

DIRTT

No Paper This Time

Paperless Marketing & Specifying

From inception, DIRTT chose not to create printed materials beyond business cards. Our on-line brochures are four pages each. We have seven in all. The brochures are full color, filled with photographs of DIRTT projects. We also have a one-page case study delivered to weekly subscribers showing real-life applications of DIRTT Walls.

For specifying, we don't have a catalog, paper or otherwise. Instead we use intelligent, object oriented, 3D software called ICE®. It automatically does all the specifying for the designer. Every part and piece is audited and priced as the design is drawn. Every modification is updated in elevation, 3D, parts list and the quote. All that information is fed directly to the production facilities and machinery.

Lifecycle Environmental Impact

The following gives you an idea of how many trees, how much energy and water it would take to print these tools (excluding delivery). Brochures are generally high-end, heavy paper with a glossy finish. Supplying them to design firm libraries and clients, plus tradeshow would require a minimum print-run of 25,000 of each. Similar paper would be used for FreshDIRTT, with 9000+ going out weekly.

For the catalogs, we estimate, if we didn't have ICE software we would likely have six product catalogs (450 pages) and a (250 page) spec guide on a newsprint quality paper with recycled content. They would be completely republished every two years after sending out several smaller update inserts. (As our Walls are completely parametric, without standard sizes, these are conservative numbers.)

We used the [Environmental Defense Fund Paper Calculator](#) to add up the wood, water, energy use and pollutants we saved by not printing. It is an excellent and comprehensive tool available to everyone.





National Averages

Brochures

Coated Freesheet
(e.g. high-end catalog)
110 tons 10% recycled.

FreshDIRTT

Coated Freesheet
(e.g. high-end catalog)
45 tons 10% recycled.

Catalogues

Uncoated Groundwood
(e.g. newsprint)
425 tons 50% recycled.

Wood Use	305 tons	125 tons	546 tons
Net Energy	3,111 million BTU's	1,273 million BTU's	10,667 million BTU's
Purchased Energy	2,307 million BTU's	944 million BTU's	10,409 million BTU's
Sulfur dioxide (SO ₂)	2,906 pounds	1,189 pounds	11,543 pounds
Greenhouse Gases	650,623 lbs CO ₂ equiv.	266,164 lbs CO ₂ equiv.	2,121,440 lbs CO ₂ equiv.
Nitrogen oxides (NOx)	980 pounds	401 pounds	4,144 pounds
Particulates	539 pounds	220 pounds	1,478 pounds
Hazardous Air Pollutants (HAP)	253 pounds	103 pounds	596 pounds
Volatile Organic Compounds (VOCs)	269 pounds	110 pounds	576 pounds
Total Reduced Sulfur (TRS)	36 pounds	15 pounds	94 pounds
Wastewater	2,063,796 gallons	844,280 gallons	6,185,593 gallons
Biochemical Oxygen Demand (BOD)	685 pounds	280 pounds	2,488 pounds
Total Suspended Solids (TSS)	1,962 pounds	802 pounds	4,532 pounds
Chemical Oxygen Demand (COD)	1,925 pounds	787 pounds	8,603 pounds
Adsorbable Organic Halogens (AOX)	7 pounds	3 pounds	9 pounds
Solid Waste	244,494 pounds	100,020 pounds	564,658 pounds

Explanation of Data Values

The Paper Calculator is based on research done by the Paper Task Force, a peer-reviewed study of the lifecycle environmental impacts of paper production and disposal.

Wood Use

Wood use measures the amount of wood required to produce a given amount of paper. The number of typical trees assumes a mix of hardwoods and softwoods 6-8" in diameter and 40' tall. Calculated collaboratively by Conservatree and Environmental Defense based on data from Tom Soder, Pulp & Paper Technology Program, University of Maine, as reported in Recycled Papers: The Essential Guide, by Claudia G. Thompson, The MIT Press, 1992.

Brochures	FreshDIRTT	Catalogs
305 tons	125 tons	546 tons
2,134 trees	873 trees	3,821 trees

Net Energy

The Paper Calculator includes an energy credit for energy that is created by burning paper – or the methane that decomposing paper creates – at the end of its life. The Net Energy takes the total amount of energy required to make the paper over its life cycle, and subtracts this energy credit. If most of the energy used to make the paper is purchased, then the energy credit might make the Net Energy lower than the Purchased Energy. The average U.S. household uses 91 million BTUs of energy in a year.

Brochures	FreshDIRTT	Catalogs
3,111 million BTU's	1,273 million BTU's	10,667 million BTU's
34 homes/year	14 homes/year	117 homes/year

Purchased Energy

A subset of total energy, purchased energy measures how much energy comes from purchased electricity and other fuels. The unit of measure is British Thermal Units (BTUs). The average U.S. household uses 91 million BTUs of energy in a year.

Brochures	FreshDIRTT	Catalogs
2,307 million BTU's	944 million BTU's	10,409 million BTU's
25 homes/year	10 homes/year	114 homes/year

Sulfur Dioxide (SO₂)

Chemical compound produced when boilers burn fuel that contains sulfur. Of the fuels used in the paper industry, oil and coal generally contain the highest quantities of sulfur. Sulfur dioxide contributes to air pollution problems like acid rain and smog. The average 18-wheel truck emits 5.5 pounds of SO₂ in a year.

