

New cutting fluid for future & the EV market

Presented by : MORESCO (THAILAND) CO., LTD.

MORESCO GROUP COMPANY

Delivers sustainable one-of-a-kind products





MORESCO (THAILAND) CO., LTD.

HEAD OFFICE AND FACTORY

Address : 700/358 Moo 6, Amata Nakorn Industrial Estate, Bangna-Trad Road, K.m. 57, T. Nongmaidaeng, A. Muangchonburi, Chonburi 20000

Major Shareholder: MORESCO Corporation Japan, 49% (Kobe, Japan)MORESCO Holding (Thailand) Co., Ltd. 50%

Establishment: 1 June 1995 **Relocation** : June, 2001

Capital: 17,500,000 THB

Land Area : 8,700 Square Meters

Production Capacity : 8,400 KL/Y

Number of Manpower: 83 Persons (Aug 2022)

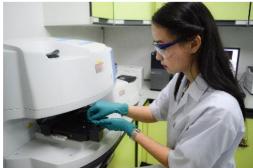
Working Time : Monday-Friday / 08:30 a.m.-05:30 p.m. (1 Shift)

Annual Sales: 565 MTHB (2021)

Main customer : Automotive & Motor cycle manufacturer / Part supplier



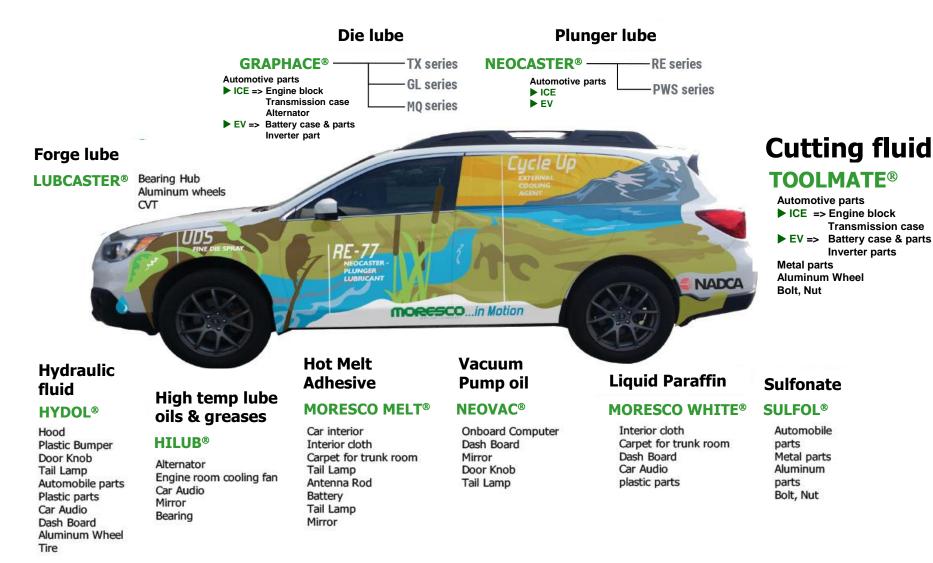






MORESCO PRODUCTS





Concept of TOOLMATE BS-40 (Materia) RESCOMPANY

- Developed as best matching for the SE Asia condition.
- Condition (Tempareture, hardness etc.)
- General Purpose (Ferrous, Aluminum (Include after DC) etc...)
- Minimum Material Cost for Asia (Base Oil, Additives)



Machine

- * Become compact and high-speed to improve productivity.
- * High pressure supply for removing chips from the workpiece.
- Trend of HV / EV parts (Also for engine parts (FIPG))
 - * Excellent washability, To reduce residue,
 - * To improve compatibility with electricity and FIPG adhesive (However, High lubricity also must be maintained.)
- Concept of our New Cutting Coolant (=>Next page)





