



Visual Solutions for a Sustainable Future™

DUGGAL®
ECOIMAGING™



Our Sustainability Philosophy

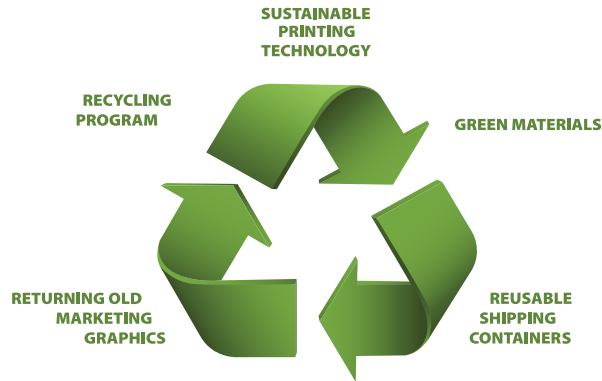
At Duggal, **sustainability** means a philosophical **commitment to innovate, detoxify and recycle** across all aspects of our supply-chain and production processes. We realize that there is no such thing as a zero-carbon production process, but by eliminating environmentally hazardous materials throughout our product line and working with our customers, we can truly make a difference. We are raising the bar for the entire graphics industry to adopt **environmentally responsible practices** and reduce their collective ecological footprint.

In creating Duggal's sustainability vision, we drew inspiration from resources such as the Natural Step, Cradle to Cradle and Life Cycle Analysis that are sustainability frameworks to aid in environmentally friendly product development and printing processes, as well as responsible end of life management. Products like Eco Tyvek, Eco Ultra Poplin, and EnviroScape Mural HD have allowed us to offer immediate alternatives to their toxic substitutes used as a standard by the rest of the industry. Our entire **Eco-Imaging product line** is designed as a closed loop system, so when the products manufactured reach their end of life, they are transported to our partner recycling facility and brought back into the production chain. Currently we are **recycling between 80 - 90%** of all waste in each of our five main production facilities.

In our corporate location on 29 w. 23rd Street, we worked with ITAC (Industrial + Technology Assistance Corporation) to **reduce our lighting energy usage by over 60%**. ITAC replaced all of our 275 bulbs with energy efficient bulbs to save energy and reduce cost. Over the next year, we will be updating our heating and cooling system to further reduce our energy usage.

Duggal is proud to be **FSC® (Forest Stewardship Council)** and **RainForest Alliance Certified** at our 23rd Street location, and **SGP (Sustainable Green Printer) certified** in our Brooklyn Navy Yard Building 500, and the first LEED Gold production facility with our Building 25.

Our hope is that by taking this leadership position and partnering with our clients and our suppliers we can provide visual solutions for a more sustainable future.



Together we can develop a comprehensive sustainable solution by establishing a complete circle using eco-friendly materials printed on eco-friendly printers, shipped and then recycled.



