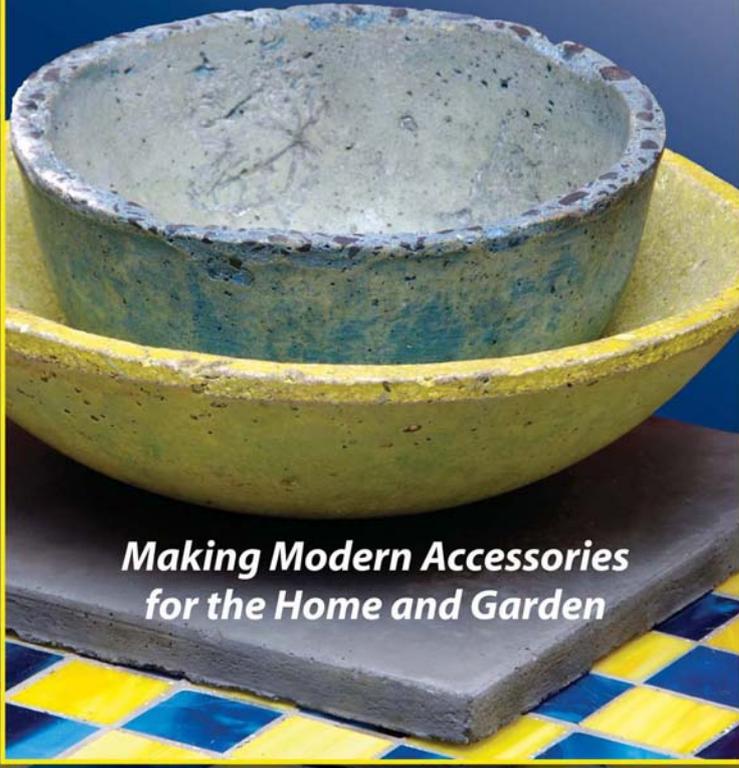


WYCHECK

CONCRETE CRAFTS

STACKPOLE BOOKS

CONCRETE CRAFTS



*Making Modern Accessories
for the Home and Garden*

Alan Wycheck

Concrete Crafts

**Making Modern Accessories
for the Home and Garden**

ALAN WYCHECK

STACKPOLE
BOOKS



0 11557 03579 7

Copyright © 2010 by Stackpole Books

Published by
STACKPOLE BOOKS
5067 Ritter Road
Mechanicsburg, PA 17055
www.stackpolebooks.com

All rights reserved, including the right to reproduce this book or portions thereof in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the publisher. All inquiries should be addressed to Stackpole Books, 5067 Ritter Road, Mechanicsburg, PA 17055.

Printed in China

10 9 8 7 6 5 4 3 2 1

First edition

Cover design by Tessa Sweigert

Library of Congress Cataloging-in-Publication Data

Wycheck, Alan.

Concrete crafts : making modern accessories for the home and garden / Alan

Wycheck. — 1st ed.

p. cm.

ISBN-13: 978-0-8117-3579-7

ISBN-10: 0-8117-3579-6

1. Handicraft. 2. House furnishings. 3. Garden ornaments and

furniture—Design and construction. 4. Concrete. I. Title.

TT910.W93 2010

745.5—dc22

2009022982

Contents

<i>Introduction</i>	iv
GETTING STARTED	1
Making Concrete	2
PROJECTS	13
1. Pavers	14
2. Tiles	30
3. Round Tabletop	51
4. Game Table	69
5. Stepping Stones	93
6. Tapered Planter	101
7. Decorative Bowls	118
CONCRETE CRAFT GALLERY	143
<i>Acknowledgments</i>	153
<i>Usage Formulas</i>	154
<i>Resources</i>	155

Introduction

This book will teach you how to make beautiful pavers, tiles, tables, bowls, and planters—all out of durable concrete. Unlike many craft books on the market, it is designed for anyone who likes to be creative and doesn't want to spend a lot of money on a new hobby. After reading the step-by-step instructions and completing the projects, you will have the necessary skills to make a variety of concrete crafts, including a concrete bowl that floats on water. All of the projects start with a simple design that you can build upon using your own creativity. It is best to read through each step of a project from start to finish before beginning that project. By doing so, you will have a good understanding of what will be required in the steps ahead, and each project will be a success.

