Product	Supplier	Cost	Item #	
1 1/2" X 1/2" X 1 1/2" Reducing Tee	McMaster-Carr	$10.03	68115K83	http://www.mcmaster.com/#68115k83/=11tfnv
1 1/2" X 1" Hex Bushing	McMaster-Carr	$3.61	44605K286	http://www.mcmaster.com/#44605k286/=11tfrz
1 1/2" X 10" Black Pipe Nipple	McMaster-Carr	$7.31	44615K538	http://www.mcmaster.com/#catalog/115/40/=129zcl
1 1/2" X 1/2" Reducing Coupling	McMaster-Carr	$6.34	44605K326	http://www.mcmaster.com/#44605k326/=11tg09
1/2" Black 90° Street Elbow	Home Depot	$1.61	SKU #103691	In-Store
(2X) 1/2" X 1 1/8" Black Pipe Nipple	Home Depot	$1.30	SKU #104523	In-Store
1/2" Black Pipe Union	Home Depot	$4.42	SKU #103713	In-Store
4,500W 240V Hot Water Heater Element (wired for 120V)	Home Depot	$9.67	SKU #296915	In-Store
Pipe Wrap Insulation Tape (Frost King)	Home Depot	$5.03	SKU #517666	In-Store
6' Extension Cord (HOT & NEUTRAL wires; 13Amp)	Home Depot	$0.96	SKU #145017	In-Store
Liquid Teflon Pipe Sealant	Home Depot	$1.94	SKU #415014	In-Store
Ring Terminals (14-16 gauge)	Home Depot	$0.99	SKU #975065	In-Store
1/2" Gate Valve (Optional)	Home Depot	$5.57	SKU #703946	In-Store
TOTAL FOR DO-IT-YOURSELF HEATER		**$58.78**		
6' Extension Cord (HOT & NEUTRAL wires; 13Amp)	Home Depot	$0.96	SKU #145017	In-Store
Power Strip- 4 outlet (15AMP)	Harbor Freight	$3.99	91334	In-Store
Digital Timer (15Amp)	Harbor Freight	$8.99	95295	In-Store
110V 1/2" Stainless Steel Viton Electric Ball Valve (Rated 1,000GPH H_20; 210°F MAX)	Absolute Centrifuge	$85.00	Electric Ball Valve	http://www.absolutecentrifuge.com/specifications.aspx
TOTAL FOR DO-IT-YOURSLEF AUTOMATED CENTRIFUGE + HEATER		**$157.72**		

Heater Assembly Instructions:

This heater assembly plumbs into the merchant coupling located in the back of the centrifuge and will vertically hang lower than the installed centrifuge, please take this into account when designing your centrifuge installation. Due to the dirty nature of the waste oil an electric ball valve must be used, a solenoid can only be used if distributing clean waste oil.

Plug the digital timer directly into the wall socket (or into an extension cord plugged directly into the wall socket) and plug the power strip directly into the digital timer. The centrifuge, heater, and electric ball valve must be plugged directly into this power strip which will be controlled by the digital timer. This configuration will allow you to set the timer to any length of time (e.g. 2 hours) in which the centrifuge, heater, and oil flow (electric ball valve) will be fully operational, once this period of time elapses the digital timer will simultaneously shut off the centrifuge, heater and electric ball valve. This process ensures that the centrifuge and the heater will not contribute to unnecessary energy consumption, while turning off the electric ball valve will eliminate dirty oil from flowing into the non-operational centrifuge.

(*Liquid Teflon pipe sealant should be used on all connecting threads.) Thread the pipe into one end of the reducer tee, and the hex bushing into the opposite end. Then thread the hot water heating element into the hex bushing making sure that the heater element does not rest against the inside wall of the pipe, if so, remove and carefully bend the heater element accordingly. Next, thread the reducing coupler onto the opposite end of the pipe and then thread the street elbow into the top of the reducing coupler. While the heater is not connected to the centrifuge, wrap the pipe, tee, and reducing coupling with the pipe insulation tape so that it has a double layer of insulation. After the heater is insulated cut off the female plug end off of the 6' extension cord, strip the two wires, and crimp a pair of ring terminals to the ends of these two wires. Connect each ring terminal to different posts located on the end of the heater element (it does not matter which post the HOT or NEUTRAL wire is connected to). It is this wire connected to the heater element that will be one of the 3 items plugged into the power strip. In order to connect the heater to the centrifuge you must thread one of the pipe nipples into the elbow then thread the other into the centrifuge with the union threaded in-between the two of them. Once the heater is connected to the centrifuge, thread the electric ball valve into the ½" end of the reducer tee. Now it is time to plumb the Feeder Tank hose (or PVC) to the heater, the electric ball valve is plumbed in-between the Feeder Tank and the heater (this ensures that the oil flow is eliminated when the power is shut off). We recommend using a gate valve (optional) upstream from the heater in order to adjust the flow rate into the centrifuge (this can be located either before or after the heater/electric ball valve assemby). A flow rate of ~10 gallons/hour will equal a processing temperature of ~150°F (if starting from an ambient temperature of ~65°F). This flow rate can be accomplished by adjusting the gate valve, using a measuring cup and a stop watch (to measure the amount of oil coming out of the centrifuge over a given period of time), and by referring to the flow rate table in the centrifuge instruction manual.