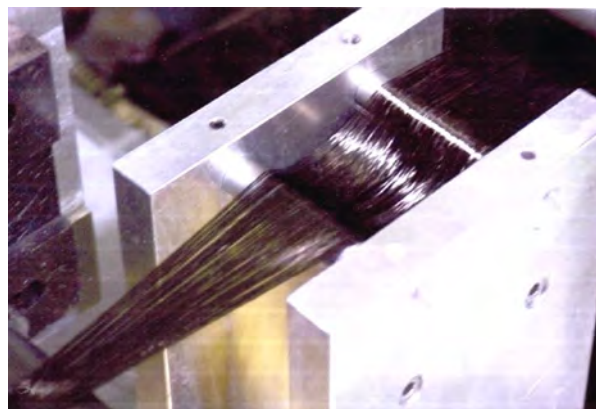


# HS/HM/HW Carbon Fiber Spreading Systems

## Benefits of Air Flow Spreading

- Air spreading is gentle to the filaments, and keeps filament breakage to a minimum.
- High spreading ratio (4-5 time original width) is possible with even filament distribution.
- Extremely lightweight and thin composite material can be produced with the air spreading method.
- Higher impregnability is possible with various types of resins. High viscosity thermoplastic resin can be used as a matrix.
- Less voids due to even spread.



## HS Series Single Tow Spreading Machine



3-stage spreading system

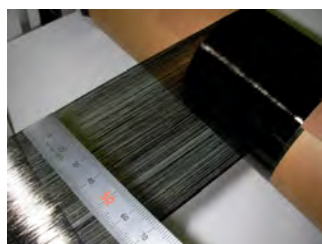
This system continuously spreads fiber over 5 times the original width, and rewinds or transfers to the next process. With an additional splitting station, it is possible to split fibers and create smaller tows.

Spread width	10mm to 100mm (* Above based on 12K carbon fiber. (* Different filament counts will have different spreading widths, so please consult.
Spread accuracy	Approx +/- 10%
Spreading speed	50m/min max (* Above is machine capability. Actual speed will depend on fiber type, spreading width, etc.
Applicable fibers	Carbon fibers, aramid fibers, ceramic fibers, glass fibers, metal fibers, etc.
Take Up Winder	Available types include reel winding, traverse winding, EKTW-C type winder
Options	<ul style="list-style-type: none"> <li>• Traversing let off creel</li> <li>• Width sensor and width monitoring</li> <li>• Tow splitting stations</li> <li>• Increased spreading stages for wider spreading</li> <li>• Heating systems for spreading fibers with sizing applied.</li> </ul>
Other	Please consult Izumi International for other special requests.



Tow splitting

Picture shows 12K split to 3K equivalents



12K to 70mm wide

## HM Series Multiple Tow Spreading Machine



50 tow spreading system

This system continuously spreads multiple fibers, and rewinds or transfers a spread sheet to the next process.

Number of tows	10 to 50 (large systems are also possible)
UD sheet output	200mm to 1000mm (* In case of 12K fiber spread to 20mm each)
Spreading speed	3m/min to 10m/min max (* Above is machine capability. Actual speed will depend on fiber type, spreading width, etc.)
Applicable fibers	Carbon fibers, aramid fibers, ceramic fibers, glass fibers, metal fibers, etc.
Other	Please consult Izumi International for other special requests.

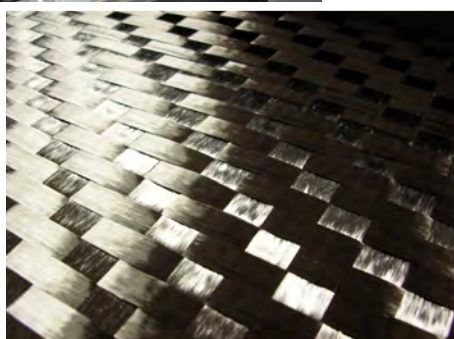
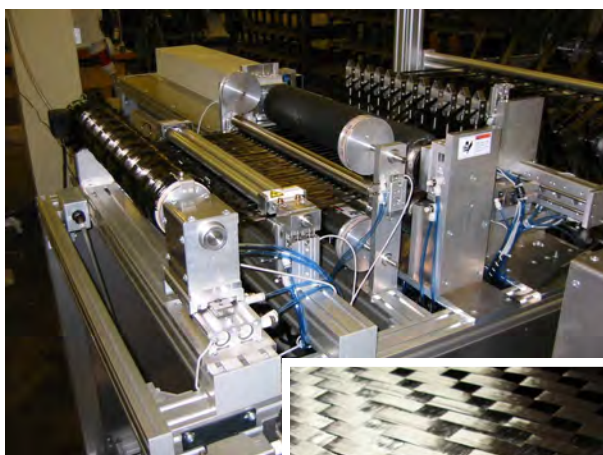


Infrared heating system for sized carbon fibers



UD sheet output

## HW Series Spread Tow Weaving Machine



This system can weave spread tow produced from the spreading systems. It produces extremely lightweight materials, and is capable of plain weaves, or available in the programmable weave option.

Fabric width	300mm to 1000mm (* Wider systems available upon request)
Weaving speed	Approx 10 picks per minute
Weaving pattern	Plain, twill, satin, etc. All patterns are programmable.