



The Best Worldwide Corporation  
for the Best Worldwide Customer!





# Making a world for the happiness of both the people and nature, That is what we strive for at BUHMWOO.

True eco-friendly products not only minimize pollution, but also consider the safety of the user.  
Buhmwoo strives endlessly to develop true eco-friendly products,  
For both the safety of our health and natural environment.  
A world where both people and nature live in harmony,  
We at BUHMWOO will make that dream come true.





# RESOURCES are LIMITED, CREATIVITY is UNLIMITED.

Buhmwoo Institue of Technology Research(BIT) was the first R&D institute to be established in our field of chemical industry in Korea.

- Over 7% of annual sales invested towards R&D
- R&D Staff – With 25% of total employees

We took up the challenge of establishing BIT with the firm belief that maintaining current technologies and simply relying on overseas technology wasn't going to be enough to lead us into the future.

We add value and class to our customers' competitiveness with only the most advanced technology and the best products.



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## For the best metalworking fluids, It is time to change the standards of your choice.

Eco-friendly cutting oil made to perform efficiently whilst placing top priority on safety for the user. With Buhmwoo's green eco-friendly metalworking fluids, we strive to maintain a world where people and nature live in harmony.



### | Buhmwoo Cutting & Grinding Oil



#### No Carcinogen

Buhmwoo products contain no carcinogens such as PCA, formalin, nitrite, DEA(diethanolamine), formaldehyde-releasing preservative, etc.



#### Minimized Dermal Irritation

By the use of low-toxic and hypo-allergenic raw materials, Buhmwoo minimizes dermal irritation for cutting and grinding oil users.



#### No Dioxin

Due to no use of chlorinated extreme pressure additives, Buhmwoo products produce no dioxin which is known as an ecomone(ecological hormone).



#### Extended Life-span of Cutting Oil

Life-span of Buhmwoo cutting oil is prolonged, with its self-curative power enhanced by biostable raw materials.



#### Minimized Environmental Pollution

Using recyclable materials such as animal and vegetable oil, and vegetable synthetic oil, Buhmwoo curtails environmental pollution.



In the process of designing and manufacturing products, Buhmwoo ensures the safety of users by minimizing toxic substances.



Buhmwoo uses eco-friendly and economical raw materials to minimize environmental pollution.

### | Eco-friendly Cutting & Grinding Oil – BW COOL Series

Water-soluble cutting oil of BW COOL Series completely excludes formaldehyde, nitrous acid, chlorinated extreme pressure additives, nonylphenol surfactant, heavy metals, PCP, PCB, TCDD or other dioxin containing substances, which removes common problems of existing water-soluble cutting oil, such as unstable emulsification, foam, short tool life, decomposition, etc.

**BW COOL NX-115CFR** ensures anti-decomposition through the technology of controlling beneficial and harmful microorganisms [without using preservatives and ammines](#).

- BW COOL [EX-Series](#) Mineral oil(incl. vegetable synthetic oil)-based emulsion type
- BW COOL [BIO-Series](#) Vegetable oil-based emulsion type
- BW COOL [NX-Series](#) Amine-free emulsion type
- BW COOL [SMART-Series](#) Eco-friendly and high-performance emulsion type
- BW COOL [ZOL-Series](#) Semi-synthetic type
- BW COOL [SYN-Series](#) Synthetic type



Water-soluble Cutting Oil

Recommendation for Applications

Materials Machining Methods	Aluminum Casting	Aluminum Alloy	Magnesium Alloy	Copper or Copper Alloys	Cast Iron	Carbon Steel	Bearing Steel	Stainless Steel	Cemented Carbide Tool
Broaching					EX-430DB EX-440	EX-680			
Reaming Boring	NX-115CFR BIO-840 EX-760 EX-7900R EX-8500 EX-860 EX-917F EX-950 EX-960 ZOL-780AL		MGX-2 NX-700MG	EX-205	EX-430DB EX-440 EX-470 ZOL-310 ZOL-330 ZOL-720 ZOL-830		EX-680		
Drilling Tapping									
Milling Turning									
Honing	EX-969K		ZOL-870H						
CBN Grinding						SYN-5500			
Cylindrical · Surface Centerless Grinding					SYN-370R SYN-454R		SYN-6520 SYN-7100F		SYN-660
Leak Test	SYN-150SJ								

\* R : Pigment-containing Product



Main Products



1) Eco-friendly & High-performance Cutting Oil – Emulsion Type

Items	KS Standard	Appearance (10%)	Gravity (15/4℃)	pH (10%)	Recommended Concentration	Applications★ and Properties™
BW COOL BIO-740R	W1 Type-1	Opaque Blue	0.98	9.3	5~12%	★ Cutting and grinding of aluminum alloy, aluminum casting, cast iron and steel – Based on rapeseed oil or its derivatives – Excellent cleaning and anti-corrosive – MEA, Boron, preservative free
BW COOL BIO-840	W1 Type-1	White Emulsion	0.93	9.4	5~12%	★ Cutting and grinding of aluminum alloy and aluminum casting – Based on rapeseed oil or its derivatives – Excellent lubrication, anti-decomposition and anti-rusting – MEA, Boron, preservative free
BW COOL BIO-910	W1 Type-1	White Emulsion	0.94	9.8	5~12%	★ Cutting and grinding of aluminum alloy, aluminum casting, cast iron and steel – Based on rapeseed oil or its derivatives – Excellent lubrication, anti-decomposition and anti-rusting – MEA, Boron free
BW COOL SMART-920	W1 Type-1	White Emulsion	0.93	9.5	5~12%	★ Cutting and grinding of aluminum alloy, aluminum casting, cast iron and steel – Excellent anti-decomposition & minimal equipment contamination – Vegetable synthetic oil contained – MEA, Boron free
BW COOL NX – 115CFR	W1 Type-2	Light green Emulsion	0.93	9.0	8~14%	★ Cutting and grinding of aluminum alloy and aluminum casting – Vegetable synthetic oil contained – Low dermal irritation & living environment considered – All amines, Boron, preservative free
BW COOL NX – 700MG	W1 Type-2	Translucent Light blue	0.95	9.0	8~14%	★ Cutting and grinding only of Mg alloy – Excellent resistance to Mg hard water and high cleaning power – Vegetable synthetic oil contained – All amines, Boron, preservative free
BW COOL NX – 900	W1 Type-2	White Emulsion	0.94	9.0	8~14%	★ Cutting and grinding of aluminum alloy and aluminum casting – Excellent lubrication, and cleaning power – Based on vegetable synthetic oil – All amines, Boron, preservative free

\* The dilution ratio for the recommended concentration is based on volume.  
\* The properties and shapes may be changed without prior notice for quality improvement.



