

BIODEGRADABLE FLUIDS SOLUTION

生物可降解关键工业流体 长期可靠运行解决方案

面向环境敏感装备、绿色功能流体与全生命周期管理

Solution for the Long-term
Reliable Operation of
Biodegradable Critical
Industrial Fluids

《生物可降解润滑剂通用技术要求》

T/CI 1581—2026主要起草单位

关键流体, 长期可靠

Critical Fluids. Long-term Reliability.



长期主义
LONG-TERMISM



工程验证
ENGINEERING VALIDATION



协同创新
COLLABORATIVE INNOVATION



价值共生
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为什么是禾泰科技？

Why HITECRUN

禾泰科技专注于关键工业流体技术研发与工程应用，围绕生物可降解润滑剂、绿色功能流体及全生命周期管理，构建覆盖研发、标准、检测、工程验证与应用服务的一体化技术平台，为环境敏感装备提供长期可靠运行解决方案

HITECRUN focuses on critical industrial fluid technologies and engineering applications. Centered on biodegradable lubricants, green functional fluids and lifecycle management, it builds an integrated technology platform covering R&D, standards, testing, engineering validation and application services for the long-term reliable operation of environmentally sensitive equipment.

“

以标准定义产品，以工程验证价值

Defining Products by Standards.
Validating Value through Engineering.

”



A. 自主研发与 专利沉淀 R&D

拥有关键工业流体与润滑材料研发能力，形成自主配方体系、专利技术沉淀与应用技术积累，持续推动绿色流体技术创新



B. 标准建设能力 Standards

《生物可降解润滑剂通用技术要求》牵头起草单位，推动绿色流体标准化导入



C. 工程验证能力 Engineering Validation

实验室评价、第三方检测、现场验证与长期跟踪，支撑可靠应用



D. 产品平台能力 Product Platform

覆盖液压油、齿轮油、链条油、润滑脂与绿色功能流体



E. 多场景应用能力 Application

风电、海事、港口、数据中心、工程机械、轨道交通等多场景应用



F. 全生命周期管理 Lifecycle Management

提供选型、切换、监测与优化服务，支撑长期可靠运行



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标准引领绿色润滑升级

Standard-led Green Lubrication Upgrade

禾泰科技作为《生物可降解润滑剂通用技术要求》T/CI 1581—2026的主要起草单位，参与构建生物可降解润滑剂从产品分类、环境性能、基础理化性能、润滑性能、功能流体性能、材料相容性到检验规则的系统化技术框架，推动绿色流体在环境敏感装备中的规范化导入

As a main drafting organization of T/CI 1581—2026 General Technical Requirements for Biodegradable Lubricants, HITECRUN helps build a systematic technical framework covering product classification, environmental performance, basic physicochemical properties, lubrication performance, functional fluid performance, material compatibility and inspection rules, supporting the standardized implementation of green fluids in environmentally sensitive equipment.

“

标准不是终点，
而是绿色润滑规模化
应用的起点

Standards are not the end point,
but the starting point for scalable
green lubrication applications.

”



A. 标准引领 Standard-led

推动生物可降解润滑剂从产品应用
走向标准化、体系化与规范化



B. 体系支撑 System Framework

覆盖液压油、齿轮油、链条油、润滑脂与
功能流体等主要产品类别



C. 工程导入 Application Implementation

支撑绿色流体在风电、海事、港口、工程机械、
数据中心与储能热管理等场景中的应用



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05 产品矩阵与典型应用方案

Product Matrix & Application Solutions

围绕环境敏感区域、高泄漏风险设备与关键工业系统长期可靠运行需求,禾泰科技形成覆盖液压油、齿轮油、链条油、润滑脂、压缩机油、特种润滑剂与绿色功能流体的产品矩阵,为不同装备和工况提供系统化绿色流体解决方案



