```xml
<?xml version="1.0" encoding="UTF-8"?>
<enderio:recipes xmlns:enderio="http://enderio.com/recipes" xmlns:xsi="http://www.w3.
org/2001/XMLSchema-instance" xsi:schemaLocation="http://enderio.com/recipes recipes.
xsd ">

<!--

These are the built-in recipes. You cannot change this file, it is a
reference for you only and will be generated every time the game starts.

To make changes to the recipes, copy the recipes you want to change to
a file in the 'user' folder. To disable a recipe, add an attribute "disabled"
and set it to true, e.g.: <recipe name="Gear" disabled="true" />

You can also disable all built-in recipes with the setting "loadCoreRecipes"
in the Ender IO config file, so that only your files in the 'user' folder will
be loaded. Please be advised that a number of recipes are absolutely needed,
so you will have to copy those over into a 'user' file for the game to load.

Item specifications can reference an alias, an ore dictionary name, a
block or an item. You can force the type by prefixing the value with
"oredict:", "block:" or "item:". Recipes that have items that cannot be
found in-game are either skipped or an error, depending on their "required"
attribute.

More information on the syntax can be found in the recipes.xsd file. An
XML editor will display that as tooltips when editing this file.

  -->

  <!--

  Grinding Balls:
  Grinding balls provide bonus outputs and reduced power use. Using the user config
new grinding balls may be added and
  existing ones removed.

  Use of the grinding ball is restricted by the bonusType of the recipe. If it is set
to "none", it will not have any grinding
  ball bonuses applied and will not reduce the durability of any balls in the mill at
the time it is  processed. If it is set
  to "chance_only", the chance and power multipliers of the grinding balls are
applied, but not the grinding multiplier. If it
  is set to "multiply_output" (default), all multipliers apply.

  - grinding:          The recipe output will be produced this many times. e.g.
"3.14" would produce 3 copies of the complete
                       output set and a 14% chance for a forth copy.
  - chance:            The chances for the different outputs of the recipe are
multiplied with this. e.g. if a recipe specifies
                       <output name="cobblestone" chance="0.15" /> a chance
multiplier of "3.14" would make it a 47.1% chance
                       of getting one cobblestone. Results of more than 100% do not
give multiples.
  - power:             The "energy cost" of the recipe is multiplied with this.
  - durability:        This specifies how long one grinding ball will last before it
is used up. The unit is the amount of
                       power used by the SAG Mill.

    -->

<grindingball name="Flint" grinding="1.2" chance="1.25" power="0.85" durability="
24000" >
  <item name="itemFlint"/>
</grindingball>

<grindingball name="Dark Steel Ball" grinding="1.35" chance="2.00" power="0.7"
durability="125000" >
```

```xml
    <item name="ballDarkSteel"/>
</grindingball>

<grindingball name="Electrical Steel Ball" grinding="1.2" chance="1.65" power="0.8"
durability="40000" >
    <item name="ballElectricalSteel"/>
</grindingball>

<grindingball name="Energetic Alloy Ball" grinding="1.6" chance="1.1" power="1.1"
durability="80000" >
    <item name="ballEnergeticAlloy"/>
</grindingball>

<grindingball name="Vibrant Alloy Ball" grinding="1.75" chance="1.35" power="1.35"
durability="80000" >
    <item name="ballVibrantAlloy"/>
</grindingball>

<grindingball name="Redstone Alloy Ball" grinding="1.00" chance="1.00" power="0.35"
