

Special Instructions, WIM® Acid Additives

Revised 09/05

WIM® pickling additives can be considered under the broad term of being "relatively safe"; however, like any chemical, their safety should not be taken for granted. The label on the containers and the current MSDS warns of general hazards in the area where the WIM® products might be used. Many times the area hazards present a greater danger to be considered, in addition to that of the safe handling of the WIM® additives. It is most important to consider **ALL** the hazards present when devising a safe handling procedure for the WIM® additives. WIM inc. will advise their customers of general handling practices but it is up to the user, which includes not only the buyer, but the people responsible for direction and actual handling of the WIM® products to identify any other additional hazardous circumstances that would need to be identified and minimized where the WIM® products were being used. Whenever any doubt exists we do require that you consult with your plant safety officer or a physician.

All of the WIM® Additives are subject to thermal decomposition. Objectionable compounds such as carbon monoxide could easily be released as well as sulfate gasses, were such decomposition allowed to take place; since these products do contain organic and inorganic compounds, salts, alcohols, and proprietary blends of inhibitors, wetting systems and other specialty chemicals as required depending on the product formula. We can foresee such objectionable releases happening only when the product has been incinerated such as under conditions of a severe fire in a plant. The gasses emitted from such decomposition could be considered slight when placed in the context of the atmosphere of incineration. Hazards to humans would probably be slight in terms of potential decomposition as subsequent release into the atmosphere. The gasses could well become a small part of the entire net emission of thermal

decomposition of the total structure and its contents which may or may not be exceptionally hazardous based on those contents. In general terms approximately <5% of the product weight might be available to enter into such thermal decomposition. Alcohols which may or may not be in the formulas are generally used in such minute quantities to act as solvents for certain compounds that the remaining solvent of water would most often off-set the relative hazard that might be associated with certain alcohols were those alcohols used in their full 100% strength.

The WIM® Additives are water soluble and use water as a solvent. This by itself initially dilutes all of the compounds used to make up the various WIM® additives. These chemicals are further diluted when added to the various solutions as recommended in the data sheets.

Thus, in terms of the atmosphere of incineration and the low inventory rate required of products of this type; (the use rate is low and just-in-time programs are encouraged) the risk of objectionable omissions is on the low side of a massive release of objectionable elements into the atmosphere. This is not meant to state or imply some level of assured safety of these products but to place the potential release into the perspective of all the hazardous emissions that could occur in the event of thermal decomposition resulting from a fire; and then treating the most appropriate hazard as indicated at the time.

Fire conditions which would not lead to thermal decomposition would not be expected to cause such release of objectionable or hazardous compounds. The containers may burst depending upon their proximity to the fire; but again, the spillage should boil away and if the temperatures are severe enough, incinerate. The compounds themselves are not flammable except those which

contain alcohols and most of those blends will extinguish an open flame at ambient temperatures.

Contact with the skin on eyes is another matter since the products are blended either in the alkaline or acid state. The pH of the products range from 2 to 12 and will always be a source of irritation. Prolonged contact with the products obviously will cause irritation to the skin or eyes and internal organs. First aid procedures are noted on the label and in the respective MSDS sheet in the event prolonged contact would happen. Again, it is important to observe the major source of irritation to a person. If the WIM[®] additive has been added to a pickling acid, then you would treat the acid effect either as an acid burn or as an acid irritant. The volume of WIM[®] additive a human is exposed to may only be a major concern if the additive made up the major portion of the exposure. Generally the first aid procedures are sufficient to treat any unusual contact. This is not meant to minimize the compounds used in the WIM[®] additives or to indicate any degree of safety by treating the major hazard first. Proper treatment is best reserved for a physician who is fully informed of the hazards involved and the relative amounts involved. A liter of pickling acid containing the normal amount of a typical WIM[®] additive would contain about 0.3% of that volume as additive or 3 mL of which about <0.2% might be considered hazardous. The pickling acid would contain anywhere from 7% to 50% of that volume as acid. An informed physician can then make his decision as how to best treat the hazard. Again, if you have any questions as to treatment consult the Plant Safety Officer or a physician.

The product label and the WIM MSDS sheets state that the use of protective clothing and equipment is required for proper safe handling of these products. This is true with any chemical. The label and MSDS also state that the product should not be taken for granted even if the user does not consider the product to be hazardous as used. Any chemical cannot be taken for granted as being 100% safe.

WIM acid additives with controlled depolarization control the pickle by reacting with the evolving

hydrogen – one necessary element for the pickling reaction to happen – speeding up your scale removal. When the scale is gone the depolarizer stops and the inhibitor goes into action protecting the base metal. Each reaction controls your pickle better by making the acid work as efficiently as possible.

The additives are generally added to a pickle tank. These tanks may be highly acidic and heated to a very high temperature. These pickle tanks regardless of the volume of acid solution or residuals, are highly corrosive and dangerous to humans. The WIM[®] additives are added to these acid solutions which use either commercial acid grades or diluted acid solutions. The WIM additives are generally water solvent based and because of this should be added to the acid very slowly so as to prevent any reaction or splashing that would cause the acid to splash on anyone near the pickle tank.

Where the pickle tank is made up and no automatic feeding pumps for adding the WIM[®] additives are used it is preferred that the WIM[®] additive be added when the level of the tank is well below any splash point. When that is not possible the additives should be added slowly to the solution. When making up a new pickle tank it is recommended that water be added first to a level of about 25% of the working level volume, then the addition of the WIM[®] additive, then the addition of the acid, completing the charge with the remaining volume of water. The water and acid additions plus any other moderate agitation will help mix the water, acid, and additives. An additive which contains a surface active agent or wetter will also generate a foam blanket over the tank which will help minimize any acid spray from reaching a nearby worker. The mixing method employed should not be so violent as to cause the acid mixture to splash upon anyone who happened to be near the pickle tank.

