



## RS-6<sup>(MOD-2001)</sup>

### PULLING SYSTEM

- APPLICATION:** Automatic web-guiding system for Maxfoam-Varimax, Liquid Lay Down Fall-Plate machines, as well as Petzetakis Square Block System on Conventional Processes.
- ADVANTAGES:** Improves block yield on Maxfoam/Varimax by 2-3%.  
No extra manpower required.  
Return on Investment of 1 month on 15,000-t/a plant.
- FEATURES:** Pre-assembled, pre-wired unit, complete with controls, specifically for retro-fit installation.  
Comprehensive installation and running instructions included.  
Maintenance free brush-less drive motors.  
Gear boxes lubricated for life.  
All machined steel parts are chromium-plated.  
Anodised aluminium profiles with high precision/hardened steel guide rail system for length adjustment. □
- TECHNICAL DATA:** AC drive motors for pulling rollers, angle adjustment, height adjustment and optional length positioning.  
Variable speed drive motor for roller speed running at synchronised speed with main conveyor □.  
Variable speed control for Length positioning, adjustable between 0.2 and 8.0 m/min for optimum control over position during foaming □.  
Pneumatic/electrical controls for automatic web-guiding.  
Power supply: 220 Volt, 50-60 Hz. AC  
or 2 X 110 Volt, 50-60 Hz. AC



# RS-6 SYSTEM

## INTRODUCTION

The abbreviation RS stands for Rectangular Section. The RS system is a further development of the patented Draka Square Block System (formerly D-3) and has been redesigned for the Maxfoam, Varimax and other "Fall-plate" process as well as the Petzetakis process (formerly U-3) on Conventional machines.


The next two paragraphs give a brief explanation about these two applications of the RS equipment.

On **Maxfoam/Varimax** machines, the RS side pulling equipment is used without additional equipment to square-off the top of the already relatively square foam block. This brochure (**RS-6 Mod-2001**) will deal with RS on Maxfoam only. The RS-6 system works equally well on so-called Liquid Lay Down processes based on a Fall Plate system .

On **Conventional** machines, the RS side pulling equipment is used in combination with so-called Petzetakis Forks to square-off the pronounced dome of the conventional foam block. The Petzetakis Process (RS + Forks) is predominantly used for polyester foam, where other squaring systems such as Draka Square Block and Planibloc Top Control fail to perform at all.

The Petzetakis process is described in our brochure "Petzetakis System".

## ADVANTAGES

- The RS system improves the yield  of a standard Maxfoam, Varimax or "Fall-Plate process" by about 2-3% in optimising the block profile.
- The Return on Investment can be as short as 1 month for a 15.000-t/a plant.
- The operation of the RS system does not require extra manpower; the regular crew can operate the remote controlled functions and automatic web guiding system.
- Clear instructions and drawings allow installation of the equipment within 2-3 working days by the local Technical Department, and normally no downtime is required for the installation.



## NEW DESIGN

The RS-6 <sup>Mod-2001</sup> system is based on its predecessors RS-3 and RS-5 as supplied in the past by Unifoam AG. The experience of some 70 to 80 previously supplied RS-3 and RS-5 units guarantee the vast improvements in the newly designed RS-6 <sup>Mod-2001</sup> system.



The RS-6 <sup>Mod-2001</sup> design does away with all the disadvantages of the outdated “Unifoam RS-5” arrangement, such as:

- Synchronised pulling roller speed, following the conveyor speed automatically, with possibility for manual fine tuning. Even during formulation changes with different conveyor speeds, the film will not drop out of the pulling rollers.
- High precision guiding rail system for horizontal positioning with adjustable (variable) speed control for the length adjustment. This enables for slow speed (min. 0.2m/min) length adjustments during foaming while in between runs adjustments at high speed can be made (max. 8.0m/min).
- Increased working range of 440-mm or even up to 600-mm on the height adjustment compared to the 230-mm range on the old “Unifoam RS-5”.
- Remote controlled motorised height adjustment in stead of manual height adjustment with lever and hand-wheel.
- A telescoping guidance unit eliminates the problem of the toothed gear-rack dipping into the rising foam.