关键设备覆盖 Key Equipment Coverage



齿轮箱
Gearboxes



轴承系统
Bearing Systems



液压系统
Hydraulic Systems



压缩系统
Compressor Systems



开式齿轮
Open Gears



汽轮机
Turbines



电机系统
Motor Systems



链条系统
Chain Systems



关键润滑部位 Critical Lubrication Points



齿面
接触区域



轴承
滚动 / 滑动部位



液压泵
与阀组



销轴
与链板



导轨
滑动面



适用工况 Typical Operating Conditions



高负荷
High Load



高温环境
High Temperature



多粉尘
Dusty Conditions



潮湿腐蚀
Moisture & Corrosion



连续运行
Continuous Operation



产品矩阵 Product Matrix

生物可降解液压油 Biodegradable Hydraulic Fluids	生物可降解齿轮油 Biodegradable Gear Oils	生物可降解链条油 Biodegradable Chain Oils	生物可降解润滑脂 Biodegradable Greases	生物可降解功能流体 Green Functional Fluids
HITECBIO EAL600	HITECBIO EHF	HITECBIO HCL	HITECBIO EAG2000	HITECTRON ILC3 / 5 / 7
面向高泄漏风险 液压系统,适用于 风电、港口机械、 工程机械、农业机 械、森林机械及近 水设备	面向重载齿轮箱、 风电齿轮箱、 工业减速机、矿 山、海事与环境 敏感区域	适用于高温链 条、传送链、导 轨、销轴、钢索 及清洁制造场景	面向轨交轴承、风 机轴承、港口机械、 工程机械、矿山设 备及长寿命免维 护部位	面向单相浸没式 数据中心、高性能 计算、储能电力电 子模块与功率电子 浸没散热系统

支持全生命周期润滑管理,助力设备长期稳定运行与绿色可持续发展
Lifecycle lubrication management for long-term reliability and sustainable operation.



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工程验证
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高性能生物可降解润滑剂评价体系

Evaluation System for High-performance Biodegradable Lubricants

高性能生物可降解润滑剂，不应只关注“能否降解”，更应同时满足环境性能、基础理化性能、润滑性能、功能流体性能与材料相容性要求。绿色润滑的真正价值，是在环境友好与设备长期可靠运行之间建立新的工程平衡

High-performance biodegradable lubricants should not be judged only by whether they can degrade. They should also meet requirements for environmental performance, basic physicochemical properties, lubrication performance, functional fluid performance and material compatibility. The real value of green lubrication lies in creating a new engineering balance between environmental responsibility and long-term equipment reliability.

环境性能分级评价体系 / Environmental Performance Classification

评价项目 Criteria	基础级 Basic	高性能级 High Performance
生物降解率, 28d Biodegradation, 28d	≥ 60%	≥ 80%
溞类急性活动抑制 EC50, 48h Daphnia EC50, 48h	≥ 100 mg/L	≥ 500 mg/L
鱼类急性毒性 LC50, 96h Fish LC50, 96h	≥ 100 mg/L	≥ 500 mg/L
生物基碳含量 Biobased carbon content	报告值 Report	≥ 25 %



生物降解性

Biodegradability
降低泄漏后在自然环境
中的长期残留风险
Reduce long-term
persistence after leakage



低生态毒性

Low Ecotoxicity
降低对水生生物和生态
系统的潜在影响
Lower impact on aquatic
organisms and ecosystems



生物基属性

Biobased Value
提升可再生与低碳属性
Improves renewable and
low-carbon value



工程可靠性

Engineering Reliability
满足抗磨、承载、稳定与
相容要求
Meets wear, load, stability and
compatibility requirements

“

绿色润滑不是性能妥协，而是更高维度的技术平衡。
Green lubrication is not a compromise in performance,
but a higher-level engineering balance.

