

Technical News Bulletin

November 1993

Deflector Series 18000

1. INTRODUCTION

Consistent product streamlining and improvements have resulted in the EMHART Deflector Series 18000 for greater efficiency and precision in gob loading. This new series is available within the range of 7/8" to 1 -3/4" and replaces the Naviculoid Series Deflectors of the same range.

Due to the extensive modular design of the new series, deflector requirements for different IS machine sections can be optimally satisfied without having to maintain a variety of different deflector bodies on stock. Improved gob delivery and performance are not the only important benefits of this new deflector series. It features the same cross section profile and full mounting compatibility with previous Naviculoid Deflector types. The new deflector curve of this series was designed to provide gob guidance for uniform, consistent and repeatable conditions for gob delivery with respect to the following parameters:

- Gob velocity at the blank mold entrance
- Gob elongation during travel from the shear to the blank mold
- Vertical alignment for straight-line gob delivery to the blank mold
- Concentric gob delivery relative to the mold opening center axis
- Simultaneous loading for multigob (DG, TG) operation

Due to simultaneous, improved gob loading in the inner and outer blank molds, there is less dwell in the blank loading cycle. Hence, the baffle-on time can be set more precisely and shortened.

Improved timing, precise and uniform gob loading of all molds result in improved ware quality and higher percent pack. The possibility of reducing timing parameters provides the potential for increasing production speed.

Test and field operations under glass confirm that the new Deflector Series 18000 makes a significant contribution to the improvement of the entire EMHART DELIVERY SYSTEM.

2. TECHNICAL ASPECTS

When traveling through the deflectors, gobs are subject to variable centrifugal forces, which, in turn, depend on the gob velocity and deflector curvature. Obviously, centrifugal forces affect both the:

- Gob shape; and
- Gob glide behaviour

To achieve impeccable gob glide conditions, the centrifugal force acting on the gob should gradually decrease, but not fluctuate, attaining a theoretical value of zero at the exit to permit gob delivery in-line with the travel axis and a straight, vertical gob drop into the blank mold without any lateral movement. Gob concentricity relative to the blank opening has a decisive effect on glass distribution in the mold and ultimately affects glass production quality.

On the other hand, centrifugal forces are required to ensure that the gob remains in contact with the deflector surface to achieve optimum gob guidance to the very end of the trajectory.

3. FIELD TESTS AND RESULTS

EMHART investigated and tested the Deflector Series 18000 and the Naviculoid Series in field operations for verification purposes and to obtain relevant performance data.

- **Fig. 1** Field measurements of Naviculoid Series Gob velocity at blank entry
- **Fig. 2** Field measurements of Deflector Series 18000
Gob velocity at blank entry

A comparison between gob loading procedures with Naviculoid Series Deflectors and Deflector Series 18000 (**Figs. 1 and 2**) clearly indicates the marked improvement in gob delivery of the Deflector Series 18000.

Greater consistency in gob velocity and mold loading achieved by Deflector Series 18000 as shown in **Fig. 2** indicates the significant improvement in the uniformity of gob arrival at the outer and inner molds.

As previously mentioned, simultaneous loading and precise cycle timing are major factors affecting glass distribution in the container wall, and ultimately glass container quality.