Concrete touches our lives almost every day. We usually think of sidewalks and highways when we think of concrete; however, concrete can be beautiful as well as functional. It is the most-used man-made substance on our planet, with approximately 7 billion cubic yards used every year. To give you an idea of how much 7 billion cubic yards is, the Hoover Dam required 4.5 million cubic yards of concrete, which is enough to make a 4-foot-wide sidewalk around the entire world at the equator. And that's just one concrete project. Most concrete is used for architecture and civil engineering projects; estimates show that China uses about half of all the concrete in the world. The potential designs made with concrete are limited only by one's imagination. Although concrete is typically



Typical use of concrete.

heavy, even the issue of weight can be overcome when designing concrete products. This book is intended to introduce you to the world of concrete with practical, inexpensive projects that you can use for both function and art. These projects require basic tools that many of you probably already have, and if you don't have them, they are readily available. All of the projects can be made quickly and inexpensively. At the time of printing, a 94-pound bag of gray Portland cement costs about \$10, and a premixed 80-pound bag costs about \$5. I hope to instill in you the desire to further explore concrete crafting and come up with designs of your own.

Getting Started

Safety

Common sense is the rule when working with concrete. Use a dust mask and protective glasses when mixing concrete. Wet concrete is caustic and can cause skin irritation and burns. I tend to work with my bare hands, but if you are going to be in contact with wet concrete for long periods of time, you should definitely wear gloves. If you get concrete in your eyes, flush it out with clean water immediately. If you get it on your skin and it irritates you, wash it off with water. Cured concrete is nontoxic and as harmless as stone.

Making Concrete



Concrete is an amazing and versatile material that has been used for thousands of years. It can be made into almost any shape and size. The Egyptians used a primitive form of concrete to bond stone and brick. The Romans used it to make roadways and buildings. In our modern world, one would have a hard time making it through a day without walking on, driving over, or living with concrete. Concrete is made of three basic components: Portland cement, water, and aggregates (sand, gravel, rock, and so on). In standard concrete mixes, the amount of water

plays an important role in the hardness of the cured concrete. If too much water is added to a particular mix of concrete, it will be weaker than if the proper amount of water were added. The lightweight mixes we use in this book are not as hard or strong as the standard mixes, but they will work just fine in some projects.

The easiest way to make concrete is to purchase dry, premixed bags, which are available in home improvement stores, hardware stores, and concrete supply stores. Premixed bags range from 10 to 90 pounds, come in various name brands,



Common aggregate



On the left is 1/2 inch or smaller limestone. On the right is pea gravel, the stone aggregate typically used in premixed bags of concrete. Notice the rounded shape of the pea gravel.



Some examples of lightweight aggregates. From left to right are perlite, peat moss, and vermiculite.

and are offered in several strengths. The strength is measured in pounds per square inch (psi); pre-mixed bags range from about 2,500 psi to 6,000 psi. As mentioned earlier, the strength will be weakened if too much water is added to these dry mixes. I recommend high-strength concrete with fiber for the projects in this book. Concrete hardens to its full potential in about four weeks, at which time it can be measured for strength. The high-strength mixes I provide for you get very hard after twenty-eight days of curing.

The aggregate you choose plays a very important role in the concrete mix because it occupies the majority of the space. Aggregate is basically filler, but its different sizes, shapes, and composition affect the workability and strength of the concrete. You can typically add up to five parts aggregate; more than that will impede the concrete's workability. I recommend small limestone as an aggregate. Pea gravel, which is a rounded hard pebble, also works well, especially if it's exposed on the final project or used when making countertops with squared corners. The

rounded form of the pea gravel allows the Portland cement and sand to thoroughly fill the corners of the mold. The sharp corners in the limestone aggregate can sometimes block the smaller aggregate—the sand—from filling the corners completely. Pea gravel, however, is not as strong as limestone. Also, acrylic fiber and water reducer are commonly added for additional strength. A standard concrete mix will yield about 3,500 psi.