”



长期主义

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07 生物可降解关键工业流体技术平台

Technology Platform for Biodegradable Critical Industrial Fluids

生物可降解关键工业流体技术平台

Technology Platform for Biodegradable Critical Industrial Fluids

禾泰科技围绕生物可降解润滑剂与绿色功能流体, 构建覆盖基础油体系、添加剂技术、环境性能评价、润滑性能验证、材料相容性与全生命周期管理的系统化技术平台, 支撑环境敏感场景下关键装备长期可靠运行

HITECRUN builds a systematic technology platform for biodegradable lubricants and green functional fluids, covering base oil systems, additive technologies, environmental evaluation, lubrication performance validation, material compatibility and lifecycle management, supporting the long-term reliable operation of critical equipment in environmentally sensitive applications.



“

我们不是单一环保润滑剂供应商, 而是生物可降解关键工业流体技术平台

We are not merely a supplier of biodegradable lubricants, but a technology platform for biodegradable critical industrial fluids.

”



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全生命周期管理, 保障长期可靠运行

Lifecycle Management for Long-term Reliable Operation

从选型、切换、运行、监测到维护、再生修复与持续改进, 禾泰科技提供覆盖全生命周期的技术服务与管理体系, 帮助客户实现设备可靠性提升、环境影响最小化与综合成本优化

From selection, changeover, operation and monitoring to maintenance, reconditioning and continuous improvement, HITECRUN provides full lifecycle technical services and management systems to help customers improve equipment reliability, minimize environmental impact and optimize total cost.

全生命周期六大阶段 Six Stages of Lifecycle Management



为客户创造的核心价值 Key Value for Customers



“ 绿色流体的价值, 不仅体现在环保指标, 更体现在全生命周期的长期可靠运行与可持续价值
The value of green fluids is not only reflected in environmental performance, but also in long-term reliability and sustainable value through the entire lifecycle. ”



长期主义
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绿色技术研发与工程验证， 驱动性能与可持续价值共创

Green Technology R&D and Engineering Validation
Driving Performance and Sustainable Value Creation

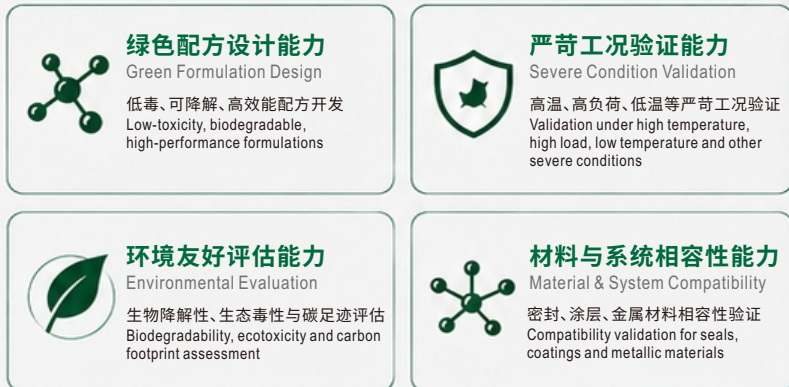
禾泰科技以技术创新与工程验证为核心，建立从实验室研发、中试验证到现场应用验证的完整研发体系，持续推动绿色流体在高端装备与严苛工况中的性能突破与可靠应用

HITECRUN centers on technological innovation and engineering validation, establishing a complete R&D system from laboratory research, pilot testing to on-site application validation, and continuously driving performance breakthroughs and reliable applications of green fluids in high-end equipment and severe operating conditions.

研发体系 R&D System



核心研发能力 Core R&D Capabilities



“以技术创新与工程验证，
助力绿色流体在全球能源与高端装备领域的可靠应用
Through technological innovation and engineering validation,
we empower the reliable application of green fluids in global
energy and high-end equipment sectors.”