durability="30000" >
    <item name="ballRedstoneAlloy"/>
</grindingball>

<grindingball name="Conductive Iron Ball" grinding="1.35" chance="1.00" power="1.0"
durability="40000" >
    <item name="ballConductiveIron"/>
</grindingball>

<grindingball name="Pulsating Iron Ball" grinding="1.0" chance="1.85" power="1.0"
durability="100000" >
    <item name="ballPulsatingIron"/>
</grindingball>

<grindingball name="Soularium Ball" grinding="1.2" chance="2.15" power="0.9"
durability="80000" >
    <item name="ballSoularium"/>
</grindingball>

<grindingball name="End Steel Ball" grinding="1.4" chance="2.4" power="0.7"
durability="75000" >
    <item name="ballEndSteel"/>
</grindingball>

<grindingball name="Construction Alloy Ball" grinding="1.0" chance="0.33" power="0.25"
durability="12000" >
    <item name="CONSTRUCTION_ALLOY_BALL"/>
</grindingball>

<!-- Thermal Grinding Balls -->

<grindingball name="Signalum Ball" grinding="1.2" chance="1.65" power="0.35"
durability="100000" >
    <item name="SIGNALUM_BALL"/>
</grindingball>

<grindingball name="Enderium Ball" grinding="1.65" chance="1.45" power="1.25"
durability="120000" >
    <item name="ENDERIUM_BALL"/>
</grindingball>

<grindingball name="Lumium Ball" grinding="1.1" chance="2.15" power="0.9" durability="
100000" >
    <item name="LUMIUM_BALL"/>
</grindingball>

    <recipe name="Dark Steel Ball Crafting" required="true">
      <crafting>
        <grid>
```

```xml
        <item/><item name="DARK_STEEL"/><item/>
        <item name="DARK_STEEL"/><item name="DARK_STEEL"/><item name="DARK_STEEL"/>
        <item/><item name="DARK_STEEL"/><item/>
      </grid>
      <output name="DARK_STEEL_BALL" amount="24"/>
    </crafting>
  </recipe>

  <recipe name="Dark Steel Casting" required="true">
    <dependency item="tconstruct:cast_custom:2"/>
    <casting>
      <input name="DARK_STEEL_NUGGET" amount="1.875"/><!-- 30mB -->
      <cast name="tconstruct:cast_custom:2"/>
      <output name="DARK_STEEL_BALL"/>
    </casting>
  </recipe>

  <recipe name="Dark Ball Smelting" required="true">
    <dependency item="tconstruct:cast_custom:2"/>
    <smelting tinkers="true" vanilla="false">
      <input name="DARK_STEEL_BALL" amount="24"/>
      <output name="DARK_STEEL" amount="5"/>
    </smelting>
  </recipe>

  <recipe name="Dark Steel Ball Reverse Casting" required="true">
    <dependency item="tconstruct:cast_custom:2"/>
    <casting>
      <input name="ingotGold" amount="2"/>
      <cast name="DARK_STEEL_BALL" consumed="true"/>
      <output name="tconstruct:cast_custom:2"/>
    </casting>
  </recipe>

  <recipe name="End Steel Ball Crafting" required="true">
    <crafting>
      <grid>
        <item/><item name="END_STEEL"/><item/>
        <item name="END_STEEL"/><item name="END_STEEL"/><item name="END_STEEL"/>
        <item/><item name="END_STEEL"/><item/>
      </grid>
      <output name="END_STEEL_BALL" amount="24"/>
    </crafting>
  </recipe>

  <recipe name="End Steel Casting" required="true">
    <dependency item="tconstruct:cast_custom:2"/>
    <casting>
      <input name="END_STEEL_NUGGET" amount="1.875"/><!-- 30mB -->
      <cast name="tconstruct:cast_custom:2"/>
      <output name="END_STEEL_BALL"/>
    </casting>
  </recipe>

  <recipe name="End Ball Smelting" required="true">
    <dependency item="tconstruct:cast_custom:2"/>
    <smelting tinkers="true" vanilla="false">
      <input name="END_STEEL_BALL" amount="24"/>
      <output name="END_STEEL" amount="5"/>
    </smelting>
  </recipe>

  <recipe name="End Steel Ball Reverse Casting" required="true">
    <dependency item="tconstruct:cast_custom:2"/>
    <casting>
