

Enhanced gob loading with new Constant Cone Bézier Delivery

Constant Cone Delivery

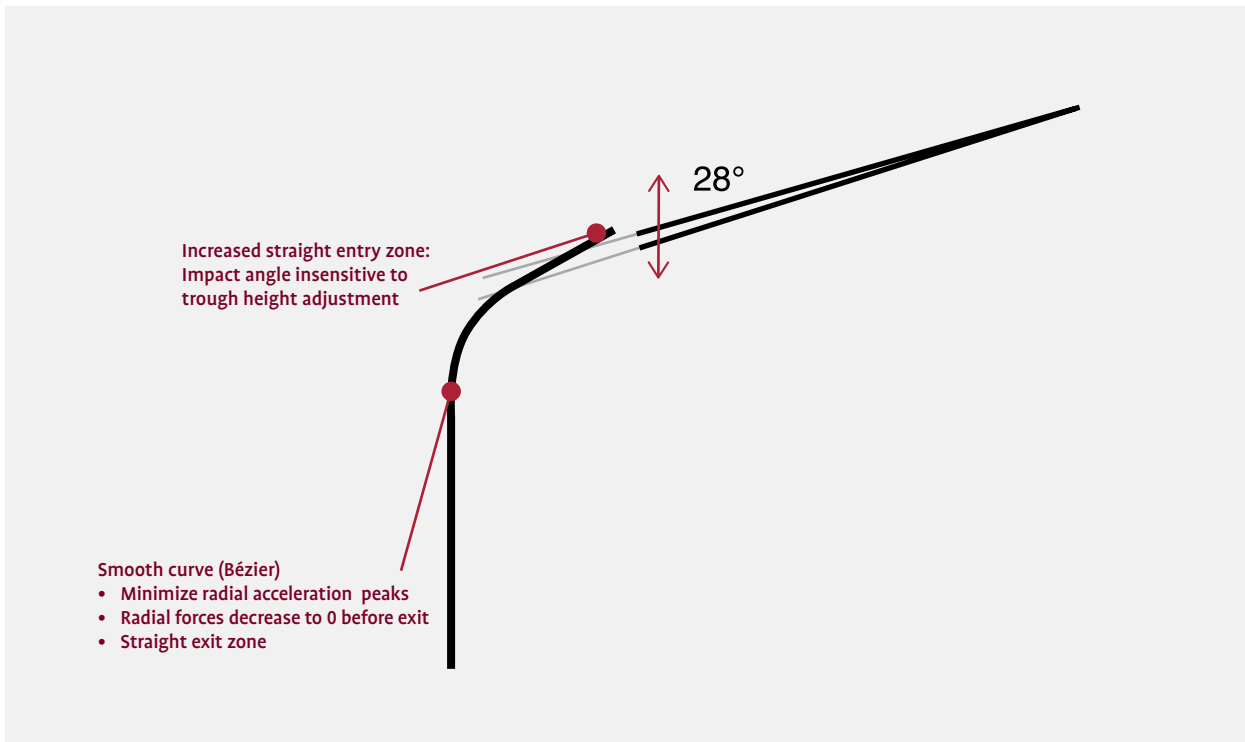


Constant Cone Delivery

Constant cone delivery is the latest Bucher Emhart Glass development for optimal gob loading. The constant cone delivery family is based on a constant trough angle of 28° and covers the full range of forming machines (NIS, BIS, AIS and IS) for all available center distances. The newly developed Bézier equipment, in conjunction with the constant cone geometry, provides for enhanced gob loading.

Optimization criteria are based on:

- Minimizing centripetal accelerations
- Reduce gradually the radial accelerations to zero
- Generate a smooth landing zone
- Increase the length of the deflector profile at the upper end



Key benefits of the new Bézier deflectors design

Smaller curvature design

- Reduced gob entry angle variations
- Reduced gob shape variations
- Increased loading stability

Smoother entry curve path

- Reduced impact forces
- Reduced Normal forces
- Increased loading stability
- Longer coating lifetime
- Reduced gob shape variations

