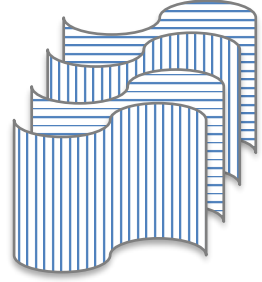


## TECHNICAL DATA SHEET

Product Name	EF 60 HB
Description	<p>A roll product consisting of four layers* of UD fibers cross plied at 0°/90°/0°/90° and consolidated with matrix</p> 
Fiber	UHMWPE Fiber
Weave Type	Balanced Unidirectional
Prepreg Areal Weight	228 (±) 15 g/m <sup>2</sup>
Roll length	100 m**
Roll width	1.60 m
Applications	Hard Ballistic Protection (Body Armor)
Key Specification	Enhanced performance-to-weight ratio Better kinetic energy absorption than woven products High temperature stability and high rigidity
Cure Temperature	120°C - 130°C
Service Temperature (°C)	-51°C and +71°C
Storage Condition	@ Room Temperature

\* can be tailored to 2 / 4 / 6 layers according to customer demand

\*\* can be tailored according to customer demand

## Process Safety & Precautions:

- All necessary precautions should be applied for the closed distance between platens so as to prevent the plate from being ejected between the platens during curing cycle.
- If it happens, it may result in serious injuries for the employees in the manufacturing area.
- In case of any further guidance is needed please call your point of contact at Kordsa.

## PE Based Cross-Plied Fabric - Usage Recommendations:

The roll is delivered with its roll report. It might have some irregularities during the roll length, those are labelled as “allowance”. Under these circumstances, it is recommended not to stack irregularities on top of each other. Rather than doing that, it is highly recommended to stack the sections along with width direction (Rather than 1-2-3; it is recommended to use 3-3-3 / 2-2-2 / 1-1-1)

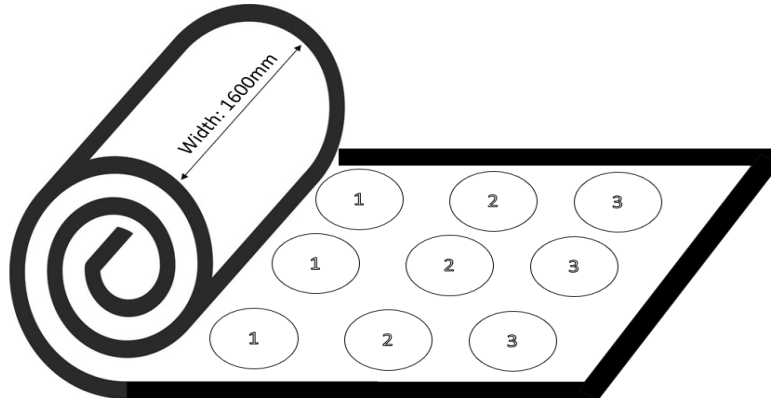


Figure 1 Visual Representation of Recommended Ply Stacks

## EF 60 HB – Important Remarks:

- Polyethylene based cross-ply fabric should be stored protected from light, dust, water or other contaminants before processing.
- Polyethylene based cross-ply fabric is primarily suitable for hot pressing process.
- If it is required, polyethylene based cross-ply fabric can be processed under autoclave conditions (7 bars of pressure) that will result in less consolidation.
- The best ballistic performance is a matter of the balance of curing time, pressure and processing temperature.
- For the manufacture of hard ballistic protective material, it is recommended the customer should conduct trials and standardize curing conditions, considering their operating conditions and the curing process properties to be used.

- The higher the applied pressures, the better ballistic performance is.
- Cure cycle time is a matter of thickness. The thicker the plate the higher the cure time is. It should be adjusted accordingly.
- Controlled heating and cooling capacity of the press will have positive impact on the required ballistic performance.
- Make sure that the temperature reading from the core does not exceed 130 °C during the whole processes):

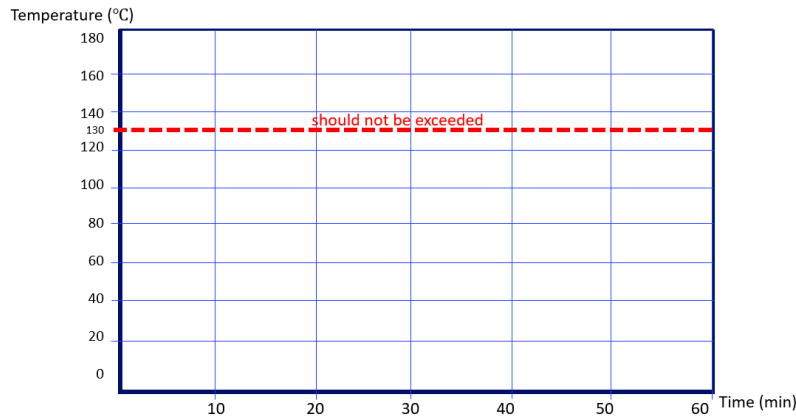


Figure 2 Upper Temperature Limit Representation

## Recommended Process Steps for Press Curing of EF 60 HB:

- Preheat the molds to 60°C before loading the stacked layers
- Place a release liner onto the surface of lower platen surface (optional)
- Load the stacked material into the mold
- Put thermocouple wire in the center of the polyethylene based cross-plyed plies to track the temperature of the center of the composite layers
- Make sure to place the thermocouple is in the middle of the stacked layers. This temperature measurement is the temperature you must track
- Place a release liner on top of the stacked materials before the pressure application (optional)
- Close the press
- Apply a minimum pressure of 20 bar (2 MPa or 20 kg/cm<sup>2</sup>)
- Increase the temperature by 3°C /min
- Temperature – Duration – Pressure should be optimized by the customer
- Decrease the temperature by 3°C /min to 50°C
- Open the mold.



USAGE AND REPACKAGING
USAGE
<ol style="list-style-type: none"><li>1. Before opening unopened rolls or plastic bags, make sure that the environment is clean.</li><li>2. Cut open the plastic bag of the room-temperature roll.</li><li>3. Remove the documents that came with the roll from the package during shipment.</li><li>4. Take the roll on the suitable bench / opener and start using it.</li><li>5. The roll contains LDPE semi-transparent film. Remove the film from UHMWPE UD layers before using the roll.</li></ol>
REPACKAGING
<ol style="list-style-type: none"><li>1. Make sure the alignment is straight.</li><li>2. Place the original shipping documents and desiccant material into the roll.</li><li>3. Threat the plastic bag over the roll.</li><li>4. Purge the air inside the roll (manually / preferably with a vacuum suction unit).</li><li>5. Complete the packaging process by lightly melting / tying the mouth part of the plastic bag not to open.</li></ol>

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