      <input name="ingotGold" amount="2"/>
      <cast name="END_STEEL_BALL" consumed="true"/>
      <output name="tconstruct:cast_custom:2"/>
```

```xml
      </casting>
    </recipe>

    <recipe name="Electrical Steel Ball Crafting" required="true">
      <crafting>
        <grid>
          <item/><item name="ELECTRICAL_STEEL"/><item/>
          <item name="ELECTRICAL_STEEL"/><item name="ELECTRICAL_STEEL"/><item name="
ELECTRICAL_STEEL"/>
          <item/><item name="ELECTRICAL_STEEL"/><item/>
        </grid>
        <output name="ELECTRICAL_STEEL_BALL" amount="24"/>
      </crafting>
    </recipe>

    <recipe name="Electrical Steel Casting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <casting>
        <input name="ELECTRICAL_STEEL_NUGGET" amount="1.875"/><!-- 30mB -->
        <cast name="tconstruct:cast_custom:2"/>
        <output name="ELECTRICAL_STEEL_BALL"/>
      </casting>
    </recipe>

    <recipe name="Electrical Ball Smelting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <smelting tinkers="true" vanilla="false">
        <input name="ELECTRICAL_STEEL_BALL" amount="24"/>
        <output name="ELECTRICAL_STEEL" amount="5"/>
      </smelting>
    </recipe>

    <recipe name="Electrical Steel Ball Reverse Casting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <casting>
        <input name="ingotGold" amount="2"/>
        <cast name="ELECTRICAL_STEEL_BALL" consumed="true"/>
        <output name="tconstruct:cast_custom:2"/>
      </casting>
    </recipe>

    <recipe name="Energetic Alloy Ball Crafting" required="true">
      <crafting>
        <grid>
          <item/><item name="ENERGETIC_ALLOY"/><item/>
          <item name="ENERGETIC_ALLOY"/><item name="ENERGETIC_ALLOY"/><item name="
ENERGETIC_ALLOY"/>
          <item/><item name="ENERGETIC_ALLOY"/><item/>
        </grid>
        <output name="ENERGETIC_ALLOY_BALL" amount="24"/>
      </crafting>
    </recipe>

    <recipe name="Energetic Alloy Casting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <casting>
        <input name="ENERGETIC_ALLOY_NUGGET" amount="1.875"/><!-- 30mB -->
        <cast name="tconstruct:cast_custom:2"/>
        <output name="ENERGETIC_ALLOY_BALL"/>
      </casting>
    </recipe>

    <recipe name="Energetic Alloy Ball Smelting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <smelting tinkers="true" vanilla="false">
        <input name="ENERGETIC_ALLOY_BALL" amount="24"/>
        <output name="ENERGETIC_ALLOY" amount="5"/>
      </smelting>
```

```xml
    </recipe>

    <recipe name="Energetic Alloy Ball Reverse Casting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <casting>
        <input name="ingotGold" amount="2"/>
        <cast name="ENERGETIC_ALLOY_BALL" consumed="true"/>
        <output name="tconstruct:cast_custom:2"/>
      </casting>
    </recipe>

    <recipe name="Vibrant Alloy Ball Crafting" required="true">
      <crafting>
        <grid>
          <item/><item name="VIBRANT_ALLOY"/><item/>
          <item name="VIBRANT_ALLOY"/><item name="VIBRANT_ALLOY"/><item name="
VIBRANT_ALLOY"/>
          <item/><item name="VIBRANT_ALLOY"/><item/>
        </grid>
        <output name="VIBRANT_ALLOY_BALL" amount="24"/>
      </crafting>
    </recipe>

    <recipe name="Vibrant Alloy Casting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <casting>
        <input name="VIBRANT_ALLOY_NUGGET" amount="1.875"/><!-- 30mB -->
        <cast name="tconstruct:cast_custom:2"/>
        <output name="VIBRANT_ALLOY_BALL"/>
      </casting>
    </recipe>

    <recipe name="Vibrant Alloy Smelting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <smelting tinkers="true" vanilla="false">
