.1 Establish 7.4.8.2 Determin before us 7.4.8.3 Determin mode, alv 7.4.8.4 Check for condition 7.4.8 Ensure th missing o 7.4.9 Operating controls 7.4.9 Operating controls 7.4.9.1 A tool tha physical s 7.4.9.2 Do not re controls t 7.4.9.3 Do not op inoperabl 7.4.10 Tool handling				

968 969 970	7.4.10.1	Read and understand the manual prior to use. Only persons who have read and understand the tool operating/safety instructions should operate the tool. Do not discard these instructions.
971 972	7.4.10.2	Always assume that tool contains fasteners.
973 974 975	7.4.10.3	Do not point tool toward yourself or others whether it contains fasteners or not.
976 977 978	7.4.10.4	Keep bystanders and children away while operating tool.
978 979 980	7.4.10.5	Do not actuate tool unless tool is placed firmly against the workpiece.
981 982	7.4.10.6	Respect tool as a working implement.
983 984	7.4.10.7	Do not engage in horseplay.
985 986 987	7.4.10.8	Stay alert, focus on your work and use common sense when working with tools.
988 989	7.4.10.9	Do not use tool while tired, after having consumed drugs or alcohol, or while under the influence of medication.
990 991 992	7.4.10.10	Do not overreach. Keep proper footing and balance at all times. Only use in a safe working place.
993 994 995 996	7.4.10.11	Do not hold or carry tool with a finger on the trigger. Keep fingers away from trigger when not operating this tool and when moving from one operating position to another.
997 998 999	7.4.10.12	Select the fastener appropriate for the work surface.
1000 1001	7.4.10.13	Do not drive fasteners into other fasteners.
1002 1003 1004 1005	7.4.10.14	After driving a fastener, tool may spring back ("recoil") causing it to move away from the work surface. To reduce risk of injury always manage recoil by:
1005 1006 1007 1008		7.4.10.14.1 Always maintaining control of tool. Hold the tool securely.
1009 1010		7.4.10.14.2 Allowing recoil to move tool away from work surface.

1011 1012 1013 1014 1015		7.4.10.14.3	Not resisting recoil such that tool will be forced back into the work surface. In "Contact Actuation Mode," if workpiece contact is allowed to re-contact work surface before the trigger is released, an unintended discharge of a fastener will occur.
1016 1017		7.4.10.14.4	Keeping face and body parts away from tool.
1018			1 0 ,1 ,
1019	7.4.10.15	Fasteners ca	n deflect and cause injury. When working close to an
1020		edge of a wo	orkpiece or at steep angles use care to minimize chipping,
1021		splitting or s	plintering, or free flight or ricochet of fasteners, which
1022		may cause ir	njury.
1023			
1024	7.4.10.16	Keep all bod	y parts away from fastener discharge area of tool and
1025		firing directi	on.
1026			
1027	7.4.10.17	When using	a tool intended to be used on hard surfaces such as steel
1028		and concrete	e, keep the tool perpendicular to the work surface to
1029		prevent slipp	ping.
1030			
1031	7.4.10.18	During opera	ation, debris from workpiece and fastener collation
1032		material ma	y be discharged.
1033			
1034	7.4.10.19	Be careful w	hen handling fasteners, especially when loading and
1035		unloading, a	s the fasteners have sharp points which could cause
1036		injury.	
1037			
1038	7.4.10.20	Do not load	tool with fasteners when any one of the operating
1039		controls is a	ctivated.
1040			
1041	7.4.10.21	Do not opera	ate tool with any power source other than that specified
1042		in tool opera	ating/safety instructions.
1043			
1044	7.4.10.22	Do not opera	ate tool with any operating pressure other than that
1045		specified in t	tool operating/safety instructions.
1046			
1047	7.4.10.23	Do not opera	ate the tool if it has been damaged.
1048			
1049	7.4.10.24	Always selec	t an actuation system that is appropriate to the fastener
1050		application a	and the training or experience of the operator.
1051	7 4 4 0 0 5	1	
1052	7.4.10.25	Inspect the v	work area and use extra caution when driving fasteners
1053		into existing	walls or other blind areas to prevent contact with hidden