Technical information

| <u>Neat fluid</u> Emulsion type (Low oil) | | | Dilution fluid @ 5% by RO water | |
|--|-------------------------|---|------------------------------------|------------|
| Appearance | Yellow hazy transparent | t | Appearance | White hazy |
| Density @ 15 °C | 0.9650 | | рН | 9.12 |
| Fea | atures | | Mei | rit |

| reatures | Ment |
|----------------------------------|--|
| Good lubrication ability | Extend tool life |
| Easy to wash | No residual left on part after washing |
| Long fluid life (Bio-resistance) | Cost effectiveness |
| Low foaming | Serve for high speed and high pressure machine |



Evaluation

| Item | TOOLMATE BS-40 | | Product A | | Product B | |
|---------------|----------------------------|-----------|----------------------------|-----------|------------|-----------|
| Item | Neat fluid | Dilute 5% | Neat fluid | Dilute 5% | Neat fluid | Dilute 5% |
| Appearance | | | | | | |
| Туре | Emulsion type (low oil) | | Emulsion type (low oil) | | Milky type | |
| To at the set | | | | | | |

Test item

- Lubrication ability by Micro-tap
- Washing ability test
- Anti-foaming test
- Bio-resistance test
- Anti-corrosion test of ADC-12
- Anti-rust test

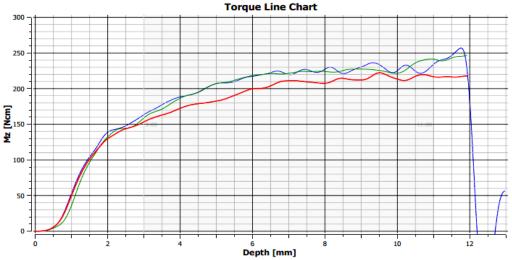


Lubrication ability by Micro-tap



Test condition Testing bar : A7075 Tapping depth : 12 mm Hole diameter : 3.3 mm

Tool diameter : 3.589 mm Cutting fluid dilution : 5%



| Results @ cutting speed 1200 rpm | | Fields of load | | Analysis results | | | |
|----------------------------------|-------------------------|----------------|----------|------------------|------------|--------------------|----------|
| | | B1 (6mm) | B2 (9mm) | Max (Ncm) | Mean (Ncm) | Std Dev σ (Ncm) | Integral |
| TOOLMATE BS-40 | Emulsion type (low oil) | 183.73 | 190.98 | 235.00 | 182.51 | 23.52 | 1460.80 |
| Product A | Emulsion type (low oil) | 186.47 | 203.14 | 255.00 | 187.46 | 28.56 | 1500.30 |
| Product B | Milky type | 208.61 | 222.10 | 267.00 | 206.89 | 26.89 | 1654.96 |

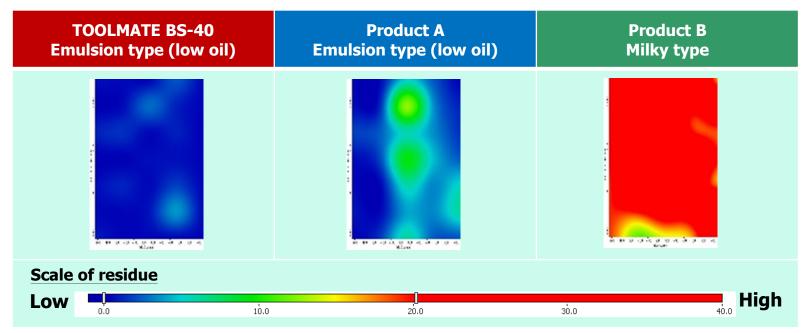
Test results : Lubrication ability => TOOLMATE BS-40 > Product A > Product B