Gob Velocity at Blank Entry

Naviculoid Delivery System

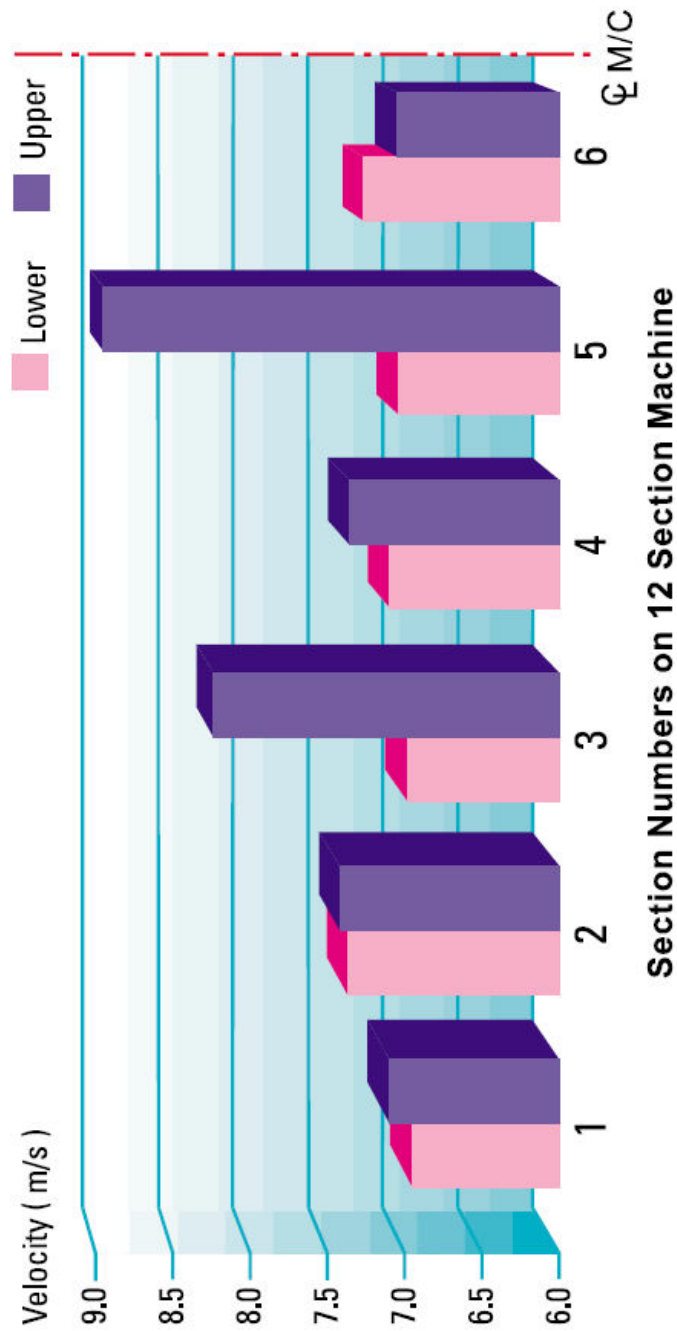


Fig. 1 Field measurements of Naviculoid Series Gob velocity at blank entry

Gob Velocity at Blank Entry

18'000 Series Delivery System

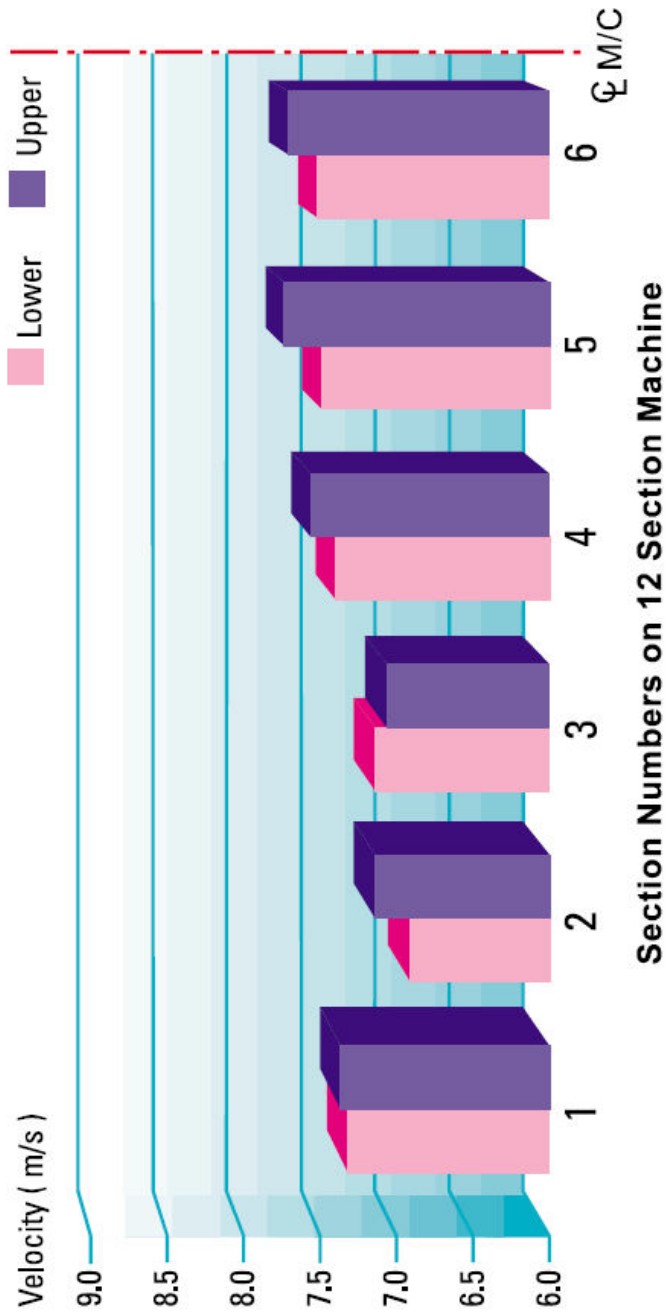


Fig. 2 Field measurements of Deflector Series 18000 Gob velocity at blank entry

4. FEATURES AND BENEFITS

FEATURES	BENEFITS
<ul style="list-style-type: none"> New longitudinal deflector curve 	<ul style="list-style-type: none"> More precise gob loading Stable gob and extended guidance over entire deflector series Accurate vertical gob drop into blank mold
<ul style="list-style-type: none"> NC-machined over entire inner profile surface 	<ul style="list-style-type: none"> Consistent and repeatable loading
<ul style="list-style-type: none"> Deflector exit at same height above all sections 	<ul style="list-style-type: none"> Simultaneous gob loading into inner and outer molds
<ul style="list-style-type: none"> Reduced number of parts through standardization 	<ul style="list-style-type: none"> Reduced accessory parts inventory
<ul style="list-style-type: none"> Mounting identical to Naviculoid parts 	<ul style="list-style-type: none"> Easy convertibility

5. RANGES

Deflector Series 18000 covers the following sizes:

7/8", 1", 1 -1/8", 1 -1/4", 1 -3/8", 1 -1/2", 1 -5/8", 1-3/4"