Brochures	FreshDIRTT	Catalogs
2,906 pounds	1,189 pounds	11,543 pounds
528 18-wheelers/year	216 18-wheelers/year	2,099 18-wheelers/year

Greenhouse Gases

Greenhouse gases including carbon dioxide (CO₂) from burning fossil fuels and methane from paper decomposing in landfills, contribute to climate change by trapping energy from the sun in the earth's atmosphere. The unit of measure is CO₂.

Brochures	FreshDIRTT	Catalogs
650,623 lbs CO ₂ equiv.	266,164 lbs CO ₂ equiv.	2,121,440 lbs CO ₂ equiv.
59 cars/year	24 cars/year	193 cars/year

Nitrogen Oxides (NO_x)

Nitrogen Oxides (NO_x, which include NO and NO₂) are products of the combustion of fuels that contain nitrogen. NO_x contribute to acid rain and can react with volatile organic compounds and sunlight in the lower atmosphere to form ozone, a key component of urban smog. The average 18-wheel truck emits 261 pounds of NO_x in a year.

Brochures	FreshDIRTT	Catalogs
980 pounds 4 18-wheelers/year	401 pounds 2 18-wheelers/year	4,144 pound 16 -wheelers/year

Particulates

Particulates are small particles generated during combustion, and pose a range of health risks, including asthma and other respiratory problems, when inhaled. The average urban bus emits 11.2 pounds of particulate matter in a year

Brochures	FreshDIRTT	Catalogs
539 pounds 48 buses/year	220 pounds 20 buses/year	1,478 pounds 132 buses/year

Hazardous Air Pollutants (HAP)

Hazardous Air Pollutants are any of a group of 188 substances identified in the 1990 Clear Air Act amendments because of their toxicity.

Brochures	FreshDIRTT	Catalogues
253 pounds	103 pounds	596 pounds

Volatile Organic Compounds (VOCs)

Volatile Organic Compounds (VOCs) are a broad class of organic gases, such as vapors from solvent and gasoline. VOCs react with nitrogen oxides (NO_x) in the atmosphere to form ground-level ozone, the major component of smog and a severe lung irritant.

Brochures	FreshDIRTT	Catalogs
269 pounds	110 pounds	576 pounds

Total Reduced Sulfur (TRS)

Total Reduced Sulfur compounds cause the odor associated with kraft pulp mills. Exposure to TRS emissions has been linked to symptoms including headaches, watery eyes, nasal problems, and breathing difficulties.

Brochures	FreshDIRTT	Catalogs
36 pounds	15 pounds	94 pounds

Wastewater

Wastewater measures the amount of process water that is treated and discharged to a mill's receiving waters. Wastewater volume indicates both the amount of fresh water needed in production and the potential impact of wastewater discharges on the receiving waters. 1 Olympic-sized swimming pool holds 660,430 gallons.

Brochures	FreshDIRTT	Catalogs
2,063,796 gallons 3 swimming pools	844,280 gallons 1 swimming pool	6,185,593 gallons 9 swimming pools

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand (BOD) measures the amount of oxygen that microorganisms consume to degrade the organic material in the wastewater. Discharging wastewater with high levels of BOD can result in oxygen depletion in the receiving waters, which can adversely affect fish and other organisms. Average home discharges 186 pounds of Biochemical Oxygen Demand (BOD) in a year.

Brochures	FreshDIRTT	Catalogs
685 pounds	280 pounds	2,488 pounds
4 homes/year	2 homes/year	13 homes/year

Total Suspended Solids (TSS)

Total suspended solids (TSS) measure solid material suspended in mill effluent, which can adversely affect bottom-living organisms upon settling in receiving waters and can carry toxic heavy metals and organic compounds into the environment. The average home discharges 207 pounds of Total Suspended Solids (TSS) in a year.

Brochures	FreshDIRTT	Catalogs
1,962 pounds	802 pounds	4,532 pounds
9 homes/year	4 homes/year	22 homes/year

Chemical Oxygen Demand (COD)

Chemical Oxygen Demand (COD) measures the amount of oxidizable organic matter in the mill's effluent. Since wastewater treatment removes most of the organic material that would be degraded naturally in the receiving waters, the COD of the final effluent provides information about the quantity of more persistent substances discharged into the receiving water. The average home discharges 465 pounds of Chemical Oxygen Demand (COD) in a year.

Brochures	FreshDIRTT	Catalogs
1,925 pounds	787 pounds	8,603 pounds
4 homes/year	2 homes/year	19 homes/year

Adsorbable Organic Halogens (AOX)

Adsorbable Organic Halogens (AOX) are an indirect measure of the quantity of chlorinated organic compounds in mill effluent, many of which are toxic and may persist in the environment.

Brochures	FreshDIRTT	Catalogs
7 pounds	3 pounds	9 pounds

Solid Waste

Solid Waste includes sludge and other wastes generated during pulp and paper manufacturing, and used paper disposed of in landfills and incinerators. 1 fully-loaded garbage truck weighs an average of 28,000 pounds (based on a rear-loader residential garbage truck).

Brochures	FreshDIRTT	Catalogs
244,494 pounds	100,020 pounds	564,658 pounds
9 garbage trucks	4 garbage trucks	20 garbage trucks



Environmental impact estimates were made using the Environmental Defense Fund Paper Calculator. For more information visit <http://www.papercalculator.org>.

The Paper Calculator is based on research done by the Paper Task Force, a peer-reviewed study of the lifecycle environmental impacts of paper production and disposal.