



ZAMBONI® SAFETY BULLETIN

Fall 2010
(DM-2018E)

To: All Owners, Operators and Service Personnel of Zamboni® Ice Resurfacers

Throughout the years, we at Frank J. Zamboni & Co., Inc., have built and upgraded the Zamboni Ice Resurfacer with safety as our primary concern. In addition, we have made a continuing effort to instruct operators and owners in the safe and proper operation of our machines. If your resurfacer is kept in good repair, operated properly, and safety instructions and warnings are followed, accidents and injuries will be avoided. We are taking this opportunity to again, re-emphasize with you and your employees certain aspects of the machine's operation which must be strictly adhered to by the operators of each resurfacer and enforced by the owners.

The condition of the ice, including removal of excess water, at all times is solely the responsibility of the rink owner, rink manager and the operator of the resurfacer. Each of these has the responsibility of either inspecting or having the surface of the ice inspected after each operation of a resurfacer. Under no circumstances should any skater be allowed on the ice until the condition of the ice has been fully inspected.

Be sure that all guards originally installed on the machine are properly in place. Removal of such safety guards or any unauthorized modification of the equipment is not to be done or permitted. This could create a dangerous condition and serious personal injury may result by a person being caught in the moving parts of the machine if safety guards are removed or if there is an unauthorized modification of any resurfacer by anyone.

Most of our machines from Serial Number 2537 onward have been equipped with plastic snow shields, which are conical in shape and bolted onto the snow dump tank. This shield is primarily designed to keep the shavings and slush from being thrown back onto the operator, but it also acts as a safety device to keep hands and fingers from being caught in the conveyor. The shield and its safety label provides a reminder to the operator of the snow conveyor's potential danger. It is imperative that the snow shield with warning label remain intact on the machine at all times. No one should ever, at any time, put or place their hands and fingers into or near the conveyor opening.

For those of you who own or operate some of our older models, or who no longer have such shields, a Conical Snow Shield Kit is available for field installation. This kit is priced at \$65.00, F.O.B., Paramount, California. This piece of equipment must be on your machine at all times while it is in operation. You will be responsible for any accidents if your resurfacer does not have a snow shield with safety label in place on the machine.

It is imperative that a conscientious effort be made to instruct all operators and properly supervise them so that at no time should anyone place their hands, fingers or feet near the conveyor system when they are in motion. All operators must be trained annually in the safe operation and use of the machine.

We cannot over-emphasize the need for your operators and maintenance people to familiarize themselves with the cautions and warnings contained in our operations manual and on the machines. A set of similar safety labels has been sent to you previously and we ask that all owners/operators ensure that these safety signs are properly placed on their machines. If a new set of labels is needed, please order with the enclosed order sheet and they will be sent to you free of charge. A new instruction sheet for your manual and a safety poster containing instructions that your Zamboni operators should follow for the proper and safe operation of the machine are also enclosed. Please place the instruction sheet in your manual immediately for your protection and the poster should be posted in a conspicuous place. If your original operations manual has been misplaced or lost, please contact us, and we will be more than happy to furnish you with a replacement at a cost of \$8.00.

It is the owners' and operators' responsibility to perform inspections and maintenance programs to ensure that all component parts are kept in good working order. It is critical that anyone working on the resurfacer exercise caution at all times. Never perform any maintenance or service on the machine without first turning the engine off and removing the key. In addition, everyone should familiarize themselves with the part of the resurfacer which they intend to service prior to doing the work, by reading the manual, and reviewing the videos before doing any maintenance work or operating the resurfacer.

It is also of utmost importance that you make sure that only qualified and trained individuals operate your ice resurfacing machine, and that a diligent effort be made to instill a sense of safety awareness in your operators by utilizing motivational techniques in your safety program.

Before operating our equipment, your operator should thoroughly acquaint himself with the resurfacers and the instructions and warnings contained in the operations manual. This training must be done at least annually and every time you make an operator change or addition.