        <input name="VIBRANT_ALLOY_BALL" amount="24"/>
        <output name="VIBRANT_ALLOY" amount="5"/>
      </smelting>
    </recipe>

    <recipe name="Vibrant Alloy Ball Reverse Casting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <casting>
        <input name="ingotGold" amount="2"/>
        <cast name="VIBRANT_ALLOY_BALL" consumed="true"/>
        <output name="tconstruct:cast_custom:2"/>
      </casting>
    </recipe>

    <recipe name="Redstone Alloy Ball Crafting" required="true">
      <crafting>
        <grid>
          <item/><item name="REDSTONE_ALLOY"/><item/>
          <item name="REDSTONE_ALLOY"/><item name="REDSTONE_ALLOY"/><item name="
REDSTONE_ALLOY"/>
          <item/><item name="REDSTONE_ALLOY"/><item/>
        </grid>
        <output name="REDSTONE_ALLOY_BALL" amount="24"/>
      </crafting>
    </recipe>

    <recipe name="Redstone Alloy Casting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <casting>
        <input name="REDSTONE_ALLOY_NUGGET" amount="1.875"/><!-- 30mB -->
        <cast name="tconstruct:cast_custom:2"/>
        <output name="REDSTONE_ALLOY_BALL"/>
      </casting>
```

```xml
    </recipe>

    <recipe name="Redstone Alloy Smelting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <smelting tinkers="true" vanilla="false">
        <input name="REDSTONE_ALLOY_BALL" amount="24"/>
        <output name="REDSTONE_ALLOY" amount="5"/>
      </smelting>
    </recipe>

    <recipe name="Redstone Alloy Ball Reverse Casting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <casting>
        <input name="ingotGold" amount="2"/>
        <cast name="REDSTONE_ALLOY_BALL" consumed="true"/>
        <output name="tconstruct:cast_custom:2"/>
      </casting>
    </recipe>

    <recipe name="Conductive Iron Ball Crafting" required="true">
      <crafting>
        <grid>
          <item/><item name="CONDUCTIVE_IRON"/><item/>
          <item name="CONDUCTIVE_IRON"/><item name="CONDUCTIVE_IRON"/><item name="
CONDUCTIVE_IRON"/>
          <item/><item name="CONDUCTIVE_IRON"/><item/>
        </grid>
        <output name="CONDUCTIVE_IRON_BALL" amount="24"/>
      </crafting>
    </recipe>

    <recipe name="Conductive Iron Casting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <casting>
        <input name="CONDUCTIVE_IRON_NUGGET" amount="1.875"/><!-- 30mB -->
        <cast name="tconstruct:cast_custom:2"/>
        <output name="CONDUCTIVE_IRON_BALL"/>
      </casting>
    </recipe>

    <recipe name="Conductive Iron Smelting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <smelting tinkers="true" vanilla="false">
        <input name="CONDUCTIVE_IRON_BALL" amount="24"/>
        <output name="CONDUCTIVE_IRON" amount="5"/>
      </smelting>
    </recipe>

    <recipe name="Conductive Iron Ball Reverse Casting" required="true">
      <dependency item="tconstruct:cast_custom:2"/>
      <casting>
        <input name="ingotGold" amount="2"/>
        <cast name="CONDUCTIVE_IRON_BALL" consumed="true"/>
        <output name="tconstruct:cast_custom:2"/>
      </casting>
    </recipe>

    <recipe name="Pulsating Iron Ball Crafting" required="true">
      <crafting>
        <grid>
          <item/><item name="PULSATING_IRON"/><item/>
          <item name="PULSATING_IRON"/><item name="PULSATING_IRON"/><item name="
PULSATING_IRON"/>
          <item/><item name="PULSATING_IRON"/><item/>
        </grid>
        <output name="PULSATING_IRON_BALL" amount="24"/>
      </crafting>
    </recipe>
```

```xml
<recipe name="Pulsating Iron Casting" required="true">
  <dependency item="tconstruct:cast_custom:2"/>
  <casting>