Additive additions to a pickle tank which has been brought up to a working volume with no automatic feeding pumps requires slowly adding the additive to the pickle so as not to splash any of

the acid mixture upon anyone near the pickle tank. Additions of the WIM[®] additives to an acid storage tank should be done when the acid level within the tank is low. Low enough that the addition of the additive will not splash acid back upon the person making the addition or anyone else who may be nearby.

The WIM[®] accelerating additives; 67, 69, Naxid S, should not be added directly to sulfuric acid when the acid concentration is above 25% by weight (250 gms/liter). A direct addition to a sulfuric acid requires a depolarizer of a different composition.

ALL depolarizers can be safely added to dilute acid concentrations of <1% - 25% (0.5 - 250 gms/liter) of sulfuric acid.

ALL WIM[®] additives can be added to a commercial HCl (hydrochloric or muriatic acid) with a commercial strength up to 35%/wt.

The general addition rule to follow is: **NEVER ADD WATER TO AN ACID.** The additives can be safely added to acid storage tanks as noted above providing extreme caution is exercised and full safety protection clothing and equipment is worn by the operator.

Special Equipment to be Worn While Using WIM[®] Additives:

WIM Inc. prefers to see that a face shield or safety goggles be worn. This is to help minimize any of the acid, additives, or pickle solution from splashing on the face or eyes. A safety helmet will help shield the wearer from being splashed on the head as well as minimize being struck on the head by other equipment being used nearby. A rubber apron will protect the body from acid, additive or acid solution splashing on the workers clothing; and the wearing of rubber gloves will prevent the acid, additive, or acid solution from splashing on the hands or arms. Rubber boots with built-in steel caps protect the feet. People using the WIM[®] additives might also be required to wear some appropriate protective hearing device.

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All of the above mentioned items of safety equipment or clothing will protect the worker from normal hazards when handling a chemical such as the WIM[®] additives. They are no guarantee of 100% protection against all of the hazards within the work area where the chemical is being used. They are no protection against a worker or plant safety program which does not take into consideration ALL of the potential hazards within the immediate work area. A worker or plant safety program which permits workers to ignore common safety rules and regulations when working with chemicals of any type cannot expect to be assured of any degree of safety when handling the WIM[®] additives. Nor can WIM Inc. project every possible hazardous condition that could occur in any plant at any time that would cause the WIM[®] additives to become, be used, or become a direct or indirect part of a hazardous situation or accident.

The pickling reaction is such that hydrogen gassing occurs when the acid is reacted with the oxide it is to remove. This is a normal evolution of H₂ and when trapped within a foam blanket it can present a hazard if ignited.

We readily acknowledge that "bad odors" can be subjective to the operator or other employees. Objectionable odors which might result from a pickling operation may be noticeable from time to time. These odors may be well known odors such as, but not limited to: the chloride fuming from a hydrochloric pickle; or sulfur particles from a sulfuric acid pickle. Employees who do find the WIM[®] products objectionable are encouraged to use whatever approved safety equipment is available to minimize their discomfort. Through the years we have been pleased to note that complaints along these lines are virtually nonexistent.

A pickle using sulfuric acid and accompanied by its normal hydrogen gassing from the pickle reaction will cause a hydrogen bubble to burst at the surface of the pickle and will throw minute particles of the acid into the atmosphere which

could irritate any exposed skin. Surface active agents (organic wetters or foamers) are generally employed and made a part of the WIM® additive. These agents reduce the surface tension of the pickle solution and will minimize this hazard. In most instances the wetters used by WIM Inc. turn the bubble inwards, sort of imploding rather than causing the bubble to burst flinging acid particles into the air. Adequate air ventilation will also be a great help in removing the acid mist and when incorporated with a fume scrubber the problem is minimized even further.

A pickle using hydrochloric acid is nothing more than a gas in water and the potential of chloride evolution depends upon the atmosphere plus the activity of the pickle reaction, and the operating temperature of the bath. These fumes are partially removed by the exhaust and scrubber systems and very slightly minimized by the surface active agents or foamers.

It is entirely possible that the manufacturing facility and its own safety committee may decide that due to the fumes from a hydrogen chloride pickle or other known fumes from other products or process operations, may require the pickle operators to wear a breathing apparatus. WIM, Inc. has no objection to this or any other added safety precaution.

The safe use of the WIM® additives is not up to WIM Inc. but to the people using the products on the pickle line. We can tell you what hazards the product contains as outlined by existing federal state, and local regulation and offer some ideas how to best cope with the compounds under some general operating situation. We are not empowered to see that the safety methods are carried out. It is the responsibility of the user to do that. The WIM® additives are purchased with full knowledge of the hazardous compounds by way of the WIM Inc. MSDS sheets which are made up from MSDS sheets supplied by our suppliers. We rely upon our suppliers to keep us updated to potential risks and forward that information on to you our customer as soon as that information can be incorporated into an updated MSDS. Our

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liability is limited to the manufacture of the products and assuring that no defects occur during the blending. WIM Inc. sells industrial chemicals for a specific purpose and those chemicals sold under a WIM label do contain known chemicals with various hazards. We cannot always blend a 100% plus safe product by chemical substitution of one compound for another and always obtain the same results. Neither can we eliminate all the various hazards within the workplace: nor can we control the use or misuse of our products once sold and placed into a manufacturing facility.



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