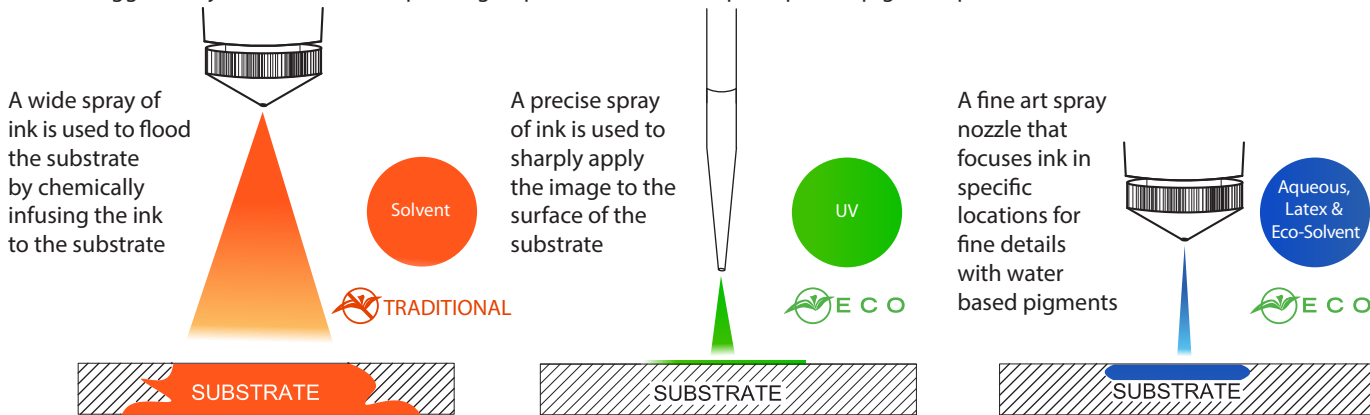
Current Industry Standard Printing

Most graphic producers use solvent inks. Solvent ink chemically penetrates the surface of the substrate, and fuses itself into the material. Solvent prints produce high VOCs and require complex ventilation systems to operate. After production and printing, the material must go through a toxic process of stripping the inks for reuse, making recycling difficult and expensive.

Sustainable Printing Technology

UV Printing (ECO)- Unlike traditional solvent inks, UV ink sits on the surface of the substrate and is then cured as it leaves the printer. UV ink is removed much easier and enables the substrate to be recycled efficiently and effectively. Our UV printers' inks are also Volatile Organic Compound (VOC) free. Duggal leads the industry with 5 high-resolution UV printers including the first Durst 900 flatbed printer installation globally and the installation of the first Durst 500R large format printer in the U.S. Each Durst printer has unmatched quality with 2040 nozzles per color including white ink technology, and has attained the prestigious Nordic Swan green certification. Duggal's array of Durst Wide Format and brand new Inca Q40i printers gives us the newest, fastest and highest quality wide format UV fleet of any digital graphics company in the U.S.

Aqueous Pigment Printing (ECO)- This form of printing utilizes similar technology to a solvent printer but uses Aqueous Pigments producing no VOCs and needing little ventilation. The head is also much closer to the substrate allowing for very accurate color placement with minimal waste. Duggal's Inkjet/Giclee Fine Art printing department has multiple aqueous pigment printers.





INCA Onset Printer



HP Latex 3000



Durst 500R

Latex Printing (ECO)- Duggal has two new HP latex printers. These eco-friendly printers use water-based inks that are odorless and have very low levels of VOCs. Similar to the aqueous pigment inks, latex printers do not need special ventilation. The latex ink is compliant with many industry-leading certifications.

Eco-Solvent Printing (MILDLY ECO)- Eco-solvent printing uses mild-solvent ink that is more environmentally friendly than traditional solvent based inks. The solvent is the liquid product in the ink that helps in the interaction of ink and the material. Hard solvents or solvent inks soften the materials and allow the inks to chemically fuse to the materials. Eco-solvent printing uses a milder solvent that still softens the material for printing but it is less dangerous than the traditional solvent prints.

Digital Offset Printing (MILDLY ECO)- Our digital offset Indigo presses utilize HP's Electroink oil-based inks as new technology is still being created. However, our press still produces little VOCs and uses almost exclusively FSC® certified and recycled papers. With Duggal's FSC® Chain of Custody Certificate we offer official FSC® certified products. In conjunction with our FSC® certification, our business practices have been recognized by the Rainforest Alliance™. Unlike conventional offset printing, all ink used in our digital offset Indigo press is recycled back into the machine.

All of the eco inks listed help promote better air quality and save on energy needed to operate the machine. All of Duggal's machines offer outstanding quality while keeping the environment in mind. As technology is continually researched and advanced, Duggal continues to benchmark ourselves with the most cutting-edge equipment and high-quality inks available.



Green Large Format Materials

By combining the latest UV printers and Duggal's **environmentally friendly** large format materials, you receive the highest quality images that can be used in a wide range of applications. Our collection offers a perfect eco-friendly substitute to your indoor and outdoor graphic projects.

