

BULLETIN NO. 76-9

# TECHNICAL INFORMATION

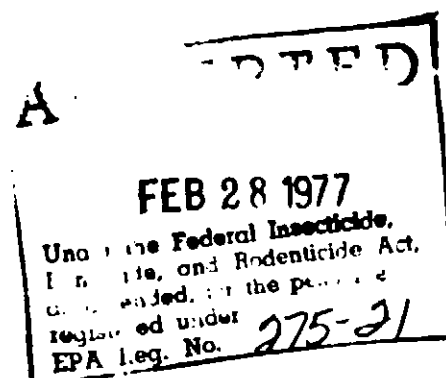


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AMICAL<sup>®</sup> 48

(EPA REG. NO. 275-21)

FUNGICIDAL ACTIVITY IN CHROME-TANNED CATTLE HIDES



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ABBOTT LABORATORIES

AMICAL 48

FUNGICIDAL ACTIVITY IN CHROME-TANNED CATTLE HIDES

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SUMMARY AND RECOMMENDATIONS

Amical 48 is an effective antifungal agent for use in protecting chrome-tanned cattle hides.

- Amical 48 efficacy has been proven in the laboratory, in the pilot plant, and in full-scale side leather tannery runs, utilizing both cement-mixer type hide processors and wooden drums.
- Test methods include Petri dish studies, trials with American Leather Chemist's Association (ALCA) jars, and evaluation of polyethylene wrapped packs of splits.

Amical 48 use levels range between one to three ounces per 1000 pounds white weight, equating to 0.006 to 0.018 percent fungicide. Exact levels are a function of the type of hide and tanning process and the duration of protection required. Table I provides recommended use levels for a variety of conditions.

TABLE I/AMICAL 48 USE LEVEL RECOMMENDATIONS FOR THE ANTIFUNGAL PROTECTION OF CHROME-TANNED CATTLE HIDES

Equipment	Winter-Kill Hides	Amical 48 Use Levels*	
		4 Week Protection oz/1000 lbs	6 Week Protection oz/1000 lbs
Hide-Processor	Pre-Fleshed	2.0	3.0
Wooden Drum	Pre-Fleshed	2.0	NA
Wooden Drum	Fleshed	1.0-2.0	1.0-2.0

\*Values based on 1000 lbs white weight hides. NA = data not available.

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## POINT OF APPLICATION IS IMPORTANT

*Amical 48 should be added at the start of chrome-tanning.*  
Amical 48 can be added with the acid and chrome liquors.

### INTRODUCTION AND COMMENTARY

In order to evaluate the performance of a compound for a specific purpose, the compound must be tested under the actual intended conditions of use. For this reason, Abbott designed a laboratory apparatus to test leather fungicides, which would duplicate tannery conditions.

Following successful laboratory tanning, Amical 48 was then tested in a pilot scale drum mill.

After evaluation of the laboratory and pilot studies, full-scale trials were conducted in tannery mills on pre-fleshed and fleshed hides, utilizing both the hide processor and wooden drums.

As Table I indicated, the performance of a fungicide is dependent upon a number of variables, such as the hide type and equipment used, in addition to routine tannery-to-tannery differences in operating procedures.

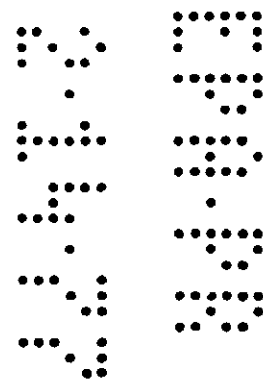
- Cattle hides that are fleshed by the tanner are generally easier to protect than hides which are pre-fleshed by the packer.
- The hide source can be a variable from one packer to the next, depending on his curing operation.

The time of year which the cattle are killed is also important.

- Winter-kill hides are more difficult to protect from fungal attack than are summer-kill hides, because they are thicker and contain more fats. This makes chrome and biocide penetration less efficient.

Another variable is the time of year at which the hides are processed.

- A more hostile environment is encountered when processing during the summer months, because fungal activity increases with temperature.



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## TESTING PROCEDURE

All studies were conducted on winter-kill cattle hides. The hides were processed during the spring and were supplied by several sources.

Leather test samples for the Petri dish and ALCA jar studies were prepared at Abbott on a laboratory and pilot plant scale.

Sixty gram samples of unpreserved bluestock were treated in the laboratory with chrome-tan solution. These samples were agitated seven hours at 32.5°C (90°F). Amical 48 was added at the beginning of the tanning procedure, during the addition of the chrome liquor.

Pilot scale tanning was performed in a drum mill in which the leather was treated in 27.2 Kg (60 pounds) quantities; Amical 48 was added with the chrome-tan solution.

## PETRI DISH EVALUATION

For agar plate testing, 2.5 cm discs were punched from treated hide samples and placed on 100 mm Petri dishes. Potato dextrose agar was then poured level with each sample and allowed to solidify.

The samples were inoculated with a mixture of  $1 \times 10^5$  spores/ml each of eleven different leather test organisms prescribed by the American Leather Chemist's Association mold resistance test, and Federal Specification KK-L-311. The source of organisms was the U.S. Army Quartermaster Laboratory, Natick, Massachusetts.