2) Mineral Oil Base(incl. vegetable synthetic oil) – Emulsion Type

Items	KS Standard	Appearance (10%)	Gravity (15/4℃)	pH (10%)	Recommended Concentration	Applications★ and Properties┐
 BW COOL EX-205	W1 Type-1	White Emulsion	0.93	9.9	3~5%	★ Cutting and grinding of copper and copper alloy – Excellent lubrication and defoaming – Based on vegetable oil – MEA/boron free
 BW COOL EX-430DB	W1 Type-1	White Emulsion	0.96	10.3	4~10%	★ Cutting and grinding of cast iron and steel – Excellent anti-decomposition, anti-rusting and cleaning – MEA/boron/preservative free
BW COOL EX-440	W1 Type-1	White Emulsion	0.92	10.3	4~10%	★ Cutting and grinding of cast iron and steel – Excellent anti-decomposition and anti-rusting – Minimal equipment contamination
BW COOL EX-470	W1 Type-1	White Emulsion	0.98	10.0	4~10%	★ Cutting and grinding of cast iron and steel – Excellent anti-decomposition and anti-rusting – Minimal equipment contamination due to excellent cleaning
BW COOL EX-680	W1 Type-1	Light Yellow Emulsion	0.94	10.2	8~15%	★ Heavy-cutting of alloy steel and carbon steel – Possible to replace some neat cutting oil due to its extreme pressure – Containing 1~5% sulfur content – Containing vegetable synthetic oil – MEA/boron free
BW COOL EX – 760	W1 Type-1	White Emulsion	0.95	9.6	8~12%	★ Cutting and grinding of aluminum alloy and aluminum casting – Excellent cleaning and anti-rusting – Containing vegetable synthetic oil – Optimal for blocking and casing of aluminum casting – MEA free
BW COOL EX-917F	W1 Type-1	White Emulsion	0.93	9.4	8~12%	★ Cutting and grinding of aluminum alloy and aluminum casting – Excellent hard water resistance and high cleaning power – Containing vegetable synthetic oil – MEA/boron free
BW COOL EX-950	W1 Type-1	White Emulsion	0.95	9.6	8~12%	★ Cutting and grinding of aluminum alloy and aluminum casting, cast iron and steel ★ Applicable to high-speed cutting such as valve body machining – Excellent lubrication, defoaming and anti-decomposition power – Containing vegetable synthetic oil – MEA free
BW COOL EX-960	W1 Type-1	White Emulsion	0.95	9.6	8~12%	★ Cutting and grinding of aluminum alloy and aluminum casting ★ Applicable only to heading, blocking and casing – Excellent cleaning, anti-rusting and defoaming – Containing vegetable synthetic oil – MEA free

Items	KS Standard	Appearance (10%)	Gravity (15/4℃)	pH (10%)	Recommended Concentration	Applications★ and Properties┐
BW COOL EX-969K	W1 Type-1	White Emulsion	0.95	9.5	8~12%	★ Honing of cast iron and aluminum – Containing vegetable synthetic oil – Excellent cleaning power, defoaming and heat resistance – MEA/boron free
BW COOL EX-7900R	W2 Type-1	Blue Transparent	1.01	9.2	5~12%	★ Cutting and grinding of aluminum alloy and aluminum casting ★ Optimal for long-period large-scale machining of aluminum alloy – Minimized discoloration of aluminum and excellent cleaning and anti-rusting – MEA/boron free
BW COOL EX-8500	W2 Type-1	Light blue Transparent	0.99	9.4	3~10%	★ Cutting and grinding of aluminum casting, cast iron and steel – Excellent cleaning and anti-decomposition power, and workability – Containing vegetable synthetic oil – Extensive use
BW COOL MGX-2	W2 Type-1	Colorless Transparent	1.01	9.1	8~10%	★ Cutting oil only for Mg alloy – Excellent resistance to Mg hard water – Containing vegetable derivatives/synthetic oil – Long-term use due to no equipment contamination or emulsification instability – MEA/boron free

\* The dilution ratio for the recommended concentration is based on volume.  
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3) Water-soluble Pipe-cutting Oil – Emulsion Type

Items	Appearance (10%)	Gravity (15/4℃)	pH (10%)	Recommended Concentration	Applications★ and Properties┐
BW COOL MP-415	White Emulsion	0.93	9.9	3~5%	★ Black pipe-only oil – Excellent heat resistance, anti-rusting and defoaming
BW COOL MP-520	White Emulsion	0.91	9.9	3~5%	★ Compatible for black and white pipes – Black Pipe: High concentration (4~5%) – White Pipe: Low (2~3%) – No remnant and white rust due to excellent cleaning power
BW COOL MP-725	White Emulsion	0.98	10.0	2~5%	★ Semi-synthetic type oil for black pipes only – Minimized post-process effect due to excellent cleaning power – Excellent anti-rusting and defoaming

\* The dilution ratio for the recommended concentration is based on volume.  
\* The properties and shapes may be changed without prior notice for quality improvement.




4) Semi-synthetic Type

Items	KS Standard	Appearance (10%)	Gravity (15/4℃)	pH (3%)	Recommended Concentration	Applications★ and Properties┐
BW COOL ZOL-310	W2 Type-1	Light blue Transparent	1.04	10.0	8~15%	★ Cutting and grinding of steel and cast iron ★ Precision grinding of bearing – Excellent anti-decomposition and anti-rusting – Boron free
BW COOL ZOL-330	W2 Type-1	Light blue Transparent	1.03	10.0	8~15%	★ Cutting and grinding of steel and cast iron – Excellent anti-decomposition and anti-rusting – Superior defoaming – MEA/boron free
BW COOL ZOL-720	W2 Type-1	Light blue Transparent	1.03	10.4	8~15%	★ Turning of crank shaft, etc. – Minimal irritation and excellent cleaning and defoamings – MEA/boron free
BW COOL ZOL-780AL	W2 Type-1	Colorless Transparent	1.03	9.3	8~15%	★ Semi-synthetic type for aluminum machining – Excellent anti-decomposition and cleaning power – Superior machinability with maintenance of transparency – MEA free
BW COOL ZOL-870H	W2 Type-1	Light blue Transparent	1.02	10.3	8~15%	★ Honing of cast iron – Excellent cleaning and defoaming, lubrication, and sedimentation property – Boron free

\* The dilution ratio for the recommended concentration is based on volume.  
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5) Synthetic Type

Items	KS Standard	Appearance (10%)	Gravity (15/4℃)	pH (3%)	Recommended Concentration	Applications★ and Properties┐
 BW COOL SYN-150SJ	W2 Type-1	Colorless Transparent	1.06	8.4	2~5%	★ Leak Test for both of iron and non-iron materials – Excellent anti-rusting and cleaning – MEA/boron/preservative free
BW COOL SYN-370R	W2 Type-1	Green Transparent	1.05	9.6	5~10%	★ Grinding of cast iron and steel – Excellent anti-rusting, anti-decomposition and defoaming – Boron free
BW COOL SYN-454R	W2 Type-1	Green Transparent	1.04	9.4	5~10%	★ Grinding of cast iron and steel – Excellent anti-rusting, anti-decomposition, cleaning and defoaming – Boron free
BW COOL SYN-660	W2 Type-1	Colorless Transparent	1.11	9.3	4~8%	★ Grinding of carbide tools – Excellent lubrication and defoaming – MEA/preservative free
BW COOL SYN-5500	W2 Type-1	Colorless Transparent	1.05	9.2	5~10%	★ Grinding of CBN, and cutting and grinding of Glass – Excellent anti-rusting, anti-decomposition, cleaning and defoaming – Excellent prevention of pore filling of grinding wheel – MEA/preservative free

Items	KS Standard	Appearance (10%)	Gravity (15/4℃)	pH (3%)	Recommended Concentration	Applications★ and Properties┐
BW COOL SYN-6520	W2 Type-1	Light blue Transparent	1.06	9.8	5~10%	★ Grinding of crank shaft and CBN – Excellent anti-rusting, anti-decomposition, cleaning and defoaming – Excellent lubrication – MEA/boron free
BW COOL SYN-7100F	W2 Type-1	Colorless Translucent	1.04	9.9	5~10%	★ Grinding of a wide range of alloy steel – Excellent anti-decomposition, cleaning, defoaming, and easy separation from other oil – Great prevention of pore filling of grinding wheel – MEA/boron free