研发成果与技术积累 R&D Achievements

授权发明专利 Authorized Invention Patents	37 项 37 items
团体 / 企业标准参与 Participation in Industry Standards	2+ 项 2+ items
关键产品性能突破 Key Product Performance Breakthroughs	10+ 项 10+ items
工程验证项目 Engineering Validation Projects	100+ 项 100+ items



10 生物可降解液压油解决方案

Biodegradable Hydraulic Fluid Solution

HITECBIO EAL600

生物可降解液压油解决方案

Biodegradable Hydraulic Fluid Solution for Environmentally Sensitive and High-leakage-risk Applications

HITECBIO EAL600 系列采用合成酯基础油与高性能无灰添加剂体系，面向环境敏感区、高泄漏风险、野外与海事场景的液压系统设计，在降低泄漏环境风险的同时，兼顾高润滑保护性、宽温运行能力与长期稳定性

HITECBIO EAL600 is formulated with synthetic ester base oils and a high-performance ashless additive system. It is designed for hydraulic systems operating in environmentally sensitive, high-leakage-risk, outdoor and marine applications, reducing environmental risk while delivering strong lubrication protection, wide-temperature capability and long-term stability.

核心性能要点 Key Performance Highlights



环保可降解

Biodegradable & Environmentally Friendly
降低泄漏后的环境影响
Reduces environmental impact after leakage



优异抗磨

Excellent Anti-wear Protection
保护泵、阀件与执行元件
Protects pumps, valves and actuators



高温抗氧化

Oxidation Stability
延缓老化，减少沉积
Resists aging and deposit formation



宽温适应

Wide Temperature Capability
低温流动性与高温油膜稳定性兼顾
Good low-temperature fluidity and stable oil film at high temperature



空气释放与抗泡

Air Release & Anti-foam
保障系统平稳运行
Ensures stable hydraulic operation



过滤性与清洁度

Filterability & Cleanliness
适合高精度液压控制系统
Suitable for precision hydraulic control systems

典型技术指标 Typical Technical Data

粘度等级 / ISO VG	22/ 32/ 46/ 68
基础油类型 / Base Oil	POE Synthetic Ester
生物降解率 / Biodegradation	70%+
溞类急性活动抑制 / Daphnia EC50	>100 mg/L
鱼类急性毒性 LC50, 96h/ Fish LC50	>100 mg/L
四球磨斑 / Four-ball Wear Scar	0.35 mm

典型应用场景 Typical Applications

- 风电液压系统 / Wind Power Hydraulic Systems
- 港口与海事设备 / Port & Marine Equipment
- 工程与矿山机械 / Construction & Mining Machinery
- 农业与森林机械 / Agricultural & Forestry Machinery
- 近水与环境敏感装备 / Near-water and Environmentally Sensitive Equipment



液压系统是绿色流体导入的优先入口

Hydraulic systems are a priority entry point for green fluid implementation.



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工程验证
ENGINEERING VALIDATION



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11 生物可降解齿轮油解决方案

Biodegradable Gear Lubricant Solution

HITECBIO EHF

全合成生物可降解齿轮润滑剂

Synthetic Biodegradable Gear Lubricant

面向重载、抗微点蚀与环保敏感场景的齿轮润滑方案

Biodegradable Gear Lubricant Solution for Heavy-duty and Environmentally Sensitive Gear Systems

HITECBIO EHF 系列面向风电齿轮箱、工业齿轮箱、矿山、海事与隧道工程等场景，兼顾生物可降解、低生态影响、重载承载、抗微点蚀、防锈防腐与宽温运行，为环境敏感区域关键齿轮系统提供长期可靠保护

HITECBIO EHF Series is designed for wind turbine gearboxes, industrial gearboxes, mining equipment, marine systems and tunnel engineering applications. It combines biodegradability, low ecological impact, heavy-duty load carrying capability, micropitting protection, rust and corrosion resistance, and wide-temperature operation to provide long-term reliable protection for critical gear systems in environmentally sensitive areas.

