

Environmental Sustainability: Agile Architectural Interiors Vs Conventional 2

The Business Case for Sustainability 4

Materials & Manufacturing 7

LEED 11

DIRTT projects of the heart 12

Acting Locally, Thinking Globally 13

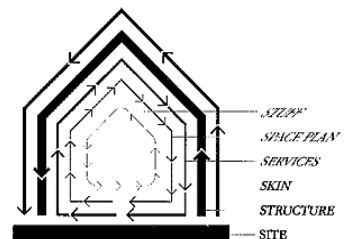
DIRTT and the Environment

This Time I will be responsive and responsible.



North American commercial buildings are among the world's worst abusers of materials, resources and the atmosphere. The area deserving the most blame is **The Office Interior**. This is also where the most important environmental advances can be made, which also happen to result in excellent economic benefits.

Workspaces must change as businesses evolve. But if built conventionally, they create huge amounts of waste through the barbaric 'churn and burn' of construction, renovation and demolition. Plus, workspace is often initially built using more real estate than necessary. And of course, if you look into the windows of any office high rise you will inevitably see wasteful lighting and heat emitting CRT computers.



“How Buildings Learn” – interior is where the most change occurs

DIRTT's *Agile Architectural Solutions* save space, adapt easily to change and have initial and on-going custom abilities that take environmental and economical sustainability far beyond conventional construction and even current environmental measurement systems.

The environmental mandate of DIRTT is based on the behavior of its solutions. Movable walls, low-profile access floors, modifiable furniture and modular power are all built on the principles of **Reduce and Reuse**. Through thoughtful engineering and design, we reduced the materials in our solutions. DIRTT's parametric design and engineering go on to allow end-users to reduce their real estate footprint and energy use, while still keeping employees productive and comfortable.

After move-in, DIRTT's simple and easily adjusted solutions then allow end-users to reconfigure and reuse their architectural elements, technology and furniture over and over without sending waste to the landfill. Further, DIRTT's mandate is also to make responsible material and process choices and after several years of reuse, DIRTT products are designed to be dismantled at the end of their life for clean recycling.

DIRTT recently received the *Excellence In Partnership Award for Industry Green Contractor* from the U.S. Coalition for Government Procurement and GSA members.

Agile Architectural Solutions and Sustainability

- A Design Team that understands the opportunities of Modular Interior Construction can help you choose a more efficient **footprint** that supports employee comfort
 - Discourages urban sprawl
 - Reduces real estate that needs maintaining, heating and cooling
- Agile Architectural Solutions are perfect for use in an **existing building** without fear of compromising technology or design
 - Low-profile floor with plug & play cabling

- Save embodied energy by choosing an existing building
- Save a building—44,000 commercial buildings are demolished annually in the U.S. – *EPA, 1998*
- Manufacturing the office interior (rather than building on-site) means a shorter move-in **schedule** with fewer trades
 - Fewer vehicles traveling to site = fewer emissions
- A controlled manufacturing process uses less **material** to build out new space
 - 12% of drywall in new construction ends up as scrap – *California Integrated Waste Management Board, 2002*
 - For every square foot of drywall installed, one pound is thrown out. – *Cornell University*
 - Drywall releases dangerous hydrogen sulfide gas when wet – whether in the landfill or stored outside before installation – which can also contribute to mold.
 - Each U.S. citizen uses approx. 75 cubic metres of solid wood every year – National Resources Defense Council www.nrdc.org
 - A manufacturer has more control over recycling programs than a construction site.
- Use less **energy** through better, efficient and effective lighting, daylighting and flat-panel monitors. (Though DIRT does not produce lighting solutions – we support their use.)
 - Commercial buildings use 17% of all energy in the U.S. – *U.S. Dept of Energy*
- Eliminate **waste** from reconfigurations, demolition and renovation by having an agile interior when changes need to be made.
 - 25 – 33% of all landfill is waste from construction, renovation and demolition. 57% of that is commercial buildings. – *U.S. EPA*
- Create **beautiful** environments.
 - No one wants to sustain ugly—James Wines, *SITES Environmental Design*

The worst environmental crime committed by conventional construction is the cycle of: build, demolish, dispose, re-build...in perpetuity. The interior is the area demanding all this change and it is the interior where DIRTT can help, because today's buildings are tomorrow's sustainable buildings.



For more information on specifying for Green Building Design, go to *The Whole Building Design Guide* and go through the *Federal Green Construction Guide* [Green Specs](#)

The Business Case for Sustainability

The message of commercial sustainability can be confusing. Some think that being environmentally conscious means sacrifice and martyring business needs for the sake of a greener building. This couldn't be further from the truth. By building an agile, space conscious, energy efficient space you are improving your company's bottom-line now and in the future.