\* The dilution ratio for the recommended concentration is based on volume.  
\* The properties and shapes may be changed without prior notice for quality improvement.

| Neat Cutting Oil

Recommendation for Applications

Classification	Machining Types	Copper or Copper Alloys	Aluminum Alloy	Cast Iron	Carbon Steel	Alloy for Machine Structure	Bearing Steel	Tool Steel	Stainless
Cutting	MQL	MQL-only [BW CUT MQL-132]					MQL-only [BW CUT MQL-955]		
	Turning	KS 1~2 [BW CUT PINE-624]	KS 2~4, viscosity 10~40 [BW CUT PINE-729]						KS 3~4 [BW CUT PINE-740]
	Boring/ Reaming /Drilling		KS 4, viscosity 10~30 [BW CUT PINE-718]						
	Gun drilling		KS 4, viscosity 10~20 [BW CUT PINE-913]						
	Tapping		KS 4, viscosity 10~40 [BW CUT PINE-830]						
	Gear cutting		KS 2 or 4, viscosity 15~40 [BW CUT PINE-718]						
	Broaching		KS 4, viscosity 10~30 [BW CUT PINE-729]						
	Electric-discharge machining	EDM-only [BW CUT EDM-109]							
Grinding	Lapping/ Honing /Super finishing		KS 3~4, viscosity 2~7 [BW CUT PINE-605]						
	Gear grinding		KS 4, viscosity 10~20 [BW CUT PINE-613]						



Main Products

1) Neat Cutting Oil

Machining Types	Items	Appearance	Kinematic Viscosity (40℃,mm²/s)	Flash Point (℃)	Copper-plate Corrosion (100℃,1h)	Sulfur Content (%)	Fat (%)	Applications★ and Properties™
Honing	BW CUT PINE-403	Light- yellow Translucent	2.7	116	1	A	B	★ Honing oil with low viscosity especially suitable for CON/ROD machining - Excellent cleaning power - Suitable for cutting and grinding of general steel
	BW CUT PINE-605	Light-yellow Transparent	5.0	137	1	A	B	★ Honing and lapping oil with low viscosity - enabling prolonged life-span of tools and enhanced machinability - Suitable for cutting and grinding of general steel
	BW CUT PINE-608G	Light-yellow Transparent	8.4	162	1	A	B	★ General honing operations - Oxidation stability secured through fixative-based oil - Suitable for cutting and grinding of general steel
	BW CUT PINE-825J	Yellowish- brown Transparent	25.3	196	3	A	C	★ General heavy cutting operations - Excellent lubrication and wear resistance - Applicable for machining of general steel and alloy steel
Cutting	BW CUT PINE-924R	Yellow Transparent	29.4	220	4	A	B	★ Turning and tapping of difficult-to-cut steel - Prolonged life-span of tools and excellent workability - Applicable for machining of alloy steel and STS
	BW CUT PINE-616J	Yellow Transparent	15.7	190	1	A	B	★ General cutting and turning operations - Excellent cooling and chip sedimentation property - Applicable for cutting and grinding of general steel
Turning	BW CUT PINE-618	Light-yellow Transparent	18.4	194	3	A	B	★ General cutting and turning - Oxidation stability through fixative- based oil - Suitable for cutting and grinding of general steel
	BW CUT PINE-624	Yellow Transparent	23.5	220	1	A	C	★ Grinding of gear and joint race - Excellent oxidation stability and chip sedimentation - Suitable for cutting and grinding of general steels
	BW CUT PINE-630	Yellow Transparent	30.5	177	1	A	B	★ Gear machining and turning operations - Excellent oxidation stability, prolonged life-span of tools, and excellent workability - Suitable for cutting and grinding of general steel
	BW CUT PINE-640J	Yellow Transparent	40.6	187	1	A	B	★ General cutting and gear operations - Excellent oxidation stability and workability, and prolonged life-span of tools - Suitable for cutting and grinding of general steel
	BW CUT PINE-725	Yellowish- brown Transparent	25.4	192	2	A	B	★ Applicable for heavy cutting and suitable for stick broaching operation - Extended life-span of tools due to excellent extreme pressure and lubrication - Applicable for alloy steel and STS Machining
	BW CUT PINE-740	Yellowish- brown Transparent	39.7	196	2	A	B	

\* A: below 5%, B: 5~10%, C: 10~20%, D: above 20%

Machining Types	Items	Appearance	Kinematic Viscosity (40℃,mm²/s)	Flash Point (℃)	Copper-plate Corrosion (100℃,1h)	Sulfur Content (%)	Fat (%)	Applications★ and Properties™
Broaching	BW CUT PINE-713	Reddish- brown Transparent	13.5	163	2	A	B	★ Applicable for heavy cutting, and especially suitable for broaching operation - Long-term use due to excellent oxidation stability and cooling ability - Applicable for alloy steel and STS Machining
	BW CUT PINE-718	Reddish- brown Transparent	17.4	164	2	A	B	★ Applicable for heavy cutting and especially suitable for high-speed turning operation - Excellent extreme pressure and oxidation stability - Applicable for alloy steel and STS Machining
	BW CUT PINE-729	Yellowish- brown Transparent	28.9	192	2	A	B	★ Applicable for heavy cutting and stick broaching operations - Extended tools' life-span due to its excellent extreme pressure and lubrication - Applicable for alloy steel and STS machining
	BW CUT PINE-914A	Light-yellow Transparent	14.5	186	3	A	B	★ Applicable for general heavy cutting oil and especially suitable for helical broaching operation - Excellent extreme pressure and lubrication - Applicable for alloy steel and STS machining
Super Finishing	BW CUT PINE-704	Reddish- brown Transparent	3.6	112	2	A	B	★ Super finishing of bearing - Optimal for enhancement of surface roughness and excellent cleaning power - Excellent cooling
	BW CUT PINE-706	Yellow Transparent	6.4	144	3	A	A	
	BW CUT PINE-803	Light-yellow Transparent	2.7	100	3	A	A	★ Super finishing of bearing - Optimal for enhancement of surface roughness, low viscosity, and excellent cleaning power - Excellent cooling
Gear Machining	BW CUT PINE-610A	Light-yellow Transparent	10.1	150	3	A	B	★ Nut taps machining and general cutting - Oxidation stability secured by the use of fixative-based oil - Suitable for cutting and grinding of general steel
	BW CUT PINE-846	Yellow Transparent	46.0	220	2	A	C	★ General heavy-cutting oil especially suitable for gear hobbing operation - Excellent extreme pressure and lubrication - Applicable for machining of general steel and alloy steel
Gear Grinding	BW CUT PINE-613	Yellow Transparent	13.5	184	1	A	A	★ Machining oil with low viscosity for gear grinding - Excellent cooling and oxidation stability - Extension of tools' life-span, and excellent workability - Suitable for cutting and grinding of general steel
	BW CUT PINE-626	Yellow Transparent	25.5	186	1	A	B	★ Grinding of gear and joint race - Excellent oxidation stability and chip sedimentation - Suitable for cutting and grinding of general steel

\* A: below 5%, B: 5~10%, C: 10~20%, D: above 20%



Machining Types	Items	Appearance	Kinematic Viscosity (40℃,mm²/s)	Flash Point (℃)	Copper-plate Corrosion (100℃,1h)	Sulfur Content (%)	Fat (%)	Applications★ and Properties™
Gun Drilling	BW CUT PINE-913	Yellow Transparent	12.7	156	4	A	A	★ Gun drilling, BTA, and tapping operations - Excellent cooling and permeability - Applicable for machining of alloy steel and STS
	BW CUT PINE-914A	Yellowish-brown Transparent	17.2	172	1	A	C	★ Tapping and drilling of difficult-to-cut steel - Excellent extreme pressure and lubrication - Applicable for machining of alloy steel and STS
Tapping-only Oil	BW CUT PINE-916	Yellowish-brown Transparent	24.3	178	3	A	A	★ General heavy-cutting oil especially suitable for roll tap operation - Excellent extreme pressure and lubrication - Applicable for machining of alloy steel and STS

\* A: below 5%, B: 5~10%, C: 10~20%, D: above 20%  
\* The properties and shapes may be changed without prior notice for quality.ement.