Ultra Canvas-Light

(Up to 16' Wide) 6 oz/yd² or 9.6 oz/yd² (Heavy)

Indoor/Outdoor (12 months)

Fire Rating: NFPA701, B1

A lightweight, fire resistant and waterproof canvas material that offers superior print quality. Outdoor version available with a 1-year warranty.

Applications: Banners, Fine Art Reproductions, Signage, Tradeshow Graphics.

Green Properties

- 80% Recyclable
- 20% from Recycled Polyester
- 97% Biodegradable Water Based Coating
- No Heavy Metal
- No PVC
- No VOCs During Manufacturing
- No Chlorine

ECO Ultra Poplin

(Up to 16' Wide) 7.2 oz/yd²

Indoor/Outdoor (3-4 months)

Fire Rating: NFPA701, B1

Made from 100% knitted polyester. Wrinkle free and has a slight stretch, making it ideal for stretch frames and other structural applications.

Applications: Banners, Signage, Stretch Frames, POP Displays, Tradeshow Graphics.

Green Properties

- 80% Recyclable
- 20% from Recycled Polyester
- 97% Biodegradable Water Based Coating
- No Heavy Metal
- No PVC
- No VOCs During Manufacturing
- No Chlorine
- Reach Compliant



By staying on the cutting edge of technology and research, Duggal strives to offer the highest quality **large format materials** and printing to our clientele. Duggal is excited to offer new, environmentally conscious options in **vinyl signage**.

ECOflex Vinyl

(Up to 16' Wide) 15 oz/yd²

Indoor/Outdoor (6 months)

Fire Rating: NFPA701 (available)

Grand format heavyweight and high durability outdoor material that is latex compatible and contains non-toxic materials, making it a functional and environmentally-friendly application suitable for front-lit digitally printed signage. The material is a flexible white substrate with a matte finish resistant to sunlight and weathering.

Applications: Banners, Display Systems, Billboards.

Green Properties

- 65% Biodegradable PVC coating
- No Heavy Metal
- No Pesticides
- 1st Truly Environmentally Friendly Biodegradable PVC
- RHOS Compliant
- Non-toxic
- Breaks down in 3-5 years

Super Smooth Blockout Vinyl

(Up to 86" Wide) 15oz/yd²

Indoor

Fire Rating: NFPA701, B1

100% PET extremely smooth moisture resistant scrimless blackout material with unmatched double-sided printing. Printed colors appear vibrant and ultra-crisp.

Applications: Banners, Signage, Tradeshow Graphics.

Green Properties

- 100% Recyclable
- 100% PET
- No PVC

Duggal offers materials that are **PVC free, phthalate free, non-toxic, phosphate free** and **recyclable**, perfect eco-friendly materials for advertising, decoration and banners.

BLOX-LITE

(Up to 102" Wide - Grande) 8.8 oz - 10.2 oz/yd²

Indoor

Fire Rating: NFPA701, M1m M2, ASTM E162 & E662 (available)

This FSC material is a two-sided, moisture-resistant blackout banner material. Bright white in color and suitable for sewing and grommeting.

Applications: Display, Advertising, Poster Exhibition Panels, Banners, Signage.

Green Properties

- 100% recyclable
- 10% post consumerwaste (PCW)
- PVC Free
- Phthalate-Free

ECO Tyvek

(Up to 10' Wide) 8.9 oz/yd²

Indoor/Outdoor

A superior lightweight print medium combining high quality with flexibility for wide format applications. Eco Tyvek also offers a recyclable alternative with superior drape-ability and low memory which resists creasing.

Applications: Banners, POP Displays, Signage, Hanging Displays, Rolling Display Panels, Architectural Wraps.

Green Properties

- 100% Recyclable
- PVC Free



Duggal's selection of specialty **wide format materials** provide unique substrate options for larger applications, so there's no need to choose between being eco-friendly and the quality of your graphics.