Washing ability test

Test method and condition

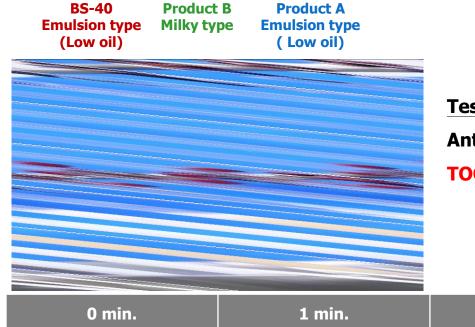
- * Prepare dilution sample 10 % by RO water.
- * Dipping test plate into diluted sample 5 min.
- * Dry test plate in oven at temperature 100 °C 1 hrs.
- * Wash each test plate 2 times by RO water in ultrasonic bath for 1 min.
- * Dry in oven at temperature 100 \circ C 1 hr.
- * Analyze the residue of cutting fluid on test plate by FTIR Microscope



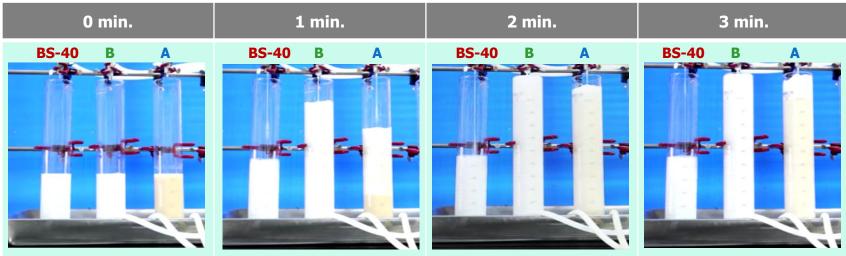
<u>Test results</u> : Cleaning ability => TOOLMATE BS-40 > Product A > Product B



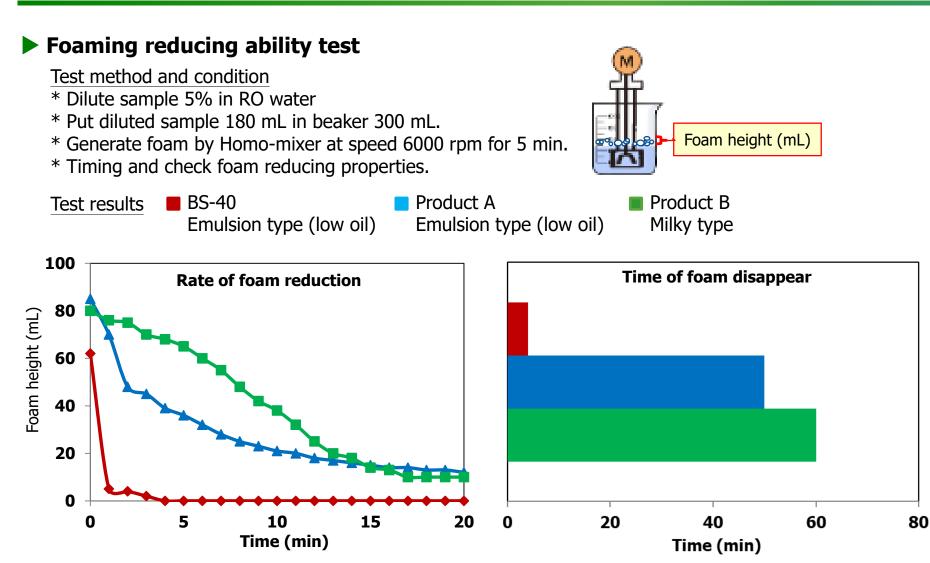
Anti-foaming test by circulation method



<u>Test results</u> : Anti-foaming test TOOLMATE BS-40 > Product A > Product B





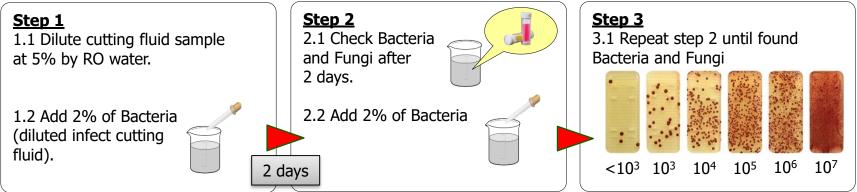


<u>Test results</u> : Foam reducing ability => TOOLMATE BS-40 > Product A > Product B