A big part of being sustainable is being **future capable**, which also happens to be a good term to use in a successful business. But often today's budget concerns override tomorrow's gains. So what are the **immediate advantages** of constructing a DIRTT modular interior? Surprisingly they are almost the same advantages as environmental advantages...

- Choose an **existing building or space** in an excellent location, while being confident it can keep up with today's technology and workspace requirements.
 - Plug & play technology universally zoned in a low-profile access floor can turn any building into a player in the 21st century and gives you a faster move in.
 - Established location gives employees and clients public transit options and is close to amenities.
 - Often heritage buildings come with government subsidies.

- Work with your designer to make an informed decision and take **less real estate** because your interior can be more efficient with a smaller footprint and still provide better comfort and productivity
 - Sliding doors on efficient, comfortable and aesthetically appropriate 10 x 10 private offices
 - DIRTT's solutions use parametric design which lets you expand, contract and reshape office elements as you and your space demand.
- Design and modify **your space** faster with ICE® software. ICE immediately creates 3D images, quotes and parts lists and makes all changes instantly.
 - Your designers and architects can see exactly where the budget is
 - You can instantly see what they are creating and make more informed choices
- Use ICE technology to create **virtual mock-ups** to show employees and stakeholders several layouts of what the workspace will look like.
 - No costly and time consuming mock-ups or manufacturing mistakes that end up in a landfill and delaying the project start
 - Get buy-in from employees and stakeholders
 - See how each area will look and function
- Integrate **legacy furniture**.
 - DIRTT Solid and Stacked Walls have horizontal support for all kinds of furniture
 - Walls are designed to support legacy furniture universally
- **Move-in faster** on a manufacturing schedule rather than a 'built on-site' schedule.
 - Rent 'swing space' for less time
 - Have your employees up and running faster
 - Time isn't lost due to trades people's schedule challenges



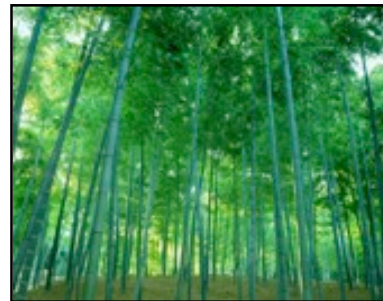
- Operation costs are lower, giving you **lower bills** or more bargaining power with your landlord

- Decrease energy through efficient, user-controlled lighting and flat panel monitors.
- If your **business changes** during construction, you do not have to tear down new walls or lay in new cabling.
 - Agile architectural solutions are simply moved to the new location
 - Even sliding barn doors are non-handed for new placement
 - Plug & play technology in a universal zone distribution means no cable cutting and expensive disposal or expensive trades on site for longer.
 - No delays in the schedule.
- Data and power cost **less to install** in the floor.
 - Everything is tested and protected from other trades.
 - IT will be up and ready to go without work crews standing on desks and fishing through the ceiling.
 - If reconfigurations are needed before, during or after move-in are easily done through the access floor and **plug & play** cabling.
- Depending on your tax regulations in your area, you may find that having modular, agile elements dramatically increases your **depreciation** claim.
 - Agile elements are not considered part of the building
 - Please consult your own tax advisor for more details.
- Because your workspace is flexible to change with your business needs, and you won't be disrupting any other tenants with demolition and construction, you can negotiate a longer more advantageous **lease** and even consider sub-let opportunities.
- Acquisitions and **mergers** can be more stealthily achieved.
- By looking at your **budget holistically** (construction, technology, lighting, furniture, fixtures & equipment) you will find that an agile modular interior costs virtually the same as fixed-in-place conventional construction.

- DIRTT developed an interactive database called ICEberg™ that uses an apples to apples comparison of the cost of conventional construction vs. Agile Architectural Solutions

Materials & Manufacturing

DIRTT offers finishes and materials never seen before in the industry. A full description of the recycled content in each wall type is available from your local DIRTT Representative or Partner. DIRTT is accredited to go beyond their standard offering and source a higher level of environmentally sustainable materials.



WATER BASED FINISHING

One of the most exciting is our **water-based finishes**. This means the factory does not have to install huge air filters and exchange units, which use a lot of energy, which emits a lot of air pollution. DIRTT is the first to use this technology on all wood surfaces. It not only makes our factory environment safer and more comfortable for DIRTT employees, it does the same for our clients. Conventional wood finishing processes lead to weeks and even months of hazardous off-gassing.

