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Consultation with an experienced Application Engineer should precede every lubricant change-over. This guarantees that the optimum lubricant system is selected. Our experienced FUCHS engineers will be glad to advise on products for the application in question but also inform you about our comprehensive range of lubricants.

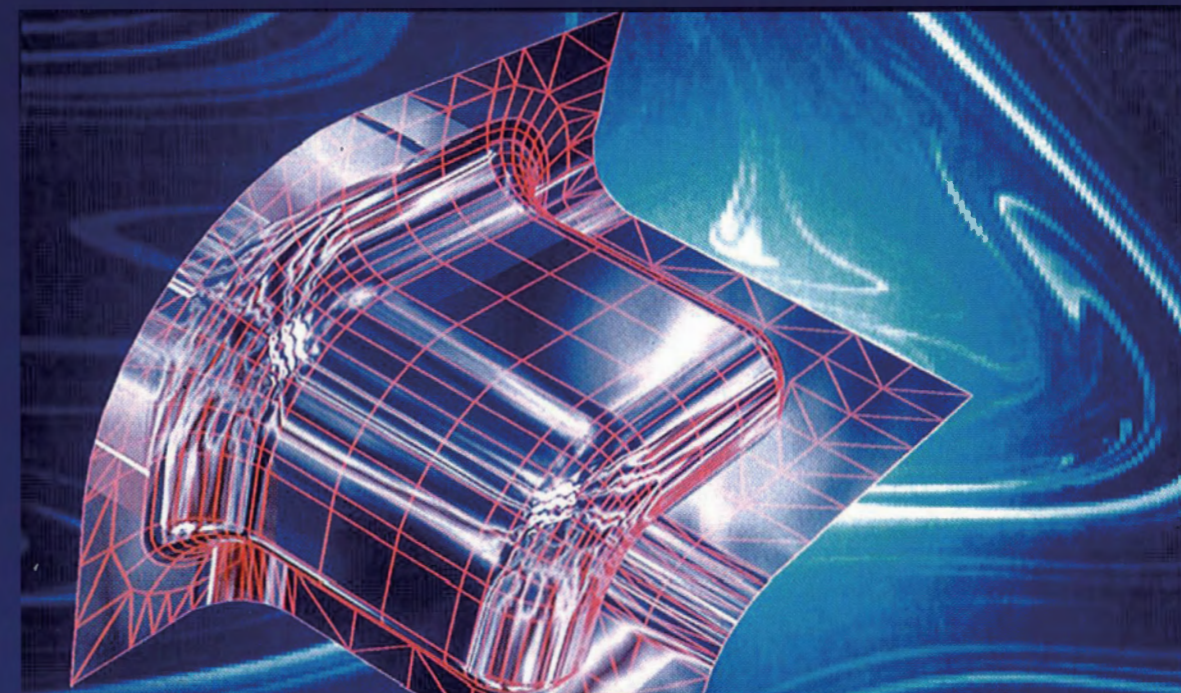
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福斯工业润滑剂
FUCHS Industrial Lubricants