2) MQL Oil

Items	Appearance	Kinematic Viscosity (40℃,mm²/s)	Flash Point (℃)	Copperplate Corrosion (100℃,1h)	Sulfur Content (%)	Fat (%)	Features
BW CUT MQL-132	Light yellow Transparent	32.0	250	1	-	D	- Excellent oxidation stability - General-purpose MQL type
BW CUT MQL-608	Light yellow Transparent	8.2	166	1	-	A	- Low viscosity, and excellent cooling and oxidation stability - General-purpose MQL type
BW CUT MQL-955	Light yellow Transparent	55.0	180	3	B	D	- MQL oil with excellent lubrication and extreme pressure - Excellent machining of difficult-to-cut steel

\* A: below 5%, B: 5~10%, C: 10~20%, D: above 20%  
\* The properties and shapes may be changed without prior notice for quality.ement.

3) EDM Oil

Items	Appearance	Kinematic Viscosity (40℃,mm²/s)	Flash Point (℃)	Copperplate Corrosion (100℃,1h)	Sulfur Content (%)	Fat (%)	Features
BW CUT EDM-109	Colorless Transparent	1.6	92	-	-	-	- EDM oil with low viscosity, minimal odor and superior oxidation stability
BW CUT EDM-211J	Colorless Transparent	2.0	110	-	-	-	

\* A: below 5%, B: 5~10%, C: 10~20%, D: above 20%  
\* The properties and shapes may be changed without prior notice for quality.ement.

Cleaning oil that leaves not a single trace of pollutant particle! Only the best choice for the perfect process.

| Eco-friendly Cleaning Oil – BW CLEAN Series

Water-soluble	BW CLEAN W-Series	· Containing no DEA, nonylphenol-type surfactant · Having excellent cleaning power by the use of special alcohol-type surfactant and complex degreasing agent · Minimal foaming when high pressure washers are used · Prevention of reattachment of oil, micro-dust, abrasive powder, etc.
Neat	BW CLEAN NW-Series	· Containing no DEA, nonylphenol-type surfactant

| Water-soluble Cleaning Oil

Recommendation for Applications

Type	Condition	Cleaning Temperature	Steel	Non-steel	Steel + Non-steel
Spray	High pressure	25℃	BW CLEAN W-610	BW CLEAN W-520	-
		60℃			BW CLEAN W-770
	General	25℃		BW CLEAN W-760	
		60℃			
Immersion · Ultrasonic waves			BW CLEAN W-470		
Special Type	Cleaning oil for white rust reduction		BW ALCOAT-1		
	Cleaning oil for equipment, and floor		BW CLEAN W-108A		
	Rust remover		BW-240P		
	Rubber lubricant		BW-0431		
	Phosphate film remover		BW REMOVER PR-2		



Main Products

1) Spray-type Cleaning Oil

Items	Condition	Appearance (Undiluted)	Cleaning Temperature	Material	Recommended Concentration	pH (10%)	Specific Gravity (15/4℃)	Applications★ and Properties┐
BW CLEAN W-610	General High-pressure	Light yellow Transparent	Ambient/High temperature 25~60℃	Iron Aluminum	10~13%	10.3	1.04	★ Applicable for iron and aluminum materials - Excellent defoaming, and anti-rusting
BW CLEAN W-760	General	Light yellow Transparent	High temperature 60℃	Aluminum	10~13%	9.7	1.03	- Excellent anti-rusting and anti-decompositions - Excellent anti-discoloring of aluminum. and cleaning power
BW CLEAN W-770	General	Light yellow Transparent	Ambient/High temperature 25~60℃	Iron Aluminum	10~13%	7.9	1.04	- Excellent anti-discoloring of aluminum - Excellent defoaming at above 55℃
BW CLEAN W-520	High-pressure	Light yellow Translucent	High temperature 60℃	Iron Aluminum	10~13%	9.4	1.04	- Little stickiness and excellent lubrication - Excellent defoaming and cleaning power
BW CLEAN W-524	High-pressure	Light yellow Translucent	High temperature 60℃	Iron Aluminum	10~13%	9.2	1.04	- Excellent anti-discoloring of aluminum, and defoaming - Excellent anti-rusting, and anti-corrosion of equipment
BW CLEAN W-560	High-pressure	Yellow Transparent	Ambient/High temperature 25~60℃	Iron Aluminum	10~13%	9.7	1.04	- Excellent anti-rusting, and anti-discoloring of aluminum - Excellent defoaming at above 55℃
BW CLEAN W-580	High-pressure	Light yellow Transparent	Ambient/High temperature 25~60℃	Iron Aluminum	10~13%	10.3	1.04	- Excellent anti-rusting for steel - Excellent defoaming at above 55℃
BW CLEAN W-610J	High-pressure	Colorless Transparent	Ambient/High temperature 25~60℃	Iron Aluminum	10~13%	10.5	1.04	- Excellent other oil separation, defoaming , and anti-rusting
BW CLEAN W-620	High-pressure	Light yellow Translucent	Ambient/High temperature 25~60℃	Iron Aluminum	10~13%	9.8	1.04	- Excellent other oil separation and anti-decomposition - Excellent anti-rusting, and defoaming

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2) Immersion・Ultrasound Cleaning Oil

Items	Condition	Appearance (Undiluted)	Cleaning Temperature	Material	Recommended Concentration	pH	Specific Gravity (15/4℃)	Applications★ and Properties┐
BW CLEAN W-470	Ultrasound	Ivory transparent	Ambient/High temperature 25~60℃	Iron	10~13%	12.5 (100%)	1.03	★ Ultrasound cleaning for steel - Excellent cleaning power
BW CLEAN W-420	Ultrasound	Ivory transparent	Ambient/High temperature 25~60℃	Iron	10~13%	9.7 (5%)	1.06	★ Ultrasound cleaning for steel and aluminum alloy - Excellent cleaning power
BW CLEAN W-435	Immersion/ Spray	Ivory transparent	Ambient/High temperature 25~60℃	Iron	10~13%	12.8 (10%)	1.07	★ Applicable for immersion and spray type cleaning - Excellent defoaming, and cleaning power

\* Dilution ratio of the recommended concentration is based on volume.  
\* The properties and shapes may be changed without prior notice for quality improvement.

