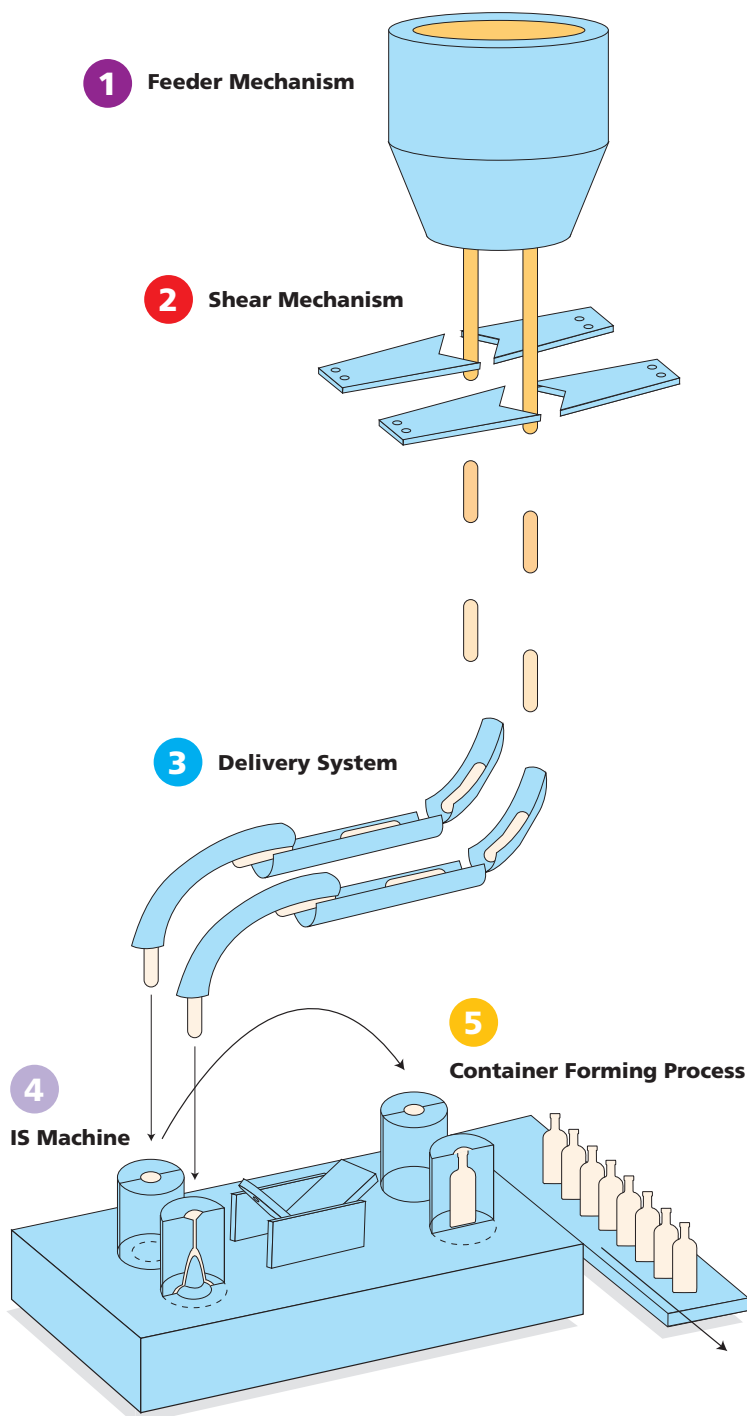


SPECIALIST LUBRICANTS FOR THE GLASS CONTAINER INDUSTRY

FUCHS Lubritech - Specialists In 'Hot-End' Lubricants

The manufacture of glass containers represents one of the most severe lubrication challenges of any production process. The combination of extreme temperature and high speeds, with the desire for optimum process efficiency, requires innovative solutions from lubricant manufacturers. These requirements are particularly prevalent at the five key stages of the 'HOT END' process; and it is here where the benefits of high technology/high performance lubricants from FUCHS are of critical importance.



Why Specialist Lubricants?

In general, glass container manufacturers succeed based on the quality of the containers they produce and the efficiency with which they produce them.

Without adequate 'key stage' lubrication, the production process will not run efficiently. Container quality and production efficiency is directly proportional to the level of performance achieved from the lubricant at each stage.

Why FUCHS Lubritech?

FUCHS Lubritech recognises the importance of specialist lubricant technology for the glass container manufacturing process. We are a world leader in this field and can offer a full range of 'Hot End' lubricants for container glass production.

To support our customers we have established a Centre of Excellence, focused purely on the study of 'glass container lubrication'. The centre includes technical experts with more than 30 years' experience of glass lubricant formulation and dedicated research and development chemists and resources.

Through the centre we are able to offer a wide range of services including customer specific research and development, problem solving, technical service support and detailed lubricant condition monitoring.

FUCHS is a truly global organisation with manufacturing in 34 countries and a total of 54 operating companies worldwide. Through our organisation we are able to offer locally available service, backed by strong technical support from our Centre of Excellence.

**Specialist Lubricants =
Improved Quality & Efficiency**



1 Feeder Mechanism

The feeder takes molten glass from the forehearth to produce uniform, consistent 'streams' of glass which feed the shears. Consistency of the mechanism's function is critical to the consistency and uniformity of the glass 'stream'.

