

GEO-SPHERE CASTING GUIDE

Step-by-Step Instructions & Techniques

Welcome to the **Geo-Sphere Casting Guide**! This guide will walk you through casting a unique 32-faced concrete geometric sphere (a truncated icosahedron) that measures approximately 9 inches in diameter. We have included both a basic method for beginners and advanced techniques for professional-grade results.

SAFETY FIRST: When working with dry concrete, always wear a dust mask, heavy-duty work gloves, and safety glasses.

Tools & Materials Checklist

Basic Essentials	Advanced Upgrades
• Two-part Geo-Sphere mold & fasteners • 27 lbs standard concrete mix (per casting) • Cold water • Fast-drying latex caulking • Large funnel (cut the tip for better flow) • Wheelbarrow or mixing bin & shovel • Paint scraper • Heat gun or hair dryer • Diamond hand polishing pads & rub brick	• 5000+ PSI High-strength concrete mix • Pure silicone caulking, paste wax & petroleum jelly (for reusable gasket) • Water reducer/plasticizer (e.g., ADVA Cast 555) • Digital scale (for exact measurements) • 5-gallon heavy-duty pail • Heavy-duty drill & mixing attachment • Wet stone polisher or diamond drill pads

Phase 1: The Basic Casting Method

Step 1: Seal and Prepare the Mold. Apply a small, continuous bead of fast-drying latex caulking along the inside of the flange holes on the lower mold shell. Set the top shell in place and bolt the two halves together (finger tight is enough). Leave the caulking to dry for at least 4 hours to create a temporary, water-tight gasket.

Step 2: Mix the Concrete. Add approximately 27 lbs of standard concrete mix to your bin. Slowly add cold water and mix with a shovel. The goal is a wet mix that blends easily without being overly watery.

Step 3: Fill the Mold. Place your large funnel into the top hole and start pouring. Use a length of wire or a wooden dowel to help the mix flow if it clogs. Give the mold a slight shake periodically to settle the mix, but do not vibrate it heavily. Once full, smooth the top with a small trowel and leave undisturbed in a warm environment (70°F is ideal) for 3 days.

Step 4: Unmold the Geo-Sphere. After 3 days, remove all fasteners. Gently apply heat to the lower cavity with a heat gun (about one minute—do not overheat). The slight expansion will free the plastic from the concrete. Pry gently with a paint scraper if needed. Flip the casting over and repeat for the top half.

Pro Tip: If you have "bug holes" (air bubbles) on the surface, make a thin paste out of portland cement and water, rub it into the holes, and scrape smooth. Wrap the casting in plastic to cure for a few weeks.

Step 5: Finish and Polish. Use the edge of a coarse concrete rub brick to carefully knock down the ridge where the mold halves met, keeping the geometric edge sharp. Follow up with diamond hand polishing pads (60 grit up to 1000 grit) to smooth out the surface. Wetting the concrete while hand polishing reduces dust. Apply an optional concrete sealer when fully dry.

Phase 2: Advanced Techniques

Once you are comfortable with the basic method, these advanced techniques will yield fewer air bubbles, a smoother finish, and a more efficient process.

1. Create a Reusable Silicone Gasket. Apply a thin coat of paste wax to the inside cavities to help release the casting later. Coat the flange of *one* half of the mold with petroleum jelly. Apply a continuous bead of 100% pure silicone to the *other* half. Gently mate the halves and loosely secure with fasteners (do not squeeze the silicone flat). Let it cure overnight. The next day, pull them apart and wipe off the jelly—you now have a reusable gasket!

2. Use a High-Strength Mix & Water Reducer. Use a 5000 or 6000 PSI concrete blend. Weigh exactly 27 lbs of mix and 2.2 lbs of water on a digital scale. Add a water reducer (like ADVA Cast 555 - 1 oz) to the water. This allows for a smooth, flowing mix with less water, creating a stronger and denser casting.

3. Power Mixing in a Pail. Add half the water and half the dry mix to a 5-gallon pail. Blend well with a heavy-duty drill mixer. Add the rest of the ingredients and blend again. This method creates a thicker, yogurt-like consistency and traps significantly less air than shovel-mixing, virtually eliminating bug holes.

4. Wet Polishing. After curing, hook up a wet stone polisher to your garden hose (or use diamond pads with a drill adapter while keeping the concrete wet). Start at a coarse 50-grit to remove the parting line and progress through finer grits. This technique brings out the aggregate for a stunning terrazzo-like finish and is completely dust-free.