Bio-resistance

Test method and condition



Test results : After 2 weeks (7 cycles)

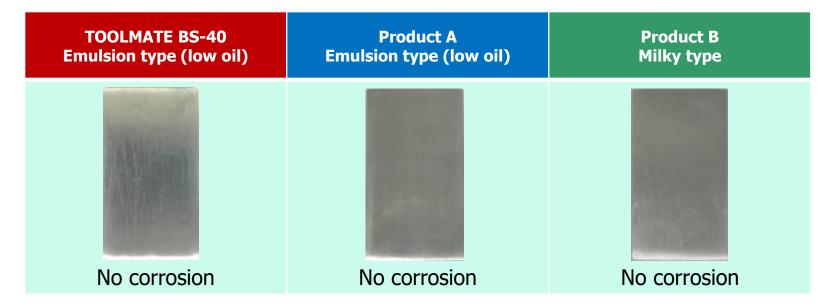
| TOOLMATE BS-40 | | | uct A | Product B | | |
|-------------------------|----------|-----------------|---------------|------------|----------|--|
| Emulsion type (low oil) | | | /pe (low oil) | Milky type | | |
| Bacteria | Fungi | Bacteria | Fungi | Bacteria | Fungi | |
| (CFU/mL) | (CFU/mL) | (CFU/mL) | (CFU/mL) | (CFU/mL) | (CFU/mL) | |
| None | None | 10 ³ | None | 106 | 101 | |

Test results : Bio-resistance => TOOLMATE BS-40 > Product A > Product B



Anti-corrosion test of ADC-12

- Test method and condition
- * Dilute sample at 5% by RO water.
- * Half dipping ADC-12 test plate in diluted sample.
- * Monitoring the corrosion after 48 hr.



<u>Test results</u> : Anti-corrosion of ADC-12 => TOOLMATE BS-40 = Product A = Product B



Anti-rust test

- Test method and condition
- * Put filter paper into petri dish.
- * Drop 2 mL of diluted sample 5% onto filter paper.
- * Put iron chip 1g on filter paper evenly.
- * Cover and seal petri dish. Then keep it in room temperature.
- * After 24 hours wash the chips from filter paper then check the rust spot.

Test results

| TOOLMATE BS-40 Emulsion type (low oil) | Product A Emulsion type (low oil) | Product B Milky type |
|---|--------------------------------------|-------------------------|
| | | |
| No rust spot | 3 rust spot | No rust spot |

<u>Test results</u> : Anti-rust => TOOLMATE BS-40 = Product B > Product A



Summarize of features

| Features | TOOLMATE BS-40 Emulsion type (low oil) | Product A Emulsion type (low oil) | Product B Milky type |
|----------------------------------|--|---|-------------------------|
| Lubrication ability by Micro tap | +++ | ++ | + |
| Washing ability | +++ | ++ | + |
| Anti-foaming ability | +++ | ++ | + |
| Foam reducing ability | +++ | ++ | + |
| Bio-resistance ability | +++ | ++ | + |
| Anti-corrosion of ADC-12 | +++ | +++ | +++ |
| Anti-rust | +++ | ++ | +++ |