Feeder Lubrication

Recommendation: ATLAS X SERIES

Atlas X grades offer outstanding thermal and oxidation stability combined with ultra-low carbon forming tendencies. As a result harmful deposit formation is minimised leading to a more efficient mechanism function and extended mechanism life. Compared to conventional lubricants, injection timings/re-lubrication intervals can be significantly extended.

ATLAS X is available in 100, 150, 175 and 220 cst viscosities.

2 Shear Mechanism

The mechanism cuts the constant stream of glass supplied from the feeder into individual glass 'gobs'. There are two key lubrication points in this process:

Mechanism

This controls the movement of the unit that holds the shear blades. Consistent functioning of this mechanism gives consistency to gob weight and gob dimensions.

Recommendation: ATLAS X SERIES

The outstanding thermal/oxidation stability combined with ultra-low carbon forming tendencies of these grades results in decreased harmful deposit formation, resulting in a more efficient mechanism function and extended mechanism life. Injection timings/re-lubrication intervals can be significantly extended.

Shear Blades

The blades are in direct contact with the molten glass and therefore require both cooling and lubrication. Lubrication is particularly critical in relation to gob geometry and consistency.

Recommendation: SHEARMASTER / GLASOL

These grades are designed to extend shear blade life and provide excellent shear cut accuracy. They offer the capability of running at high dilution ratios with minimum build up on the shear blades, are biodegradable and have excellent thermal and hard water tolerance.

SHEARMASTER	Type	Ratio
RD 722 X	Synthetic, veg oil base	<1:1500
GSI	Synthetic, veg oil base	<1:900
DP 3344	Semi-syn	<1:1200
GLASOL	Type	Ratio
SHEARLUBE B	Synthetic, veg oil base	<1:700
RSK	Synthetic, veg oil base	<1:250

3 Delivery System

The delivery system transports the cut glass gob to the machine and final forming or moulding processes.

Gob Distribution Mechanism

This alternates the delivery of the cut gobs, via various elements of the delivery system, into the required sections of the IS Machine.

Recommendation : ATLAS X SERIES

Scoops, Troughs & Deflectors

Recommendation: SCIRON 68 or GLASOL NESSAL WHITE

These are designed to reduce the co-efficient of friction between the gob and the delivery equipment, so that the gob slides quicker and loads consistently into the blank without deformation of the gob geometry. They are highly refined products with significantly reduced carbon forming tendencies by comparison with conventional mineral oil lubricants.

Delivery Coatings

In order to assure consistent quality and high efficiency, a gob must reach the mould equipment at a constant speed with consistent geometry and without checks and inclusions.

Recommendation: GLASOL D

FUCHS Lubritech produces a range of '2 Pack' systems for this application. They provide a low coefficient of friction coating to allow the gob to be easily transported through the delivery system to the blank. They also insulate the gob from excessive heat loss.

4 IS Machine

The IS Machine is made up of individual but identical sections placed side-by-side in-line. Each section comprises an arrangement of mechanisms enabling the sections to be operated independently of the others.

The sections hold and move the mechanisms that are integral to the forming of the container. Each section consists of numerous mechanisms, usually operated by either electro pneumatic or electro servo systems. Most mechanisms are lubricated individually by means of a timed injection/total loss application.

Machine

Recommendation: ATLAS X SERIES

The method of lubrication and the high temperatures involved dictates that an extremely high level of performance is required from the lubricant. In the past issues of oil oxidation leading to excessive deposit formation were common with conventional lubricants, which in turn caused mechanism malfunction and premature failure. The fully synthetic ATLAS X grades minimise oil oxidation due to their outstanding thermal stability. Carbon/ deposit formation in feed pipes and mechanisms is virtually eliminated, leading to a more consistent mechanism function, reduced machine down time and extended mechanism life. Injection timings/re-lubrication intervals can also be significantly extended.

Plunger Mechanism

Recommendation: ATLAS PM 46

A specially developed 46cst plunger mechanism lubricant, combining all of the benefits of the ATLAS X grades with a reduced viscosity to ensure smoother operation of the mechanism

5 Container Forming Process

Swabbing compounds are used to provide lubrication and release between the container and the blank and mould. Typically they are complex mixtures containing graphite, sulphur, wetting agents and additives to penetrate into tight surfaces. They provide uniform dry film coatings on the blank and mould surfaces and their performance is integral in order to minimise container defects.

Blank & Moulds

Recommendation: MOULDMASTER TBS / GLASOL

A premium range of swabbing compounds that provide excellent forming consistency, superior surface quality/cleanliness, extended swabbing cycles and reduced build up in the forming equipment. They are suitable for all processes including BB, PB and NNPB.

MOULDMASTER	Graphite	Sulphur
TBS 3000	5-6%	4-5.5%
TBS 3010	3.0-4.3%	4-5.5%
TBS 3020	1.5-2.7%	4-5.5%

GLASOL 250 & 350 are specialist, high performance swabbing compounds based on lower viscosity formulations.

Neck Rings

Recommendation: MOULDMASTER NRL46

A specially formulated light to medium viscosity lubricant and release agent for use on the neck rings. It can be used on all processes and is particularly effective in reducing carry over of lubricant, therefore reducing the problem of 'dirty neck rings' on the formed container.

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