Energy Efficiency: Using a Standard Wood Stove

(General)

Safety First

Inspect your wood stove and chimney before use each season. Clean, repair and upgrade it to be safe before using it.

Never Burn These in a Wood Stove

These things cause toxic fumes:

- Treated or coated wood
- Magazines and colored paper
- Wood pallets
- Cardboard
- Trash
- Driftwood (metal salts from being in the water can cause toxic fumes)
- Lighter fluid - produces toxic fumes and the extra heat can damage your chimney liner.

About Firewood

Firewood will burn more efficiently and be more convenient to use if it is properly seasoned.

- Firewood should be cut and split in early spring to be ready for burning that fall. (If it is not split, it may take longer.)
- Piece length should be at least 3” shorter than the firebox. (14” to 16” is a good length.)
- Split the logs to a variety of sizes, from 3” to 6” across. (Most commercial firewood is not split small enough for convenient fire management.)
- Never leave firewood in a pile on the ground for more than a couple of days. Wet wood on the ground quickly attracts bugs and mould. Stack wood on rails to keep it off the ground.
- Wood should be stacked in an open area exposed to sun and wind to dry. Green wood can take twice as long to season in a wood shed or in deep shade.
- Cover just the tops of firewood stacks for good air circulation.
- Avoid stacking more than four feet high because tall piles become unstable.
- When seasoned, usually by late September, the wood can be moved to winter bulk storage where it should be fully sheltered from rain and snow.
- Bring in wood to warm up before burning, but only one or two week’s supply at a time.
- Avoid storing large amounts of wood in the house because mould spores and moisture can affect indoor air quality.
- Be sure to have a collection of dry tinder and kindling ready to go.

Tinder

Tinder easily lights and is small, ranging from just mere shavings up to twigs no thicker than a pencil, including:

- Dry, dead grass
- Dead leaves
- Wood shavings
- Pine needles
- Various tree bark
- Cotton balls
- Dryer lint
- Newspaper (avoid color or gloss print)

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Kindling

Kindling is wood that is a step up, ranging from pencil thickness to about thumb thickness.

It is still pretty combustible, but it needs the heat from the tinder to get it started.

Once it’s lit, it lasts longer than tinder does and is used to bridge the gap between tinder and your larger firewood.

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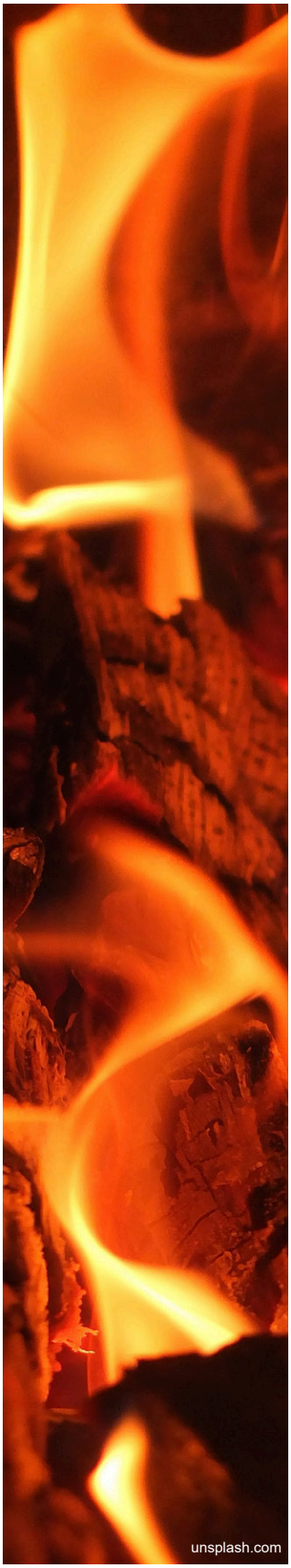
Get Extra Help with Fire Starters

- Tea lights or other candles (just set on top of kindling to boost heat.)
- Commercial fire starters
- Home-made fire lighters made from egg cartons, etc. See:

