TDS updated 03/2023

PHACT™ CA1690P

PHACT CA1690P is an environment-friendly semi-crystalline biopolymer which has excellent biodegradability.
It is a compounded polymer based on Polylactic acid and Amorphous polyhydroxyalkanoate.
PHACT CA1690P is a transparent resin and appropriate for thermoforming and blow molding process.

PROPERTIES OF PHACT CA1690P

Properties	Units	ASTM No	CA1690P
Forms	-		**Pellet**
Specific Gravity	-	D792	**1.23**
Hardness	Shore D	D2240	
- Max			**90**
- 15s			**88**
Tensile Strength at Peak[1)]	MPa	D638	**62**
Elongation at Break[1)]	%	D638	**11**
IZOD Impact Strength (Unnotched)	kJ/m^2	D256	**24**
Heat Deflection Temperature / 0.455 MPa	℃	D648	**56**
Melting Point[2)]	℃	D3418	**150**
Glass Transition Temperature[2)]	℃	D3418	**-16, 57**
Melt Flow Rate (190 ℃, 2.16 kg)	g/10 min	D1238	**4-5**
Mold Shrinkage[3)]	%	-	**0.3**

1) Injection specimens conforms to ASTM D638. Crosshead speed 50 mm/min for tensile strength.

2) Differential Scanning Calorimeter (DSC), peak of endotherm. Heating rate 10 ℃/min.

3) Injection mold temperature was 25 ℃.

PROCESSING CONDITION FOR SHEET EXTRUSION

Feed Zone	20 ~ 40 ℃	Nozzle	165 ~ 190 ℃
Melt Zone	165 ~ 175 ℃	Roll Temperature	25 ~ 55 ℃
Mixing & Conveying	175 ~ 185 ℃	Stored Temperature of Sheet	< 40 ℃

*The extrusion temperature condition should be mild (165 ~ 175 ℃) for reducing degradation and yellowshing of prouduct.

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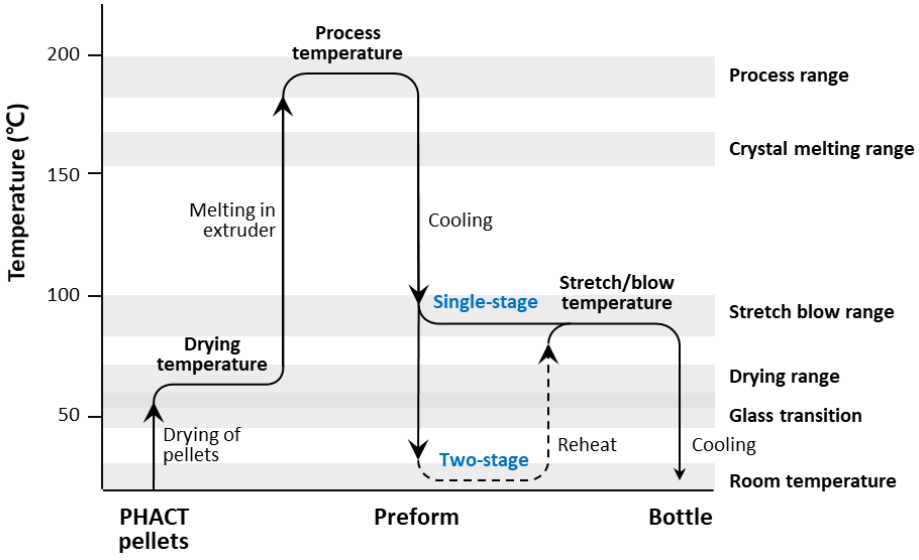
PROCESSING CONDITION FOR THERMOFORMING

Sheet Thickness	0.45 mm	Heat Vent Time	2.0 sec
Mold Temperature	30 ~ 40 ℃	Forming & Vent Time	1.5, 2.0 sec
Heater Platen Temperature	100 ℃	Eject Delay and Eject Time	0.2, 0.2 sec

PROCESSING CONDITION FOR INJECTION STRETCH BLOW MOLDING

Preform Temperature	80 ~ 100 ℃
Stretch Rod Speed	1.2 ~ 2.0 m/sec
Stretch Blow Mold Temperature	21 ~ 35 ℃

[Process structure of ISBM]



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GENERAL DRYING PROCESS AND PURGING CONDITION

Drying Process Condition

Since biodegradable materials have strong hygroscopicity, make sure to keep in a dry place to store for a long time.
Consume all the products with an open bag if possible, and if there is a residual unavoidably,
seal them completely and keep them in a dry place, and avoid storing them for a long time.
PHACT must be dried under 40 ℃ at over 12 hrs or caking can happen because Tg of these compounds is 60 ℃.
It is preferable to dry with air below -40 ℃ dew point.
In case of composites are exposed to moisture in the air, they must be dried in the dehumidifying dryer before use.

Purging

※ Following PET, PA, or HDPE

It is critical to clean the material handling system of PET, nylon and high molecular weight HDPE
to assure that these materials do not inadvertently feed into the extruder during or after the purging process.

1) Purge with low MFR (e.g., <1) transition resin at normal PET operating temperatures.
   PET and PHACT are temperature incompatible, so the transition resin is one that can be processed
   at the high temperatures of PET and the low temperatures of PHACT.
   Suggested transition resins include PP, crystal PS, and PETG.
   Purge for at least 7x average residence time, much of the time at the typical PET production rate (~30 minutes).
2) Let system empty as much as possible. Clean out the hopper as much as possible.
3) Introduce higher melt flow transition resin (PP, PS, PETG) and change to normal PHACT operating temperatures.
4) Let system empty as much as possible.
5) Then transition to pure PLA resin and purge, again, for minimum 7x average residence time.
   Change screen pack when it becomes obvious that primarily PLA is exiting the die.
6) At the completion of a trial run, purge all PHACT from the extrusion system, using low melt index PP or PS.

Notes

It is critical that all drying and conveying/receiving systems be free of all PET and vacuumed to ensure that
there is no remaining polymer dust, before adding PHACT. PET will not melt at PHACT operating temperatures
and will block screens, if it is present in the system.