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Specialites for Specialists

RENOFORM



福斯金属成形润滑剂
FUCHS Metal Forming Lubricants

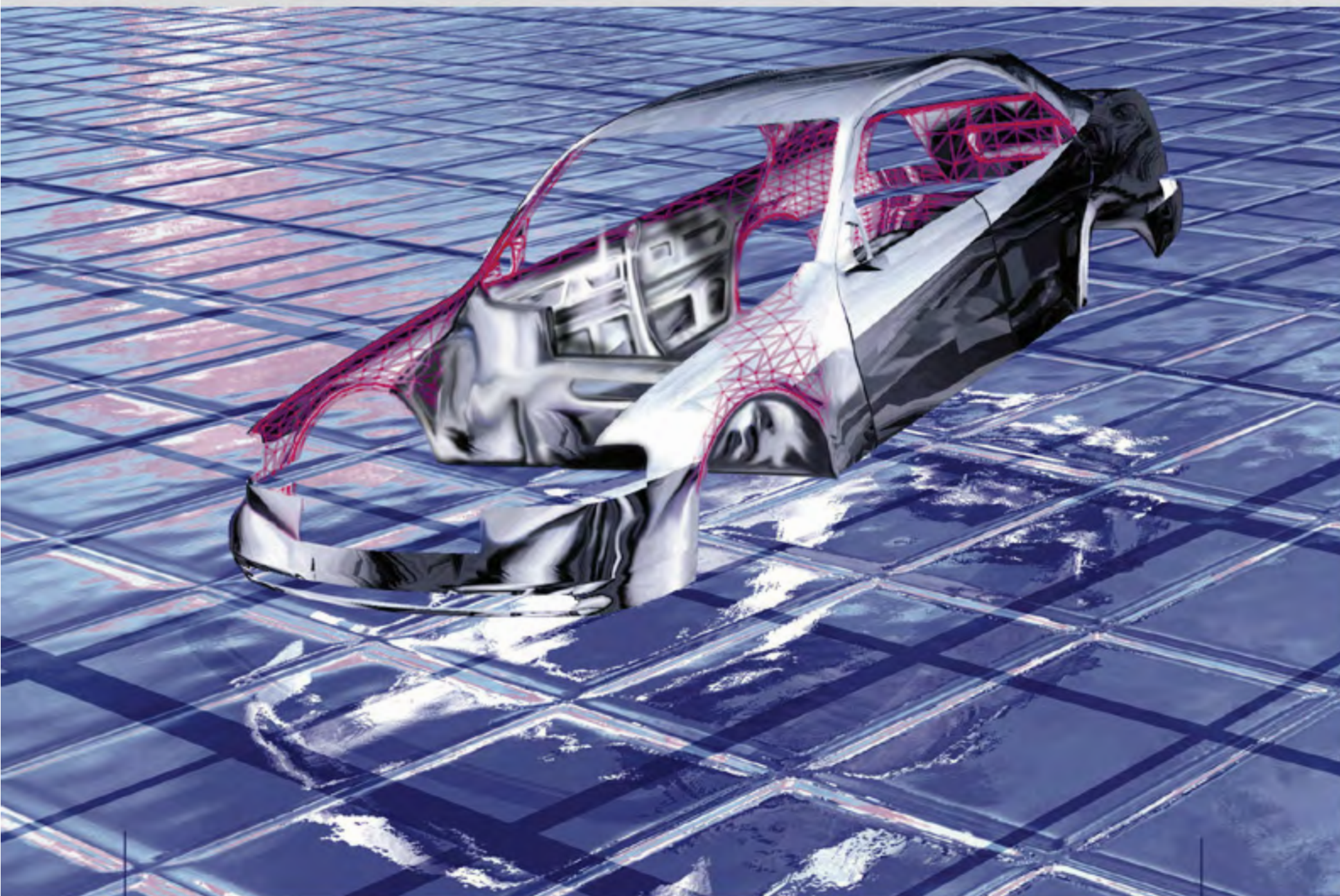
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对于所给定的技术数据及其检测方法存在可重复性及可比较性。

LUBRICANTS.
TECHNOLOGY.
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- 挥发性成形油
/ Volatile metal forming oil
- 水基成形油
/ Water based metal forming fluid
- 纯油类成形油
/ Neat metal forming oil
- 管线棒材加工油
/ Metal forming oil for wire/pipe/rod

The global operating FUCHS Group, as the world's largest independent lubricant manufacturer in the industry, has become the market leader for lubricants. The strong focus on product development, know-how and application engineering has created the foundation for FUCHS to be one of the most successful and most recognized metal working fluid suppliers in the world.

