Gazpromneft HTO 32

HEAT TRANSFER OIL · TEXTILE FACTORIES



Textile finishing stenter (Brückner) — industry illustration

Semi-synthetic heat transfer oil for circulating thermal oil systems

Industrial track record and FEOTECH support in Indonesia — for engineers, maintenance and purchasing at textile factories

MANUFACTURER · DISTRIBUTOR

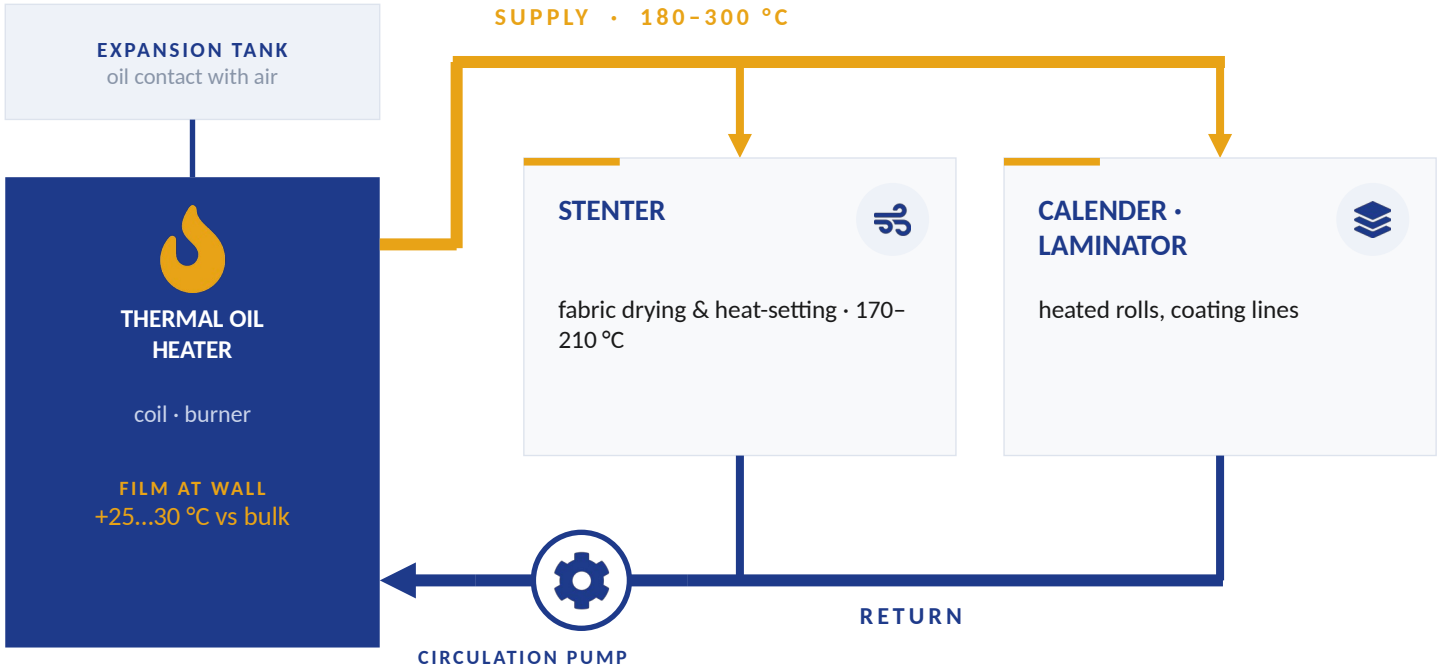
GAZPROM NEFT LUBRICANTS

FEOTECH ENERGY NUSANTARA

POWERED BY EXPERIENCE. DRIVEN BY PEOPLE

Thermal oil system at a textile factory

WHERE HTO 32 WORKS · HOTTEST POINT — OIL FILM IN THE HEATER COIL





Coating and laminating line — industry illustration (Brückner)

180–300 °C
OIL IN CIRCUIT
stenters, calenders

170–210 °C
HEAT-SETTING
polyester, 15–50 s

MAIN RISK coil film overheating → coke, deposits on rolls, leaks and fire

Sources: Samson Indonesia Boiler (180–300 °C in textiles); textilelearner.net (heat-setting); EM · THM (wall film). Photo: Brückner Textile Technologies — industry illustration.