Certain precautions are mentioned in our video tapes and written instructions. Your driver should always operate the machine with safety in mind and by using the operator training and retraining program including the following:

1. The resurfacers are designed to be operated by one, and only one person. Riders are not to be permitted anywhere on the machine at any time. Keep everyone except authorized rink personnel off the ice while the resurfacers are operating.
2. Hands, fingers and feet and other parts of the body should be kept away from conveyors, belts, chains and other moving parts. At no time should anyone stick their hands or fingers in the conveyor opening where the paddles force the snow or slush into the bin. Serious injury will result.
3. Hands, feet and the body must be kept out from underneath the dump or snow tank, conditioner, and other raised parts unless they are blocked securely. Extreme caution must be used at all times when handling the shaving knife, as it will cause injury whether it is sharp or dull.
4. Exhaust products from any internal combustion engine are dangerous gases that can cause serious injuries or death. Make certain that the ice resurfacers or edgers are operated only in ventilated areas, contain only clean fuel and are properly tuned.
5. Use extreme caution when handling fuel and store only in approved U.L. or U.L.C. containers. Refuelling operation must only be done outdoors.
6. Only authorized and trained qualified personnel should work on, repair, install, service, inspect or otherwise touch any part of the machine.

To increase the understanding of each owner and operator, an instructional video and a safety poster have been developed that outline the safe and proper operation of the resurfacers. The video entitled "Resurfacers Operation", should be viewed by every operator prior to operating the machine and used annually for retraining. To make this possible, a safety video tape was previously distributed to every rink. The Zamboni Safety Poster, which has also been previously distributed to every rink, should be kept posted and every owner and operator of Zamboni Resurfacers is instructed to read and abide by the safety instructions and warnings on the poster. If you do not have one or if they have been misplaced, we will be glad to send copies to you at no charge.

We at Zamboni are proud of our equipment, but more importantly, we are deeply interested that our resurfacers are operated properly thereby avoiding accidents. Please remember you have a personal responsibility to comply with all safety warnings, operating instructions, and maintenance instructions pertaining to the use of the resurfacers.

If at any time you have any questions, or need assistance regarding the proper use and operation of any of our resurfacers, or the installation of all safety devices, warning labels, etc., please feel free to contact us.

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Canada, 38 Morton Ave., East, Brantford, ON N3T-5T6 Ph: (519) 758-5000 Fx: (519) 758-0500

P.S. Many owners have more than one Zamboni Ice Resurfacers. If you do, please fill out the enclosed card as we will be glad to send you a set of labels for each machine. If you are aware of anyone with a Zamboni Ice Resurfacing machine who did not receive this mailing, please let us know or ask them to contact us directly.



To: All Owners, Operators and Service Personnel of Zamboni® Ice Resurfacers

Ensuring a healthy indoor environment should be a year-round priority of every person who works in or manages ice skating rinks and arenas. It is especially important when higher outdoor temperatures are present at the beginning and end of the typical skating season. With higher temperatures, some operations face problems relating to increased humidity inside their buildings as well as difficulty in retaining a sheet of ice.

While these are legitimate concerns, they should never be addressed at the expense of air quality in your building. The following are safety reminders on this subject:

1. Building ventilation

Never operate the resurfacer in an enclosed rink without adequate ventilation. Make sure your ventilation system is working properly and turned on when operating the resurfacer.

Make sure you are in compliance with OSHA and your local health, as well as any local building codes and safety laws. Air quality requirements can vary from one locality to another and since few buildings are identical, the actual amount of ventilation needed should be assessed and implemented at each particular ice arena. **Readings of carbon monoxide (CO) and nitrogen dioxide (NOX) levels in your building should be taken on a daily basis.** Sources of air contamination can include:

- - ice resurfacing machine
- - engine powered ice edger
- - polluted air intake
- - cigarette smoke
- - refrigerant leaks
- - contamination from heaters, furnaces, or boilers
- - CO2 tanks
- - fireworks
- - fuel with impurities
- - restaurant and/or vendor equipment

It is the rink operator's responsibility to assure clean air at all times. If you are unsure if your ventilation is adequate, consult with a qualified Heating Air Conditioning and Ventilation (H.A.C.V.) engineer and/or local air quality officials.