VENEER WRAPPING

This patent pending process takes the finest quality thinly sliced veneer and wraps it directly onto aluminum extrusions which is then finished with a water-based finish. The process allows for beautiful wood finishing without using copious amounts of wood or extra substrate materials.

(Global wood consumption is projected to increase by 50 percent by the year 2050 – National Resources Defense Council.) The adhesive is a non-hazardous, non-flammable, micro-emission **PUR** (polyurethane reactive). It is free of VOC (volatile organic compounds) and HAP (hazardous air pollutants) and does not require ovens for curing (lowering energy consumption).

FOREST STEWARDSHIP COUNCIL (FSC)

DIRTT Environmental Solutions just earned Forest Stewardship Council (FSC) Chain-of-Custody accreditation. This means they can source FSC certified veneers and medium density fiberboard (MDF). As these materials go through the production facility, DIRTT guarantees it will maintain a tracking and handling system ensuring the FSC products are not mixed in with other materials.

FSC certified wood products are accepted materials within the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) points system – an important step in creating environmentally sustainable buildings and workspaces.

Chain-of-Custody certification provides a guarantee about the production of FSC-certified products and is the path taken by raw materials from the forest to the consumer. This includes all successive stages of processing, transformation, manufacturing and distribution. A product can only carry the FSC label or logo if the forest receives an FSC forest management certificate, and if all steps along the supply chain receive a chain of custody certificate.

For chain-of-custody certification, an auditor from an FSC accredited company evaluates a company to assess whether an adequate tracking and handling system is in place to ensure that FSC-certified products will not be mixed with non-certified products. The company must demonstrate the integrity of the FSC-certified product flow will not be compromised.

DIRTT's official certification code: SCS-COC-00848

UREA FORMALDEHYDE FREE/FSC CERTIFIED MDF

DIRTT is the first manufacturer in this industry to find the world's only supplier producing Forest Stewardship Council certified and urea formaldehyde-free Medium Density Fiberboard (MDF). Until now, clients striving for LEED certification had to choose between the point for urea formaldehyde free or FSC certified. For the first time they can have both.

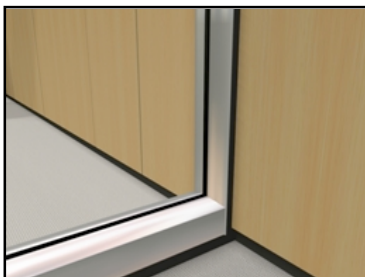
POWDER COATING

Where liquid finishes contain solvents with pollutants known as volatile organic compounds (VOCs), powder coating contains no solvents and releases negligible amounts of VOCs into the atmosphere. Powder coat lines generally use 50% less energy than conventional systems.

ALUMINUM

We use **aluminum** as our structural wall and furniture elements. Though aluminum mining and processing is considered energy intensive and greenhouse gas heavy, in 2002 the aluminum industry received an EPA Climate Change Award for reducing perfluorocarbons by 45%.

Aluminum also has several environmental benefits:



- **Recyclable** - Aluminum is totally recyclable. The recycling rate of aluminum is currently approximately 50%, and awareness programs should increase this number.
- **Less Waste** – When aluminum is used in design, there is minimal material waste (as the component can be created virtually to exact size), reducing waste for landfills. Where manufacturing of components cannot be done to exact size, the left-over portions can still be recycled, eliminating waste entirely.

- **Energy Efficiency of Recycled Aluminum** – The recycling process consumes very little energy (about 5% of energy required to create primary aluminum). The more it is recycled, the more energy efficient it becomes.
- **Common resource** – Aluminum is the most common metal in the world; found in mica, feldspar, clay and is primarily extracted from bauxite.
- **Sustainable** – Strong, light (saving energy in some applications) and enduring, aluminum products will often outlast their initial application.
- **Lightweight** – transporting aluminum, versus steel, requires much less fuel

GLASS

Joel Berman Glass works beautifully with DIRTT's wall products. Their Editions™ glass is 20% post-industrial recycled materials and they can offer 100% post-consumer glass through reclamation of demolished office spaces. (This product is available on request and has some size restrictions.)

www.bermanglasseditions.com

ecoresin™

DIRTT also works closely with 3Form. We encourage the use of their ecoresin, an environmentally positive composite, commonly identified as co-polyester. It contains at least 40% post industrial, recycled content and is free of plasticizers and/or stabilizers. ecoresin does not off-gas, even when being melted to become another product. All DIRTT's furniture and walls solutions are open to the option of using 3Form's ecoresin. For more information on 3Form and ecoresin, please go to

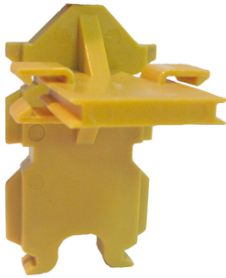
www.3-Form.com

A Helping Hand...