1054		objects (e.g., wires, pipes.) or persons on other side, which can cause				
1055		<u>injury.</u>				
1056	7 4 10 20	Denot here lift will as lower tool by the tool of here				
1057	7.4.10.26	Do not hang, lift, pull of lower tool by the <u>tool air</u> hose.				
1058	7 4 10 27	Be aware of trip hazards caused by the tool air base				
1059	7.4.10.27	Be aware of the hazards caused by the <u>tool</u> an hose.				
1060	7 / 11 Discon	posting tool				
1062	7.4.11 DISCOIN					
1062	Disconnec	t tool from the power source when:				
1064	Disconnec	toor nom the power source when.				
1065	7/111	Not in use				
1065	/.4.11.1	Not in use				
1067	7.4.11.2	Changing or replacing accessories such as the workpiece contact or				
1068		rafter hook accessory.				
1069						
1070	7.4.11.3	Making any adjustments				
1071						
1072	7.4.11.4	Performing any maintenance or repairs				
1073						
1074	7.4.11.5	Clearing a jam				
1075						
1076	7.4.11.6	Elevating, lowering or otherwise moving the tool to a new location				
1077						
1078	7.4.11.7	Tool is outside of the operator's supervision or control; or				
1079	7 4 44 0					
1080	7.4.11.8	Removing fasteners from the magazine.				
1081						
1082	8 Power Source					
1084	b Tower Source					
1085	8 1 Safe Power Sour	re				
1086	0.1 Sale i Swei Sou					
1087	The compressed air powe	er source shall be pressure-regulated. The regulated pressure must				
1088	not exceed the maximum air pressure marked on tool. If a regulator fails, the pressure					
1089	delivered to a tool must not exceed 1.5 times the maximum air pressure or 200 psig (13.8 bar)					
1000	whichever is greater. <sup>6</sup> A tool normally is not operated at the maximum air pressure but at a					
1090	lower pressure determined by the type of fastener used the workniece and other conditions of					
1090	lower pressure determin	ed by the type of fastener used, the workpiece, and other conditions of				
1090 1091 1092	lower pressure determin use. Tools shall be used a	ed by the type of fastener used, the workpiece, and other conditions of at the lowest pressure required for the operation.				

<sup>&</sup>lt;sup>6</sup> Power source pressure-limiting is normally accomplished by use of one or more pressure-limiting devices, such as pressure relief valve(s) or rupture disc(s).

1094	Compressed air can be hazardous if not used properly. Never point compressed air at yourself					
1095	or anyone else. Whipping hoses can cause injury. Always check hoses for damage and loose					
1096	fittings.					
1097						
1098	8.2 Hazardous Power Source					
1099						
1100	Hazardous power sources shall not be used. Explosion may occur. Hazardous power sources					
1101	include, but are not limited to:					
1102						
1103	8.2.1 Reactive gases including, but not limited to, oxygen and combustible gases.					
1104						
1105	8.2.2 Pressure sources that can deliver in excess of 1.5 times the maximum air					
1106	pressure of a tool or 200 psig (13.8 bar), whichever is greater, if a regulator fails.					
1107						
1108	8.3 Regulator					
1109						
1110	Pressure regulators shall be used to limit compressed air pressure supplied to tool. Regulators					
1111	shall be set at an operating pressure that is lower than or equal to the tool manufacturer's					
1112	specified maximum air pressure.					
1113						
1114	8.4 Hose					
1115						
1116	Compressed air supply hoses shall have a minimum working pressure rating equal to or greater					
1117	than the pressure from the power source if a regulator fails, or 150 psig (10.3 bar), whichever is					
1118	greater.					
1119						
1120	8.5 Disconnect					
1121						
1122	Tools shall only be used with a fitting or hose coupling attached in such a manner that all					
1123	compressed air in tool is discharged at the time the fitting or hose coupling is disconnected.					
1124						

