

GRINDING OIL/ METAL SWARF RECYCLING UNITS
GRU-60 TO GRU-3000



Customizable
Customizable



Highest
quality
design



Pan-european 24h
on-site service
ON-SITE SERVICE



Safe through
primary EX-protection
primary EX-protection



Fully automatic for
monitoring free
24h operation
24h operation



Integratable into
existing systems
existing systems



GRU-2000
GRU-2000

GRINDING OIL/ METAL SWARF RECYCLING UNITS

GRU-60 TO GRU-3000

THE EFFICIENT SOLUTION FOR THE EXTRACTION AND REUSE OF METAL SWARFS AND GRINDING OIL


Do you want to recover your precious metal and cooling lubricant feedstock? - We offer the solution:

The solvent extraction units of the GRU series have been designed for the de-oiling of metal swarfs. With this units metal swarfs can be de-oiled up to residual oil content of 0,01%.

First, the grinding oil mixture is flooded with solvent. Then, the oils are extracted from the solid particles using upflow classification and/ or suspension. The solvent/ cooling lubricant mixture, the so-called remains of the extraktion, is separated and treated using vacuum distillation so that after the process the solvent as well as the cooling lubricant is available for reuse.

The GRU series is equipped with a conical vessel* and can be installed in EX-zones 1 or 2 due to ist explosion protected design.

(* On request, the GRU also can be delivered with a horizontal lying vessel with extraction filter baskets.)



Process characteristics:

- De-oiling of gross to powdery metal swarfs
- Recovery of grinding oil and cooling lubricant
- De-oiling up to a residual oil content of 0,01%
- Grinding oil and cooling lubricant reusable



DISTILLATION-/ EXTRACTION UNIT

▶ Conical extraction vessel without baskets	✓
▶ Continous, freely adjustable level measurement between 50% and 95%	✓
▶ Either circulation pump or agitator in spark free design for suspension of solid particles	✓
▶ Pneumatic ⌘-filling slider (safety function "single locking") with electro-pneumatic ⌘-control valve	✓
▶ Pneumatic ⌘-discharge slider (safety function "single locking") with electro-pneumatic ⌘-control valve	✓
▶ Safety closure with O-ring seal	✓
▶ Cleaning and maintenance aperture in manhole version	✓ ²
▶ Nitrogen flooding with heating for drying of the metal swarfs	✓
▶ Stainless steel fine filter unit, filter fineness 200 - 20 µm	✓
▶ Stainless steel fine filter unit, filter fineness 200 - 5 µm	○
▶ Horizontal lying vessel for extraction filter baskets	○
▶ Extraction filter baskets, filter fineness 200 - 5 µm	○

1) up to unit size 300l 2) from unit 400l and above

HEATING

▶ Heating in ⌘-design	✓
▶ 1 to 3 stage, PID-controlled heat carrier heating	✓
▶ Redundant temperature and heating monitoring	✓
▶ Heat carrier: thermal oil	✓
▶ 4 and multistage, PID-controlled heat carrier heating	○
▶ Heat carrier: hot water	○
▶ Heat carrier: steam	○

FRAME VARIANTS

▶ Anodized, conductive aluminum profile frame	✓ ¹
▶ including covering panels	✓ ¹
▶ Welded, conductive stainless steel frame	○
▶ including covering panles	○ ¹
▶ Powder coated, conductive steel frame	✓ ²
▶ Galvanized, conductive steel frame	○

1) up to unit size 300l 2) from unit size 400l and above

✓=Standard, ○=Optional

Direct and automatic process

- ▶ Automatic feed of the grinding sludge/ swarfs
- ▶ Automatic discharge of the de-oiled metal swarfs

Conical extraction vessel

- ▶ Easy and complete discharge
- ▶ Optimal heat transfer through direct contact to the heated vessel surface
- ▶ Optimized drying of the metal swarfs