2) Special-purpose Cleaning Oil

3-1. White Rust Reduction for Al Alloy

Items	Condition	Appearance (Undiluted)	Cleaning Temperature	Material	Recommended Concentration	pH (10%)	Specific Gravity (15/4℃)	Applications★ and Properties┐
BW ALCOAT-1	Spray Immersion	Yellow Translucent	Ambient/ High temperature 25℃~60℃	Al	10~13%	7.9	1.03	★ White-rust reduction for aluminum alloy - Reduced dermal irritation by its design of pH close to neutrality

3-2. Cleaning of Equipment & Floor

Items	Condition	Appearance (Undiluted)	Cleaning Temperature	Material	Recommended Concentration	pH (10%)	Specific Gravity (15/4℃)	Applications★ and Properties┐
BW CLEAN W-108A	-	Colorless Translucent	Ambient/ High temperature 25℃~60℃	Iron	10~13%	12.0	1.03	★ Widely used for floor cleaning - Excellent cleaning effect by the use of special surfactant

3-3. Rust Removal

Items	Condition	Appearance (Undiluted)	Cleaning Temperature	Material	Recommended Concentration	pH (10%)	Specific Gravity (15/4℃)	Applications★ and Properties┐
BW-240P	Immersion	Ivory-yellow Transparent	Ambient temperature 25℃	Steel	1~2%	1.1	1.42	- Quick rust removal of steel by the use of phosphoric acid and surfactant - Neutralization needed immediately after rust removal

3-4. Rubber Lubrication

Items	Condition	Appearance (Undiluted)	Cleaning Temperature	Material	Recommended Concentration	pH (10%)	Specific Gravity (15/4℃)	Applications★ and Properties┐
BW-0431	Immersion	Light yellow Transparent	Ambient temperature 25℃	Rubber	Undiluted solution	8.6	1.01	★ Injection type lubricant oil for tire and hose assembly
BW LUBE-2	Immersion	Colorless Transparent	Ambient temperature 25℃			8.0	1.13	★ Injection type lubricant oil for hose assembly

3-5. Phosphate Film Removal

Items	Condition	Appearance (Undiluted)	Cleaning Temperature	Material	Recommended Concentration	pH (10%)	Specific Gravity (15/4℃)	Applications★ and Properties┐
BW REMOVER PR-2	Immersion / Ultrasound	Colorless Transparent	Ambient temperature 25℃	Steel	10~13%	9.0	1.52	★ Effective for spray type due to little foaming - Excellent anti-rusting for general steel

\* Dilution ratio of the recommended concentration is based on volume.  
\* The properties and shapes may be changed without prior notice for quality improvement.



| Neat Cleaning Oil

Recommendation for Applications

Cleaning/Drying	Flash Point (°C)	IBP (°C)_min	EP (°C)_max	Steel + Non-steel
Very Excellent	below 30	41	140	BW CLEAN NW-810
	31~50	145	205	BW CLEAN NW-542
Excellent	51~70	165	215	BW CLEAN NW-858
	71~130	200	280	BW CLEAN NW-8102

Main Products

Items	Small odor	Appearance (Undiluted)	Gravity (15/4°C)	Flash Point (°C)	Use	Applications★ and Properties┐
BW CLEAN NW-507		Colorless Transparent	0.70	7	General cleaning	– Excellent drying and cleanings
BW CLEAN NW-810	●	Colorless Transparent	0.73	10	Paint cleaning	★ Widely used to remove foreign substances of paint – Small odor and excellent cleaning
BW CLEAN NW-810B	●	Colorless Transparent	0.73	10	General cleaning	– Small odor solvent with excellent cleaning and dryings
BW CLEAN NW-534		Colorless Transparent	0.77	33	General cleaning	– Solvent of excellent cleaning effect without causing dermatitis
BW CLEAN NW-840	●	Colorless Transparent	0.75	40	General cleaning	★ Cleaning of metalworking fluids, contaminated Parts and tanks – Small odor and excellent cleaning
BW CLEAN NW-542		Colorless Transparent	0.78	42	Anti-rusting wax cleaning	★ Cleaning of wax, grease, and lubricant – Excellent cleaning
BW CLEAN NW-858	●	Colorless Transparent	0.77	58	General cleaning	★ Immersion and ultrasound type spray – Odorless solvent
BW CLEAN NW-862	●	Colorless Transparent	0.74	62	Heating treatment cleaning	★ Cleaning oil of heat treatment – Excellent recovery and cleaning
BW CLEAN NW-576		Colorless Transparent	0.80	76	Anti-rusting wax cleaning	– Solvent of excellent cleaning effect without causing dermatitis
BW CLEAN NW-8102	●	Colorless Transparent	0.80	102	General cleaning	– Hydrocarbon solvent highly refined at high flash point – Small odor solvent with excellent cleaning effect
BW CLEAN NW-5102S		Colorless Transparent	0.80	102	Water-soluble cleaning	– Solvent with strong water displacement – Suitable for cleaning and water displacement after cutting and grinding operation with water-soluble oil

\* The properties and shapes may be changed without prior notice for quality improvement.

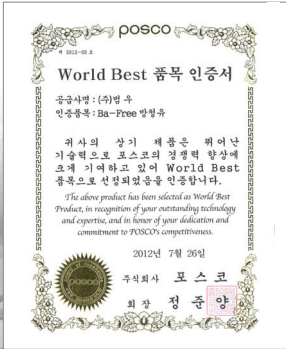
1 Our World-class Anti-rusting oil will protect both your assets and their values.

With excellent anti-rusting, removability and oil stain resistance, Buhmwoo's anti-rusting oil which was selected as a world-class product in 2013 is now recognized in both the Korean and overseas markets. Korea's proud anti-rusting oil – Only by Buhmwoo.

- ▼ 2013 Korean World-class Product Award for Anti-rusting Oil for Steel
- by The Ministry of Trade, Industry and Energy, and KOTRA



- ▼ 2012 POSCO World Best Item for Ba-free Anti-rusting Oil





# Anti-Rusting Oil

## Eco-friendly Anti-rusting Oil

Classification	Items	Features
VOC-free	P-WP, PSW-30, W-BT, W-30KN	Harmless for human body due to no VOC contained, and the use of water as a solvent
Low Odor	P-308HD, P-309YG	Low harm to human body by the use of low-allergenic and little-odor materials
Ba-Free	BW-70BF	No Ba(barium) and Ba compounds contained

## Anti-rusting Oil

### Recommendation for Applications

Machining Types		Required Functions	Features		
			Short-term type (below 1 month)	Mid-term type (2~6 months)	Long-term type (above 6 months)
Steel	Pickled and Oiled Steel Sheet	Oil stain resistance and anti-rusting	BW-70PS-19, BW-70PS, BW-70PS(1)		
	Cold Rolled Steel Sheet	Lubrication, removability, and acid resistance	BW-70PS-19, BW-70PS, BW70PS(1)		
	Coated Steel Sheet	Sealer adhesion	BW-90EG, BW-90BG, P-910		
Automobile	PRESS	Anti-rusting, water displacement, cleaning, and removability	P-DBH(A), P-340N		
	KD	Anti-rusting and water displacement			P-250, P-260, P-260N
	Machined Part	Anti-rusting and water displacement		P-325S, P-325Y, P-DBH(N)	
Pipes	Film Type	Anti-rusting, water displacement, thin film, and oil stain resistance	P-320(B)	P-320(DW)	
	General Type	Anti-rusting, water displacement, and oil stain resistance		P-320, P-370	
Wires	Hard Steel Wire	Anti-rusting, little odor and tempering	P-308HD		
	Wire rope	Anti-rusting, durability, and lubrication			P-200ACL(A2)
Bar Steel	Polishing	Anti-rusting, lubrication, thermo-stability		PO, PO(K)	
	Final anti-rusting	Anti-rusting, water base, discoloration resistance, and oil stain resistance		P-DBH(N)	P-DBH(DB)
Machinery	General machine	High volatility, anti-rusting, cleaning, and water displacement	P-SV(A)2 P-SV(C)2		
	Mechanical equipment	High anti-rusting			P-203D, P-126, P-126N
Others	Bearing	Anti-rusting and water displacement	P-351	P-325N	
	Non-ferrous metals	Anti-rusting, water displacement, anti-discoloring, and oil stain resistance		P-325S, P-325Y, P-DBH(N)	P-250, P-260, P-260N