Indonesia heat transfer fluid market

SIZE · USER INDUSTRIES · EQUIPMENT · PRACTICE

≈ USD 80–110 m
THERMAL FLUID MARKET · 2026
largest SEA market: 24–32% of region

+7.6–7.9%
CAGR · SEA
thermal fluid forecast to 2032–2034

≈ 45%
MINERAL OILS
SEA share — MarkNtel estimate

1.2 bn L
ALL LUBRICANTS
Indonesia, 2025 · industry grows faster

WHERE THERMAL FLUIDS WORK · INDUSTRY SCALE IN INDONESIA

Textiles
≈ 2,000 BPS, 2021
large and medium enterprises
stenters and calenders · West and Central Java

Oleochemicals, palm
11.8 m t Kemenperin, 2023
installed capacity per year
fatty acid distillation

Asphalt & bitumen
1,036 Bina Marga, 10.2026
licensed asphalt plants
oil heater — standard asphalt plant unit

Plywood & boards
No. 2 Indonesia Eximbank
global plywood exporter
hot presses 110–150 °C

Chemicals & resins
1,840 BPS, 2021
large and medium enterprises
reactor and resin process heating

Food industry
14.5 bn WINA, 2025
noodle servings a year — world No. 2
indirect heating: fryers and ovens

EQUIPMENT
heaters 0.1–3 m kcal/h and up; coal, biomass, gas

RULES
heater operator licence (K3); NPT for oils

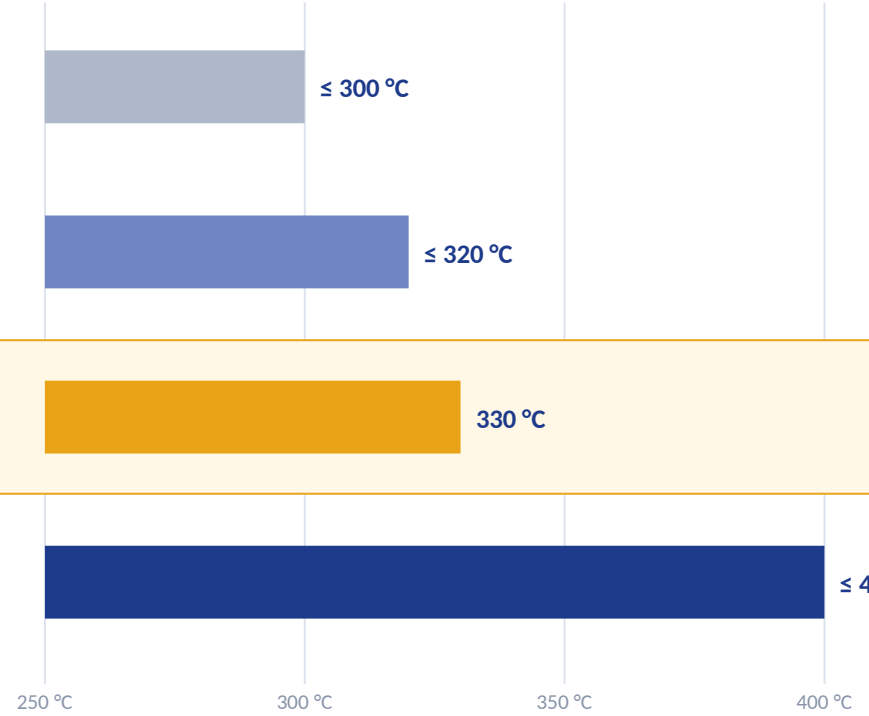
PRACTICE
common issues: sludge, overheating, coil coking

Sources: MarkNtel Advisors, The Report Cubes (SEA, 2026); Mordor Intelligence (2025); sector data — on cards. Indonesia size — FEOTECH estimate by country share.

Heat transfer fluid classes in use today

FROM AROMATIC OILS TO SYNTHETICS · MAXIMUM FILM TEMPERATURE AND SERVICE LIFE

CLASS · EXAMPLES	OIL LIFE (GPN-SM)	PRICE · SUPPLY
Aromatic MT-300 OM and similar — selective-refining extracts	≈ 1 yr	low
Paraffinic mineral Highly refined mineral oils, ISO VG 32	≤ 3 yrs	medium
Gazpromneft HTO 32 Semi-synthetic + detergent	**2.5 yrs at 180–200 °C***	**stock in Jakarta**
Synthetic Alkyl aromatics and other synthetic fluids	≤ 5 yrs	high



TAKEAWAY the more stable the fluid, the longer its life and the cleaner the system; HTO 32 adds temperature margin without costly synthetics