    <input name="PULSATING_IRON_NUGGET" amount="1.875"/><!-- 30mB -->
    <cast name="tconstruct:cast_custom:2"/>
    <output name="PULSATING_IRON_BALL"/>
  </casting>
</recipe>

<recipe name="Pulsating Iron Smelting" required="true">
  <dependency item="tconstruct:cast_custom:2"/>
  <smelting tinkers="true" vanilla="false">
    <input name="PULSATING_IRON_BALL" amount="24"/>
    <output name="PULSATING_IRON" amount="5"/>
  </smelting>
</recipe>

<recipe name="Pulsating Iron Ball Reverse Casting" required="true">
  <dependency item="tconstruct:cast_custom:2"/>
  <casting>
    <input name="ingotGold" amount="2"/>
    <cast name="PULSATING_IRON_BALL" consumed="true"/>
    <output name="tconstruct:cast_custom:2"/>
  </casting>
</recipe>

<recipe name="Soularium Ball Crafting" required="true">
  <crafting>
    <grid>
      <item/><item name="SOULARIUM"/><item/>
      <item name="SOULARIUM"/><item name="SOULARIUM"/><item name="SOULARIUM"/>
      <item/><item name="SOULARIUM"/><item/>
    </grid>
    <output name="SOULARIUM_BALL" amount="24"/>
  </crafting>
</recipe>

<recipe name="Soularium Casting" required="true">
  <dependency item="tconstruct:cast_custom:2"/>
  <casting>
    <input name="SOULARIUM_NUGGET" amount="1.875"/><!-- 30mB -->
    <cast name="tconstruct:cast_custom:2"/>
    <output name="SOULARIUM_BALL"/>
  </casting>
</recipe>

<recipe name="Soularium Ball Smelting" required="true">
  <dependency item="tconstruct:cast_custom:2"/>
  <smelting tinkers="true" vanilla="false">
    <input name="SOULARIUM_BALL" amount="24"/>
    <output name="SOULARIUM" amount="5"/>
  </smelting>
</recipe>

<recipe name="Soularium Ball Reverse Casting" required="true">
  <dependency item="tconstruct:cast_custom:2"/>
  <casting>
    <input name="ingotGold" amount="2"/>
    <cast name="SOULARIUM_BALL" consumed="true"/>
    <output name="tconstruct:cast_custom:2"/>
  </casting>
</recipe>

<recipe name="Construction Alloy Ball Crafting" required="true">
  <crafting>
    <grid>
      <item/><item name="CONSTRUCTION_ALLOY"/><item/>
```

```xml
            <item name="CONSTRUCTION_ALLOY"/><item name="CONSTRUCTION_ALLOY"/><item name="
CONSTRUCTION_ALLOY"/>
            <item/><item name="CONSTRUCTION_ALLOY"/><item/>
          </grid>
          <output name="CONSTRUCTION_ALLOY_BALL" amount="24"/>
        </crafting>
      </recipe>

      <recipe name="Construction Alloy Casting" required="true">
        <dependency item="tconstruct:cast_custom:2"/>
        <casting>
          <input name="CONSTRUCTION_ALLOY_NUGGET" amount="1.875"/><!-- 30mB -->
          <cast name="tconstruct:cast_custom:2"/>
          <output name="CONSTRUCTION_ALLOY_BALL"/>
        </casting>
      </recipe>

      <recipe name="Construction Alloy Ball Smelting" required="true">
        <dependency item="tconstruct:cast_custom:2"/>
        <smelting tinkers="true" vanilla="false">
          <input name="CONSTRUCTION_ALLOY_BALL" amount="24"/>
          <output name="CONSTRUCTION_ALLOY" amount="5"/>
        </smelting>
      </recipe>

      <recipe name="Construction Alloy Ball Reverse Casting" required="true">
        <dependency item="tconstruct:cast_custom:2"/>
        <casting>
          <input name="ingotGold" amount="2"/>
          <cast name="CONSTRUCTION_ALLOY_BALL" consumed="true"/>
          <output name="tconstruct:cast_custom:2"/>
        </casting>
      </recipe>

      <!-- Thermal Grinding Balls -->

      <recipe name="Signalum Ball Crafting" required="false">
        <crafting>
          <grid>
            <item/><item name="ingotSignalum"/><item/>
            <item name="ingotSignalum"/><item name="ingotSignalum"/><item name="