EnviroScape Mural HD

(Up to 50' wide - perfect for paneling) 9.3 oz/yd

Indoor

Fire Rating: Class A (ASTM E-84)

High performance, dimensionally stable, breathable and environmentally sustainable material perfect for replacing standard PVC wallpapers.

Applications: Wallpaper, wall decor.

Green Properties

- 10% post consumer waste (PCW)
- 100% waste activated adhesive
- 100% dry strippable (no residue)
- No PVC
- Phthalate-Free
- Elemental & process chlorine free
- Non-toxic



A Duggal Big Picture Foundation sponsored project at NYC's VA Medical Center

Duggal's eco-friendly **Descor® material** is one of the most environmentally conscious materials on the market for interior design wallscapes and ceiling graphics. For a full list of Duggal's other specialty materials, contact us at marketing@duggal.com.

Descor®

(Up to 16' Wide) 6.6 oz/yd²

Indoor

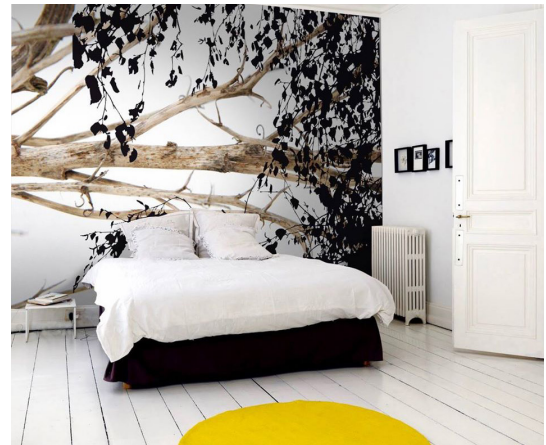
Fire Rating: NFPA701, CSFM, M1, B1, IMO, EN 14716

Descor® is a highly durable architectural fabric that can be professionally installed by Duggal in a custom framing system for ceilings and/or walls without panels, seams, and joints.

Applications: Ceiling graphics, Wall Covering, Cruise Ships, Architectural Projects.

Green Properties

- 100% water based coating
- 20% from recycled polyester
- 90% recyclable coating
- No Heavy Metal
- No PVC
- No Chlorine
- Reach compliant
- CE certified
- 97% biodegradable in its liquid form



Duggal's eco-friendly self-adhesive materials are **PVC** and **chloride free**, offering customers a greener solution to wrap everything from vehicles to boats to windows or textured buildings.

ECO Matte SAV

(Up to 54" Wide) 2.5 mil

Indoor/Outdoor

This matte-finished material is manufactured with less solvent compared to traditional solvent-based adhesive products, making it an ecologically responsible choice for digitally printed or screen printed graphics that don't require heat or stretching during installation.

Applications: Illuminated Signs, Labels, Windows, Non-Illuminated Signs, Walls, Vehicle Wraps.

Green Properties

- No PVC
- No Polyvinyl Chloride
- No Monomeric Plasticizers

ECO Film Wrap

(Up to 54' Wide) 15 oz/yd²

Indoor/Outdoor

A versatile material that is ideal for long-term graphic applications and for short-term wall graphics on smooth or moderately textured surfaces. The nonvisible air release channels make for fast and easy, bubblefree installations with a luster finish.

Applications: POS Displays, Signage, Vehicle Wraps

Green Properties

- No PVC
- No Polyvinyl Chloride or Halogens
- Manufactured using 60% Less Solvent

Duggal's **rigid substrates** combine high-quality direct-to-substrate printing and traditional mounting with eco-friendly components. We offer a vast number of Eco-Solutions from Rainforest Alliance and FSC® Certified composites to 100% biodegradable foamcore.



BioBoard HDF

A 3mm solid replacement for foam panels and other rigid substrates that can easily be cut, routed and sawed specifically for your wide format tradeshow graphics or indoor signage. This rigid substrate is coated on two sides with FSC® certified paper liners with excellent printability.

Applications: Signage, Tradeshow Graphics.

Double sided printing available.