*Sources: Gazpromneft-Lubricants (GPN-SM) presentation, 06.08.2026, slide 2 (classes, film, life, cost); TDS HTO 32 04/2026 (330 °C); * GPN-SM example, slide 13. Scale — film temperature.*

What weak oil properties cost

PROPERTY → WHAT HAPPENS IN THE SYSTEM → WHAT IF THE PROPERTY IS LACKING

DEPOSITS IN THE CIRCUIT

CLEAN HEAT TRANSFER SURFACE



Concept image: deposits narrow the channel and hinder heat transfer

PROPERTY → IF IT IS LACKING

Thermo-oxidative stability

Air in the expansion tank oxidises hot oil → sludge and varnish on pipes, poorer heat transfer, higher fuel consumption

Resistance to breakdown

Coil film is 25–30 °C hotter than bulk, +10 °C ≈ ageing twice as fast → coke: 1 mm = tube wall 22–44 °C hotter, burn-through

Detergent additive

No detergency: sludge settles in pipes and air heaters → stenter rolls and chambers heat unevenly

Material compatibility

Seals and flanges at 200–300 °C → leaks; oil in insulation — a common cause of fires

WHAT THE FACTORY GAINS

- Clean circuit and heater coil
- Stable heat transfer at the stenter
- Fewer unplanned stops

Figures: Quest Integrity (coke and wall temperature), EM (film, ageing rate), insurer HDI (fires). Illustration prepared for FEOTECH, not a site photo.

Cost of error: real failures

THERMAL OIL SYSTEM FIRES AND INCIDENTS AT TEXTILE AND INDUSTRIAL PLANTS

1991

TARARE, FRANCE · DYEING PLANT

Fire destroyed the thermal fluid heater. Production stopped, staff placed on temporary layoff.

2006

ST-QUENTIN, FRANCE · AUTO TEXTILES

Fire on a stenter (tenter frame) due to oil build-up. Flames spread into exhaust ducts.

2016

VALENCE, FRANCE · POLYAMIDE FIBRE

600 L of thermal fluid at 280 °C leaked at a flange. €2 m damage, 1,000 m² building destroyed.

2026

EDAYAR, INDIA · OIL PROCESSING

A crack in the coil of a heater in service for 17 years led to a fire at the plant.

"Stenters used for thermal bonding are a common source of fires"
HSE, UK health and safety regulator

WHAT THE FACTORY GAINS WITH FEOTECH

- heater duty review → lower overheating risk
- scheduled oil analysis → no sudden stops
- flushing, change, top-up → clean circuit

×1,600

WATER IN HOT OIL

expands 1,600 times when boiling — oil blow-out, shocks, pump cavitation

Sources: ARIA database, France (Nos. 2653, 31578, 47678); JOIFF, April 2026 (Edayar); HSE "Textiles: fire and explosion"; PTH "Water in Thermal Fluid Systems".

Gazpromneft-Lubricants Ltd.

GAZPROM NEFT LUBRICANTS · GAZPROM GROUP — WORLD'S LARGEST GAS COMPANY



HYDP complex · Omsk Lubricants Plant · since 2023

590K t
OILS, GREASES AND TECHNICAL FLUIDS PER YEAR

>3,700
SKU · >800 PRODUCTS

70+ YEARS
LUBRICANT PRODUCTION EXPERIENCE · OMSK REFINERY

>55
COUNTRIES OF SUPPLY · >150 DISTRIBUTORS

No. 1
IN RUSSIA · PACKAGED LUBRICANTS AND MARINE OILS

I · II · III · V
OWN API BASE OIL GROUPS · HYDP OMSK +220K T/YR

PRODUCTION SITES

- Omsk (OZSM) — the largest site: base oils, blending, packaging, greases, additives
- Moscow — Gazpromneft MLP (Fryazino) — blending and packaging; SUCOFINDO audit for SNI, 2024
- Yaroslavl (YANOS) — base-oil JV · Rospolikhim — esters · 4 processing sites abroad: Turkey, UAE, China

R&D AND TECHNOLOGY

- 4 R&D centres: Moscow (HQ), Fryazino (flagship), Omsk, Nizhny Novgorod
- >3,000 laboratory and bench tests per year
- Alchemist AI formulation platform: >500 formulations developed per year

MARKET POSITIONS

- No. 1 in Russia: packaged lubricants (31% share) and marine oils (36%)
- Dual-brand strategy: G-Energy (premium) · Gazpromneft (mass segment)
- Key regions: Russia & CIS, Central Asia, Middle East, Africa, SE Asia, South Asia

Source: Gazpromneft-Lubricants Ltd. corporate presentation, January 2025

Gazpromneft HTO 32: product and temperature limits

SEMI-SYNTHETIC HEAT TRANSFER OIL WITH DETERGENT · TDS 04/2026



Semi-synthetic heat transfer oil for open and closed circuits with intensive forced circulation. Synthetic components provide high thermal and thermo-oxidative stability and reduce deposits on system components.

