

TRAK[®] MACHINE TOOLS



SOUTHWESTERN INDUSTRIES, INC.

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White Paper

Why Toolroom Mills Should Not Have Tool Changers --

It is foolish to violate safety standards

The objective of this paper is to provide you with facts regarding the standards recently adopted by the American National Standards Institute (ANSI). Where we state our own opinions, we will make it clear that we are doing so.

The New Standards

The American National Standards Institute (ANSI) has issued new standards for machines that perform milling, drilling, and boring. The recent advancements in technology in this field have caused the old 1983 standard "Safety Requirements For The Construction, Care And Use Of Drilling, Milling And Boring Machines" (ANSI B11.8 -1983) to become obsolete. It has been replaced by two standards:

- B11.8 -2001 – focused on manual and CNC mills
- B11.23 -2002 – focused on machining centers and automatic mills

Point of Differentiation

The characteristic that determines whether a mill falls under the B11.8 or B11.23 standard is whether or not it has a tool changer.

Paragraph 1 of B11.23 defines the scope of the standard and states:

"This standard specifies the safety requirements for machining centers (which are) numerically controlled machine tools with automatic tool changing capability and work support means capable of multiple functions of drilling, milling, boring..."

And paragraph 1 of B11.8 defines the scope of the standard and states:

"These machines may have automatic capability but may not be equipped with automatic tool changing or automatic part handling systems."

In our opinion, the reason for this differentiation is that ANSI recognizes that machines with tool changers are substantially more automated and, therefore, less under the control of the machinist.

Safety Standards for Machines with Tool Changers

The safety requirements under B11.23 (mills with tool changers) specify in safeguarding paragraphs 6.21.1.1 and 6.21.1.2:

"Work zones shall be guarded using fixed or interlocked movable guards designed to contain processed materials, fluids, parts and tooling."

And:

"Measures to minimize possible defeat of interlocking shall be taken"

And:

“Machine operation shall only be possible when the interlocked movable guards are closed and the safeguarding (protective) devices are active.”

And in the Automatic Tool Changer Safety paragraph 6.21.3 of B11.23:

“Fixed or interlocked movable guards shall prevent access to movable parts. When interlocked movable guards providing access to the tool changer from the work zone, tool magazine or other directions are open, the movement of the tool changer shall be inhibited.”

In other words, according to ANSI B11.23, milling machines with tool changers must be fully guarded (or enclosed), and tool changers must not operate when the guards are open.

Safety Standards for Machines Without Tool Changers

In contrast the safeguarding requirements under B11.8 (mills without tool changers) specify in paragraph 6.21:

“Machines shall be safeguarded as follows:

In the manual mode: chip and coolant splash shields as required by the user.

In the automatic mode: chip and coolant splash guards as required. Interlocked guards depending on the application, as determined by the user.”

In other words, for mills without tool changers, the need for guarding may be determined by the user with consideration to his application, use, skill, and preferred method of operation. This is far different from the mandatory requirements of B11.23. (Please note that interlocked guards are available from Southwestern Industries for all of its TRAK mill products.)

Safety Standards and the Law

We are not offering legal advice. If you need legal advice, please see a qualified attorney. We are offering the text of the standards and a logical interpretation. To see the entire text, you can go to the ANSI web site at www.ansi.org. ANSI specifications are not the law. Many, including B11.8 and B11.23 are not mandated by OSHA. They are, however, accepted national standards. They have been developed through the AMT (the association of machine tool builders) through a collaborative effort of machine builders, machine users, and insurance executives. They have been reviewed, approved, and published by ANSI, whose voluntary standardization has been clarifying how to improve the safety of products since 1918.

Interpretation and Opinion

We don't like being the bearer of bad news – we know that it would be nice to have the best of both worlds, and it is disappointing to hear that you can't. But whatever your opinion about the proliferation of standards and regulations, one thing is sure -- ignoring them is foolish. In a liability lawsuit every party - manufacturer, distributor, and user - will surely be held accountable as to whether they met the requirements of these standards. It is clear that ANSI, in spirit and in text, has adopted a standard that prohibits the use of machining centers with tool changers unless they are protected with an interlocking guard.

This paper was written both to defend ourselves from unfair, uninformed criticism and to help you avoid a product choice which may prove disastrous. Our competitors want to cast us in a poor light for not having tool changers on our products. Ironically, they frame it as a technology issue. This is ironic because ProtoTRAK controls have always utilized the most advanced technology available. In contrast, tool-changer technology is not advanced; low-tech machine tool builders have been doing it for decades. Tool changers are readily available from relatively low-tech countries such as Taiwan and China. It isn't technology that keeps us from incorporating a tool changer; it is the B11.8 and

B11.23 standards. We believe that machines with enclosures do not fit toolroom work, and the ProtoTRAK is exclusively dedicated to toolroom work.

Other measures to comply with the standards, such as kill switches and warning labels, are clearly insufficient. They do not provide physical protection from “*processed materials, fluids, parts and tooling*”. They are easy to defeat -- especially when the set-up technician shows the operator the setting on the CNC that defeats it! Even when properly used, a kill switch makes running the machine a pain – you can’t walk away when you must have your hand on the switch.

Other companies have chosen to ignore ANSI standards by making and selling machines that are in clear violation. We believe this is reckless. We will not jeopardize the livelihood of our employees, distributors, and customers in order to meet the competition when doing so puts users in physical danger and companies that employ them in danger of being destroyed by lawyers. We urge you to suspend your trust in the brand names, read what the standards say, and judge for yourself. You can bet the personal injury attorney will.

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