核心性能要点 Key Performance Highlights



抗微点蚀与齿面疲劳保护
Micropitting & Surface Fatigue Protection

抑制齿面疲劳损伤，提升啮合可靠性
Helps reduce surface fatigue and improve meshing reliability



FZG FZG 承载能力支撑重载运行
Heavy-duty Load Carrying Supported by FZG Performance

适应高载荷、冲击载荷和严苛传动工况
Suitable for high load, shock load and severe transmission conditions



高温抗氧化与热稳定
Oxidation Stability & Thermal Stability

延缓油品老化，减少沉积与漆膜风险
Slows oil aging and reduces deposits and varnish risks



防锈、防腐与抗乳化
Rust, Corrosion & Demulsibility Protection

适应潮湿、冷凝水与复杂环境
Suitable for humid conditions, condensed water and complex environments



适应潮湿、多水、高盐雾环境
Suitable for Wet, Water-rich and High-salt-mist Environments

适用于近水、港口、海事与环境敏感区域
Applicable to near-water, port, marine and environmentally sensitive areas



兼顾工程性能与绿色低碳属性
Engineering Performance with Green & Low-carbon Value

在可靠运行基础上兼顾环境友好要求
Combines environmental responsibility with reliable operation

典型技术指标 Typical Technical Data

粘度等级 / ISO VG	150/ 220/ 320/ 460
FZG 失效负荷等级/FZG Load Stage	12+
四球磨斑 / Four-ball Wear Scar	0.30 mm
生物降解率 / Biodegradation	> 60 %
生物基/可再生属性/Biobased / Renewable Attribute	报告值 Report
溞类急性活动抑制 / Daphnia EC50	>100 mg/L
鱼类急性毒性 LC50, 96h/ Fish LC50	>100 mg/L
倾点 / Pour Point	< -33℃
闪点 / Flash Point	> 220℃

“生物可降解齿轮油的价值，不只是绿色替代，更是在重载传动系统中实现环保属性与工程可靠性的平衡”

典型应用场景 Typical Applications



风电齿轮箱 / Wind Power Gearboxes



工业齿轮系统 / Industrial Gear Systems



矿山与工程机械 / Mining & Construction Machinery



海事与港口设备 / Marine & Port Equipment



近水与环境敏感装备 / Near-water and Environmentally Sensitive Equipment



长期主义

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工程验证

ENGINEERING VALIDATION



协同创新

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12 特种生物可降解产品族

Biodegradable Product Family for Specialized Applications

面向特殊工况的生物可降解产品族

Biodegradable Product Family for Specialized Applications

围绕高温链条、长效润滑、压缩机冷却、涡轮系统、含油轴承以及绿色功能流体等特殊工况方向，禾泰科技形成面向特殊工业场景的生物可降解产品族，为环境敏感装备提供更完整的绿色流体解决方案

HITECRUN has developed a biodegradable product family for specialized applications including high-temperature chain lubrication, long-life lubrication, compressor cooling, turbine systems, oil-impregnated bearings and green functional fluids, providing a more complete green fluid solution for environmentally sensitive equipment.



HITECBIO HCL 合成生物可降解 高温链条润滑剂

Synthetic Biodegradable
High-temperature Chain Lubricant

适用于印染、玻璃、陶瓷、热处理、食品烘焙等高温链条
For high-temperature chains in textile finishing, glass, ceramics, heat treatment and food baking.



HITECBIO EAG2000 合成生物可降解 长效润滑剂

Synthetic Biodegradable
Long-life Lubricant

适用于轨交、风电、港口机械、矿山机械、海事设备及免维护部位
Suitable for rail transit, wind power, port machinery, mining equipment, marine equipment and maintenance-free points.



HITECBIO RS 合成生物可降解 压缩机冷却液

Synthetic Biodegradable
Compressor Coolant

适用于螺杆式、回转叶片式、往复式空气压缩机
Suitable for screw, rotary vane and reciprocating air compressors.



HITECBIO GT 合成生物可降解 涡轮机油

Synthetic Biodegradable
Turbine Oil

适用于水轮机、燃气轮机、蒸汽轮机及近水环境
Suitable for hydro, gas and steam turbines, especially near-water environments.



HITECBIO PMOE 合成生物可降解 含油轴承油

Synthetic Biodegradable
Oil-impregnated Bearing Oil

适用于粉末冶金含油轴承、微电机、精密设备
Suitable for powder metallurgy bearings, micro motors and precision equipment.