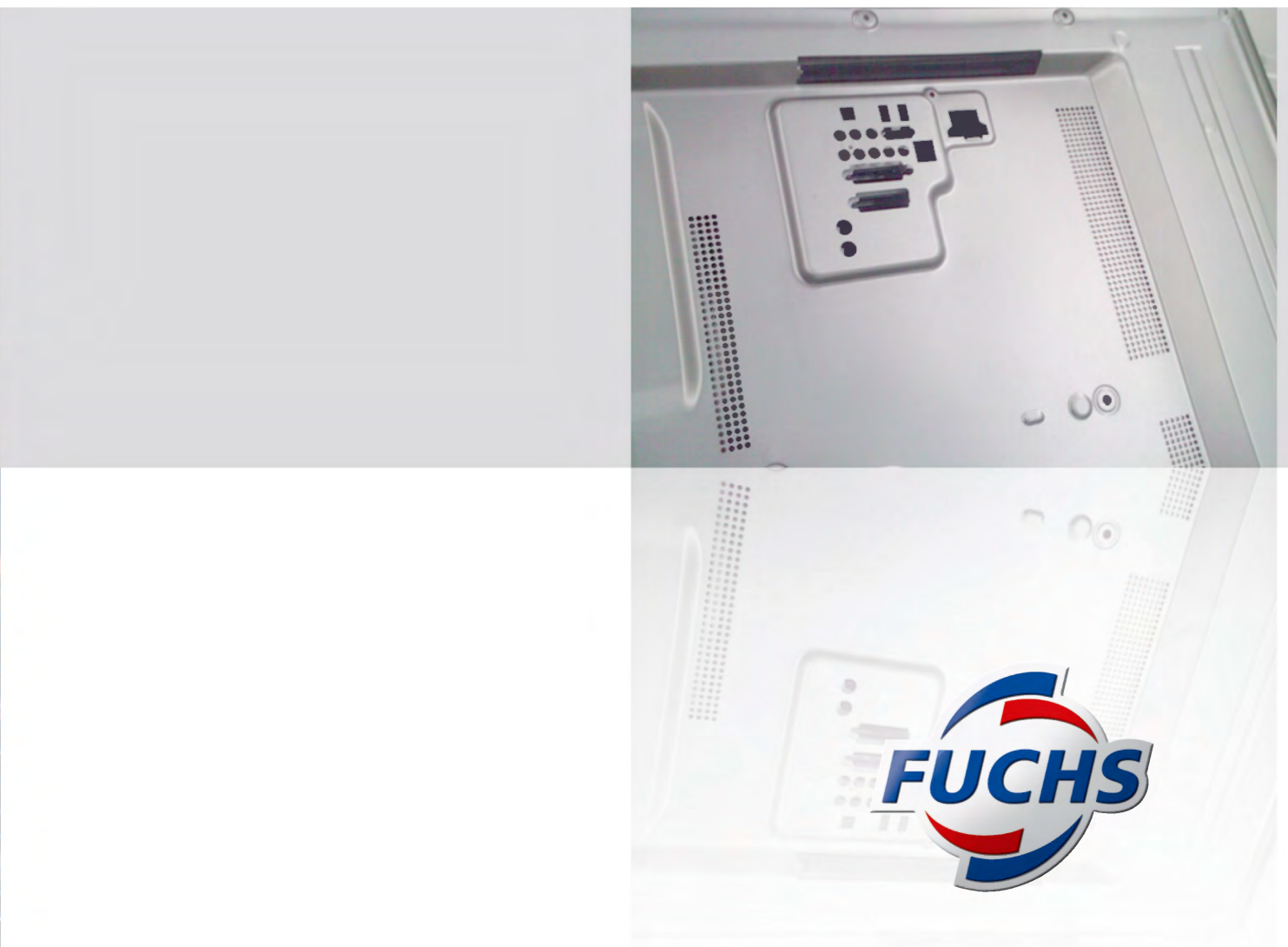
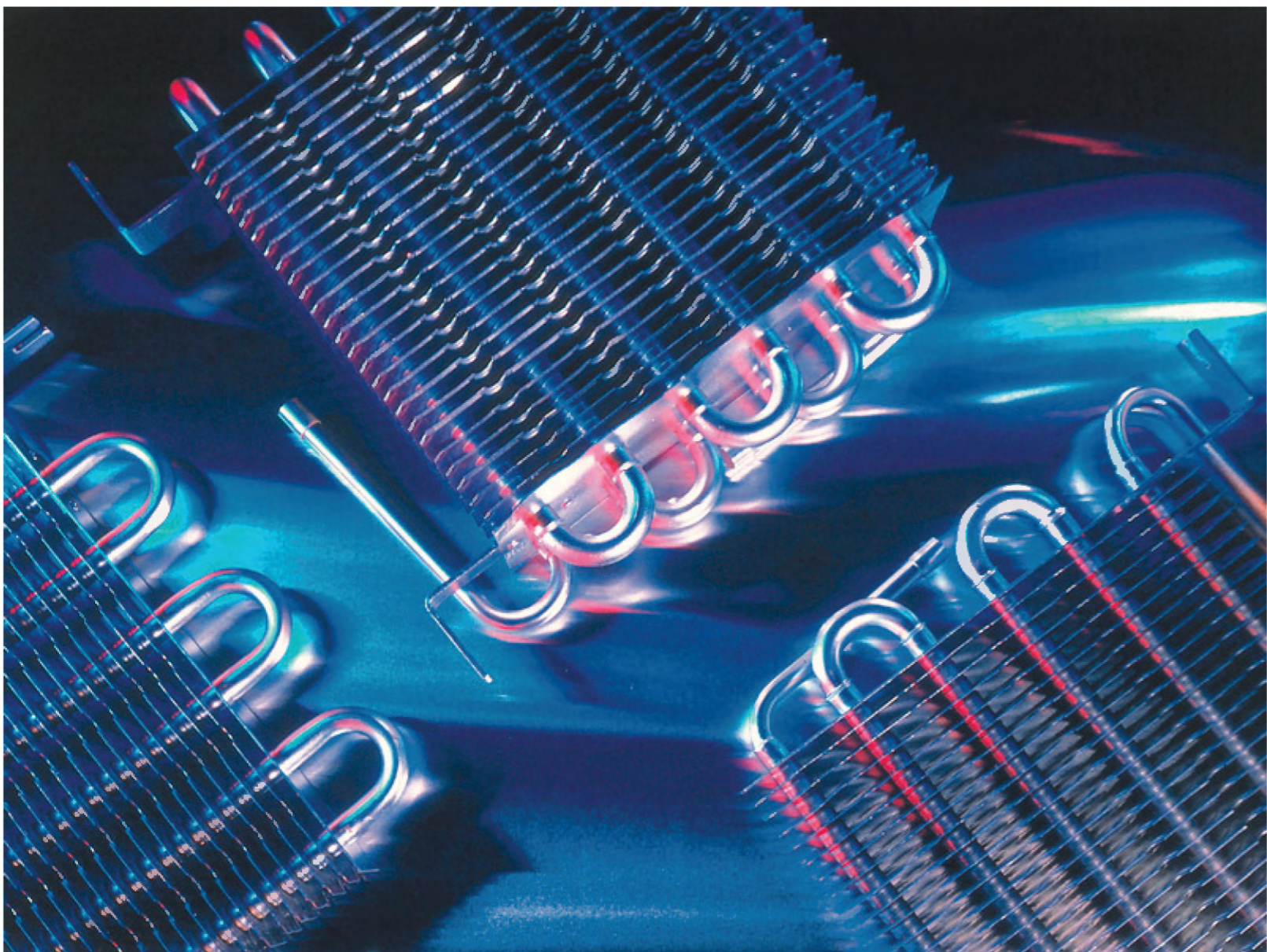
FUCHS offers products for all metal working areas:
ECOCOOL, ECOCUT and RATAK - worldwide patented brands for water miscible coolants, neat cutting and grinding oils
RENOFORM - metal forming oils
RENOCLEAN - the comprehensive line of industrial cleaners
THERMISOL - quenching oils
PLANTO MIKRO and ECOCUT MIKRO series - most advanced technology in fast biodegradable and occupational safe Minimum Quantity Lubricant (MQL)
FUCHS provides high quality standards, reliable service and superior products to our customers.

