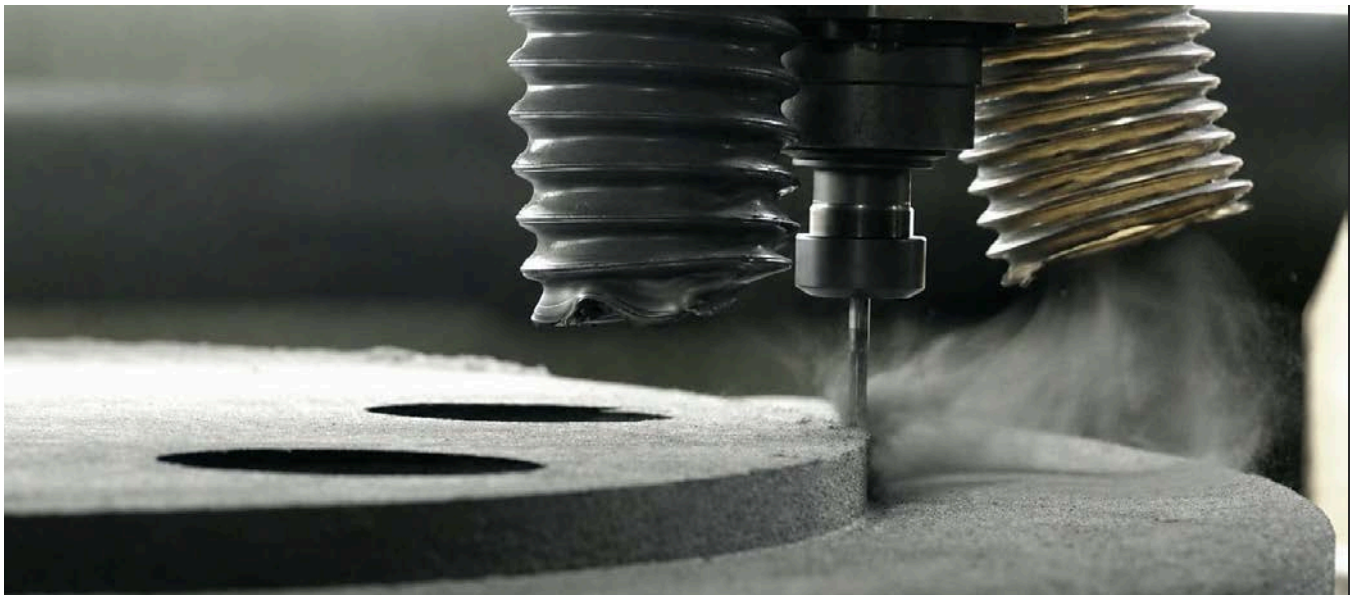
TECHNICAL DATA SHEET

Carbon Fiber Rigid Insulation/Felt



IPS

PITCH-BASED SHORT-FIBER RIGID FELT

Pitch precursor · 2D fiber arrangement

IRS

RAYON-BASED SHORT-FIBER RIGID FELT

Rayon precursor · short-fiber route

IRL

RAYON-BASED LONG-FIBER RIGID FELT

Rayon precursor · long-fiber route

OVERVIEW

AYD has decades of experience in carbon materials, specializing in pitch- and rayon-based carbon fiber insulation for high-temperature hot zones. The CarboniteX® series combines controlled rigid-felt forming, 2D fiber architecture, and high-purity treatment to provide integrated rigid- and soft-felt solutions for photovoltaic, semiconductor, fiber optics, and industrial furnace applications.

APPLICATIONS

- Single-crystal silicon growth (CZ / FZ)
- Semiconductor wafer hot zones
- PV ingot furnaces
- Fiber drawing
- SiC
- High-temperature industrial furnaces

03 PARAMETERS

PHYSICAL PROPERTIES / TYPICAL VALUES

IPS Pitch-Based Short-Fiber Rigid Felt · Key Physical Properties (Typical Values)

Item	Unit	Standard	Graphitized (High-Temp)	Purified	Remarks
Density	g/cm³	0.14 – 0.25			Higher density on request
Carbon Content	wt%	>99	>99.9	>99.99	
Ash	ppm	≤200	≤100	≤20	
Thermal Conductivity	900°C	0.129	0.124	0.124	W/(m·K) · Vacuum
	1300°C	0.167	0.157	0.157	
	1500°C	0.238	0.312	0.312	
	1700°C	0.266	0.346	0.346	
Thermal Expansion Coefficient	×10⁻⁶/K	<3.5			Room temp – 1000°C
	×10⁻⁶/K	<6.0			Room temp – 2000°C
Compressive Strength	MPa	≥0.55	≥0.55		Failure direction
Flexural Strength	MPa	≥0.69	≥0.69		Failure direction

IRS Rayon-Based Short-Fiber Rigid Felt · Key Physical Properties (Typical Values)

Item	Unit	Standard	Graphitized (High-Temp)	Purified	Remarks
Density	g/cm³	0.14 – 0.25			Higher density on request
Carbon Content	wt%	>99	>99.9	>99.99	
Ash	ppm	≤200	≤100	≤20	
Thermal Conductivity	900°C	0.082	0.108	0.108	W/(m·K) · Vacuum
	1300°C	0.116	0.125	0.125	
	1500°C	0.183	0.270	0.270	
	1700°C	0.211	0.298	0.298	
Thermal Expansion Coefficient	×10⁻⁶/K	<3.5			Room temp – 1000°C
	×10⁻⁶/K	<6.0			Room temp – 2000°C
Compressive Strength	MPa	≥0.55	≥0.55		Failure direction
Flexural Strength	MPa	≥0.69	≥0.69		Failure direction

IRL Rayon-Based Long-Fiber Rigid Felt · Key Physical Properties (Typical Values)

Item	Unit	Standard	Graphitized (High-Temp)	Purified	Remarks
Density	g/cm³	0.14 – 0.25			Higher density on request
Carbon Content	wt%	>99	>99.9	>99.99	
Ash	ppm	≤200	≤100	≤20	
Thermal Conductivity	700°C	0.056	0.058		W/(m·K) · Vacuum
	900°C	0.0913	0.102		
	1300°C	0.213	0.277		
	1500°C	0.251	0.329		
Thermal Expansion Coefficient	×10⁻⁶/K	<3.5			Room temp – 1000°C
	×10⁻⁶/K	<6.0			Room temp – 2000°C
Compressive Strength	MPa	≥0.4			Failure direction
Flexural Strength	MPa	≥0.6			Failure direction

Pitch-Based Short-Fiber Rigid Insulation

Rayon-Based Long-Fiber Rigi

05 Surface Treatments

SURFACE TREATMENTS

01 No Treatment 02 Graphite Coating 03 Graphite Paper 04 Graphite Cloth

05 Carbon Cloth + Graphite Paper 06 Carbon-Carbon Composites 07 CVD Coating 08 Others / Custom