- Chromium-plated steel parts are for ease of cleaning and durability.
- Anodised aluminium dual profile High Precision Guide Rail with hardened steel guiding parts.
- Maintenance free, brush-less motors.
- Gearboxes lubricated for life.

## DESCRIPTION OF THE RS-6<sup>Mod-2001</sup> EQUIPMENT

The RS-6<sup>Mod-2001</sup> system is basically available now in one single model. This model combines the best features from the previously offered RS-6<sup>Plus</sup> and RS-6<sup>Superior</sup>.

The main features of the RS-6<sup>Mod-2001</sup> system are:

- Automatic synchronised pulling film speed, matching the conveyor speed at all times.
- Remote controlled height adjustment via a telescoping guidance unit.
- Fully automatic motorised angle adjustment by means of air sensors with the possibility to run the angle adjustment in manual mode. The film height sensing system is based on low pressure compressed air (low air consumption).
- Variable, adjustable speed control on the length adjustment. This feature allows low speed adjustments during production on the length setting, forward and backward, without disturbing the film tracking.

A more detailed overview is given in the table on one of the following pages.

On special request quotations can be made to customer requirement with fewer of the above features or even extra features.

## PRINCIPLE

The principle of the RS-system is based on the reduction/elimination of the friction of the upward rise of the foam by lifting a polyethylene web on the side of the block during the rise of the foam.

The polyethylene web is fed into the foaming machine near the mixing head and runs at the inner side of the side paper (or side film) in horizontal direction for approx. 30% of the rise. The film then travels upward at the same angle as the rising foam over the next 50% of the rise.

The upward displacement of this film is achieved by a set of driven pulling rollers, positioned at approx. 80% of the total rise of the foam.

The speed control of the pulling rollers, the angle at which the pulling rollers are positioned, the height and the horizontal position are four of the most important operating parameters of the system.



## INSTALLATION

The RS <sup>MOD-2001</sup> system comes as a complete kit, pre-wired, including guide rails PE-film unwind stations, air reducing valve etc.

The PE-film unwinds stations are of a universal design and are intended to be installed near the side paper stations. Preferably the PE-film stations are fitted to the trough raising frame work, so that changes in trough height involve automatic height adjustment of the PE-film. If required, FFS can quote separately for a set of custom made unwind stations.

NOT included in the offer are the following cables;

- Power supply to RS unit
- Tacho signal from conveyor tacho generator to RS unit
- Control cable between control panel and RS unit

FFS will specify the type of required cables in detail or alternatively FFS can also quote for the required cables to the lengths as specified by the customer.

The installation instructions and drawings provide clear information for the mechanic/electrician, to install the equipment in a relatively short time. The installation in principle can be done in between production time, without having any downtime in the foam production.

The operating instructions give adequate information to any experienced Maxfoam or Varimax operator to commission the system without any difficulty.

## HISTORY

The RS-system has been in use since 1977 on several hundreds of Maxfoam and Varimax machines. It enables the operator to obtain a more rectangular block profile, especially on bun heights of over 1.0 metre (40 inches).

In general, the use of the RS system on Maxfoam gives an improvement in conversion yield <sup>☞</sup> of some 2-3% (raising the yield from some 91% to some 94% by weight).

Therefore, the payback time for the RS equipment is usually in between 1 and 6 months, which is strongly depending on the annual production rate of the plant.