Upflow classification and/ or suspension of solid particles

- ▶ Minimized residual oil content (up to 0,01%)
- ▶ Reduced extraction duration
- ▶ Optimized and even de-oiling also with angled or unfavourable swarf shapes

SAFETY/ SYSTEM INTEGRATION

► Explosion protection class EX II 3 G c IIA T3 (with inerting and suction)	✓
► Inerting unit	✓
► Suction at vessel filling and discharge	✓
► Explosion protection class EX II 2 G c IIA T3 (without inerting/ suction)	○
► External, single- or double walled container for fresh/ contaminated goods	○
► Safety collecting drip pan according to WHG	○
► Integration into existing plants/ systems	○
► System version as combined extraction and distillation unit	○

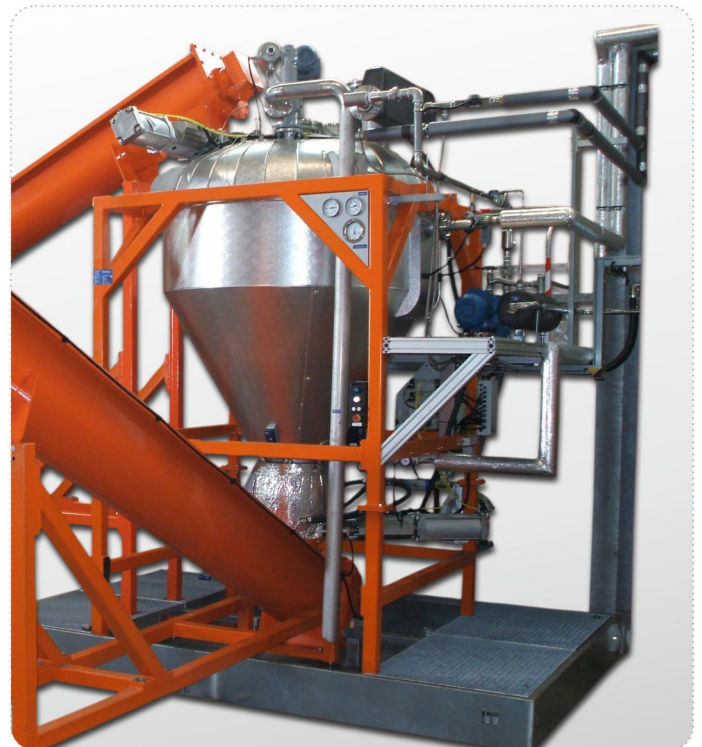
CONTROL SYSTEM

► Fully automatic, PLC operated system	✓
► Designed for monitoring free 24h operation	✓
► Delay timer for night-/ weekend operation	✓
► Including 15m cable loom (from unit to switching cabinet)	✓
► Additional extraction programs for different grinding sludges/ metal swarfs	✓
► <u>At unit</u>	
► On-/ off-switch	✓
► ⚠-operation indicator lamp	✓
► Emergency stop palm button	✓
► <u>At switching cabinet</u>	
► Graphics display and operating terminal at cabinet door, monochromatic, 16 gradations, touchscreen	✓
► Operation indicator lamp	✓
► Error indicator lamp	✓
► Emergency stop palm button	✓
► PID-controller & display	✓
► 50m cable loom	○
► <u>At unit</u>	
► ⚠-error indicator lamp	○
► Graphics and operating display in ⚠-design	○
► <u>At switching cabinet</u>	
► Graphics and operating terminal with color display, touchscreen	○

✓=Standard, ○=Optional

VACUUM UNIT

► Vacuum pump in ⚠-design	✓
► Liquid ring vacuum pump, up to 35mbar, low maintenance	✓
► High-performance chemistry diaphragm pump, up to 10mbar	○
► Dry running high performance pump, up to 1mbar, low maintenance	○



SERVICE

► 24 months warranty	✓
► Pan-european 24h on-site service	✓
► Express shipment of spare parts	○
► Up to 60 months warranty	○
► Remote maintenance through automation device or modem	○
► Support at the creating of the explosion protection document	○