### Main Products

#### 1) Solvent Dilution Type

- Solvent dilution anti-rusting oil forms a uniform oily film because it is made by adding solvents of low viscosity to anti-rusting additives of high viscosity and anti-rusting effect.
- Types
  - KP-1, KP-2 : Suitable for long-term anti-rusting operation (products for export and long-term storage)
  - KP-3 : Suitable for short-term or medium-term anti-rusting operation (products for domestic supply)

Codes	Items	Kinematic Viscosity (40℃,cSt)	Flash point (℃)	Film Thickness (μm)	Anti-rusting (Salt spray)	Indoor Anti-rusting Period (Months)	Applications	Features
KP-1	RUSTOP P-126	63	42	50 ↑	200 ↑ , A	12 ↑	Outdoor anti-rusting, large-scale equipment, and machine parts	Long-term anti-rusting
	RUSTOP P-126N	2200*	45	50 ↑	200 ↑ , A	12 ↑	Outdoor anti-rusting, large-scale equipment, and machine parts	Long-term anti-rusting
KP-2	RUSTOP P-203D	11.1	50	10 ↑	200, A	6 ↑	Mechanical equipment, and long-term storage	Long-term anti-rusting
	RUSTOP P-200ACL (A2)	20	50	10 ↑	350, A	6 ↑	Wire rope of automobile, and long-term storage	Long-term anti-rusting, and high lubrication
KP-3	RUSTOP P-250	8.6	45	5~10	120, A	6 ↑	KD parts of automobile and long-term storage	Long-term anti-rusting
	RUSTOP P-260	2.9	45	3~5	120, A	6 ↑	KD parts of automobile and long-term storage	Long-term anti-rusting
	RUSTOP P-260N	3.0	45	3~5	120, A	6 ↑	KD parts of automobile and long-term storage	Long-term anti-rusting
	RUSTOP P-340N	2.9	103	2~3	8, A	1 ↓	Press panel of automobile	High degreasing power, cleaning and permeability
	RUSTOP P-DBH(A)	2.7	75	2~3	12, A	1 ↓	Press panel of automobile	High degreasing power, cleaning and permeability
	RUSTOP P-351	1.2	45	1~2	12, A	1 ↓	Bearings	Thin film type
	RUSTOP P-320(B)	1.7	74	1~2	12, A	1 ↓	Steel pipes	Thin film type, and oil stain resistance
	RUSTOP P-SV(A)2	0.8	13	2~3	15, A	1~2	Precision machine parts	Quick drying
	RUSTOP P-308HD	3.9	110	2~3	18.A	1~2	Hard steel wires and spring wires	Little odor, and high flash point
	RUSTOP P-DBH	2.3	45	2~3	36, A	2~3	General machine parts	General-purpose anti-rusting oil

\* Brookfield Viscosity (cPs)



Anti-Rusting Oil

Codes	Items	Kinematic Viscosity (40℃,cSt)	Flash point (℃)	Film Thickness (μm)	Anti-rusting (Salt spray)	Indoor Anti-rusting Period (Months)	Applications	Features
KP-3	RUSTOP P-325N	1.4	45	0.5~1	36, A	2~3	Bearings, and general machine parts	Ultrathin film type
	RUSTOP P-325S	1.6	45	1~2	36, A	2~3	Machined parts including engines and transmission of automobile	Thin film type
	RUSTOP P-309YG	2.0	50	2~3	36, A	2~3	General machine parts	Little odor
	RUSTOP P-320(DW)	1.8	74	1~2	36, A	2~3	Steel pipes	Thin film type, and oil stain resistance
	RUSTOP P-DBH(N)	2.1	45	2~3	48, A	3~6	General machine parts, and round bars(steel bars)	General-purpose anti-rusting oil
	RUSTOP P-370	2.4	45	2~3	48, A	3~6	Steel pipes	Oil stain resistance
	RUSTOP P-306	1.7	45	2~3	60, A	3~6	Storage in acid conditions	Acid resistance
	RUSTOP P-DBH(DB)	2.0	45	2~3	84, A	6~8	General machine parts, and round bars(steel bars)	Long-term anti-rusting
	RUSTOP P-325Y	1.6	45	1~2	100, A	6~8	Bearings, and general machine parts	Thin film type, and long-term anti-rusting
KP-19	RUSTOP M-250	—	—	—	24, A	1~2	General machine parts, and exported products	Dry, clear film type

\* 'A' in the above 'salt spray' part of the table means 'not rusting'.  
\* The above indoor anti-rusting period may not be warranted due to the differences depending on the oil conditions, work environment, and storage conditions and methods, temperature and humidity  
\* The properties and shapes may be changed without prior notice for quality improvement.

2) Lubricating oil (Anti-rusting Lubricating oil)

- Buhmwoo lubricating oil containing no solvents mainly consist of mineral oil and lubrication additives.  
As the anti-rusting additives for steel sheets and coils in the steel production process, those oil have various functions in addition to anti-rusting.
- Hot Rolled and Cold Rolled Steel Sheets:Preventing hot rolled and cold rolled steel sheets from rust and oil stain.
  - Galvanized Steel Sheets:Preventing galvanized steel sheets from rust and oil stain.

Codes	Items	Kinematic Viscosity (40℃,cSt)	Flash point (℃)	Film Thickness (μm)	Anti-rusting (Salt spray)	Indoor Anti-rusting Period (Months)	Applications	Features
KP-8	BW-90EG	18.6	150	3~5	12, A	1 ↓	Cold rolled and galvanized steel sheets	High lubrication
	RUSTOP PO	21.8	140	3~5	36, A	2~3	Polishing of round steel bars (bar steels)	High viscosity, heat resistance
	RUSTOP PO(K)	22.1	170	3~5	36, A	2~3	Polishing of round steel bars (bar steels)	High viscosity, heat resistance

Codes	Items	Kinematic Viscosity (40℃,cSt)	Flash point (℃)	Film Thickness (μm)	Anti-rusting (Salt spray)	Indoor Anti-rusting Period (Months)	Applications	Features
KP-9	BW-70PS	14.0	150	3~5	12, A	1 ↓	Cold rolled and hot rolled steel sheets	General-purpose anti-rusting oil
	BW-70PS(1)	14.0	150	3~5	12, A	1 ↓	Cold rolled and hot rolled steel sheets	General-purpose anti-rusting oil
	BW-70PS-19	11.2	154	3~5	12, A	1 ↓	Cold rolled and hot rolled steel sheets	General-purpose anti-rusting oil
	BW-70BF	14.0	150	3~5	12, A	1 ↓	Cold rolled and hot rolled steel sheets	Ba-free
	BW-90BG	14.4	165	3~5	12, A	1 ↓	Galvanized steel sheets	High degreasing power and high lubrication
	RUSTOP P-910	16.7	150	3~5	12, A	1 ↓	Galvanized steel sheets	High lubrication

\* 'A' in the above 'salt spray' part of the table means 'not rusting'.  
\* The above indoor anti-rusting period may not be warranted due to the differences depending on the oil conditions, work environment, and storage conditions and methods, temperature and humidity  
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3) Volatile Anti-rusting Oil

- Containing VCI (Volatile Corrosion Inhibitor), these oil have double effects of anti-rusting film (oil film) and anti-rusting additives volatilized in closed space when applied to the materials' surface.  
(However, volatile anti-rusting is effective only in the closed space.)
- Classified into two types: solvent based oil and non-solvent based oil (mineral oil) according to whether solvent is contained or not.