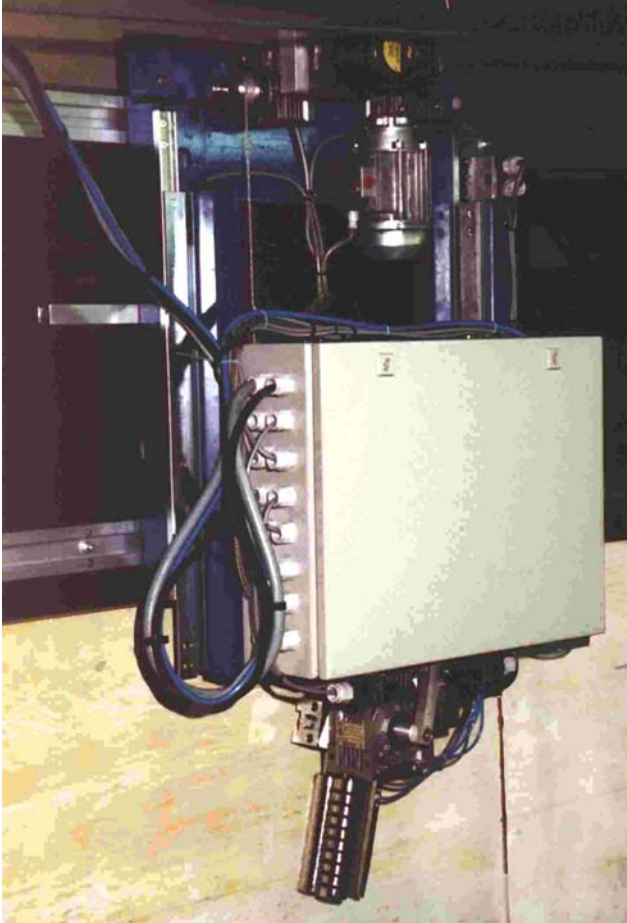
When the Maxfoam process was introduced in 1972/1973 the average block height for the density range 14-40 kg/m<sup>3</sup> (0.9-2.5 pcf.) varied from 1.05-0.90 mtr. (41-35 inch).

By nature, the Maxfoam process creates blocks of foam having an excellent block profile and resulting in a yield rate of some 91-92% by weight. During the period 1972-1978, the block height was gradually increased and nowadays an average



block height of 1.25-1.3 mtr. (49-51 inch) is being achieved on the large Maxfoam/Varimax installations.

This increase in block height and the need to reach optimum efficiency led to the development of the so-called RS-system in 1978/1979.



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Yield figures are based on weight percentages of test blocks of 50 cm block length, cutting off 12-mm of skin on each side, 18-mm of bottom skin and clearing the top skin marginally. Practical yield figures depend strongly on parameters like; block dimensions, foam grade, experience and skills of operators, plant conditions, procedures in conversion etc. and may vary therefore from plant to plant.



**OVERVIEW OF THE FUNCTIONS OF THE RS-6 <sup>Mod-2001</sup> PULLING SYSTEM**

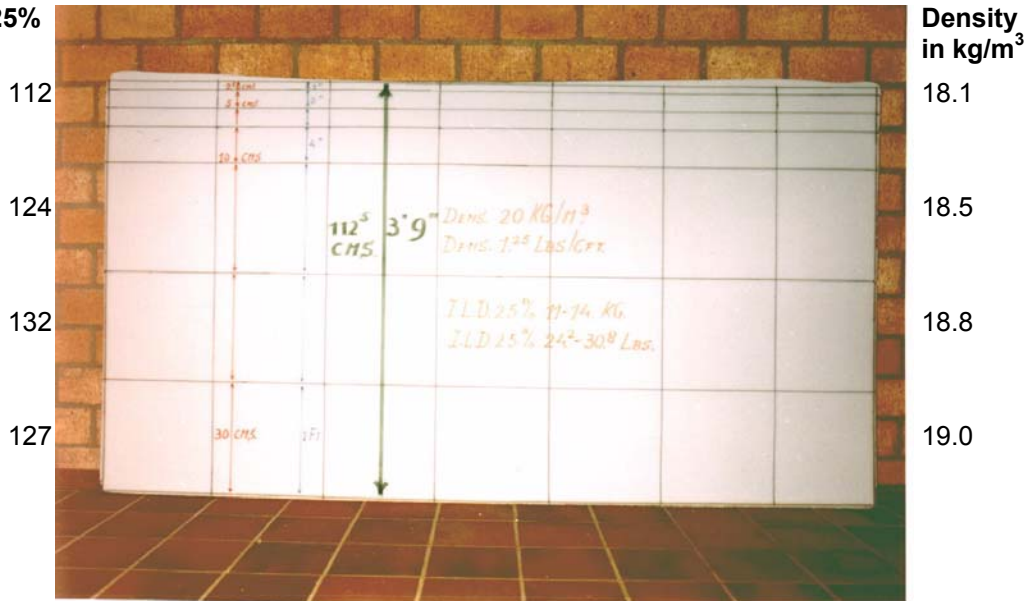
	RS-5 Unifoam	<b>RS-6 Model 2001</b>
<b><u>Pulling Rollers</u></b>		
variable speed drive	Y	Y
Automatic synchronisation with conveyor	N	Y
fine tuning of synchronisation (overspeed)	n/a	Y
<b><u>Height adjustment</u></b>		
principle of adjustment	gerrack	<b>telescopic</b>
Motorised	N	Y
adjustment range in mm	230	<b>440/520/600</b>
<b><u>Angle adjustment</u></b>		
Motorised	Y	Y
Automatic mode	Y	Y
manual mode	Y	Y
<b><u>Length adjustment</u></b>		
Motorised	N	Y
Variable speed control on length adjustment (0.2 – 8.0m/min)	n/a	Y