作为全球最大的独立润滑油生产商，福斯集团已成为润滑油行业的领导者。

对产品开发，技术和应用的专注使得福斯集团成为世界上最成功和最受认可的金屬加工液生产商之一。

福斯能够提供品种齐全的金属加工液产品：
ECOCOOL, ECOCUT 和 RATAK - 世界专利品牌水溶性、纯油性切削液及磨削产品
RENOFORM - 金属成形润滑剂
RENOCLEAN - 全面的工业清洗剂
THERMISOL - 淬火油
PLANTO MIKRO 和 ECOCUT MIKRO 系列 - 快速生物降解高科技产品和注重职业健康安全的最小量润滑产品

福斯可以为我们的客户提供高品质产品，可靠的服务和最好的性价比。

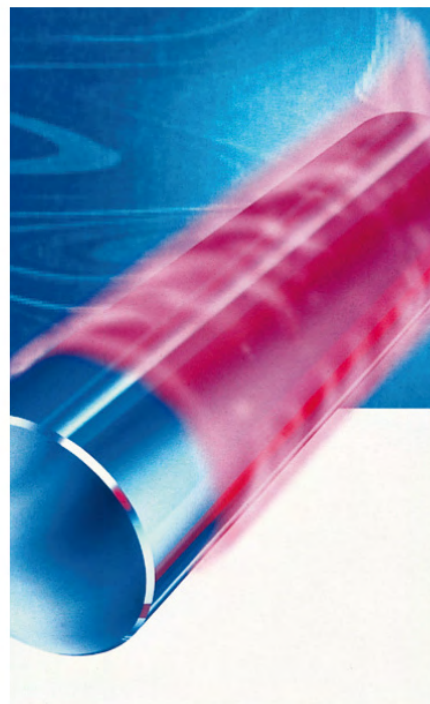


挥发性成形油

产品名称	运动粘度, (40°C) [mm ² /s]	适用金属材质	性能简述	应用推荐
RENOFORM UBO 377/1 S	1.07	铜, 铝, 低碳钢	快速挥发, 良好润滑特性, 不含氯, 硫, 硅及其它有害物质, 无残留, 免清洗	广泛用于电子电器行业零部件的冲裁及其它成形加工
RENOFORM UBO 377/8 S	1.18	铜, 铝, 碳钢, 不锈钢	快速挥发, 良好润滑特性, 不含氯, 硫, 硅及其它有害物质, 低残留, 可据工情况免清洗	广泛用于各类金属薄片类工件的冲裁折弯及其它成形加工
RENOFORM SSI 29	1.70	铜, 铝及其它有色金属	快速挥发, 良好润滑特性, 低残留	适用于铝及铝合金工件加工, 推荐用于家用空调铝箱散热翅片的冲裁
RENOFORM SSI 29 N	1.35	铜, 铝及其它有色金属	良好润滑特性, 无气味, 低残留	广泛用于各类有色金属工件的冲裁, 冲压, 拉深加工

Vanishing Metal Forming Oil

Product Name	Viscosity, (40°C) [mm ² /s]	Applied Material	Description	Application
RENOFORM UBO 377/1 S	1.07	Copper, aluminum, carbon steel	Fast vanishing, good lubricity, free of chlorine, sulfur, silicon and other harmful material, no residue, no need to clean	Widely applied to high speed stamping and other forming processing in electronic and electrical industry
RENOFORM UBO 377/8 S	1.18	Copper, aluminum, carbon steel, Stainless steel	Fast vanishing, good lubricity, free of chlorine, sulfur, silicon and other harmful material, low residue, normally no need degreasing	Widely applied to metal sheet forming including stamping, bending, blanking etc.
RENOFORM SSI 29	1.70	Copper, aluminum, other non-ferrous metal	Fast vanishing, good lubricity, low residue	Recommended for aluminum and aluminum alloy forming processing, especially for aluminum fin stamping in home AC
RENOFORM SSI 29 N	1.35	Copper, aluminum, other non-ferrous metal	Fast vanishing, good lubricity, low residue	Widely applied to non-ferrous metal forming, including stamping, blanking, drawing



水基成形油

产品名称	pH值, 10%溶液	适用金属材质	性能简述	应用推荐
RENOFORM MZAN 20 S	8.3	冷轧板, 热轧板	重负荷乳化型成形油, 极佳润滑与极压性能, 不含氯, 不含矿物油, 使用方便, 极易清洗, 乳液稳定	适用于板料的冲压, 落料和拉伸及其它成形加工, 特别推荐用于钢管扩径工艺
RENOFORM MZAN 900	8.2	冷轧板, 热轧板	重负荷乳化型成形油, 极佳润滑与极压性能, 不含氯, 不含矿物油, 使用方便, 极易清洗, 乳液稳定	适用于板料的冲压, 落料和拉伸及其它成形加工, 特别推荐用于钢管扩径工艺
RENOFORM MBW 677/6	9.1	碳钢, 合金钢, 不锈钢	乳化型成形油, 极佳润滑特性, 不含氯, 防锈性良好, 清洗后残留极少	适用于钢板的冲压及拉深加工, 可用于大系统集中供液, 推荐用于各类小型壳体类工件如电池壳, 电机壳等多工位拉深加工
ECO DRAW HVE 1	8.8	冷轧板, 热轧板, 有色金属	全合成成形油, 不含氯及硫化极压剂, 不含矿物油, 不含动植物脂肪, 优秀润滑特性, 易使用, 易清洗, 生物降解	广泛用于各类冷轧及热轧薄板的冲压, 拉深, 尤其用于后续电镀或油漆有较高要求的场合, 如汽车覆盖件, 家用电器配件等
XL DRAW 9000 V	8.1	冷轧板, 热轧板, 镀锌板, 铝板	重负荷乳化型成形油, 极佳润滑特性, 含氯, 对水质硬度适应性极强, 乳液稳定	适用于板料的冲压, 冲孔及拉深