HITECRON ILC Series 绿色功能流体方向

Green Functional Fluids

面向浸没式冷却、储能热管理、电力电子与电气绝缘冷却系统
For immersion cooling, energy storage thermal management, power electronics and electrical insulation cooling systems.

“从润滑到冷却，生物可降解产品族让绿色流体覆盖更广泛的特殊工况
From lubrication to cooling, the biodegradable product family extends green fluids to a wider range of specialized applications.”



长期主义
LONG-TERMISM



工程验证
ENGINEERING VALIDATION



协同创新
COLLABORATIVE INNOVATION



价值共生
SHARED VALUE

13 典型应用场景解决方案

Typical Application Solutions

为环境敏感装备提供全场景 生物可降解流体解决方案

Comprehensive Biodegradable Fluid Solutions
for Environmentally Sensitive Applications

针对不同工业领域的环境敏感需求，禾泰科技提供从润滑、保护到冷却的全场景生物可降解流体解决方案，助力设备长期可靠运行与绿色可持续发展

For different industries with environmentally sensitive requirements, HITECRUN provides full-scenario biodegradable fluid solutions from lubrication, protection to cooling, helping equipment achieve long-term reliable operation and promoting green and sustainable development.



风力发电 Wind Power



- 齿轮箱、主轴轴承、液压系统等关键部位润滑保护
- 适应海上及高湿环境，兼顾可靠性与环保要求
- Lubrication protection for gearboxes, main bearings, hydraulic systems and other critical parts
- Suitable for offshore and high-humidity environments with biodegradability requirements



港口与海事 Marine & Port



- 港口机械、甲板设备、舵机、绞车等润滑应用满足
- 近水作业与防污染法规要求
- Lubrication applications for port machinery, deck equipment, steering gear, winches, etc.
- Meets near-water operation and anti-pollution regulation requirements



工程机械 Construction Machinery



- 齿轮箱、液压系统、润滑点的生物可降解保护
- 降低泄漏对土壤与水体的潜在影响
- Biodegradable protection for gearboxes, hydraulic systems and lubrication points
- Reduces potential impact of leakage on soil and water



农业与林业机械 Agricultural & Forestry Machinery



- 农机传动、液压和润滑系统的绿色解决方案
- 契合农业与林业对环保与可持续的需求
- Green solutions for agricultural and forestry machinery transmission, hydraulic and lubrication systems
- Meets the needs for environmental protection and sustainability in agriculture and forestry



轨道交通 Rail Transit



- 齿轮箱、轴承与润滑系统的生物可降解应用
- 提升设备可靠性，降低环境风险
- Biodegradable applications for gearboxes, bearings and lubrication systems
- Enhances equipment reliability and reduces environmental risk



数据中心与储能热管理 Data Centers & Energy Storage Thermal Management



- 浸没式冷却、储能热管理、电力电子与电气绝缘冷却
- 绿色、安全、高效的功能流体方案
- Immersion cooling, energy storage thermal management, power electronics and electrical insulation cooling
- Green, safe and efficient functional fluid solutions



环境友好

Environmentally Friendly

生物可降解，降低对生态环境的影响
Biodegradable to reduce environmental impact



可靠保护

Reliable Protection

优异的润滑与防护性能，
保障设备长期稳定运行
Excellent lubrication and protection
ensure long-term stable operation



适应广泛

Wide Adaptability

适用于多种工况与严苛环境
Suitable for various operating
conditions and harsh environments



提升效率

Enhanced Efficiency

减少能耗与维护成本
Reduces energy consumption
and maintenance cost



绿色未来

Green Future

助力工业绿色转型与可持续发展
Supports green transition and
sustainable development



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价值共生
SHARED VALUE

为环境敏感装备提供全场景 生物可降解流体技术支持

Reliable Biodegradable Fluid Technology Support
for Environment Sensitive Applications

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