3form is producing lthemba™ (pronounced "ee-tem-bah). This masterpiece of woven wire mesh is meticulously created by African women directly affected by HIV/AIDS. 3form aims to give them hope--and give architects worldwide a fascinating and meaningful design element.

If you incorporate lthemba in your next project through DIRTT, we will donate 10 percent of the cost of the lthemba to your local AIDS/HIV foundation.

PACKAGING



Of course products need to be packaged properly for safe, damage-free shipping, but packaging quickly becomes trash on the job-site.

Initially DIRTT was using cut lengths of 2 x 4 lumber to keep the walls from damaging each other. It was an expensive, labor intensive, wasteful method. Since then DIRTT developed a solution that protects the walls, creates 10% more room in the trucks and is infinitely reusable. It is

affectionately called the 'Cookie' (because it looks like someone serving you a tray of cookies fresh out of the oven...mmm – where was I?). Cookie is a plastic molded piece that is lightweight, strong and is mailed back to DIRTT in a self-addressed 'Cookie Bag' for the next shipment.

LEED

DIRTT is a member of the U.S. Green Building Council and staunch promoter of LEED (Leadership in Energy and Environmental Design). Several of our employees are LEED Accredited. We feel it is an important measurement and direction for sustainable design and construction and congratulate the USGBC and LEED for their efforts in turning the tide of energy sapping buildings and their vulgar disregard for the resources of the planet.

But LEED is only the beginning. Once freed from the constraints of industry and trade lobbying, LEED will be able to move beyond material choices and make leaps forward in ensuring all parts of a building reduce footprint, include reusable elements and turn to recycling as a last resort. A building can still be sustainable without being LEED certified. www.usgbc.org

Recycled Content

Contact your DIRT representative for more detailed LEED credit information regarding DIRT.

DIRTT projects of the heart

Waste to Wonder: DIRT is working with Green Standards to help bring a program called 'Waste to Wonder' to the U.S. This program takes used equipment and furniture that would otherwise be sent to the landfill and refurbishes them for installing in schools and charity offices around the world. The Green Standards organization takes all of the responsibility of ensuring the items are shipped and correctly installed and any pieces that cannot be reused are properly recycled.

www.greenstandards.com



Kamchatka Bear Fund: What started as an observation program, turned into an indescribable relationship between humans and one of the most feared and misunderstood animals in the world. In 1997 Charlie Russell and his partner Maureen Enns went to the Russian Kamchatka peninsula to study grizzly bears. While there they were given the responsibility for reintroducing three grizzly bear cubs (rescued from a circus) into the wild. Until 2003 Charlie and Maureen documented the bears, and their threats. They've since set up a foundation to train and employ full time rangers to protect the grizzlies of the Russian peninsula. DIRT is a proud supporter of the *Kamchatka Bear Fund*. www.cloudline.org

Pacific Salmon Foundation: All his life Mogens Smed has been an avid fisherman (catch and release only!) His respect of the mighty Pacific Salmon drew him to the Pacific Salmon Foundation. The PSF work centers around preserving habitat, educating the public and building up fish stocks.

www.psf.ca

AIDS Calgary: DIRT is a triple-bottom line company. Business, Social and Environmental concerns must all be considered when decisions are made. AIDS Calgary has been a long-time concern for Mogens Smed and his companies. www.aidscalgary.org

Acting Locally, Thinking Globally

99% of all DIRT marketing material is created and kept in an electronic medium. DIRT will never have product catalogues. All product information is digital. We only have one paper brochure with the promise there will never be another.



At the DIRT HQ the computers are all run by wind power and several DIRT Bags drive either Smart Cars or Toyota Prius coupes. Our factory uses T5 lamps for better and more efficient lighting that will last for many years. Plastics, paper, glass and metal are all recycled. What printing we do is on either recycled or unbleached paper. And our computers are all run on wind power through the Pembina Institute [20,000 wind powered computers](#)

Team CLEAN/DIRT is made up of members of DIRT from Production and the Office. They meet to discuss ideas for continually improving recycling, material choices and pollution reductions at DIRT. They then implement the ideas and gently police them.

“Until buildings themselves have ongoing sustainability, we are taking the feathers and leaving the chicken on the table.” – Mogens Smed, 2004 Environmental Champion – Interiors & Sources Magazine.