Water Based Metal Forming Fluid

Product Name	pH Value, 10% Conc.	Applied Material	Description	Application
RENOFORM MZAN 20 S	8.3	cold rolled and hot rolled steel	Heavy duty water based forming fluid, excellent lubricity and EP property, free of choline and mineral oil, easy to use, readily cleaned, stable in both and soft water	Recommended for forming processing include stamping, blanking, drawing, especially for the steel pipe expanding process
RENOFORM MZAN 900	8.2	Cold rolled and hot rolled steel	Heavy duty water based forming fluid, excellent lubricity and EP property, free of mineral oil, easy to use, readily cleaned, stable in both and soft water	Recommended for forming processing include stamping, blanking, drawing, especially for the steel pipe expanding process
RENOFORM MBW 677/6	9.1	Carbon steel, steel alloys, Stainless steel	Water based high performance drawing fluid, good lubricity and EP property, free of choline, good anti rust performance, readily cleaned, low residue	Recommended for steel sheet stamping and drawing, could be applied to central system, suitable for various multistage drawing of shell including battery shell, electronic motor etc.
ECO DRAW HVE 1	8.8	Cold rolled and hot rolled steel, non-ferrous metal	Fully synthetic metal forming fluid, good lubricity property, contains no choline, free of sulfur as EP, mineral oil, easy to use, readily cleaned, biodegradable, good e-coat and paint compatibility	Widely applied to cold and hot rolling sheet forming processing include blanking, drawing, especially for the processing required good washability and very low residue on metal surface, for example cover parts of automotive and home appliance
XL DRAW 9000 V	8.1	Cold rolled and hot rolled steel, galvanized and aluminum	Heavy duty water based drawing fluid, excellent lubricity, choline containing, stable in both hard and soft water	Recommended for steel drawing, piercing, drawing processing

纯油类成形油

产品名称	运动粘度, (40°C) [mm ² /s]	适用金属材质	性能简述	应用推荐
RENOFORM CFH 40 S	40	碳钢, 不锈钢	纯油性紧固件加工用油, 极佳极压特性, 保护模具及工件表面, 不含氯	适用于各类冷成形加工如冷镦, 冷挤压及其它加工
RENOFORM EXT 319 IS	63	碳钢, 不锈钢, 有色金属	半合成冷成形加工油, 含极少量矿物油, 极佳润滑极压特性, 延长模具寿命, 改善工件表面质量, 极少烟雾, 不含氯	广泛用于各类紧固件的冷镦, 冷挤及其它加工, 推荐用于难度较高的不锈钢紧固件加工
EXTRUDOIL 519 HT	100	碳钢, 合金钢, 不锈钢	重负荷半合成冷成形加工油, 由特殊润滑成分组成, 极少烟雾, 不含氯	适用于各类冷成形加工如冷镦, 冷挤, 推荐用于高难度的, 产生大量热量的冷成形工艺
RENOFORM HBO 2222	59	碳钢, 合金钢, 不锈钢	顶级纯油性成形加工油, 低粘度, 不含氯, 在诸如润滑, 极压, 防锈, 可清洗性方面具有突出的性能	适用于各类钢板包括厚板料的高难度的精冲, 冲压, 落料, 深拉深加工
RENOFORM HBO 962/2	85	碳钢, 合金钢, 不锈钢	纯油性成形加工油, 不含氯	广泛用于各类钢板的精密冲裁及拉深加工
RENOFORM MZAN 51	105	碳钢, 合金钢, 不锈钢	重负荷合成成形加工油, 极佳润滑极压特性	适用于各类钢板包括厚板料的高难度的精冲, 冲压, 落料, 深拉深加工, 也可用于钢丝拉拔
RENOFORM MZAN 54 CN	40	碳钢, 合金钢, 不锈钢	纯油性成形加工油, 良好润滑特性, 低粘度	适用于各类钢板的冲压及拉深加工, 推荐用于厚度低于2mm的板料加工
TUF DRAW 2806 M-100	500	合金钢, 不锈钢, 有色金属	重负荷成形加工油, 高粘度, 极佳润滑特性, 与硬质合金模具相容	适用于难度较高的厚板冲压及深拉深加工
RENOFORM 675 LV	55	铝, 铝合金, 铜, 铜合金	纯油性成形加工油, 低粘度, 可喷涂使用, 对铝及铜无污染, 不含氯, 不含硫, 不含磷, 不含任何 OSHA Z 列表上的有害物质, 可用于食品, 化妆品行业	适用于各类有色金属的拉深, 冷挤, 压印加工, 推荐用于铝合金及高纯度铝的拉深及冷挤加工
RENOFORM 1905 L	285	铝, 铝合金, 铜, 铜合金	重负荷纯油性成形加工油, 对铝及铜无污染, 不含氯, 不含硫, 不含磷, 不含任何 OSHA Z 列表上的有害物质, 可用于食品, 化妆品行业	适用于各类有色金属的高难度冲压, 拉深及冷挤加工, 推荐用于对润滑要求极高的铝合金冷挤工艺
RENOFORM 96	38	碳钢, 合金钢, 不锈钢	纯油性金属成形加工油, 优良的润滑和极压性能, 工序间防锈性能良好, 易清洗	适用于板材的精密剪切及成型加工