Before starting, you need to determine the volume of concrete required for your project. An 80-pound bag of premixed concrete will make about 0.6 cubic feet of cured concrete. In other words, an 80-pound bag will provide a 24-inch square that is 2 inches thick. A list of helpful formulas to calculate volume is provided on page 154. Always make a little more concrete than you think you need. You can always fill a small mold, like a bowl or a tile, with any extra concrete.

Mixing Prepackaged Concrete

1. Place the bag of dry concrete mix in a wheelbarrow or mixing trough.



2. Cut open the bag.



3. Dump the entire contents of the bag into the wheelbarrow.



4. Add about $\frac{3}{4}$ gallon of water to the dry mix a little at a time.



5. Use a shovel to thoroughly work the water into the dry mix.



6. Add more of the water and work it in.



7. Work all of the water into the dry mix.



8. Scrape to the bottom of the mix, and when you think it is mixed thoroughly, mix a little more.



9. Work the concrete until there is no dry mix visible. It should resemble this photo when it's ready to be used.



Concrete Recipes

Standard Concrete Mix

1 part Portland cement
2 parts sand
3 parts stone
(Fiber mesh and water reducer may also be added for increased strength)

Craft Concrete Mix

This mix is more workable than the standard mix. It creates a claylike concrete.

1 part Portland cement
2 parts sand
2 parts aggregate
1 handful of acrylic fiber (optional)
2 ounces of water reducer (not readily available, but if you can find it, use it)

Concrete recipes are measured in parts, or units. In other words, one part equals one bucket, one scoop, or one of whatever measuring device you're using. By using a 16-ounce cup as your unit (one part), you will have enough concrete to make a small bowl or planter about 12 inches in diameter, 7 inches tall, and 1 inch thick. A 5-gallon bucket (one part) will yield enough concrete to make the 22-inch tapered planter in chapter 6 with some left over. The standard concrete recipe will contain six parts of material: one of Portland cement, two of sand, and three of stone. Portland cement acts as the glue that holds all of the ingredients together.

Portland cement is typically sold in 94-pound bags that contain 1 cubic foot of material. The only difference between gray and white Portland cement is the color, which results from the oxides used in the manufacturing process. White Portland cement is manufactured with raw materials that contain less iron oxide and magnesium oxide, the ingredients that give gray Portland cement its color. White Portland cement is generally used to produce either brilliant whites or vibrant colors; the latter is achieved by using color additives. Portland cement is made from a mix of calcium carbonate (limestone), alumina, sil-

Lightweight Concrete Mix

Bowls made from this mix will actually float on water, though it's not as strong as the other mixes. The lightweight concrete mix can be used for any of the projects in this book with the exception of the tiles and pavers, which have to support foot traffic. Also known as hypertufa, this is a modern formula that holds up well in any weather. For instructions on making a hypertufa planter, see pages 115–117.

1½ parts Portland cement
2 parts horticultural perlite
2 parts sphagnum peat moss
1 pinch of fiber mesh
½ cup of acrylic bonding agent (optional)
2 ounces of water reducer (optional)
Enough water to make a claylike mixture



ica, and iron oxide. It is available in eight different types; for most common applications, Type I is used. The other types are for a variety of specific uses.

You can add up to five parts of aggregate without affecting the concrete's strength. This will depend on the strength of the aggregate, however. For instance, limestone is much stronger than perlite. More aggregate will also affect the concrete's workability. I recommend small limestone as a standard aggregate. Pea gravel also works well, especially if it's exposed on the final project, but it's not as strong as limestone. You may eventually want to experiment with different mixes and aggregates. Acrylic fiber and water reducer are commonly added for additional strength. The standard concrete mix will yield about 3,500 psi.

