



Manufacturing Green in Precision Metalworking

NTMA Technology Team Best Practice

When we think about our shops being green we feel that it would cost more that it would benefit us. In reality, becoming green can actually save you company money. There are many simple and commonsense green things that we all can do with very little effort. The following NTMA Green Program will help give you ideas on manufacturing green. If we all become a little greener we can make a difference. A Green Manufacturing Worksheet that your company can use to monitor green activities is also available.

Landscaping - Using native plants can reduce the watering. Keep the grass over 2" long. Capture rainwater from your down spouts to use to water plants and grass.

Lights - Changing out fluorescent tubes to T8, and replacing the transformer to digital will reduce heat and lighting cost. Turning off lights when not in use will help. Motion activated lights switches that turn on and off based on motion in restrooms, lunch, storage rooms and offices will reduce energy. External spot or floodlights with photo and/or motion sensors to control the lights during night will also reduce costs.

Natural Lighting - Adding windows to bring in light will reduce energy. At night and in summer, shades will improve the heat or cooling loss.

Windows - Replacing old outdated single pane windows will save energy.

Computers - Turn off and unplug computers at night reduces energy and may eliminate any damage from night electrical storms. Replacing the old CRT monitors with Flat screens will reduce energy and heat. Use power strips to easily power down computers, printers and monitors.

Machines - Power down all unused equipment. Equipment that is powered up and not running still draws power.

Chargers - Unplug all device and/or battery chargers when not being used; they draw power even if not used.

Water based Coolants - Use vegetable or biodegradable coolants; they require less chip washing. Use a tramp oil skimmer and water evaporator to reduce disposal costs. You can make an evaporator using a 55 gal., steel drum and a drum heater. Caution: Set this up in a metal out building as there is always the possibility of a fire.

Cutting Oils - Use vegetable or biodegradable coolants. Petroleum or synthetics add to disposal cost and are not renewable. Using reduced volume applicators or spray units can in some cases reduce cutting fluid usage by a factor of ten or more. On light duty work add plastic blocks to the coolant tank to reduce volume. Note: This might cause the coolant to heat up faster affecting the part thermal expansion.

Chips - Always recycle chips, even in the smallest amount. Using vegetable or biodegradable coolants, makes the storage and selling of chips easier. For large chip generators, invest in a chip compressor to reduce storage and create higher resale value.

Waste water - If possible skim and filter your wastewater. Even running it through a settlement tank will reduce metals getting into the treatment plants.

Wipes vs. shop rags - The reusable shop rag should be used over disposal wipes. However, if using wipes, they should be made from recycled products.

Part cleaning - Change from solvents to biodegradable cleaners such as Simple Green. Using ultrasonic cleaners will clean parts faster than solvents.

Part drying - Air drying instead of using heat or compressed air is a slower process, but uses much less energy.

Paper - Reduce paper usage by using email, which should help reduce the need to make copies. Making drawings, specifications and manuals into electronic copies will reduce paper usage.

Housekeeping - Repairing leaking shields and tanks will reduce cleanup cost and materials. Use catch trays to catch coolant or oil instead of oil dry. Use reusable socks or mats to absorb coolant or oil.

Shipping - Reusing shipping boxes for shipping to outside services or for in house product storage reduces purchasing of new product. Using shredded paper from your office will reduce packing costs. Reusable shipping container will help also. When purchasing new pallets, consider recycled plastic; they will out last wood. Old wood pallets can be given away as firewood instead of going in the landfill.

Travel - Reduce trips to your customers by using teleconferencing or video conferencing. Grouping trips together will reduce airline flights. Attend online webinars instead of attending trade shows to review new products.

Part handling - Recycling of cardboard boxes when possible or purchase recycled plastic totes.

Lunch Room - Setup recycling bins to aide in sorting recyclables.

Recycle - Waste oil, chips, paper, cardboard boxes, wood pallets and food containers should all be recycled when ever possible.

Raw Material - Purchasing much more raw material than needed creates the need to make more material, including transporting and storing it, all of which is not very green. Recycle cutoffs.

Tools - Carbide tools and insert can be sold and recycled. Larger tools can be re-sharpened instead of disposed of.

Lean - Less traveling of the product or employee reduces resources and floor space. Using 6S lean and manufacturing cell concepts can also reduce wasted time and travel.

Equipment - Equipment sized for the job; if the equipment is 4x larger than the average job, it will cost more to operate and wastes floor space. Older equipment cost more to operate.

Air System - Review your compressed air requirements yearly or use a variable screw compressor that will adjust for the demand. Every six months or less, walk the complete air system looking for leaks. Leaking air can overtax your compressor.

Maintenance - Replacing filters will keep air cleaner. Maintaining the equipment will make the equipment run more efficient, thus using less power. Keep the floors clear of chips. Reduce cross contamination of different materials of chips producing a higher recycle payback.

Environmental - Using air and mist filters keeps the environment cleaner. Not storing chips or waste product outside reduces the impact on our environment.

Reducing Scrap - This is one green item that we all actually strive for. A good quality system and properly training employees will aid in the reduction of scrap. Try to enforce "Check twice and cut once".

Extra Credit – Lastly, for those who are really looking to turn green, install geothermal heating / cooling, solar heat, solar cells and wind power. These are the ultimate systems for reducing energy costs.

Conclusion - You are probably already engaged in green manufacturing and did not even know it. Please use the audit to monitor your companies green manufacturing results. It would be a much healthier world we can all do a little to reduce our carbon footprint.