1125 1126 Annex A 1127 (informative) The symbols below are examples of appropriate symbols. 1128 1129 A.1 Per Clause 3.4.4 alternate symbols evaluated in accordance with ANSI Z535.3 and meeting 1130 that criteria or ISO 3864-2 are acceptable. 1131 1132 1133 Symbols 1134

SYMBOL 1: Read Tool Manual

1135



Figure A1

SYMBOL 2: Wear Eye Protection



Figure A2

SYMBOL 3: Personal Injury



1138	
1139	Annex B
1140	(informative)
1141	
1142	Exemplar Tool Label Meeting Marking Requirements
1143	
1144	B1. Development of Label
1145	
1146	All recommendations of ANSI Z535.3: <u>2022</u> regarding label type style, type size, use of
1147	upper/lower case, etc. were followed.
1148	
1149	B2. Layout
1150	
1151	Figures B1 and B2 are example layouts of symbols and text messages. Layouts may vary on a
1152	tool based on considerations such as area and shape of spaces available on tool for a label.
1153	
	A WARNING
	Read and understand tool labels and manual. Failure to     follow warnings could result in DEATH or SERIOUS INJURY.
	2. Operators and others in work area MUST wear safety glasses with side shields.
	3. Keep fingers AWAY from trigger when not driving fasteners to avoid accidental discharge.
	<ol> <li>Know and understand what trigger system you are using. Check manual for triggering options.</li> </ol>
	5. NEVER point tool at yourself or others in work area.
1154	occur.
1155	Figure B1
1156	

		5	Fig	ure B1				
WARNING     1. Read and ur     could result in DEATH or SEI     wear safety glasses with sid     fasteners to avoid accidenta     are using. Check manual for     in work area. 6. NEVER use c	iderstand tool label NOUS INJURY. 2. 0 shields. 3. Keep fi discharge. 4. Know triggering options. xxygen or other bot	Is and n )perato ingers / v and u , 5, NEV tled gas	nanual. Fai rs and othe WAY from nderstand v ER point to sses. Explo	lure to follow w rs in work area trigger when no what trigger sys ol at yourself o sion may occur	arnings MUST ot driving etem you r others			
Model XXXX Ser. No.	Operating Pressure: Company Name,	MIN 60 4.1 Locati	MAX 100 6.9 on, Country	PSI Fast BAR Len of Manufacture	MIN ener 1/4" gth: 6.4 mm	MAX 5/8" 15.9 mm	Gauge /Ø ➡☐►	22 .7 mm 3/8" 9.5 mm
			Fig	ure B2				

- Note: Use of safety orange in signal word panel of both sample labels corresponds to use of the
- signal word "Warning," whereas safety red would be used in signal word panel if signal word was "Danger."

1158 

1165	
1166	
1167	Annex C
1168	(informative)
1169	
1170	Referenced ISO and American National Standards
1171	
1172	Below is a list of American National Standards referenced in this standard.
1173	
1174	ANSI Z87.1- 2020, American National Standard for Occupational and Educational Personal Eye
1175	and Face Protection Devices.
1176	
1177	ANSI Z89.1-20014, American National Standard for Industrial Head Protection.
1178	
1179	ANSI Z535.1-2017, American National Standard for Safety Colors.
1180	
1181	ANSI 2535.3-2011, American National Standard for Criteria for Safety Symbols.
1182	
1183	ANSI 2535.4-2011, American National Standard for Product Safety Signs and Labels.
1184	
1185	ANSI 2535.6-2011, American National Standard for Product Safety Information in Product
1186	Manuals, Instructions, and Other Collateral Materials.
1187	ACTNA F2412 2010 Standard Cresification for Deviance Deviance at for Destative (Crefety)
1188	ASTM F2413-2018, Standard Specification for Performance Requirements for Protective (Safety)
1189	The Cup Footwear
1190	ISO 2964 2:2016 Craphical Symbols Safety Colours And Safety Signs Dart 2: Design Principles
1191	150 3804-2.2010, Graphical Symbols - Sajely Colours And Sajely Signs - Part 2: Design Principles
1192	FOR Product Sujety Lubers
1193	