Less handling effort

- No elaborate insertion and discharge of the metal swarfs
- No elaborate equipping, transport of the extraction filter baskets
- Minimized cleaning effort, since cleaning of filter baskets is not necessary

Systems engineering according to european regulations

- Highest operational safety

Economic

- Optimized throughput
- Lower personnel costs
- Lower operational costs

Safety

- No risk at discharge of explosive metal powders
- No elaborate discharge airlock for filter baskets necessary



Customizable

ΠΡΟΣΑΡΤΗΡΙΑΣΤΕΟ

There are many use cases for grinding oil recycling. For that reason, every unit is individually tailored and designed to the specific requirements in order to producing optimum results for you and your company.



Integratable into existing systems

ΠΡΟΣΑΡΤΗΡΙΑΣΤΕΟ ΣΤΟ ΕΞΙΣΤΟΥΣ ΣΥΣΤΗΜΑ

DesbaTec recycling units can be directly integrated into existing systems/ plants. This saves handling effort and allows a continuous supply of your processes with recovered solvent.



Highest quality

ΗΜΕΙΣ ΕΝΟΙΟΥΜΕΝ

Highest quality of the components is natural for us, as well as efficient production processes and precise, electronic measuring and control technology. All wetted parts are made of stainless steel, including the double-walled jacket and the welded heat-exchanger.



Safe through primary explosion protection

ΣΥΓΓΡΑΜΜΗ ΠΡΩΤΟΓΕΝΟΥΣ ΕΚΠΛΟΞΙΩΝ

Primary explosion protection is written in capitals at DesbaTec. All grinding oil recycling units come off-the-shelf with inerting unit. This offers besides the self-evident secondary measures the highest possible safety.

TECHNICAL DATA	GRU-60	GRU-265	GRU-420	GRU-1600	GRU-2000	GRU-3000
Overall capacity (l)	60	265	420	1600	2000	3000
Operating capacity ca. min.-max. (kg)	20-30	100-110	150-180	600-650	700-750	1000-1100
Extraction rate (kg/h) ⁽¹⁾	3-15	10-20	15-30	65-75	75-85	100-120
Process pressure (bar)			-1,0 to +0,5			
Prozesstemperatur max (°C) ⁽²⁾			100°			
Thermal oil heating	integrated	integrated	integrated	separate ⁽⁸⁾	separate ⁽⁸⁾	separate ⁽⁸⁾
Protection class						
- with inerting and suction			EX II 3 G c IIA T3 ⁽¹¹⁾			
Power consumption						
- Normal operation (kW) ca.	4	8	16	42	50	65
- Heating (kW)	5	10	20	50	60	80
Voltage, frequency ⁽³⁾			230/ 400V, 3Ph, 50Hz			
Coolant requirement (m ³) ⁽⁷⁾	1,0	1,8	2,4	4,8	5,4	7,2
Width (mm)	590	850	2400	2800	2800	3200
Height (mm) ⁽⁴⁾	1600	1600	3200	3600	3800	4500
Depth (mm)	1500	2000	1800	1800	1800	2000
Weight (kg) ca.	350	650	980	1240	1630	2000
RELATED VACUUM UNIT						
Vacuum pressure max. (mbar) ⁽⁵⁾	35	35	35	35	35	35
Max. suction capacity (m ³ /h) ⁽⁶⁾	14	18	30	48	48	60
Weight (kg) ca.	30	65	65	140	165	180

(1) depending on solvent, operating conditions, level of contamination and water content, (2) higher temperatures possible, (3) further on request, (4) depending on residue container, (5) vacuum system for up to 1mbar possible, (6) process liquid H₂O at 15°C, at 50Hz, (7) at max. 15°C, (8) integratable on request, (11) Optional EX II 2 G c IIA T3 possible

The technical data stated above are to be regarded as orientation, as every unit is built and developed according to your wishes and requirements. // Version: 10/2014
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