Lightweight, low-inertia rollers allow faster web speeds, reduce vibration, decrease waste, and improve product quality.
The Double E Company manufactures composite rollers of all types and sizes.

**CARBON FIBER ROLLERS FROM THE EXPERTS**

The Double E Company pioneered the use of carbon fiber composite material in the manufacture of web handling equipment in 1986. Today, with tens of thousands of carbon fiber shafts and rollers in operation all over the world, the Double E Company is the recognized authority in composite technology.

We manufacture tubes in our own state-of-the-art winding and curing facility, so quality and on-time delivery can be carefully controlled. Our extensive research and development efforts and strict procedures allow us to deliver consistent product quality and exceptional customer service.

**WHY CARBON FIBER?**

Carbon fiber rollers have low rotational inertia, high stiffness, a high stiffness to density ratio, low mass, and low momentum.

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>ADVANTAGE</th>
<th>BENEFIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Rotational Inertia (Reduced mass moment of inertia by up to 80%)</td>
<td>Rollers spin at line speed.</td>
<td>Far less web scratching.</td>
</tr>
<tr>
<td></td>
<td>Quicker response to changes in line speed.</td>
<td>Fewer web breaks.</td>
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<tr>
<td></td>
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<td>Far less start-up waste.</td>
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<td>Less web stretch.</td>
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<tr>
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<td></td>
<td>Less web wrap-up in the event of a web break.</td>
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<td>Extended roller life and reduced coating thickness.</td>
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<tr>
<td></td>
<td></td>
<td>Lower energy consumption.</td>
</tr>
<tr>
<td>High Stiffness (High Modulus)</td>
<td>Less deflection.</td>
<td>Less web wrinkling.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Longer bearing life.</td>
</tr>
<tr>
<td>High Specific Modulus (High Stiffness to Density Ratio)</td>
<td>Faster line speeds with less vibration. (Higher critical speed).</td>
<td>More throughput and better product quality.</td>
</tr>
<tr>
<td>Low Mass</td>
<td>Super lightweight.</td>
<td>Easier and safer handling.</td>
</tr>
<tr>
<td></td>
<td>Less bearing wear.</td>
<td>Longer bearing life.</td>
</tr>
<tr>
<td>Low Momentum</td>
<td>More accurate transducer measurements.</td>
<td>More precise tension control.</td>
</tr>
<tr>
<td></td>
<td>Less lay-on roller bounce.</td>
<td>Higher quality wound rolls with less air entrainment.</td>
</tr>
<tr>
<td></td>
<td>Quicker dancer and accumulator roller response.</td>
<td>Better dancer and festoon performance with consistent tension control and less web stretch.</td>
</tr>
</tbody>
</table>

**THE IMPORTANCE OF LOW ROTATIONAL INERTIA**

Lightweight, high-stiffness rollers exhibit lower inertia to acceleration and deceleration (rotational or translational), and can run at higher speeds.

Carbon fiber rollers provide better performance than traditional steel or aluminum rollers, particularly when wide web widths, heavy loads, and faster speeds are necessary. Consider this example where a 164 inch steel roller with an 11.25 inch O.D. was replaced with a carbon fiber roller with the same dimensions:

<table>
<thead>
<tr>
<th>EXISTING STEEL ROLLER</th>
<th>REPLACEMENT LIGHT–SPEED CARBON FIBER ROLLER</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT</td>
<td>1,000 lbs.</td>
</tr>
<tr>
<td>Rot. Inertia</td>
<td>34,330 lb.-in.²</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>220 lbs.</td>
</tr>
<tr>
<td>Rot. Inertia</td>
<td>4200 lb.-in.²</td>
</tr>
</tbody>
</table>
The Double E Company offers a comprehensive line of composite roller and roll core products. We analyze each customer application to select the best materials and configurations to meet their specific performance requirements.

### LIGHT–SPEED® ROLLERS
- Help paper manufacturers and converters to run heavier roll weights at faster speeds.
- Dynamically balanced to ISO 1940/41 standards.
- Highest quality ABEC rated bearings to insure minimum start-up and running drag and dependable performance (dead shaft configurations).
- Standard bearings are sealed to provide long life and trouble-free operation.
- Proprietary curing process ensures a straight tube with the least run out.
- Our process yields a nearly void-free surface (less than one percent).

### LIGHT–SPEED® ROLLERS
- Consistent wall thicknesses and true concentricity allow higher critical speeds and greater structural integrity.
- We design and manufacture everything from cantilevered narrow web rollers to roll cores with diameters as wide as four feet and lengths over 35 feet. Our rollers are being used on blown film lines, flexible packaging and film machines, all types of converting equipment, and high speed paper machines.

### ALL TYPES AND SIZES
The Double E Company offers a comprehensive line of composite roller and roll core products. We analyze each customer application and manufacture rollers to meet deflection criteria while minimizing the weight of the roller. We select winding angles, fiber type, and laminates to optimize performance.

We design and manufacture everything from cantilevered narrow web rollers to roll cores with diameters as wide as four feet and lengths over 35 feet. Our rollers are being used on blown film lines, flexible packaging and film machines, all types of converting equipment, and high speed paper machines.