APPLICATIONS

- Open and closed heating systems
- Textile, chemical and other industries

REGISTERED IN INDONESIA

NPT · SNI 7069.25:2024 · ISO VG 32 · 205 L drum

180 °C — OPEN SYSTEMS — maximum oil temperature

310 °C — CLOSED SYSTEMS — maximum oil temperature

330 °C — FILM AT WALL — maximum at the heated surface

ISO 6743-12 · FAMILY Q — HEAT TRANSFER FLUIDS · CATEGORIES BY BULK OIL TEMPERATURE

QA ≤ 250 °C	**QB** ≤ 300 °C	**QC** 300–320 °C	**QD** > 320 °C	**QE** −30...200 °C
Open system	Closed system	Closed, with pump	Extra-stable synthetics	Cooling circuits
HTO 32 — up to 180 °C		**HTO 32 — up to 310 °C**		

Properties: batch within specification, with margin

GOST METHODS, ASTM EQUIVALENTS · MANUFACTURER STO LIMITS · BATCH 79172 COA

PROPERTY	METHOD GOST → ASTM	LIMIT	TDS	BATCH	MARGIN
Viscosity at 40 °C, mm²/s	GOST 33 → ASTM D445	28.8–35.2	—	**34.80**	ISO VG 32
Viscosity at 100 °C, mm²/s	GOST 33 → ASTM D445	5.0–6.5	5.7	**5.76**	in spec
Flash point, open cup, °C	GOST 4333 → ASTM D92	≥ 210	230	**224**	+14 °C
Flash point, closed cup, °C	GOST 6356 → ASTM D93	≥ 175	—	**202**	+27 °C
Autoignition, °C	GOST 12.1.044 → ASTM E659	≥ 350	—	**350**	in spec
Pour point, °C	GOST 20287 → ASTM D97	≤ −30	−37	**−42**	by 12 °C
Acid number, mg KOH/g	GOST 11362 → ASTM D664	≤ 0.30	0.12	**0.01**	30× lower
Density at 20 °C, kg/m³	GOST 3900 → ASTM D1298	—	856	**860.7**	—
Water	GOST 2477 → ASTM D95	none	none	**none**	✓

0.01

ACID NUMBER

30× below the limit

224 °C

FLASH POINT, OPEN CUP

14 °C above limit

VG 32

ISO VISCOSITY GRADE

34.8 mm²/s at 40 °C

Sources: COA No. 25001947-OZSM, Gazpromneft-Lubricants, 27.02.2025 (STO 84035624-225-2017 limits and batch results); TDS Gazpromneft HTO 32, 04/2026 (typical values, ASTM D445/D92/D4052).

HTO 32 and global heat transfer oils

MANUFACTURER DATA · MB · MTH 605 AND SH · HT S2 — OILS REPLACED BY HTO 32 IN RUSSIA

PROPERTY	GAZPROMNEFT HTO 32	MB · MTH 605	SH · HT S2	TE · SRL 1510
Base	**semi-synthetic**	mineral oil	mineral oil	mineral oil
Closed system, max °C	**310**	315	300	310
Open system, max °C	**180**	180	—	—
Film at wall, max °C	**330**	—	330	330
Flash point, open cup, °C	**230**	230	220	230
Viscosity at 100 °C, mm²/s	**5.7**	5.4	5.1	5.2
Detergent additive	**yes**	—	—	—
Replaced by HTO 32	**—**	yes, 2018	yes, 2020	—

Temperature limits — on par with leading global brands

Flash point 230 °C — on par with leading global brands

Detergent additive — the system stays cleaner

Brand/product names abbreviated. Sources: TDS Gazpromneft HTO 32 (04/2026); MB · MTH 600 Series PDS (PDS MB); SH · HT S2 PDS v1.5 (2022); TE · SRL 1510 TDS. "—" — not in the manufacturer's PDS.