Codes	Items	Kinematic Viscosity (40℃,cSt)	Flash point (℃)	Film Thickness (μm)	Anti-rusting (Salt spray)	Indoor Anti-rusting Period (Months)	Applications	Features
KP-20	RUSTOP VP-101	4.5	100	2~3	PASS (volatile, anti-rusting)	2~3	Applicable for closed space for packing, etc.	Solvent based volatile anti-rusting oil
	RUSTOP P-CH(A)	16.8	140	4~5	PASS (volatile, anti-rusting)	2~3	Applicable for closed space for packing, etc.	Non-solvent based anti-rusting oil

\* The properties and shapes may be changed without prior notice for quality improvement.



4) Water based Anti-rusting Oil

- Buhmwoo water based anti-rusting oil able to be diluted with water is eco-friendly and harmless to human body without using solvent containing VOC.
  - Emulsion Type : Its undiluted solution is composed of mineral oil and additives, and the solution diluted with water shows ivory color
  - Chemical Type : This type basically containing water is still transparent even when diluted with water.

Codes	Items	Kinematic Viscosity (40℃,cSt)	Flash point (℃)	Film Thickness (μm)	Anti-rusting (Salt spray)	Indoor Anti-rusting Period (Months)	Applications	Features
OP	RUSTOP P-WP	70 (Undiluted)	112	-	24, A (Casting chips)	1 ↓	-	Emulsion type Water based anti-rusting oil
	RUSTOP W-BT	21 (Undiluted)	140	-		1 ↓	-	
	RUSTOP PSW-30	-	-	-		1 ↓	-	Chemical type Water based anti-rusting oil
	RUSTOP W-30KN	-	-	-		1 ↓	-	

\* 'A' in the salt spray in the table means no rusting.  
\* Indoor anti-rusting period in the table may not be guaranteed by the performance of anti-rusting oil only, and it varies depending on oil' s state, work environment, and storage conditions and methods, temperature, and humidity.  
\* The properties and shapes may be changed without prior notice for quality improvement.

Automotive Rust Preventives of world-top quality Making the difference of it all.

Buhmwoo develops and supplies the world-class automotive rust preventives in technical cooperation with EFTEC AG well known for its best technology in North America and Europe. Enjoy the unparalleled quality of Buhmwoo's automotive rust preventives.



Automotive Rust Preventives



# Automotive Rust Preventives

## Eco-friendly Automotive Rust Preventives

Use		Main Products	TYPE	Applications★ and Properties™
Anti-rusting WAX	UNDER-BODY	WB950A1	Water based	★ Wax for underbody of vehicles – Water used as a solvent, almost no odor
	CAVITY	WH516C1 WH522A2	ZERO-EMISSION	★ Wax for cavity of vehicles – More than 98% of solid content, excellent penetration and anti-rusting – Baking oven system needed for film formation.
	SHIPPING	KATS 5080	Water based	★ Vehicle surface protective agent for short period – Water used as a solvent – Easily removable by using applicable removers or tap water.
	Others	M-800R	Water based	★ Grit removers for coating factories – Painting after spreading on grit in advance – Easy removal including contaminants by using a water jet after application.
Under-body Coatings		2710B 3030K 2231MPD	Water based	★ Protective under-body coatings for vehicles (Resin) – Damping performance when applied in above certain thickness, and quick drying.
Others		W-222	Water based	★ Short-period rust preventive for hoop – Easy application for its excellent slipping

### Features by Types

Use	Required Function	Main Products	Applications
Underbody Wax	Anti-rusting, anti-chip, workability, and storage stability	BW M-400	HMC/KIA, RSM
Cavity Wax	Anti-rusting, permeability, and workability	3641A, CA-150	HMC
Engine Room Wax	Anti-rusting, transparency, and thermo-stability	M-610N	SSMC
Shipping Wax	Protective function, removability, and workability	KATS 5080	GMK
Waterborne Underbody Coating	Damping performance and abrasion resistance	2231 MPD	Daewoo Bus
Sealer	Anti-rusting, soundproof, adhesion, and abrasion resistance	PB S04 SD1	GMK

## Main Products

Types		Items	Flash point (°C)	Viscosity	Film State	Film Thickness (μm)	Salt Spray (Time)	Applicable Standard
UNDERBODY WAX		M-400	42	21000cPs(°C)	Black, Opaque	100	1000 ↑	MS 566-06
		3641U	42	65sec(20°C)	Black, Opaque	50	1000 ↑	EDS M-8308
		WB950A1	Water-soluble	16,160cPs(°C)	Black, Opaque	100	1000 ↑	MS 566-06
CAVITY WAX		3641A	42	3000cPs(°C)	Light yellow, Opaque	25	240 ↑	MS 566-04
		3641A(DC)	42	65sec(23°C)	Light yellow, Opaque	50	240 ↑	EDS M-8305
		M-320	42	2000cPs(20°C)	Light yellow, Opaque	50	1000 ↑	KES T-L063
		WH516C1	182	160cPs(23°C)	Brown, Transparent	80	500	03-7055/--B
		WH 522A2	130	180cPs(23°C)	Brown, Transparent	70	500	GMW 15416
ENGINE ROOM WAX		E-1000	42	16sec(23°C)	Translucent wax	15	240 ↑	EDS M-8313
		E-330	32	17sec(20°C)	Transparent resin	15	72 ↑	EDS M-8767
		M-610N	32	sec(20°C)	Transparent resin	10	72 ↑	SES N 104-04
SHIPPING WAX		C-90N	42	12sec(20°C)	Translucent wax	100	N/A	ME 566-03
		C-80	42	12sec(20°C)	Translucent wax	100	N/A	KES T-L458
		KATS 5080	Water-soluble	200cPs(20°C)	Transparent resin	10	N/A	EDS M-8304
WATERBONE UNDERBODY COATING		2710B	Water-soluble	40000cPs(25°C)	Black resin	1000	1000	GM 9984273
		3030K	Water-soluble	60000cPs(25°C)	Black resin	200	1000	D-EDS-S-B-K-030
		2231MPD	Water-soluble	50000cPs(25°C)	Black resin	200	1000	D-EDS-S-B-K-030
SEALER	ANTICHIP	PB S04 SD1	204	60000cPs(25°C)	Gray PVC	300	300	GMW-15978
	HEMING	B104E	210	130000cPs(25°C)	White Opaque	3000	300	L002 0579
	ROOF DITCH	PB1222	210	80000cPs(25°C)	White Opaque	3000	300	L002 0369
	UBS	PB221G3	210	65000cPs(25°C)	Black Opaque	3000	300	L001 0170
	UBC	PB221G1	210	65000cPs(25°C)	Black Opaque	1000	300	L001 0170
CONTAINER U/B WAX		4941K	42	5000cPs(20°C)	Black wax, Asphalt	150	1200 ↑	TS-96-11
GRIT REMOVER		M-800R	Water-soluble	12000cPs(20°C)	White Opaque	300	N/A	N/A
HOOP COATING		W-222	Water-soluble	11sec(20°C)	Transparent wax	2~5	1 ↓	N/A

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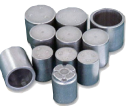
Providing the best performance and solution through Innovative designs to enhance work efficiency.