### COMPARISON OF IDLER ROLLER MATERIALS

```
<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>WALL THICKNESS in [mm]</th>
<th>DENSITY in [g/cc]</th>
<th>MODULUS in [GPa]</th>
<th>SPECIFIC MODULUS in [g/cc* GPa]</th>
<th>TUBE WEIGHT in [lbs]</th>
<th>ROTATIONAL INERTIA in [lb-in²]</th>
<th>CRITICAL WEB SPEED in [FPM]</th>
<th>CRITICAL DEFLECTION in [mm]</th>
<th>FATIGUE RESISTANCE</th>
<th>CRITICAL RESISTANCE</th>
<th>ROTATING RESISTANCE</th>
<th>ABUSE RESISTANCE</th>
<th>DEFORMATION RESISTANCE</th>
<th>CORROSION RESISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>THIN WALL ALUMINUM</td>
<td>0.25 (6.4)</td>
<td>0.098 (2.173)</td>
<td>70 (69)</td>
<td>102 (25.4)</td>
<td>23 (10.4)</td>
<td>82 (0.107)</td>
<td>31324 (952)</td>
<td>0.018 (0.46)</td>
<td></td>
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</tr>
<tr>
<td>STEEL</td>
<td>0.25 (6.4)</td>
<td>0.283 (7.833)</td>
<td>106 (207)</td>
<td>106 (26.4)</td>
<td>67 (30.4)</td>
<td>267 (0.311)</td>
<td>3184 (970)</td>
<td>0.008 (0.25)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CARBON FIBER</td>
<td>0.125 (3.2)</td>
<td>0.057 (1.578)</td>
<td>16 (110)</td>
<td>281 (69.7)</td>
<td>7 (32.2)</td>
<td>28 (0.033)</td>
<td>5344 (1629)</td>
<td>0.017 (0.43)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>COMPOSITE</td>
<td>0.125 (3.2)</td>
<td>0.057 (1.578)</td>
<td>16 (110)</td>
<td>281 (69.7)</td>
<td>7 (32.2)</td>
<td>28 (0.033)</td>
<td>5344 (1629)</td>
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</tr>
</tbody>
</table>
```

### LIGHT–SPEED® ROLLERS
- Proprietary curing process ensures a straight tube with the least run out.
- Consistent wall thicknesses and true concentricity allow higher critical speeds and greater structural integrity.

### LIGHT–SPEED® ROLLERS
- We manufacture rollers according to strict quality standards, and lead times are among the best in the industry.

### LIGHT–SPEED® ROLLERS
- Consistent wall thicknesses and true concentricity allow higher critical speeds and greater structural integrity.
- We design and manufacture everything from cantilevered narrow web rollers to roll cores with diameters as wide as four feet and lengths over 35 feet. Our rollers are being used on blown film lines, flexible packaging and film machines, all types of converting equipment, and high speed paper machines.

**COATINGS & COVERS**

Light–Speed composite rollers can be coated with any material that is customarily offered for metal rollers. Rubber, polyurethane, and hard metal spray finishes can be applied to meet individual wear resistance and coefficient of friction requirements.
**LIGHT-SPEED® SPECIFICATIONS**

Company: ____________________________ Date: ____________________________

Name: ____________________________ Title: ____________________________

Address: ____________________________ City/State/Zip: ____________________________

Telephone: ____________________________ Fax: ____________________________ email: ____________________________

**PRESENT ROLLER:** (Bearing #: _____________ ) **WEB DATA:**

Overall Length: __________ Diameter: __________

Body Length: __________ Wall Thickness: __________

Body Material: __________ Coating: __________

Reason for coating: __________

Support Separation: __________

Grooved? Yes □ No □ Groove Type: __________

Application: □ Load Cell □ Idler □ Other: __________

**TENSION (P.L.I.): __________ Wrap Angle: _______**

Basis Weight: __________ Width: __________

Speed: __________

Can O.D. be changed?: __________

Min./Max.: __________

**PLEASE DESCRIBE CURRENT PROBLEMS OR ANY SPECIAL REQUIREMENTS:**

Inertia □ Weight □ Speed □ Other □ __________

**PLEASE DESCRIBE ANY EXISTING ENVIRONMENTAL CONCERNS:**

Moisture □ Dust □ Solvents □ Temp > 180° F □ If so, what temp.? __________

**NEW ROLLER:** QUANTITY: _______ **TYPE:** □ Live (fixed journal) □ Dead (body only) □ Dead

**COATING:** □ Standard (Dura-Stat wear-resistant conductive polyurethane, 32 Ra) □ Other __________

**BALANCE:** □ G6.3 □ G2.5 □ G1.0 □ Static □ Other __________

*Double E standard is ISO 1940/41 G6.3 Dynamic Balance @ customer specified RPM.*

**T.I.R.:** Double E standard is Class B Roller, .00015” per inch of body length.

**AIR ENTRAINTMENT GROOVING:** None □ Standard Groove □ Micro Groove (for thin web) □

**OTHER COMMENTS:** __________________________________________________________________________________________

**PLEASE SKETCH EXISTING WRAP ANGLE AND ROLLER DETAILS:**

![Diagram of roller details](image)

*PLEASE DISTRIBUTE SPECIFICATIONS WORKING WRAP ANGLE AND ROLLER DETAILS*:

**Duran Converting**

Joan Duran

+34 669 864 394

joan.duran@duranconverting.com

www.duranconverting.com