This range covers most of the required production applications for IS machines in DG and TG operation. The exceptions to this case are all SG operations and the 6-section TG 3" machine. SG operations require the Naviculoid delivery system, and the 6-Section TG 3" machine the Non-Naviculoid delivery system.

6. NAVICULOID SERIES

Naviculoid Deflectors must be used for applications outside the range of the Deflectors Series 18000 and for all SG configurations. Naviculoid Deflectors are still available in the following sizes:

3/8", 1/2", 5/8", 3/4", 7/8", 1", 1 -1/8", 1 -1/4", 1 -3/8", 1 -1/2", 1 -5/8", 1 -3/4", 1 -7/8", 2", 2 -1/8", 2 -1/4", 2 -3/8", 2 -1/2", 2 -5/8", 2 -3/4".

Note: The application range of the deflectors listed above depends on the machine size and operation (SG, DG, TG).

7. OVERVIEW OF SUPPORTED CONFIGURATIONS

The complete product line of the Deflector Series 18000, ranging from 7/8" to 1 -3/4" (in increments of 1/8") is available for a wide range of machine configurations, regardless of the mold and delivery center distance. Please refer to *Customer Information ZG 374/0593E* for further information.

8. CONVERSIONS

Please refer to *Customer Information ZG 374/0593E* for relevant conversion tables and additional information.

Note: The use of mixed deflector sets is not recommended because different deflector trajectory and performance characteristics will result in varying operating conditions which would adversely affect ware quality.