

## CASE STUDY

### Green-ZipTape Used as a *Source Reduction*<sup>1</sup> Method to Reduce Greenhouse Gases and Increase Landfill Diversion in Commercial, Interior Partitions

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#### ABSTRACT

Drywall partitions are used because they are cheap, fast, and easy. However, current installation methods render the materials useless after first use and too labor intensive to recycle. This case study reveals Green-Zip Tape (GZT), a patented drywall joint tape, seeks to adjust the installation culture with a small change of joint tape that allows for reuse of practically all partition components. *Source Reduction* indicates that reuse of materials significantly increases landfill diversion and dramatically reduces greenhouse gas (GHG) emissions.<sup>A</sup>

When using Green-Zip Tape, this Case Study reveals the following:

Greenhouse gas reduction rates of 70-90%  
Landfill diversion rates of 70-90%

#### BASELINE CASE STUDY

For a baseline case study, the following “typical” commercial office tenant build out assumptions have been made:

Partition Description: 2 ½” x 20 gauge x 24 o.c. steel studs, 5/8” type X drywall, taped and floated (ready for paint), 9’ tall

Partition Quantity: 1,500 lineal feet of wall per 20,000 square feet of floor area

#### Material Quantities:

Drywall: 1,500 lf × 18 sf/lf = 27,000 sf of drywall

27,000 sf × 2.2 lbs/sf = 59,400 lbs of drywall

Steel studs: 1,500 lf × .65 studs/lf = 975 studs

975 studs × 9’ tall = 8,775 lf of stud

8,775 lf × .37 lb/lf = 3,246 lbs of steel studs

Steel track: 3,000 lf × .34 lb/lf = 1,020 lbs of steel track

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<sup>1</sup> EPA. Modeling Reuse in EPA’s Waste Reduction Model. Washington, D.C.: United States Environmental Protection Agency.

**GHG CALCULATIONS (use of EPA waste reduction model factors, WARM)<sup>2</sup>**

Baseline is normal drywall construction methods, which render reuse virtually impossible, therefore:

$$\text{Drywall: } 59,400 \text{ lbs} \times .3967 \text{ lbsCO}_2\text{E/lb drywall}^3 = 23,563 \text{ lbsCO}_2\text{E}$$

$$23,563 \text{ lbsCO}_2\text{E} \div 2,000 \text{ lbs/ton} = 11.78 \text{ tons CO}_2\text{E}$$

$$\text{Steel: } 3,246 \text{ lbs(studs)} + 1,020 \text{ lbs(track)} = 4,266 \text{ lbs}$$

$$4,266 \text{ lbs} \times 2.916 \text{ lbsCO}_2\text{E/lb steel}^4 = 12,439 \text{ lbsCO}_2\text{E}$$

$$12,439 \text{ lbsCO}_2\text{E} \div 2,000 \text{ lbs/ton} = 6.21 \text{ tons CO}_2\text{E}$$

$$\text{Total GHG: } 11.78 + 6.21 = 17.99 \text{ tons CO}_2\text{E}$$

When GZT is used, each and every reuse of wall components leads to a proportional *decrease* in GHG.

**Chart A: Greenhouse Gas**

<b>% Wall Reuse</b>	<b>Decrease in GHG</b>
70	$(.70 \times 17.99) = 12.59 \text{ tons CO}_2\text{E}$
80	$(.80 \times 17.99) = 14.39 \text{ tons CO}_2\text{E}$
90	$(.90 \times 17.99) = 16.19 \text{ tons CO}_2\text{E}$

**SUMMARY AND IMPLICATIONS**

“Source Reduction refers to any change in the design, manufacture, purchase, or use of materials or products ... that reduces the amount of material entering the waste collection and disposal system. Source Reduction and reuse conserve resources and reduce ... greenhouse gas (GHG) emissions ... Reusing an item reduces ... materials from entering the waste stream.”<sup>5</sup>

**Chart B: Landfill Diversion**

<b>% Overall Reuse</b>	<b>Diversion Tonnage</b>
70	$(.70 \times 31.83) = 22.28 \text{ tons}$
80	$(.80 \times 31.83) = 25.46 \text{ tons}$
90	$(.90 \times 31.83) = 28.65 \text{ tons}$

<sup>2</sup> EPA. (2012) Solid Waste Management and Greenhouse Gases: Documentation for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model (WARM). Washington, D.C.: United States Environmental Protection Agency. <http://www.epa.gov/climatechange/waste/SWMGHGreport.html>

<sup>3</sup> EPA, Exhibits 6, 9, 10, 17.

<sup>4</sup> Roger A. Sedjo. (October 2001) Wood Materials Used as a Means to Reduce Greenhouse Gases (GHG): An Examination of Wooden Utility Poles. Table 1, page 3.

<sup>5</sup> E EPA. Modeling Reuse in EPA’s Waste Reduction Model. Washington, D.C.: United States Environmental Protection Agency.

*Business Week* reports the manufacture of drywall alone “accounts for 1% of all the energy used by U.S. industry, and thus a comparable percentage of all industry emissions;”<sup>6</sup> and approximately 26% of the waste in a construction landfill is drywall.<sup>7</sup>

Green-ZipTape allows for simple, low cost, and immediate relief to the “waste stream” of wall components that are traditionally thrown away.

Consider, there is no “away.”

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<sup>6</sup> 26% of the waste by weight in a construction landfill is drywall according to NAHB Resource Center; EPA Report by IFC Corp. states 20% by volume.

<sup>7</sup> Business Week, Taking the Heat off Drywall, January 21, 2008 pg 62