Green Properties

- 100% Recyclable
- FSC® Certified Paper Liner



ECO Foamcore

(up to 60" x 120")

Smooth natural white or black paper liner that produces superior ink holdout and excellent color gloss. Highly warp-resistant (3/16") foamcore with a coating that acts as a barrier to minimize ink and adhesive absorption.

Applications: Exhibitions, Digital Imaging, Signs & Posters, Decoration, POP Displays, Tradeshow Graphics, Sets & Props, Framing.

Green Properties

- 100% Biodegradable in less than 5 years (Traditional Foamcore degrades in 80- 450 years)
- SFI Certified Paper Liner



ECO ConBoard

(up to 60" x 120") Indoor/Outdoor

Eco-ConBoard is a rigid print media that can be directly printed on both sides and is specifically designed to provide high impact and crush resistance into a fully recyclable alternative to foam or corrugated plastic boards. Can be used both indoor and short-term outdoor P.O.P and signage applications.

Applications: Packaging, POP Displays, Mounting, Exhibitions, Tradeshow Graphics, Lightweight Furniture, Posters, Events, Signs, Decoration, Interior Design.

Green Properties

- Rainforest Alliance and FSC® certified
- 10% Post Consumer Waste
- 92% Recycled Material



Duggal Visual Solutions' Indigo fleet now includes state-of-the-art **7-color HP Indigo 12000 and 5900 digital offset presses**, both conveniently located at our 29 w. 23rd Street corporate headquarters in Manhattan. In the spirit of Duggal's commitment to sustainability, we offer a large array of FSC® Certified papers. Please talk to your sales rep for a full list of all our indigo options.

Color & Substrates

The new digital press now offers unparalleled color gamut and accuracy as well as double sided printing in seven colors (CMYK, Orange, Violet, and White) up to 20" x 29", with PMS color matching. An extensive array of substrates are available such as:

- Text stocks*
- Cover Stocks*
- Pressure Sensitive Stocks
- Plastics
- Vinyl
- Hi Gloss

*Neenah Classic Crest

Classic Crest papers deliver the whole package - unmatched luxury, dependable results and best-in-class quality. Excellent formation and uniform surface ensure incredible print performance.

Green Properties

Entire offering is FSC® Certified and manufactured with 100% renewable energy – choose from 10 recycled papers



A fully equipped bindery operates on premises and offers trimming, scoring, folding, saddle stitching and binding. Capable of printing on materials such as canvas, foil, static cling, and plastics, the HP 12000 and 5900 Presses offer versatility and cutting edge technology.

Applications:

- Fine Art Reproductions
- Variable Data Printing
- Presentation Folders
- Fashion Look Books
- Booklets
- Photography Books
- Promotional cards
- CD/DVD Covers
- Invitations
- Sell Sheets
- Stationary
- Catalogs
- Portfolios
- Post Cards



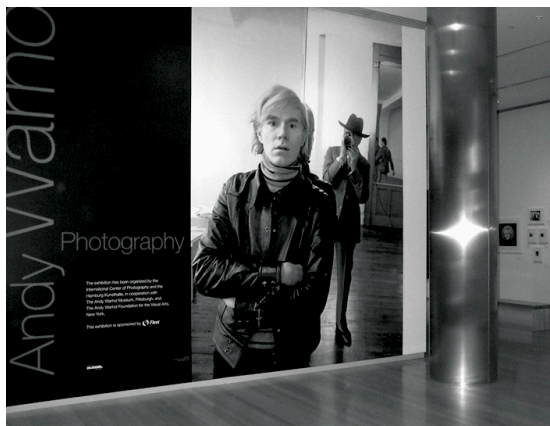
Duggal offers a range of exceptional **archival fine art printing** options from digital files with our papers and multiple eco-friendly solution printers. With an extraordinarily wide gamut of color control, we are able to match the aesthetic and nuance for even the most discerning fine artists.

ECO Sunset Hot Press Rag

Exceptional quality, smooth, warm-toned paper that allows for deep rich blacks and sharp details.