Smaller impact and nominal forces

- Less kinematical energy consumption
- Higher loading speed
- Better gob shape

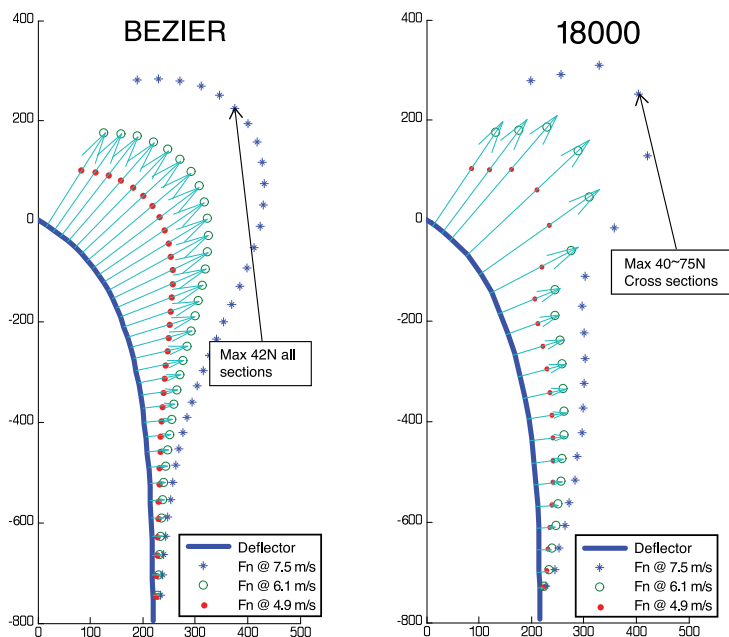
Uniform Normal force distribution on all sections

- Reduced gob speed and gob shape variation from section to section

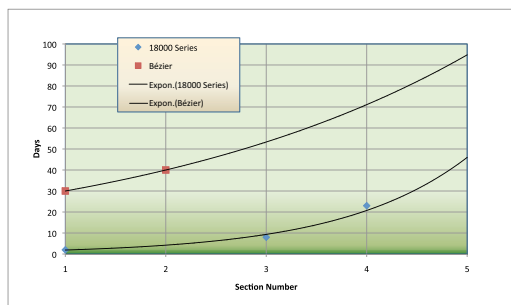


IS/AIS specification guidelines	IS/AIS 6 section		IS/AIS 8 section		IS/AIS 10 section		IS/AIS 12 section	
Delivery Geometry	Constant Cone		Constant Cone		Constant Cone		Constant Cone	
Equipment	18000	BEZIER	18000	BEZIER	18000	BEZIER	18000	BEZIER
Delivery system	210-2075	210-2150	210-2072	210-2152	210-2069	210-2154	210-2055	210-2156
Suspension	SG	401-1364-4 401-1364-11	401-1183-4 401-1183-15	401-1227-4 401-1227-11			N/A	
Suspension	DG	401-1364-2 401-1364-9	401-1183-2 401-1183-13	401-1227-2 401-1227-9			401-1007-2 401-1007-9	
Suspension	TG	401-1364-3 401-1364-10	401-1183-3 401-1183-14	401-1227-3 401-1227-10			401-1007-3 401-1007-10	
Suspension	QG	N/A	N/A	N/A			N/A	
Deflector adjustor	210-2051-00		210-2051-00		210-2051-00		210-2051-00	
Trough bracket	401-1182-00		401-1182-00		401-1182-00		401-1101-0	
Delivery equipment	401-1365-00	401-1537-00	401-1222-00	401-1515-00	401-1362-00	401-1525-00	401-1104-00	401-1532-00
Set of troughs	SG	401-1435-00 401-1540-00	401-1435-00 401-1520-00	401-1435-00 401-1528-00			N/A	
Set of troughs	DG	401-1435-00 401-1539-00	401-1435-00 401-1517-00	401-1435-00 401-1527-00			401-1435-00 401-1534-00	
Set of troughs	TG							
Set of troughs	QG	N/A N/A	N/A N/A	N/A N/A			N/A N/A	
Set of deflectors	SG	401-1541-00	401-1519-00				N/A N/A	
Set of deflectors	DG	401-1366-00 401-1538-00	401-1223-00 401-1516-00	401-1353-00 401-1526-00			401-1106-00 401-1533-00	
Set of deflectors	TG							
Set of deflectors	QG	N/A N/A	N/A N/A	N/A N/A			N/A N/A	

