

NSF Protocol P152 Health Effects and Corrosivity of Commercial Espresso Machine Chemical Cleaners

NSF International



June 27, 1994

NSF International, an independent, not-for-profit organization, is dedicated to public health safety and protection of the environment by developing standards, by providing education and by providing superior third-party conformity assessment services while representing the interest of all stakeholders.

This Protocol is subject to revision.
Contact NSF to confirm this revision is current.

Users of this Protocol may request clarifications and interpretations, or propose revisions by contacting:

NSF International
Engineering & Research Services
789 Dixboro Road
Ann Arbor, MI 48105
Phone: (734)769-8010 Telex: 753215 NSF INTL
FAX: (734)769-0109 E-mail: info@nsf.org
Web: <http://www.nsf.org>

**NSF PROTOCOL P152
HEALTH EFFECTS AND CORROSIVITY OF COMMERCIAL
ESPRESSO MACHINE CHEMICAL CLEANERS**

JUNE 27, 1994

**Prepared by:
NSF International
Engineering & Research Services
3475 Plymouth Road
Ann Arbor, MI 48105**

Copyright 8 1994 All Rights Reserved

TABLE OF CONTENTS

SECTION 1. INTRODUCTION.....	3
1.1 SCOPE AND PURPOSE	3
SECTION 2. DEFINITIONS	3
2.1 ABSORPTION.....	3
2.2 ADSORPTION	3
2.3 ADULTERATE	3
2.4 CHEMICAL CLEANER.....	3
2.5 COMMON MATERIALS OF FABRICATION IN ESPRESSO MACHINES.	3
2.6 ESPRESSO MACHINE	3
2.7 EXTRACTION	3
2.8 NSF PROTOCOL	3
2.9 PROTOCOL CERTIFICATION.....	3
2.10 TOXIC METALS	3
2.11 TOXIC RESIDUE.....	4
SECTION 3. REQUIREMENTS	4
3.1 FORMULATION REVIEW.....	4
3.2 ADULTERATION OF COFFEE.....	4
3.3 EXTRACTION OF ADSORBED INGREDIENTS	4
3.4 CORROSIVENESS.....	4
3.5 TOXICOLOGY REVIEW AND REPORT	4
3.6 PROTOCOL CERTIFICATION.....	4
3.7 INITIAL AND ANNUAL RETESTING	5
SECTION 4. TESTING PROCEDURE	5
4.1 REFERENCES	5
4.2 APPARATUS	5
4.3 REAGENTS.....	5
4.4 SAMPLE COLLECTION, PRESERVATION AND STORAGE	5
4.5 PROCEDURE	5
4.5.1 Cleaner Corrosivity.....	5
4.5.2 Formulation Review.....	6
4.5.3 Espresso Machine Corrosion.....	6
4.5.4 Extraction of Adsorbed Chemicals.....	7

**NSF PROTOCOL P152
HEALTH EFFECTS AND CORROSIVITY OF
COMMERCIAL ESPRESSO MACHINE CHEMICAL CLEANERS**

SECTION 1. INTRODUCTION

1.1 SCOPE AND PURPOSE

- 1.1.1 This protocol specifies the health effects requirements for a chemical cleaner when used to clean an espresso machine. It includes evaluation and testing procedures.
- 1.1.2 The requirements of the protocol address the minimum health concerns of using a chemical cleaner. Evaluation of the chemical cleaner against the protocol provides the information and data necessary to substantiate an NSF package statement.

SECTION 2. DEFINITIONS

- 2.1 **ABSORPTION:** The ability of a substances (absorbent) to hold or concentrate gases, liquids or dissolved substances (absorbates) within itself.
- 2.2 **ADSORPTION:** The ability of a substance (adsorbent) to hold or concentrate gases, liquids or dissolved substances (adsorbates) upon its surface.
- 2.3 **ADULTERATE:** To make impure by the addition of a foreign substance to a food product.
- 2.4 **CHEMICAL CLEANER:** A chemical used to remove the accumulated coffee residue from the internal components of an espresso coffee machine.
- 2.5 **COMMON MATERIALS OF FABRICATION IN ESPRESSO MACHINES:** Components of an espresso machine in contact with a chemical cleaner made from stainless steel (types 303, 304 and 400 series), brass copper or rubber (puna-n) and chrome plated materials in which the plating complies with an applicable ASTM specification.
- 2.6 **ESPRESSO MACHINE:** Equipment that is used to make espresso.
- 2.7 **EXTRACTION:** The process of chemical migration when exposed to an aqueous media.
- 2.8 **NSF PROTOCOL:** A document which states a set of requirements for a product, system or service and the procedures and/or test methods for determining if a product, system or service conforms to the requirements.
- 2.9 **PROTOCOL CERTIFICATION:** A contractual agreement between a manufacturer and NSF that a product conforms with the requirements of an NSF Protocol.
- 2.10 **TOXIC METALS:** The metals regulated by the U.S. EPA for drinking water.