Triplicate samples of the leather discs were observed for fungal growth at one and two weeks.

The test organisms included:

<i>Aspergillus repens</i>	QM 7708	<i>Penicillium oxalicum</i>	QM 7633
<i>Aspergillus terreus</i>	QM 7709	<i>Myrothecium verrucaria</i>	QM 7636
<i>Penicillium verruculosum</i>	QM 7613	<i>Aspergillus flavus</i>	QM 7637
<i>Rhizopus arrhizus</i>	QM 7627	<i>Gliocladium species</i>	QM 7638
<i>Penicillium diversum</i>	QM 7628	<i>Penicillium spinulosum</i>	QM 7642
<i>Aspergillus niger</i>	QM 7629		

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## ALCA EVALUATIONS

Tests with leather inoculated and suspended in glass jars were conducted in accordance with standard ALCA methods. The results of these studies showed efficacy for Amical 48, indicating field trials were warranted.

## FIELD TRIALS

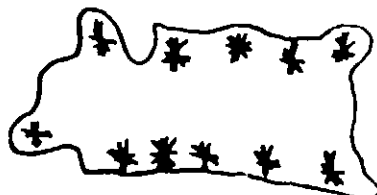
Full-scale trials were performed at two tanneries. Equipment included hide processors (cement mixers) and wooden drums. Both pre-fleshed and fleshed hides were used in each type of equipment. Tests were performed on winter-kill, wrung, flesh-side splits.

In all trials, Amical 48 was added at the beginning of the tanning procedures along with the chrome-tan solution.

The antifungal activity of Amical 48 and competitive products was determined using ALCA jars and by evaluating antifungal performance in polyethylene wrapped packs.

The polyethylene packs contained five splits each, wrapped flesh to flesh and stored at 72°F (22°C). The packs were observed at four, six and eight weeks.

The hides wrapped in polyethylene packs were evaluated by making visual ratings of eleven different areas of each split surface. A hide diagram showing these areas is presented below.



## AMICAL 48 PHYSICAL PROPERTIES

Amical 48 is one of a series of newly developed organic chemicals offered exclusively by Abbott Laboratories. Chemically, Amical 48 is diiodomethyl *p*-tolyl sulfone. Its structural formula and physical properties are summarized in Table 2.

TABLE 2/PHYSICAL PROPERTIES OF AMICAL 48

Appearance	Fine Tan Powder
Melting Point	147-150°C
Specific Gravity	2.20 g/cc
Bulking Value	5.46 gal/100 lb
Assay	Min. 95%



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## SAFETY AND HANDLING

Normal bulk chemical handling precautions are adequate when handling Amical 48 powder.

Amical 48 is a very fine powder. Although it is not irritating to the skin, Amical 48 can cause slight, temporary irritation of the eyes.

Although Amical 48 is not considered a toxic substance when inhaled, care should be taken to avoid breathing the dust. For further information, please refer to Table 3 and its footnotes. It is good practice for workers to take the standard precautions of wearing gloves, protective glasses and dust masks when handling Amical 48.

TABLE 3/AMICAL 48 TOXICOLOGICAL PROPERTIES

Amical 48 Study	Results
Oral LD <sub>50</sub>	
Mice	10,000 mg/kg
Rats	9,400 mg/kg
Dermal LD <sub>50</sub>	20,000 mg/kg
Dermal Irritation; rabbits, normal and abraded skin	None
Eye Irritation, Draize Test (1)	Slight
Inhalation Toxicity(2)	Not Toxic
TL <sub>50</sub> (3)	
Rainbow trout	0.29 ppm
Bluegills	0.35 ppm

NOTES (1) The pure chemical put directly into the eye causes no corneal damage but can cause slight, temporary irritation. See first aid suggestions below. (2) Amical 48 is not considered a toxic substance when inhaled as defined under 40 CFR 162.8. (3) Amical 48 is toxic to fish. Care should be taken not to contaminate any body of water with Amical 48 by cleaning equipment or disposing of wastes.

## FIRST AID

If Amical 48 gets on the skin wash area immediately with soap and water. If Amical 48 gets on the eye, flush immediately with copious amounts of water and call a physician. In case Amical 48 is ingested, induce vomiting at once and call a physician.

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## SAMPLES

For more information or samples for evaluation, write or phone: Amical, Abbott Laboratories, Chemical and Agricultural Products Division, D-900, North Chicago, Illinois 60064; (312) 688-5173.

NOTE: Our recommendations for use of this product are based upon tests believed to be reliable. The data and statements contained herein are based on information received from many sources, and Abbott Laboratories does not undertake to guarantee the accuracy of any information herein set forth. The use of this product being beyond the control of Abbott, no guarantee, expressed or implied is made as to the effects of such or the results to be obtained if not used in accordance with directions or established safe practice. The buyer must assume all responsibility, including injury or damage, resulting from its misuse as such, or in combination with other materials. Abbott does not assure customers or recipients of the information herein set forth of freedom from infringement of patents owned by Abbott or by others in connection with the use of any product, formula, process or use described herein.

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