## MAXFOAM CROSS SECTION, USING RS

**OVERALL DENSITY**      **19.1 KG/M<sup>3</sup>**  
**PIECE DENSITY**        **18.6 KG/M<sup>3</sup>**

IFD @ 25%  
in N.



	Sides	Top	Bottom	TOTAL
<b>Scrap loss =</b>	1.09%	2.46%	1.82%	5.37%

## MAXFOAM CROSS SECTION, USING RS

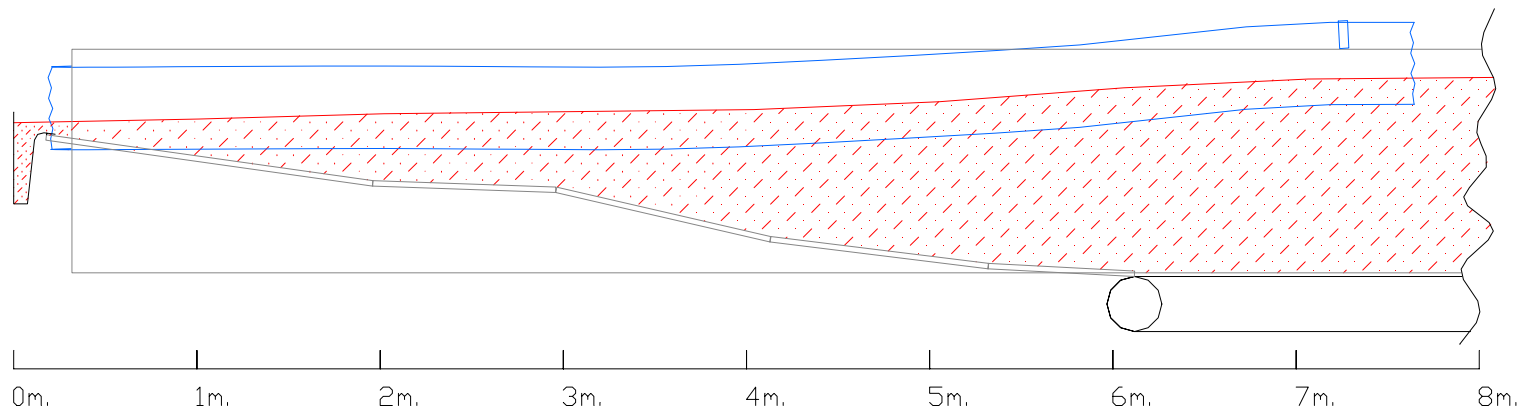
**OVERALL DENSITY**      **28.9 KG/M<sup>3</sup>**  
**PIECE DENSITY**        **28.3 KG/M<sup>3</sup>**

IFD @ 25%  
in N.



	Sides	Top	Bottom	TOTAL
<b>Scrap loss =</b>	1.06%	3.50%	1.38%	5.94%

## Principle of RS on Maxfoam/Varimax





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