Technical Data Sheet

Formerly Known As: **Shell Delima S Oils**

Shell **Paper Machine Oil *S3 M 220***

- Extra Protection
- Water Shedding
- Long Life

Paper Machine Circulating Oils

Shell Paper Machine Oils S3 M are high performance oils based on modern ashless additive technology. They are designed to provide excellent all round protection for the diverse needs and conditions found in modern paper machines. They meet the requirements of Metso, SKF and Voith systems.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Good oil life – Maintenance saving**

  Shell Paper Machine Oils S3 M have been designed to resist breakdown under high temperatures and in the presence of water. They have excellent performance in tests such as the ASTM Turbine Oil Stability Test (TOST), a commonly used method of assessing relative oil life capability.

- **Reliable wear & corrosion protection**

  Shell Paper Machine Oils S3 M use a modern, ashless (zinc-free) anti-wear system to provide high performance protection against wear.

  In addition, they are formulated to provide effective protection against corrosion, even in the wet environments found in paper machine applications.

- **Maintaining system efficiency**

  Excellent water separation and air release helps in conjunction with high quality base oils helps ensure the efficient lubrication of the machines and systems.

  Shell Paper Machine Oils S3 M are also suitable for use with fine filtration to help ensure effective contaminant free lubrication to critical machine parts.

Main Applications



- **Paper machine applications**

  There is extensive operator experience with Shell Paper Machine Oils S3 M in many applications especially in Metso and Voith paper machine circulating systems, which include the dry and wet ends of the machine plus the calender stacks.

Shell Paper Machine Oils S3 M are specifically designed for:

- Lubrication of bearings, gears and auxiliary equipment in the wet end and dryer sections of paper machines
- Hydraulic and lubrication systems in deflection-compensating rolls
- Enhanced protection of gears under severe operating conditions.

Specifications, Approvals & Recommendations

- SKF (paper machine oils)
- Metso (paper machine oils)
- Voith VN 108
- DIN 51517-2 – type CLFAG FE-8 (120^{0}C)
- FZG load stage 12 (DIN 51354)

  For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Compatibility & Miscibility

- **Seal & Paint Compatibility**

  Shell Paper Machine Oils S3 M are compatible with seal materials and paints normally specified for use with mineral oils.

Typical Physical Characteristics

Properties			Method	Paper Machine S3 M 220
Kinematic Viscosity	@40°C	mm^2/s	ASTM D445	220
Kinematic Viscosity	@100°C	mm^2/s	ASTM D445	19.2
Viscosity Index			ISO 2909	98
Density	@15°C	kg/m^3	ISO 12185	897
Flash Point (COC)		°C	ISO 2592	250
Pour Point		°C	ISO 3016	-21
Demulsibility Separation Time	@82°C	mins	ASTM D1401	10
Rust Test, Synthetic Sea Water			ASTM D665B	Pass
Oxidation Life (TOST)		hrs	ASTM D943	4378
Timken, OK Load		lbs	ASTM D2782	60
Foam Test, Seq II ml		ml foam at 0/10 mins	ASTM D892	0/0
FZG Load Stage			ASTM D5182	12 Pass

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Paper Machine Oils S3 M are unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Safety Data Sheet, which can be obtained from http://www.epc.shell.com

- **Protect the Environment**

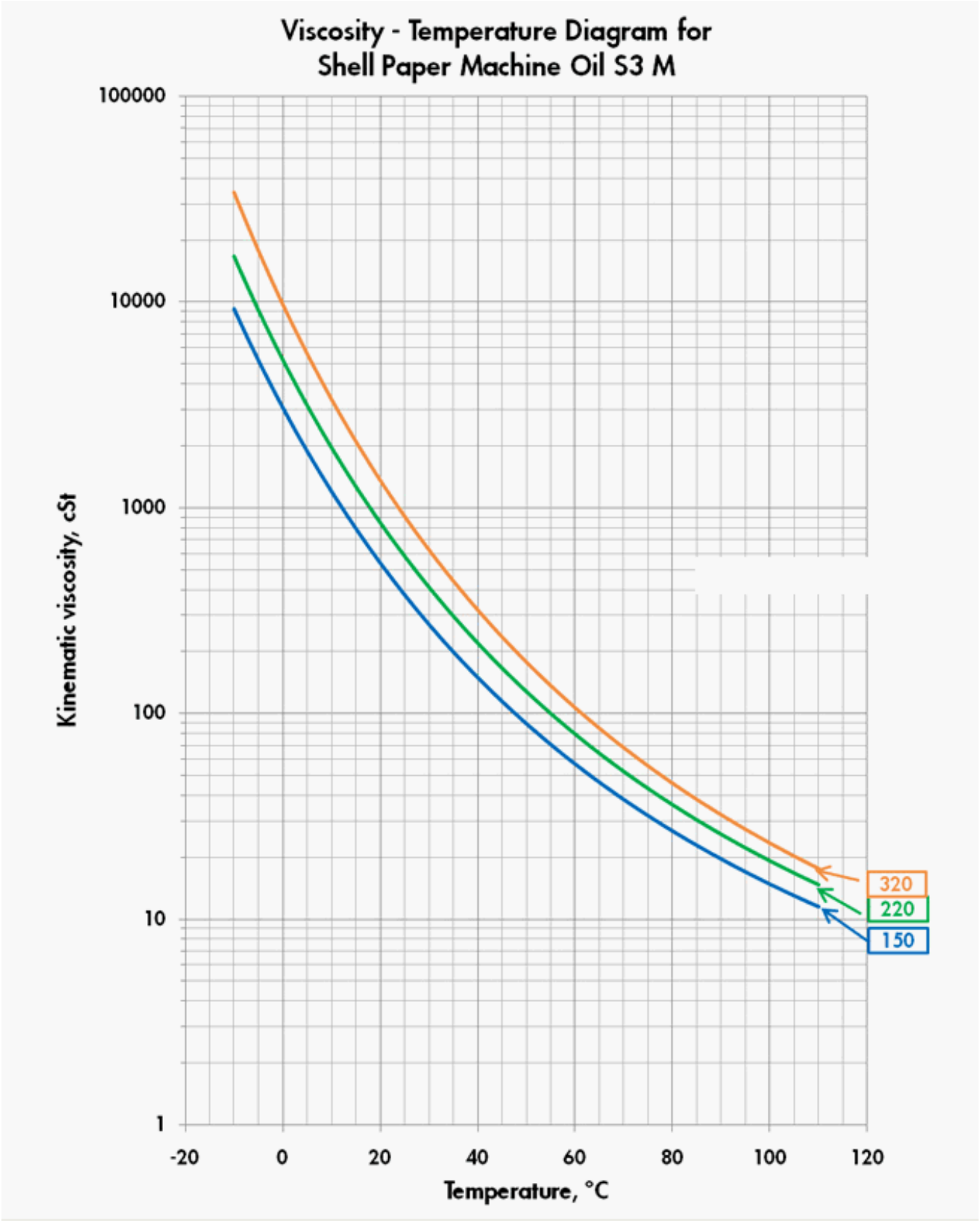
  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Advice**

  The bulk temperature of the oil should not continuously exceed 80°C.

  Advice on applications not covered here may be obtained from your Shell representative.


Viscosity - Temperature Diagram for
Shell Paper Machine Oil S3 M
Kinematic viscosity, cSt
100000
10000
1000
100
10
1
-20
0
20
40
60
80
100
120
Temperature, °C
320
220
150