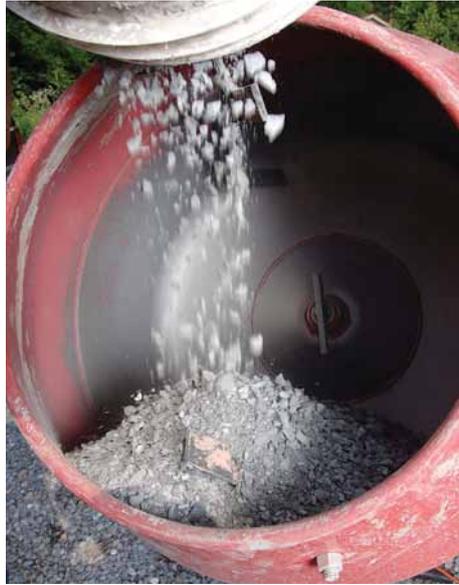
Mixing the Concrete Recipes

We will use the concrete craft recipe for this example and mix it in a small electric mixer. A wheelbarrow or mixing trough can be used instead of the electric mixer. Regardless of the mixing container that you use, choose a measuring device for the parts that will allow adequate room for mixing after all the ingredients are in your mixing container. If you use a wheelbarrow or trough, add the ingredients in the order as described in the electric mixer example, then blend them with a shovel as described in the pre-mixed concrete example on pages 4–6.



Note: Always wear a dust mask when mixing concrete!

1. Load the mixer with two buckets (parts) of limestone.



2. Turn on the mixer and saturate the stone with water.



3. Add about 2 ounces of water reducer (optional).



Your mix should look like this. Notice the foam created by the water, water reducer, and lime dust from the stone.



Note: Water reducers are commonly used in today's concrete mixes. They produce a chemical reaction during the hydration process that makes the mixture more liquid with minimal water. They range in strength and can reduce the amount of water used in a mix up to 40 percent, thereby increasing the strength of the concrete. The water reducer in this mix causes the concrete to feel more like clay.

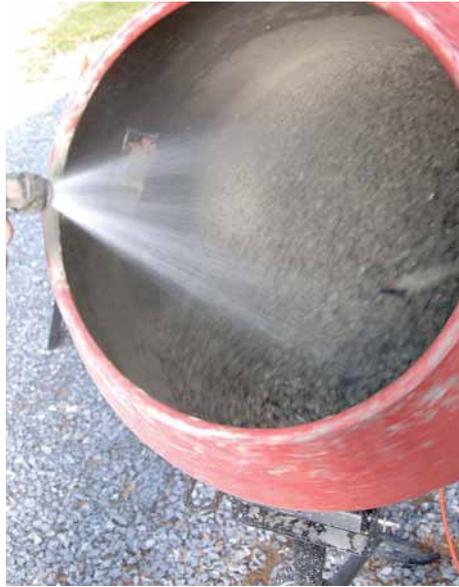
4. Slowly add one bucket (part) of Portland cement and let the mixer run for a few minutes until the cement is evenly distributed through the aggregate.



The Portland cement will cling to the stone.



5. Add more water.



At this point, the mix should look like sticky, wet clay.



Note: I recommend adding the Portland cement to the stone because the Portland cement often clumps in the bag from moisture and compression. The moving stone tends to break up these clumps.

6. Add a small handful of fiber to the mix.



7. Sprinkle the fiber into the mix a little at a time so it mixes throughout the concrete evenly.



8. Slowly add two buckets (parts) of sand.



The mix should look a little dry.



9. Add small amounts of water at a time. Remember, your concrete will be weakened if you add too much water to your mix.



The concrete should look like sticky oatmeal and peel off the sides of the mixer as it spins.



