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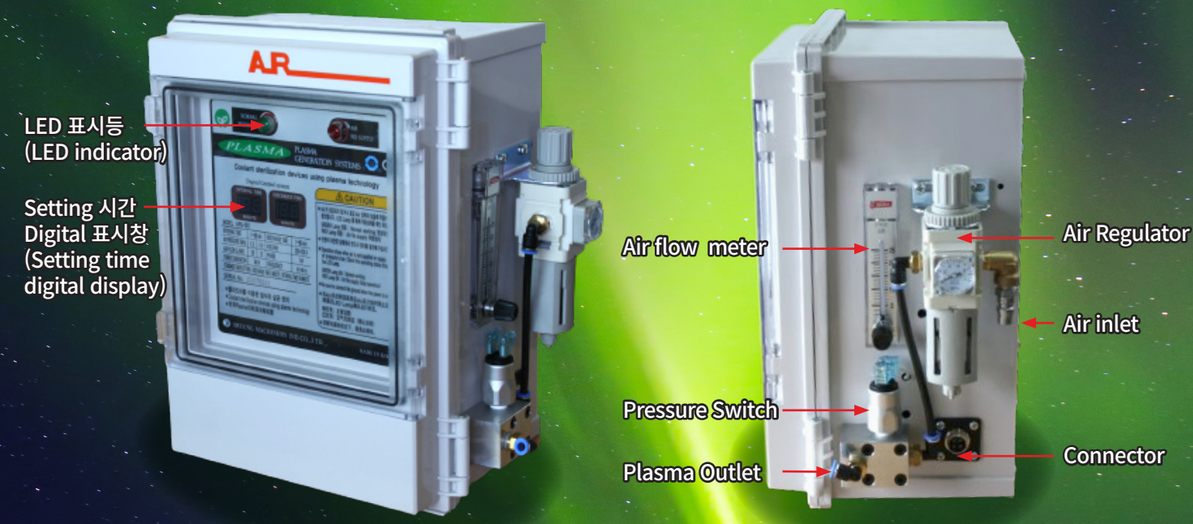
All pumps & system for Machine tools

ISO9001 : 2015, ISO14001:2015

Since' 1976

NEW

低温プラズマを用いた切削油殺菌装置
Plasma coolant sterilization devices!

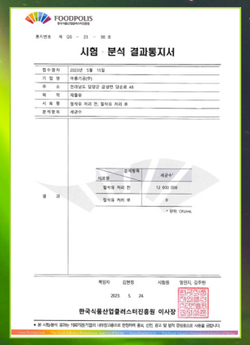


特許、認証及び公認成績書 / Patents, certifications and official reports

특허증
CERTIFICATE OF PATENT

CERTIFICATE
No. U8 068422 0020 Rev. 00

A-Ryung MACHINERY IND. CO., LTD.


시험 분석 결과통지서

ZERTIFIKAT ★ CERTIFICATE ★ 证书 ★ CERTIFICADO ★ CERTIFICAT

ARYUNG
www.aryung.co.kr

AR_2023-KE

Plasma coolant sterilization device

APG-001

✦ プラズマを用いた切削油腐敗防止技術

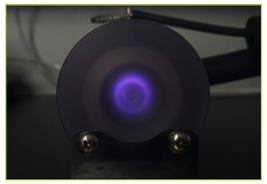
プラズマ誘電体バリア放電と微細気泡により発生する活性ラ　ジカル（オゾン、過酸化水素、OHなど）を利用して、擦る　だけで腐敗菌を殺菌し、水溶性冷媒の腐敗を防止、または遅らせる装置です。

✦ プラズマの主な性能と特徴

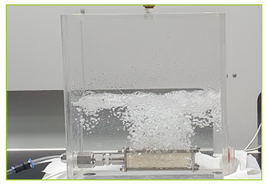
- 安全に長時間プラズマ発生が可能で微生物殺菌能力を確保
- 腐敗原因菌の殺菌能力99.9%、有機物除去能力90%以上
- クリーン切削油で使用して長期間（約2年）クリーン円形を維持
- 加工工場内の悪臭除去効果
- 切削油殺菌処理の際にバブラーを用いて処理効率を高める
- 低電力で高濃度活性ラジカルを生成して殺菌効果を最大化
- プラズマ発生器の電極構造の簡素化により製品の小型化を実現
- コンパクトなデザインでスタンド、壁掛け用に取り付け可能

✦ 切削油腐敗防止装置の主な部品

プラズマを用いた切削油腐敗防止装置の主な構成要素は、Plasma Generator、Power Supply、Bubbler、Air Flow Meter、Sedimenter、Controller、Safty Deviceで構成される。