HOW TO MAKE 7 AMAZING DIY FIRE STARTERS

https://compareoutdoorgear.com/fire-starter/



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How To Build An Easy Starting Fire

1. Before building a fire, remove excess ash from the firebox; never let ash build up to more than two inches.
2. Open the air control fully and open the bypass damper if the stove has one.
3. **It is important to start with a small kindling fire to quickly heat up the chimney and the firebox to get air moving up the chimney.** The draw of this air will keep your fire going and prevent a cold downdraft from pouring smoke into the room.
4. The edges of firewood pieces heat up and ignite first. The more edges close together in your kindling fire, the faster it will ignite.
5. There are different ways to set the wood into the firebox. This method takes advantage of heat rising
   - Place two split logs parallel to each other in the firebox with a space between. (Again, closer edges produce more heat so do not space too far apart.)
   - Fill the space with newspaper or tinder.
   - Place several pieces of kindling crosswise on top.
   - Place some small logs crosswise across the large kindling
   - Light the paper at the bottom.
   - (You may need to leave the door open a bit while it gets started. Do not leave it unattended until you can close the door.)
6. Leave the air control wide open until the firebox is full of flame. Turn down the air in two or three stages.

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How To Maintain Your Wood Fire

1. Prevent the wood from smoldering which leads to creosote build-up in the chimney and more air pollution. There will be little visible smoke if the wood burns with bright, active flames.
2. Avoid adding a log each hour trying for a steady heat output. Wood burns best in cycles. A cycle begins when a new load of wood is placed behind a coal bed and ends when that wood is reduced to a similar-sized coal bed.
3. To produce low heat output in mild weather, use small loads of soft wood placed in a crisscross formation.
4. To produce high heat output in cold weather, use larger loads of hard wood placed compactly in the firebox.
5. Long burn times are not efficient. In fact, peak heating is usually achieved with burn cycles of eight hours or less.

Dealing With Wood Ashes

1. Remove a small amount of ash frequently. During 24 hour heating in cold weather, a small amount of ash can be removed each morning before the new fire is kindled.
2. Ashes often contain live coals which can stay hot and give off carbon monoxide for days. So, put ashes in a metal container with a lid and place it outside the house on a concrete surface and away from combustible materials.
3. Some ash can be used in the garden and compost piles to provide nutrients and reduce acidity. Some people use ashes to provide traction on icy driveways and sidewalks. Excess wood ash can be taken to garbage disposal sites.

Restarting From Coals

1. After an overnight fire you will find the remaining coals at the back of the firebox, furthest from the combustion air inlet. This is the time to remove a small amount of ash.
2. Avoid spreading the charcoal out because this can lead to smoldering before the wood ignites.
3. Instead, rake the coals towards the air inlet. (For most stoves, this is at the front where the loading door is.)
4. Place logs behind the coals with some small, dry pieces directly on the coal bed to help ignite it.

Why Upgrade To An EPA Certified Stove?

Although the EPA (Environmental Protection Agency) test for wood stoves was created to reduce air pollution, it resulted in added benefits

- On average, they are one-third more efficient so you need less wood.
- They help burn the smoke more before it leaves the firebox, producing more heat and less air pollution.
- Less smoke means less creosote (which is condensed smoke) in your chimney. This means less cleaning and more safety from chimney fires.
- They are easier to light and burn more reliably.

DID YOU KNOW?

Wood Doesn't Actually "Burn"

100°C - The water in the wood begins to boil and evaporate. (Evaporation takes a lot of energy.)

260°C - Wood starts to break down chemically and give off organic gases.

280°C - Gases released from wood begin to burn and continues toward 480° C, releasing of a large amount of energy ("primary combustion").

590°C and higher - This temperature is only reached if there is enough oxygen. This "secondary combustion" burns off even more gases that contain up to 60% of the potential heat in the wood. This is when you have a very clean and efficient burn.

(So, it is the gases that burn, not the wood directly. That's why you have to use tinder and kindling to get wood hot to get the fire to properly start.)