Green Properties

- Certified: Forest Stewardship Council™ (FSC®)
- Mill Certified ISO 14001



ECO MOAB Entrada Rag Bright

Smooth, lightly toothed heavy weight fine art paper. Combines outstanding quality with a light tactile surface.

Green Properties

- Hydropower Source for energy at mill
- Tree Free- Cotton Based
- Recycled & Recyclable
- Repulpable

ECO Somerset Velvet Enhanced

Soft textured bright white fine art paper option that exemplifies an image's subtle beauty.

Green Properties

- Chlorine Free
- Tree Free
- Mill Certified ISO14001

ECO Hanemuhle Photo Rag Baryta

Extraordinary depth and detail, archival quality permanence, and the semigloss finish of traditional fiber based photo paper. Optimized for pigmented inks, it brings out the best in B&W and color images.

Green Properties

- 100% cotton
- Acid -free
- Produced with renewable raw materials
- Produced with only wind, solar or water energy
- Nottreated with bound chlorine

ECO Arches Aquarelle Rag Natural

Textured-based, warm white watercolor paper that specializes in holding rich colors and line details. Made out of 100% cotton fibers.

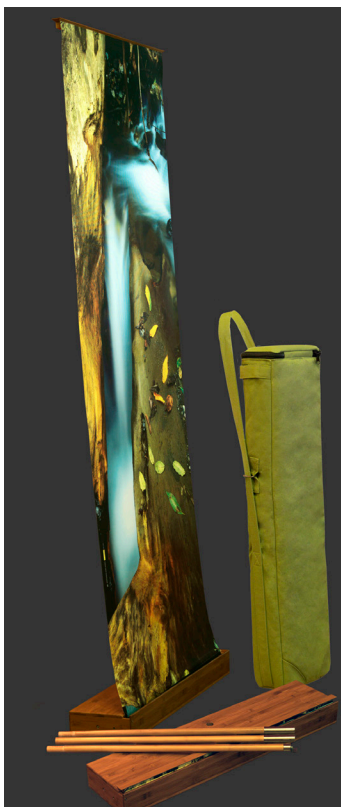
Green Properties

- Chlorine Free
- Acid Free



(Fine art installation)

Duggal offers an ever-broadening line of **specialty materials**, as well as eco-friendly display products such as our natural **bamboo display**, the premier choice for sustainable portable graphics. Please talk to your sales rep about our complete line of specialty materials and other stands available.



ECO Bamboo Retractable Stand

(31 ½" wide x 83" tall)

Freestanding retractable bamboo banner stand. Choice of materials for graphic that is housed in an elegant bamboo case. Carrying case included.

Application: Tradeshows, Store Displays, and Event Graphics

Green Properties

- Renewable Bamboo
- Clean Modern Design
- Easy to use

ECO Micro Paper

Lightweight, customizable, expanded post consumer PET plastic material that is 100% weatherproof and is 80% less dense than a solid plastic sheet. Has a bright white surface and comes in glossy or matte. Eco-friendly substitute for styrene.

Applications: Large Signs, Wall Hangings, Printed Panels, Show Booths, Consumer Packaging, POP Displays, Dry Erase Boards, Shopper Cards.

Green Properties

- 50% Post Consumer Recycled PET plastic
- 100% Recyclable

(special order)

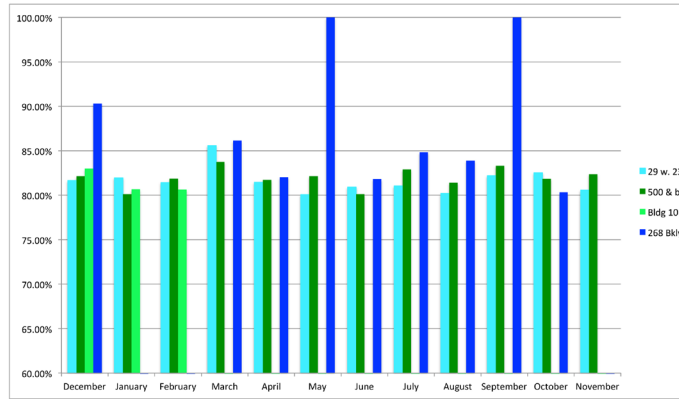
Custom, **LED wall-mounted or freestanding lightboxes** can dramatically enhance your images by brightly illuminating them with sustainable energy. These beautiful visuals can be fitted with solar panels and/or wind turbines adding to the energy efficiency of the LED light source (LEDs use 1/3 less energy than Incandescent or Fluorescent bulbs and last years longer). Working side by side with our clients, we routinely create unique designs to match their concepts.



