

Plasticware

Fusion

Pressing and
Pelletizing

XRF
Accessories

HANDBOOK
OF SAMPLE
PREPARATION
& HANDLING

Pulverizing and
Blending

SPEX
CertiPrep



SPEX CertiPrep Handbook of Sample Preparation and Handling

Fifth Edition Contributing Editors

Ralph H. Obenauf, Ph.D
Richard Bostwick
William Fithian
Mena McCann
Joan D. McCormack
David Selem

SPEX CertiPrep, Inc.

203 Norcross Avenue
Metuchen, NJ 08840

1-800-LAB-SPEX • 732-549-7144 • Fax 732-603-9647

e-mail: sampleprep@spexcsp.com

Website: <http://www.spexcsp.com>

TABLE OF CONTENTS

How to Order .....	.5
How to Use This Handbook .....	.12

SECTION I PRODUCT INFORMATION

Chapter One *Pulverizing and Blending*

Introduction .....	.14
Products for Pulverizing and Blending	
Jaw Crusher and Accessories .....	.15
Boron Carbide Mortars and Pestles .....	.17
Freezer/Mills .....	.18
6750 Freezer/Mill .....	.18
6800 Freezer/Mill .....	.19
6750 Accessories .....	.20
6800 Accessories .....	.21
Micro Hammer-Cutter Mill and Screens .....	.22
Wig-L-Bug and Accessories .....	.24
Mixer/Mills .....	.26
5100 Mixer/Mill .....	.26
Mixing and Grinding Containers .....	.27
5300 Mixer/Mill .....	.30
Mixing and Grinding Containers .....	.31
8000D Mixer/Mill .....	.32
8000 Mixer/Mill .....	.34
Mixing and Grinding Containers (8000 Series) .....	.35
Adapters (8000 Series) .....	.39
Shatterboxes .....	.42
8500 Shatterbox .....	.42
8510 Shatterbox .....	.43
8520 Shatterbox .....	.44
Shatterbox Grinding Containers .....	.46
Shatterbox Accessories .....	.48
Nylon Sieves .....	.49

Chapter Two *Pressing and Pelletizing*

Introduction .....	.52
Products for Pressing and Pelletizing	
Automated Presses .....	.53
3624B X-Press .....	.53
3630 X-Press .....	.54
Manual Presses (SPEX CertiPrep-Carver) .....	.55
Pellet Dies and Accessories .....	.57
Spec-Caps for Reinforcing XRF Pellets .....	.60

Chapter Three *Fusion*

Introduction .....	.64
Products for Fusion	
SPEX CertiPrep-Claissse Automated Fusion Fluxers .....	.65
SPEX CertiPrep-Claissse Fluxer Crucibles, Molds, and Accessories .....	.68
Graphite Crucibles and Handling Equipment .....	.69
Fusion Fluxes .....	.72
Non-Wetting Agents .....	.73

Chapter Four *XRF Accessories*

Introduction .....	.76
Products for XRF	
Spec-Caps for Reinforcing XRF Pellets .....	.77
PrepAid Binders, Grinding Aid and KBr Pre-weighs .....	.79
X-Cells for XRF Liquid Samples .....	.80
Thin Film for XRF Cell Windows .....	.82
X-Ray Spectroscopy Standards .....	.85
Element Kits .....	.85
Pellements .....	.85
Sulfur Oil Standards .....	.86

**Chapter Five**
Plasticware**NEW**

Introduction	88
Products	
Autosampler Cups	89
Beakers	90
Bench Guard	91
Pre-cleaned Bottles	91
Centrifuge and Microcentrifuge Tubes	92
Funnels	93
Glass Fiber Pads	94
Gloves	94
Parafilm	95
Pipette Tips	95
Peristaltic Pump Tubing	97
Sample Bags	97
Scoops	97
Sealing Film	98
Spatulas	98
Specimen Containers	99
Laboratory Swabs	99
Test Tubes	100
Transfer Pipettes	101
Tweezers	101
Volumetric Flasks	101
Weighing Boats and Canoes	102
Weighing Dishes	103

SECTION II TECHNICAL INFORMATION**Chapter One**
Pulverizing and Blending

Introduction	106
Grinding Container Materials	107
Key Points About Grinding	112
Summary of the Many Uses for Freezer/Mills	116
Products for Pulverizing and Blending	
Boron Carbide Mortars and Pestles	119
Jaw Crusher	122
Freezer/Mills	123
Guide to Freezer/Mill Capacity	125
Micro Hammer-Cutter Mill	128
Mixer/Mills	130
Shatterboxes	136

**Chapter Two**
Pressing and Pelletizing

Introduction	142
Preparing Powder Samples for XRF	143
Particle Size Effects	143
Pressing Sample Discs	145
Care and Maintenance of Pellet Dies	146
Set-up and Loading of Pellet Dies	147
Proper Use of Spec-Cap	148
Binders	149
Anti-sticking Agents	151
Pressing the Sample Disc	152
Sample Disc Removal	153
Sample Disc Handling	154
Trouble Shooting	155
Selecting a Pellet Die	156
Choosing a Laboratory Press	157
3630 Automated X-Press	157
3624B X-Press Motorized Hydraulic Press	158
SPEX CertiPrep-Carver Manual Hydraulic Presses	158

**Chapter Three**
Fusion

Introduction	160
Preparing Fused Samples	161
Selecting a Fusion Flux	162
Additives for Fusions	163
Products for Fusions	
Fluxers	165
Graphite Crucibles	167

**Chapter Four**
XRF Accessories

Introduction	170
Reinforcing XRF Pellets	171
X-Cells for XRF	171
Selecting Thin Film Windows for XRF	172

Bibliography
Catalog Number Index
Subject Index
Questionnaire for Test Grinding of Samples
Equipment Selection and Comparison Charts
Conversion Factors
Chemical Elements and Symbols
Periodic Chart of the Elements