Case 1. “Yug” bitumen terminal: replacing MB · MTH 605

2018 · GAZPROMNEFT-BITUMEN MATERIALS · SALSK, ROSTOV REGION · FERROLI ELICOIL BOILERS



Ferroli Elicoil NO — image of the equipment model (ferroli.com)

140 kt
throughput/year

30 kt
bitumen storage

300 t/day
polymer-modified bitumen

Rail intake of bitumen, storage, binder production and truck dispatch — year-round heating.

EQUIPMENT

- Ferroli Elicoil NO 1600 — 1,861 kW
- Ferroli Elicoil NO 4000 — 4,652 kW
- Coil boilers, 3 gas passes, up to 300 °C on mineral oil
- Duty: bitumen heated to 200 °C

DATASHEET DATA: BEFORE → AFTER

	MB · MTH 605	HTO 32
Closed, °C	315	**310**
Open, °C	180	**180**
Flash COC, °C	230	**230**
Detergent additive	—	**yes**

FACTORY TAKEAWAYS

- MB · MTH 605 replaced by HTO 32 in Ferroli Elicoil NO 1600 and NO 4000 boilers — documented case, 2018
- Bitumen heated to 200 °C — the same range as stenters and calenders
- Same equipment type: coil boiler with forced circulation
- 2 years later, repeated at the group’s second plant (case 2)

Sources: GPN-SM presentation 06.08.2026, slide 2; Ferroli Elicoil NO (ferroli.com); Gazprom Neft, 26.07.2018 (Salsk terminal acquisition); Eurobitume (up to 200 °C for paving bitumen). Comparison based on manufacturers’ datasheets.

Case 2. Ryazan Bitumen Materials Plant: replacing SH · HT S2

2020 · GAZPROMNEFT-BITUMEN MATERIALS · RYAZAN · LARGEST PMB PRODUCTION IN RUSSIA



TMN series thermal oil heater — equipment example

2 units
heating circuit oil

60 kt
annual PMB capacity

No. 1
PMB in Russia

Polymer-modified bitumen production: stable heating of bitumen and polymer — key to product quality.

EQUIPMENT

- TMN-1000G — thermal oil heater for bitumen plants, ~1 MW
- TR 100 — second oil heating unit of the bitumen plant
- Oil replaced circuit-wide
- Duty: bitumen heated to 200 °C

DATASHEET DATA: BEFORE → AFTER

	SH · HT S2	HTO 32
Closed, °C	300	**310**
Film, °C	330	**330**
Flash COC, °C	220	**230**
Detergent additive	—	**yes**

FACTORY TAKEAWAYS

- SH oil replaced in both units (TMN-1000G, TR 100) — whole circuit on HTO 32
- HTO 32 datasheet limits match the equipment duty
- Solution replicated: second group plant after “Yug” terminal (2018)
- Russia’s No. 1 PMB producer chose HTO 32 for its own production

Sources: GPN-SM presentation 06.08.2026, slide 2; Gazprom Neft, 14.01.2014 (plant acquisition, 60 kt/yr PMB); SH · HT S2 PDS v1.5 (2022); TDS HTO 32 04/2026. Photo: Obitex catalogue (TMN-1000). Comparison based on datasheets.

Case 3. 2.5 years, not 6–7 months, at 180–200 °C

REPLACING AROMATIC HEAT TRANSFER OIL MT-300 OM · CRITERION — CARBON RESIDUE 1.0%

6–7 mos

MT-300 OM

to 1.0% carbon residue — oil change due

2 yrs 6 mos

GAZPROMNEFT HTO 32

same system, same criterion

×4–5

longer life

GPN-SM EXAMPLE · 180–200 °C · SAME CARBON RESIDUE CRITERION 1.0%

- Criterion — Conradson carbon residue of the in-service oil, condemning limit 1.0%
- On opening, many hard MT-300 OM deposits were removed from the vessel — the manufacturer links this to HTO 32 detergency



GPN-SM photos for this case: deposits in the system after MT-300 OM

WHAT IS MT-300 OM · GLOBAL EQUIVALENT

Russian aromatic heat transfer fluid based on selective-refining extracts — class “aromatic mineral heat transfer fluids”. Base oil below API Group II/III; operating limit up to 280–300 °C, prone to coking. Discontinued.

Sources: Gazpromneft-Lubricants presentation, 06.08.2026, slide 7 (example, deposit photos); GPN-SM tech support letter, 17.09.2026 (MT-300 OM); TU 38.4011092-2002 (AMT-300).