2. Maintain ice resurfacer

Tune the engine and adjust valves as recommended in the engine maintenance book. Beware that an LPG engine can produce high levels of NOX if the engine is tuned to a low CO level. Only warm up the engine prior to resurfacing in a properly ventilated area, with an exhaust line to the outside or the machine being outdoors.

It is imperative that proper maintenance is performed by a qualified mechanic on a regular and scheduled basis.

For those rinks requiring additional protection, consider:

- - installing an appropriate and reputable catalytic exhaust purifier
- - installing a fuel management system (lambda feedback) if available for your model
- - changing a gasoline engine to propane
- - installing a high-rise exhaust kit
- - purchase a new ice resurfacer, such as the Zamboni® 500 Series Electric or Fuel Powered

You must remember, however, that even if an internal combustion engine is equipped with LPG, CNG, catalytic exhaust purifier and/or high-rise exhaust, it still produces emissions and a buildup of these emission fumes is hazardous.

3. Distribute this reminder to your staff. Also, review with your staff all safety information sent by Zamboni® previously, including manuals, video tape, safety decals and poster.

An arena manager has no greater responsibility than ensuring a safe environment for the patrons and staff at his or her facility. The staff at Zamboni has and will continue to assist you in your performance of this all-important task. If you have questions, please call.

VENTILATION REFERENCE LIST

1. The State of Minnesota is a leading state in providing safe air quality in indoor ice arenas. Every indoor operator needs to know the proper procedures to protect individuals from unsafe exposures to exhaust emissions that can occur. Refer to the Minnesota Department of Health (<http://www.health.state.mn.us/divs/eh/indoorair/arenas/>) for obtaining correct information and procedures.
2. U.S. Department of Labor "Safety and Health Requirements for Working with Carbon Monoxide" and their video tape presentation.
3. The EPA publication "Building Air Quality" A Guide for Building Owners and Facility Managers. No. 91-114
4. USEPA (Region 1-Boston) letter, dated February 29, 1992 to Ice Rink Managers and User Groups regarding Air Quality.
5. EPA "Indoor Air Facts No. 1" dated December 1991 entitled "EPA and Indoor Air Quality."
6. EPA "Ice Skating Rinks (Indoors)" Fact Sheet dealing with Carbon Monoxide and Nitrogen Dioxide.
7. Air Sampling Information, distributed by the Massachusetts Department of Labor & Industries. (This document contains Carbon Monoxide - Permissible Exposure Limits, Nitrogen Dioxide Permissible Exposure Limits, Reasons for Taking Air Samples and Air Sampling Equipment.
8. EPA Indoor Air Quality Program Fact Sheets, #1, #2, #4, #6.
9. EPA "Targeting Indoor Air Pollution".
EPA's Approval and Progress.
EPA 400-R-92-012, dated September 1992.
EPA Web Site (<http://www.epa.gov>).
10. CFR 1910.94 Ventilation
CFR 1910.106 Flammable and Combustible Liquids
CFR 1910.110 Liquefied Petroleum Gases
11. O.S.H.A. Web Site (<http://www.osha-slc.gov>).
O.S.H.A. Sampling & Analysis (<http://www.osha-slc.gov/SLTC/samplinganalysis/index.html>). (This contains a summary of chemical properties, exposure limits and recommendations, and sample collection and analysis parameters. It provides links to OSHA Standards and compliance information, as well as other information available in the OSHA online documents.)

Note: See also appropriate Trade Journal Air Quality Articles, Air Quality Technical Papers, State Air Quality Regulations and various Technical Standards.