Plasma Generator



Micro Bubbler

Power Supply

Air flow meter/sedimenter

Accessories

✦ Water-soluble coolant sterilization device using plasma technology

A device prevents or delays the spoil of water-soluble coolant by sterilizing spoilage bacteria by simply rubbing it by using active radicals(ozone, hydrogen peroxide, OH, etc.) generated through plasma dielectric barrier discharge and fine bubbles

✦ Plasma's main performance and characteristics

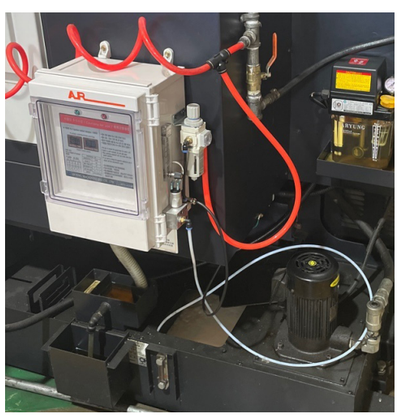
- Securing the ability to sterilize spoilage bacteria by safely generating plasma for a long time
- 99.9% sterilization ability of decay-causing bacteria, 90% or more organic matter removal ability
- Clean coolant water maintains its shape for a long time (About 2years)
- Odor removal effect in the machine tool plant.
- When coolant water is sterilized, a bubbler is used to increase treatment efficiency
- Maximizes sterilization effect by generating high-concentration active radicals with low power
- Realization of product miniaturization by simplifying the electrode structure of the plasma generator
- Compact design allows installation as a stand or wall mount

✦ The main components of the coolant sterilization device

The main components of the coolant sterilization device consist of plasma generator, power supply, microbubbler, air flow meter, sedimenter, controller and safety device.

✦ 実用の例と経済効果 / Examples and economic effects of practical use

▶ 実使用の例

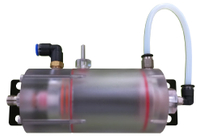


▶ 経済的効果

- 切削油の購入コストを削減 (亞隆 MCT8台, CNC6台)
  / Coolant purchase cost (Aryung 8MCTs,6CNCs)
  ：4,850ウォン/リットル、240リットル/月、1,400万ウォン/年
- 廃切削油の廃棄コストを削減 / Waste coolant disposal costs
  ：70,000ウォン/ドラム(200KG)、350,000ウォン/TON
  亞隆気功の例) 廃棄 10TON/年, 350万ウォン
- 経験的資料(亞隆)：切削油コスト50%程度削減と廃水処理費用60%程度削減効果（総910万ウォン/年)
  Experiential data (ARYUNG)：50% reduction in coolant cost and 60% reduction in coolant disposal costs (total ₩ 9,100,000/year)
- 工具購入費の削減：工具使用時間の増加
  Reduce tool purchasing costs / Increased tool usage time
- 付加効果：切削油の交換回数、交換時の作業中断、加工品質の影響、清掃時間の短縮
  Additional effect：Reducing the no. of coolant changes and cleaning time
  Reduction in work stoppage due to replacement/cleaning
  Improved processing quality

✦ 設置要領 / How to install Plasma sterilization device

Plasma-generator (APG-001)



Power-supply (60W)

Air-regulator
gas in (air 3~5bar)
(工場エア利用 /
Use of factory air)

Standard setting	圧力 Pressure (bar)	流量 Flow rate (L/min)
No. 1	3	20
No. 2	5	15

Air-flow meter
(Maximum 25L/min)

安全装置: ガス供給ができなければ電源遮断
Safety device：Power off when gas supply is not available

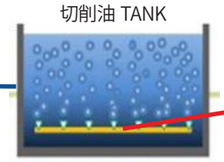
Controller timer setting
(5分稼動 / 10分休止)
(2minutes on / 5minutes stop)

Temperature sensor

Connector cable

テフロンホース

切削油 TANK



オゾン注入及び接触施設
Ozone injection
and contact facilities

Bubbler(30~50㎛)

✦ 稼働要領 / How to operation

<使用条件に応じた稼働方法とバブラー数基準 /
Operation method and number of bubblers according to usage conditions>

タンク容量 tank capacity (L)	浸水深さ immersion depth (mm)	可動方法(稼動/休止) Operation method (operation/stop)	バブラー数 number of bubblers	排オゾン量測定 amount of ozone measurement
200以下 (200 below)	200以下(200 below)	2minutes / 5minutes	1	0.05ppm이하 (0.05ppm below)
	250	5minutes / 10minutes	1	
201~350	200以下(200 below)	7minutes / 15minutes	1	
	250	10minutes / 20minutes	1	
351~500	250以下(250 below)	15minutes / 30minutes	2	
	300	20minutes / 40minutes	2	
501以上(501 more)	300以上(300 more)	25minutes / 50minutes	3	

工場出荷時の設定状態 / Factory setting state：2minutes (Operation) / 5minutes (Stop)