Oil monitoring: numbers to act on

GAZPROMNEFT-LUBRICANTS LIMITS · INDUSTRY GUIDANCE · SAMPLING SCHEDULE

PROPERTY	METHOD	CAUTION	CHANGE	INDUSTRY GUIDANCE
Viscosity at 40 °C	ASTM D445	**±25%**	**±50%**	vs fresh oil sample
Acid number	ASTM D664	**+0.5**	**+1.0**	1.0 mg KOH/g — change oil
Water, ppm	ASTM D6304	**150**	**300**	normal ≤ 50; > 150 — act
Carbon residue, %	ASTM D4530	**0.5**	**1.0**	≥ 1% — full change
Flash point, closed cup, °C	ASTM D93	**< 100**	**< 80**	min. 100 °C
Low boilers, %	ASTM D2887	**1.5**	**3.0**	> 3% — fire risk

SAMPLING SCHEDULE

0
fresh oil sample at filling

3 mos
after start-up and oil change

6 mos
second sample — trend

annually
at least once a year

INSURER GUIDANCE (HDI)

Keep operating oil temperature at least 30 °C below the limit. For HTO 32 in a closed system this is about 280 °C bulk.

280 °C
operating target = 310 °C − 30 °C

Sources: GPN-SM, 06.08.2026, slide 8 (caution / change); DTH, ALS Tribology, GHT (guidance); insurer HDI (low boilers, 3 mos, 30 °C margin); EM; DIN 4754 / VDI 3033 (annually).

Switching to HTO 32 with FEOTECH technical support

5 STEPS · TOGETHER WITH GAZPROMNEFT-LUBRICANTS · SUPPORT THROUGHOUT OIL SERVICE LIFE

01

System data

- heater and capacity
- temperatures, volume, current oil

02

Oil analysis

- current oil sample
- deposit check

03

Technical review

- GPN-SM tech support
- limits, flushing

04

Change & start-up

- drain, flush, fill
- fresh oil sample

05

Follow-up

- scheduled analyses
- Jakarta warehouse stock

WHAT TECHNICAL SUPPORT INCLUDES

- Oil analysis
- System audit
- Engineer visit
- Product selection
- Staff training
- Cost reduction

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Appendix. Data sources

FOR REFERENCE · MANUFACTURER DOCUMENTS AND OPEN SOURCES

MANUFACTURER — GAZPROMNEFT-LUBRICANTS

- *TDS Gazpromneft HTO 32, 04/2026 (RU); TDS 07/2020 (EN) — historical*
- *COA No. 25001947-OZSM, batch 79172, 27.02.2025*
- *Presentation "Use of heat transfer oils in heat exchange equipment", 06.08.2026*
- *Letter from industrial products technical support (I. Ivanov), 17.09.2026*
- *Safety Data Sheet Gazpromneft HTO 32, rev. 0, 17.10.2024*

STANDARDS

- *ISO 6743-12:1989 — heat transfer fluid classes, family Q*
- *DIN 4754, VDI 3033 — operation of thermal oil systems*
- *GOST / ISO / ASTM — test methods (slide 9)*
- *SNI 7069.25:2024 — heat transfer oils; NPT registration (ESDM)*

Full documents (TDS, SDS, COA) are available from FEOTECH on request.

OIL AND EQUIPMENT MANUFACTURERS

- *MB · MTH 600 Series PDS (MB); SH · HT S2 PDS v1.5 (2022)*
- *TE · SRL 1510 TDS; PT · TRM 32 (distributor listing)*
- *Ferroli Elicoil NO; Akkaya (heaters); EM · THM (SFE-HTF-20212, TF-38)*

INDUSTRY DATA, INCIDENTS

- *HDI "Heat Transfer Oil Systems"; GHT; DTH; ALS Tribology; PTH*
- *Quest Integrity — coke, wall temperature; Eurobitume — bitumen temperatures*
- *ARIA (France) Nos. 2653, 31578, 47678; JOIFF, 04.2026; HSE (UK)*
- *Indonesia market: MarkNtel, The Report Cubes, Mordor, BPS, Kemenperin, Bina Marga, Eximbank, WINA*
- *Samson Indonesia Boiler; textilelearner.net; Gazprom Neft (press releases 2014, 2018)*
- *Images: Brückner, Ferroli — illustrations; drum — GPN-SM pack design; diagram — FEOTECH*