10. Optional: Add color to the mix. Allow it to mix thoroughly.



I have always had success mixing concrete using this method. Concrete recipes often call for exact amounts of water, but I have found that if you keep your mix on the dry side throughout the process, you will produce workable concrete that cures strong and hard. Be patient when you are mixing and allow the water to thoroughly mix with all of the elements in the batch. Some of the projects in this book will work better with a more liquid mixture of concrete. It is best to make concrete more liquid with the use of water reducer.

Projects

1. Pavers

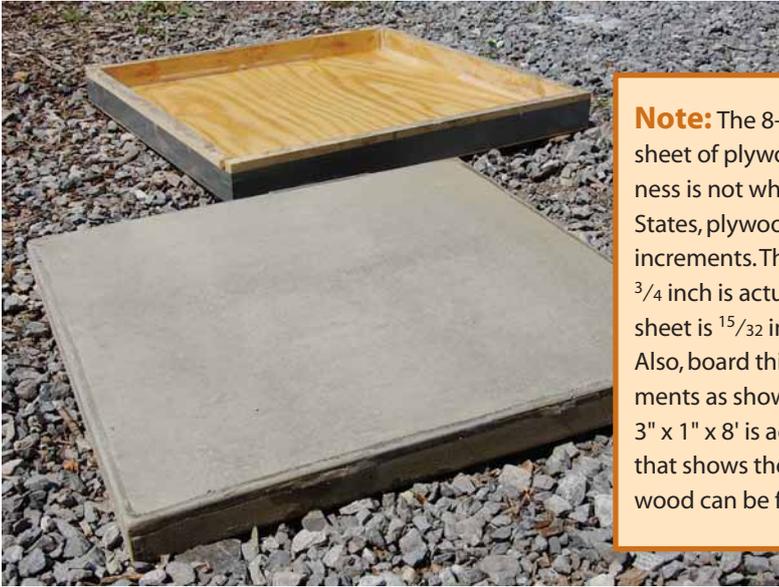


Supplies

- 3/4-inch plywood
- 3-inch x 1-inch x 8-foot boards
- 1 3/4-inch coarse drywall screws
- Concrete mold release (vegetable oil or motor oil work well)
- Fiberglass resin
- Paint roller or brush
- 100 percent silicone caulk

Making a Square Mold

The first step in shaping concrete is to make a mold into which the concrete will be poured. The following steps will teach you how to make a simple 2-foot-square mold that will render a finished paver 2 feet square by 1 3/4 inch thick. Like most of the projects in this book, your finished dimensions may vary slightly due to shrinkage, slight miscalculations, and other variables. You will find that the irregularities in all of the projects in this book are what make them beautiful and unique.



Note: The 8-foot length and 4-foot width of a sheet of plywood are fairly accurate. But the thickness is not what you may expect. In the United States, plywood is actually measured in $\frac{1}{32}$ -inch increments. Therefore, a sheet that is labeled $\frac{3}{4}$ inch is actually $\frac{23}{32}$ inch. Similarly, a $\frac{1}{2}$ -inch sheet is $\frac{15}{32}$ inch and a $\frac{1}{4}$ -inch sheet is $\frac{7}{32}$ inch. Also, board thicknesses are not exact measurements as shown on the label. A board labeled 3" x 1" x 8' is actually 2 $\frac{1}{2}$ " x $\frac{3}{4}$ " x 8'. A good chart that shows the actual dimensions of finished wood can be found at www.woodbin.com.

1. Decide how many pavers you want and the amount of wood you will need. If you want to pave a large area, make several molds at one time.

2. Select good quality $\frac{3}{4}$ -inch-thick plywood and straight 3-inch x 1-inch x 8-foot boards. I like to use $\frac{3}{4}$ -inch-thick plywood because of its durability and rigidity.