Recycling

Duggal Visual Solutions has partnered with a leading recycling company to maintain the goal of recycling 80-90% of waste from all of our production facilities. Due to our continued success with this process, we are now able to extend this service to our clients, complete with monthly reports documenting the recycling of their used graphics. Last year our overall recycling average was 81.57%.

**Month To Date Totals %
Duggal Visual Solutions' Facilities**



**Monthly Snapshot
of recycled material**

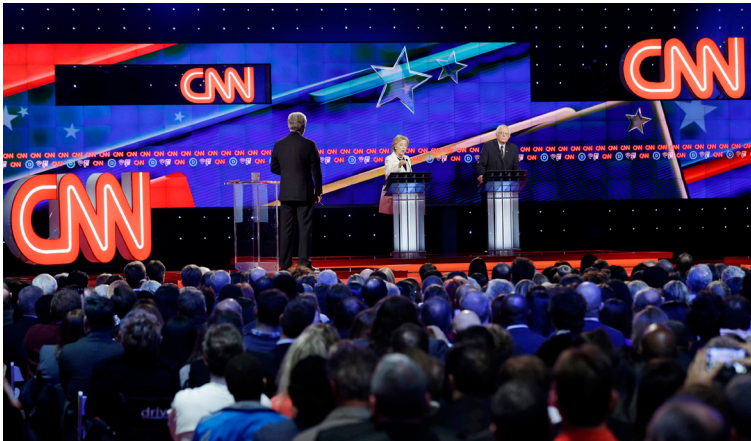
Waste Description	29 w. 23rd St. Manhattan	500 & bldg 25 Bklyn Navy Yard
Wood	30.72%	53.07%
Metal	0.00%	0.00%
Cardboard	22.47%	11.20%
Concrete/ Brick	0.00%	0.00%
Glass	0.00%	0.00%
Dirt	0.00%	0.00%
Paper	15.60%	7.62%
Plastic/ Vinyl/ Textile	11.78%	10.48%
Sheetrock/Screened Fines	0.00%	0.00%
Residual	19.43%	17.63%
Total	100%	100%
Average Recycled %	80.57%	82.37%

Month	29 w. 23rd St. Manhattan	500 & bldg 25 Bklyn Navy Yard
December	81.65%	82.15%
January	81.95%	80.12%
February	81.43%	81.88%



Green: Past, Present, Future

In addition to Duggal's product line, printers, and practices, Duggal teamed up with renowned green architects to implement solutions in our 35,000-square-foot event space. The project, called The Duggal Greenhouse, is the standard for green industrial spaces in NYC.



Duggal has always strived to be environmentally conscious and make continued efforts to raise the standard when it comes to sustainable practices.

Our foothold in the sustainability movement refocused back in 2008, when we chose to honor Mahatma Gandhi and his message for a sustainable world by printing his poignant sayings on Eco-Imaging billboards around New York City. The billboards were printed on a variety of our eco-friendly materials, featuring serene photographs of natural landscapes by Antonio Vizcaino.

Within the next couple of decades, our planet is expected to face unprecedented resource depletion. Only bold steps today can solve the crises of tomorrow. We at Duggal are proud to apply our energy to creating large-scale solutions that will reduce our collective environmental footprint and contribute to maintaining the health of our planet.

For more information or to book an event:
www.duggalgreenhouse.com