Neat Metal Forming Oil

Product Name	Viscosity, (40°C) [mm ² /s]	Applied Material	Description	Application
RENOFORM CFH 40 S	40	carbon steel, stainless steel	Neat oil for fastner forming, excellent EP property, dies protection and fine finishes, chroline free	Recommended for various cold forming processing including cold heading, cold extrusion and others
RENOFORM EXT 319 IS	63	Carbon steel, stainless steel, non-ferrous metal	Semi-synthetic cold forming oil, contains very little mineral oil, excellent lubricity and EP property, extends tool life, improves degree of parts surface, very low oil mist, chroline free	Widely applied to cold heading, cold extrusion and other cold forming processing of fastner, especially to difficult processing such as stainless steel forming
EXTRUDOIL 519 HT	100	Carbon steel, steel alloys, Stainless steel	Heavy duty semi-synthetic cold forming oil, contains special lubricity and EP additives, very low oil mist, chroline free	Recommended for various very difficult cold forming processing, especially for the operations that generate excessive heat
RENOFORM HBO 2222	59	Carbon steel, steel alloys, Stainless steel	Topmost neat forming oil, low viscosity, chroline free, extreme performance such as lubricity, EP, antitrust and washability	Recommended for various very high difficult forming operations include high thickness sheet fine blanking, deep drawing
RENOFORM HBO 962/2	85	Carbon steel, steel alloys, Stainless steel	Neat forming oil, chroline free	Widely applied to steel precise stamping and drawing
RENOFORM MZAN 51	105	Carbon steel, steel alloys, Stainless steel	Heavy duty synthetic metal forming oil, excellent lubricity and EP property	Recommended for high difficult forming processing including fine blanking, deep drawing especially for high thickness sheet, also could be applied to steel wire drawing
RENOFORM MZAN 54 CN	40	Carbon steel, steel alloys, Stainless steel	Neat forming oil, good lubricity, low viscosity	Recommended for steel sheet stamping and drawing, especially for the material that thickness less than 2 mm
TUF DRAW 2806 M-100	500	Steel alloys, stainless steel, non-ferrous metal	Heavy duty forming lubricant, high viscosity, excellent drawing performance, compatible with carbide tooling	Recommended for very difficult deep drawing processing especially required very good washability of lubricant
RENOFORM 675 LV	55	Aluminum and alloys, copper and alloys	Neat forming oil, low viscosity, could be applied by spray, resistant to staining aluminum and copper, contains no chroline, sulfur, phosphorus, and not include any ingredient found on OSHA Z list, so it could be applied in food or cosmetics industry	Recommended for non-ferrous metal forming processing include drawing, extrusion, pressing, especially for high purity aluminum and aluminum alloys forming
RENOFORM 1905 L	285	Aluminum and alloys, copper and alloys	Heavy duty neat for ming oil, resistant to staining aluminum and copper, contains no chroline, sulfur, phosphorus, and not include any ingredient found on OSHA Z list, so it could be applied in food or cosmetics industry	Recommended for non-ferrous metal forming processing include drawing, extrusion, pressing, especially for very high difficult extrusion processing of aluminum alloy
RENOFORM 96	38	carbon steel, steel alloys, stainless steel	Neat forming oil, excellent lubricity and EP performance, good antitrust performance during the process and good cleaning performance	Widely applied to plates shearing and forming process