<u>Remark</u>: +++ Good ++ Fair + Worse

5. 切削油剤の管理 – 管理方法–



Refractometer To check coolant dilution % Daily



<u>pH check paper</u> To check pH Value (Bacteria) Every week

Refractometer

糖度計(濃度計)による 倍率管理方法 指定濃度での管理 →安定生産に繋がる



※ツールメイトE-500の濃度換算係数 F=1.5

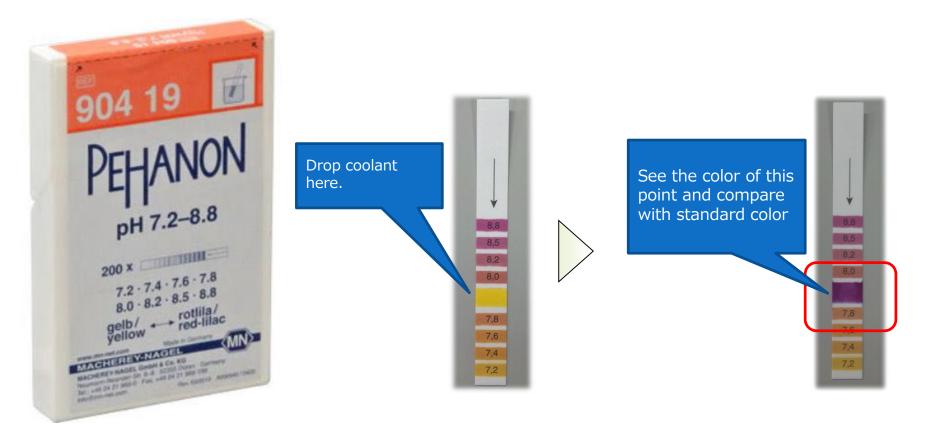


Analog

PAL-1は今までの糖度計の概念を 変える、全く新しいタイプの携帯 型デジタル糖度計です。次のよう な特徴があります。



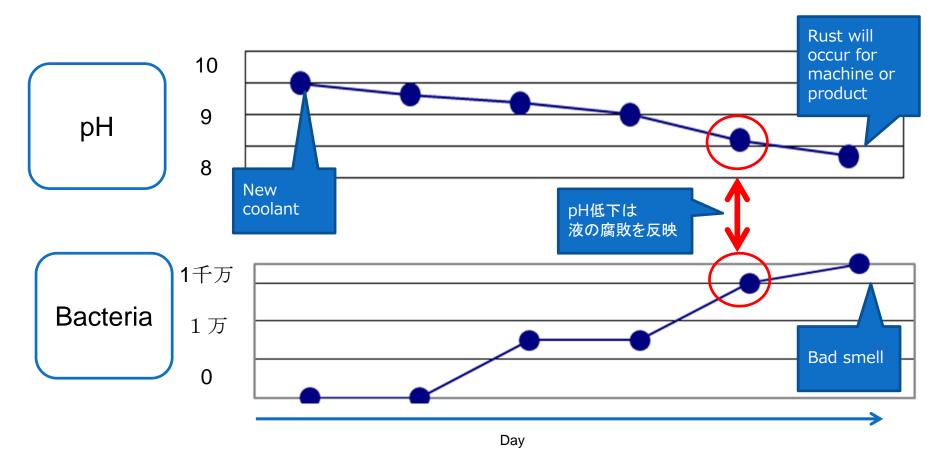
pH Value



200pc ¥3,300- モノタロウなどで購入可能

※pHを定期管理する事で、腐敗・錆びの抑制につながります※

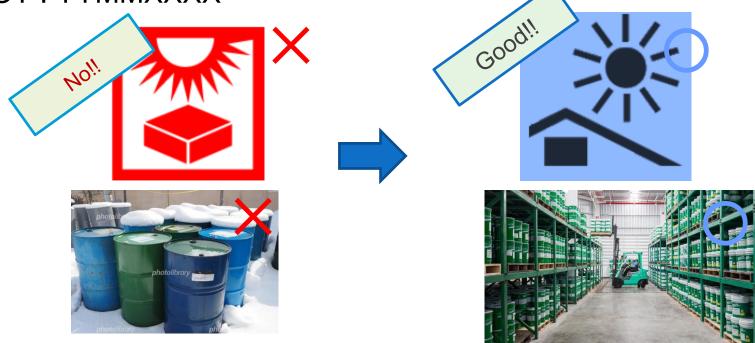
Relate pH & Bacteria



pH8.5 is standard to replace coolant

How to keep metalworking fluids (Water based)

- Prevent Direct sunshine and hot / cold place
- Try to keep in indoor & room temperature (10-30°C)
 LOT : YYMMXXXX



Product Life : 6 months in Drum / Pail.



Thanks for your support

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