Comparison of the normal force distribution



Coating life*



* As measured at Emhart Glass Research Center

NIS specification guidelines

	NIS 8 section		NIS 10 section		NIS 12 section		
Delivery Geometry	Constant Cone		Constant Cone		Constant Cone		
Equipment	18000	BEZIER	18000	BEZIER	18000	BEZIER	
Delivery system	400-54-00	400-5403-00	400-53-00	400-5404-00	400-112-00	400-5405-00	
Suspension	SG	N/A	N/A		N/A		
Suspension	DG	400-5222-1	400-5222-2	400-5192-1	400-5192-2	400-5147-1	400-5147-2
Suspension	TG	400-5223-1	400-5223-2	400-5193-1	400-5193-2	400-5148-1	400-5148-2
Suspension	QG	400-5224-1	400-5224-2	400-5194-1	400-5194-2	400-5149-1	400-5149-2
Deflector adjustor	400-5087-00		400-5087-00		400-5087-00		
Trough bracket	400-5138-00		400-5138-00		400-5138-00		
Delivery equipment	400-5221-00	400-5408-00	400-5201-00	400-5410-00	400-5146-00	400-5412-00	
Set of troughs	SG	N/A	N/A	N/A	N/A	N/A	
Set of troughs	DG	400-5232-00	400-5429-00	400-5202-00	400-5417-00	400-5151-00	400-5423-00
Set of troughs	TG	400-5233-00	400-5430-00	400-5203-00	400-5418-00	400-5152-00	400-5424-00
Set of troughs	QG	400-5234-00	400-5431-00	400-5204-00	400-5419-00	400-5153-00	400-5425-00
Set of deflectors	SG	N/A	N/A	N/A	N/A	N/A	
Set of deflectors	DG	400-5242-00	400-5426-00	400-5212-00	400-5414-00	400-5154-00	400-5420-00
Set of deflectors	TG	400-5243-00	400-5427-00	400-5213-00	400-5415-00	400-5155-00	400-5421-00
Set of deflectors	QG	400-5244-00	400-5428-00	400-5214-00	400-5416-00	400-5156-00	400-5422-00

Upgrade

The extension of the deflector upper end optimizes the landing zone and minimizes the impact forces. When using Bézier deflectors, shorter troughs are needed resulting in improved thermal behavior.

All the existing constant cone delivery can be upgraded to Bézier geometry by replacing deflectors, troughs and suspension forks.

Upgrades of a previous non-constant cone machine are possible by replacing the machine top beam and the related spacers. The retrofit will result in a machine height increase.

Increase of machine height with new constant cone delivery

Machine	Top of beam DG/TG	Top of funnel air ride DG/TG	Top of interceptor DG/TG
6 Section IS 4-1/4	412	372/428	372/416
6 Section IS 5"	285	245/301	259/289
8 Section IS 4-1/4	393	353/409	353/397
8 Section IS 5"	266	226/282	226/270
10 Section IS 4-1/4	278	238/319	238/307
10 Section IS 5"	278	238/319	238/307
12 Section IS 4-1/4	205	164/-	165/-
12 Section IS 5"	205	164/245	165/233
6-Section IS 5-1/2	348	308/-	308/-
6-Section AIS 6-1/4"	348	308/-	308/-
8-Section IS 5-1/2	410	369/-	370/-
8-Section AIS 6-1/4"	409/384	368/400	369/388
10-Section IS 5-1/2	320	280/-	280/-
10-Section AIS 6-1/4"	320	280/314	280/302
12-Section IS 5-1/2	208	167/-	168/-
12-Section AIS 6-1/4"	208/143	167/184	168/171

BIS specification guidelines

Delivery Geometry	BIS 8 section		BIS 10 section		BIS 12 section		
	Constant Cone		Constant Cone		Constant Cone		
Equipment	18000	BEZIER	18000	BEZIER	18000	BEZIER	
Delivery system	401-1507-1	401-1507-2	401-1509-1	401-1509-2	401-1511-1	401-1511-2	
Suspension	SG	N/A	N/A		N/A		
Suspension	DG	401-1183-2	401-1183-13	401-1227-2	401-1227-9	401-1007-2	401-1007-9
Suspension	TG	401-1183-3	401-1183-14	401-1227-3	401-1227-10	401-1007-3	401-1007-10
Suspension	QG	N/A		N/A		N/A	
Deflector adjustor	401-1050-00		401-1050-00		401-1050-00		
Trough bracket	401-1182-00		401-1182-00		401-1101-0		
Delivery equipment	401-1222-00	401-1515-00	401-1362-00	401-1525-00	401-1104-00	401-1532-00	
Set of troughs	SG	N/A	N/A	N/A	N/A	N/A	
Set of troughs	DG	401-1435-00	401-1517-00	401-1435-00	401-1527-00	401-1435-00	401-1534-00
Set of troughs	TG	N/A		N/A	N/A	N/A	N/A
Set of troughs	QG	N/A	N/A	N/A	N/A	N/A	N/A
Set of deflectors	SG	N/A	N/A	N/A	N/A	N/A	N/A
Set of deflectors	DG	401-1223-00	401-1516-00	401-1353-00	401-1526-00	401-1106-00	401-1533-00
Set of deflectors	TG	N/A		N/A		N/A	
Set of deflectors	QG	N/A		N/A		N/A	

Specifications are subject to change. Actual performance depends on specific application, container size, and line speed. Dimensions represent nominal machine size and are not for installation purposes.

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