ingotSignalum"/>
            <item/><item name="ingotSignalum"/><item/>
          </grid>
          <output name="SIGNALUM_BALL" amount="24"/>
        </crafting>
      </recipe>

      <recipe name="Signalum Casting" required="false">
        <dependency item="tconstruct:cast_custom:2"/>
        <casting>
          <input name="nuggetSignalum" amount="1.875"/><!-- 30mB -->
          <cast name="tconstruct:cast_custom:2"/>
          <output name="SIGNALUM_BALL"/>
        </casting>
      </recipe>

      <recipe name="Signalum Ball Smelting" required="false">
        <dependency item="tconstruct:cast_custom:2"/>
        <smelting tinkers="true" vanilla="false">
          <input name="SIGNALUM_BALL" amount="24"/>
          <output name="nuggetSignalum" amount="5"/>
        </smelting>
      </recipe>

      <recipe name="Signalum Ball Reverse Casting" required="false">
        <dependency item="tconstruct:cast_custom:2"/>
        <casting>
```

```xml
        <input name="ingotGold" amount="2"/>
        <cast name="SIGNALUM_BALL" consumed="true"/>
        <output name="tconstruct:cast_custom:2"/>
      </casting>
  </recipe>

  <recipe name="Enderium Ball Crafting" required="false">
    <crafting>
      <grid>
        <item/><item name="ingotEnderium"/><item/>
        <item name="ingotEnderium"/><item name="ingotEnderium"/><item name="
ingotEnderium"/>
        <item/><item name="ingotEnderium"/><item/>
      </grid>
      <output name="ENDERIUM_BALL" amount="24"/>
    </crafting>
  </recipe>

  <recipe name="Enderium Casting" required="false">
    <dependency item="tconstruct:cast_custom:2"/>
    <casting>
      <input name="nuggetEnderium" amount="1.875"/><!-- 30mB -->
      <cast name="tconstruct:cast_custom:2"/>
      <output name="ENDERIUM_BALL"/>
    </casting>
  </recipe>

  <recipe name="Enderium Ball Smelting" required="false">
    <dependency item="tconstruct:cast_custom:2"/>
    <smelting tinkers="true" vanilla="false">
      <input name="ENDERIUM_BALL" amount="24"/>
      <output name="nuggetEnderium" amount="5"/>
    </smelting>
  </recipe>

  <recipe name="Enderium Ball Reverse Casting" required="false">
    <dependency item="tconstruct:cast_custom:2"/>
    <casting>
      <input name="ingotGold" amount="2"/>
      <cast name="ENDERIUM_BALL" consumed="true"/>
      <output name="tconstruct:cast_custom:2"/>
    </casting>
  </recipe>

  <recipe name="Lumium Ball Crafting" required="false">
    <crafting>
      <grid>
        <item/><item name="ingotLumium"/><item/>
        <item name="ingotLumium"/><item name="ingotLumium"/><item name="ingotLumium"/>
        <item/><item name="ingotLumium"/><item/>
      </grid>
      <output name="LUMIUM_BALL" amount="24"/>
    </crafting>
  </recipe>

  <recipe name="Lumium Casting" required="false">
    <dependency item="tconstruct:cast_custom:2"/>
    <casting>
      <input name="nuggetLumium" amount="1.875"/><!-- 30mB -->
      <cast name="tconstruct:cast_custom:2"/>
      <output name="LUMIUM_BALL"/>
    </casting>
  </recipe>

  <recipe name="Lumium Ball Smelting" required="false">
    <dependency item="tconstruct:cast_custom:2"/>
    <smelting tinkers="true" vanilla="false">
      <input name="LUMIUM_BALL" amount="24"/>
```

```xml
      <output name="nuggetLumium" amount="5"/>
    </smelting>
  </recipe>

  <recipe name="Lumium Ball Reverse Casting" required="false">
    <dependency item="tconstruct:cast_custom:2"/>
    <casting>
      <input name="ingotGold" amount="2"/>
      <cast name="LUMIUM_BALL" consumed="true"/>
      <output name="tconstruct:cast_custom:2"/>
    </casting>
  </recipe>

</enderio:recipes>
```