3. Get a 2 x 2-foot square of plywood.



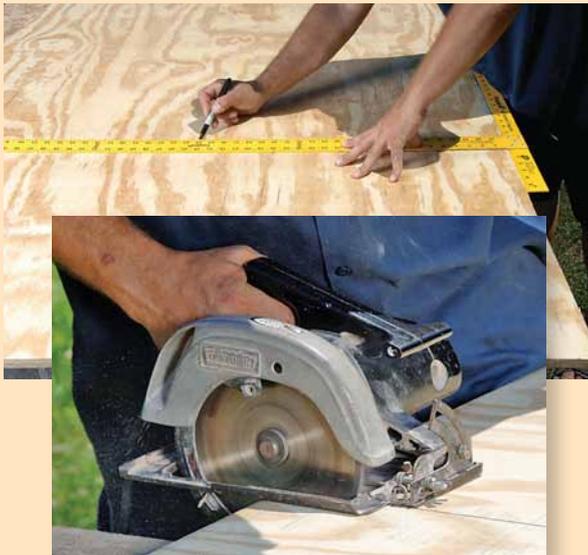
Note: Many building supply stores sell precut 2 x 2-foot plywood pieces. They also usually have a panel cutter in-house and will cut plywood for you in any size for free. But if you want to cut it for yourself, follow these steps:

1. Make sure the edges of the plywood are square, then mark 24 inches on the long side of the plywood.



2. Mark 24 inches on the short dimension of the plywood.

3. Cut out the square.



Note: If you are going to make several molds at one time, cut a 24-inch x 8-foot piece of plywood.

1. Mark 24 inches on the short dimensions of your plywood.

2. Cut the plywood along the length after marking a 24-inch reference line.



Constructing the Mold

All the surfaces of the mold that will be in contact with the concrete should be coated with fiberglass resin. I use Bondo brand, which is available in most auto parts stores. Concrete will stick to wooden surfaces even if a release agent is used. While you don't have to use fiberglass resin, if you do, your molds will last longer and, most importantly, your concrete will slip out easily.

1. Prepare the wooden surface for the fiberglass resin by brushing off any sawdust.



2. Prepare a small quantity of fiberglass resin. Carefully follow the manufacturer's instructions. Use small amounts of resin at a time because it only has about a 10-minute working time.



3. Add hardener.



4. Mix thoroughly.



5. Pour the mixed resin onto the plywood.



6. Spread the resin evenly over one side of the plywood with a smooth-surface paint roller.



7. Make sure every bit of the wood is covered.



8. Coat one side of the 3 x 1-inch boards at the same time you are coating the plywood with fiberglass resin.



9. Allow the fiberglass resin to harden, then apply a second coat.



10. Take notice of any low spots on the wood and try to make the surface as even as possible.



11. To make the mold's side pieces, mark two resin-coated 3 x 1-inch boards at 24 inches (after the resin has dried).



12. Cut the boards.



Note: We are using a miter saw to ensure our cut is square. A circular saw or a hand saw, however, will work just fine.

13. Mark two resin-coated 3 x 1-inch boards at 25½ inches.



- [click The Competent Cook](#)
- [Four Grooms and a Queen \(Murder Most Gay, Book 2.5\) pdf](#)
- [click Software for Data Analysis: Programming with R \(Statistics and Computing\) for free](#)
- [read Marx's Crises Theory: Scarcity, Labor, and Finance](#)
- [download Dietary Supplements of Plant Origin: A Nutrition and Health Approach book](#)

- <http://sidenoter.com/?ebooks/Beekeeping--A-Primer-on-Starting---Keeping-a-Hive.pdf>
- <http://tuscalaural.com/library/How-to-Build-Your-Own-Greenhouse--Designs-and-Plans-to-Meet-Your-Growing-Needs.pdf>
- <http://creativebeard.ru/freebooks/Software-for-Data-Analysis--Programming-with-R--Statistics-and-Computing-.pdf>
- <http://www.freightunlocked.co.uk/lib/Marx-s-Crises-Theory--Scarcity--Labor--and-Finance.pdf>
- <http://yachtwebsitedemo.com/books/The-Adventures-of-Tom-Sawyer--Barnes---Noble-Classics-Series-.pdf>