管线棒材加工油

产品名称	运动粘度, (40°C) [mm ² /s]	PH值, 10%溶液	性能简述	应用推荐
RENOFORMMCU 20	—	8.8	乳化型铜拉丝液, 极佳润滑及冷却特性, 长寿命, 低泡沫, 抗污染, 乳液稳定, 生物稳定性极佳	广泛用于各类铜丝的粗拉及中拉工艺, 也可用于部分细拉工艺, 可用于单机及集中供液系统
LUSOL WD 7F	—	9.3	合成型铜拉丝液, 为模具提供充分润滑, 油性适中, 不污染铜线及模具, 良好冷却性能, 生物稳定性极佳	广泛用于各类铜丝的细拉及超细拉工艺, 可用于单机及集中供液系统
RENOFORM SL 97 CR	—	8.5	乳化型铜管加工液, 均衡的润滑及冷却特性, 保护模具及铜管表面	适用于铜管轧制过程的润滑冷却
RENOFORMADO 2019 SW	130	—	纯油性铝拉丝油, 为模具提供充分润滑, 延长模具寿命, 抗高温, 抗污染	适用于铝线的粗拉及中拉工艺
RENOFORM 718	5	—	纯油性铝拉丝油, 低粘度, 延长模具寿命, 改善铝线表面质量, 抗高温, 抗污染	适用于铝线的细拉工艺
RENOFORM FW 50 S/H	800	—	纯油性铝管拉拔油, 极佳润滑特性, 适应高速拉拔, 高温分解完全, 低残留	适用于空调管的高速拉拔的内润滑
RENOFORM ETA	1500	—	重负荷钢管轧制油, 极佳润滑极压特性	适用于皮尔格轧制工艺, 也可用于钢丝的拉拔
RENOFORM SD 40	40	—	纯油性管棒材拉拔油, 低粘度, 极佳润滑性和极压特性, 少污染	适用于钢棒及不锈钢棒的冷拉拔

Metal Forming Oil for Wire / Pipe / Rod

Product Name	Viscosity 40°C [mm ² /s]	PH Value, 10% Conc.	Description	Application
RENOFORM MCU 20	—	8.8	Water-miscible copper wire drawing fluid, excellent lubricity and cooling performance, long life, low foaming, anti contamination, high microbiological resistance	Widely applied to heavy and medium copper wire drawing, could be used for fine drawing after evaluation, suitable for both individual machine and central cooling system
LUSOL WD 7F	—	9.3	Synthetic copper wire drawing fluid, good lubricity for tools, good balance between lubricity and cooling, resistant to staining copper and tools, high microbiological resistance	Widely applied to fine and super fine drawing of copper wire, suitable for individual machine and central cooling system
RENOFORM SL 97 CR	—	8.5	Water-miscible copper pipe rolling fluid, good balance on lubricity and cooling, good tools protection and fine finishes of surface	Recommended for AC copper pipe rolling
RENOFORM ADO 2019 SW	130	—	Neat aluminum wire drawing oil, excellent tools protection, excellent high temperature endurance, resistance to contamination of aluminum powder	Recommended for heavy and medium aluminum wire drawing
RENOFORM 718	5	—	Neat aluminum wire drawing oil, low viscosity, excellent cooling performance, good tools protection, resistance to contamination of aluminum powder	Recommended for aluminum wire drawing
RENOFORM FW 50 S/H	800	—	Neat aluminum pipe drawing oil, excellent lubricity, suitable for high speed drawing, easily degrading at high temperature, low residue	Recommended for inner lubrication of aluminum AC pipe high speed drawing
RENOFORM ETA	1500	—	Heavy duty steel pipe rolling oil, excellent lubricity and EP property	Recommended for pilger rolling of steel and stainless steel pipe, could also be applied to steel wire drawing
RENOFORM SD 40	40	—	Neat steel rod drawing oil, low viscosity, excellent lubricity and EP property, low contamination	Recommended for steel rod and stainless steel rod drawing process