I Forging Oil

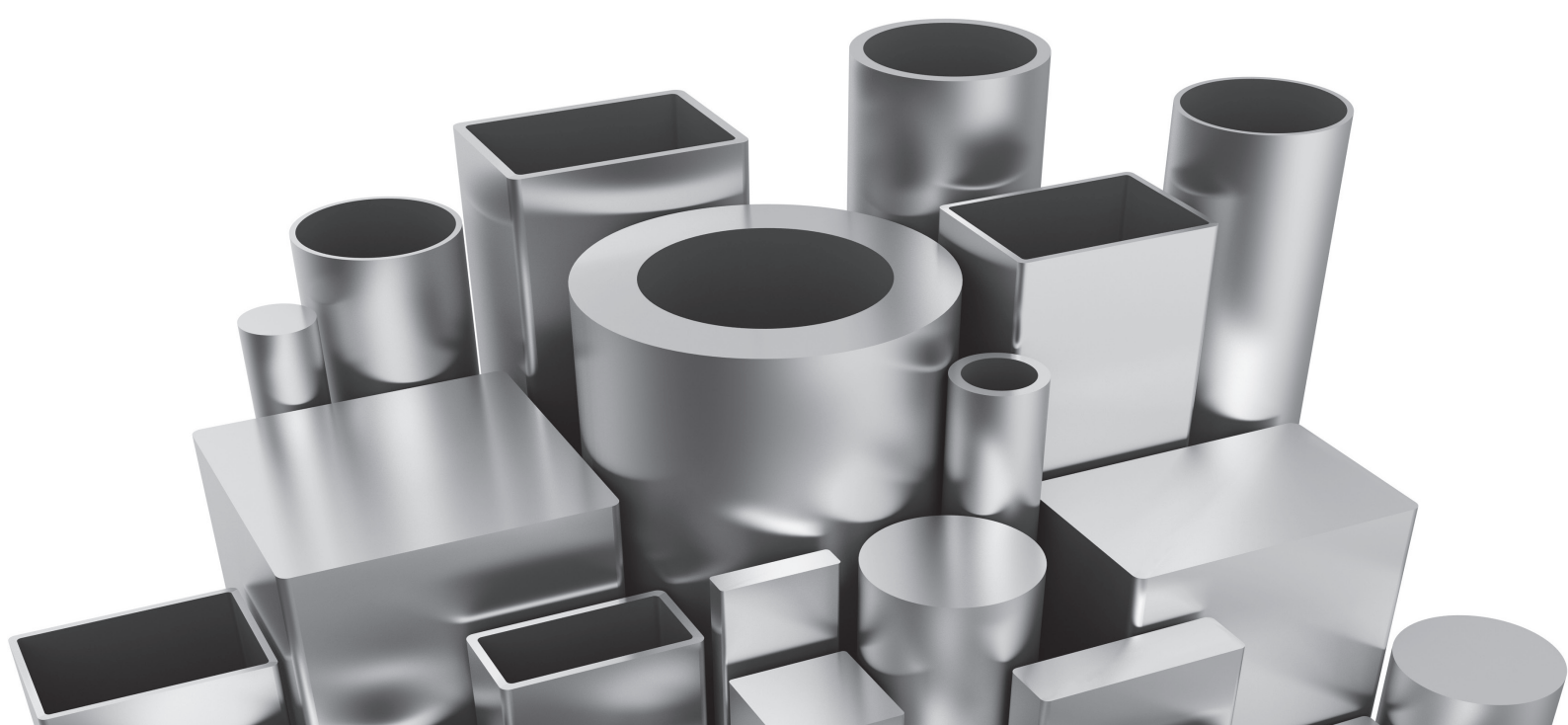
Recommendation for Applications

Machining Type	Materials			
	Aluminum	Copper & Copper Alloy	Carbon Steel/Alloy Steel	Stainless Steel
Light-Duty Type	FINEFORM 300B FINEFORM 570B	FINEDORM 1900W	FINEFORM 300B FINEFORM 1800JC FINEFORM 1900	FINEFORM 50P
Medium-Duty Type	FINEFORM 400B FINEFORM 1900 FINEFORM 570B		FINEFORM 400B FINEFORM 60P	FINEFORM 4700K
Heavy-Duty Type	FINEFORM 3700K FINEFORM 4700K	FINEDORM 1900	FINEFORM 80S, FINEFORM 3700K FINEFORM 4700K, FINEFORM 3000	

Main Products

Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Load Capacity (kgf/cm <sup>2</sup> )	Applications★ and Properties™	Machined Products
BW FINEFORM 400BS	25	5-10	★ High speed 3-step facility - rolling and tapping processes available Generating little amount of sludge and mist - Low sludge and mist occurrence	
BW FINEFORM 1500	33	5-10		
BW FINEFORM 1800JC	45	5-10		
BW FINEFORM 570B	57	5-10	★ Mild speed 4-stage facility - Superior color of processed products, little amount of fume - Satisfactory anti-seize property	
BW FINEFORM 1900W	46	5-10		
BW FINEFORM 1900	76	5-10		
BW FINEFORM 900B	80	5-10		
BW FINEFORM 3700K	70	15 <	★ Bolt & shaft process for diverse speed (5-step or higher) ★ Heading process of 50~57mm piston blanks - Excellent anti-seizure function	
BW FINEFORM 4700K	76	15 <		
BW FINEFORM 50P	41	10~15	★ High speed facility of diverse speed (5- or 6-step) ★ Chlorine-free parts former - Available for hole process and 12mm or longer nut process - For rolling process of alloy steels making surface fineness	
BW FINEFORM 60P	55	10~15		
BW FINEFORM 80W	55	15 <		
BW FINEFORM 70	70	10~15		

\* The properties and shapes may be changed without prior notice for quality improvement.



| Press Working Oil

Recommendation for Applications

Thickness (mm)	Materials			
	Nonferrous Metals (copper and aluminum)	Cold Rolled Steel Sheet	Carbon Steel	Stainless Steel
0.1~0.5	FINEPRESS 300W	FINEPRESS 3000MW	FINEPRESS 250	FINEBLANK 150S
0.5~1.0	FINEPRESS 300	FINEPRESS 3000MS	FINEBLANK 150S	FINEPRESS 2000SB
1.0~3.0	FINEPRESS 250	FINEPRESS 2000SA	FINEPRESS 2000SB	FINEPRESS 2000SA
3.0~6.0	FINEPRESS 550	FINEPRESS 3000G, FINEPRESS 1500		

Main Products

Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Load Capacity (kgf/cm <sup>2</sup> )	Applications★ and Properties┐	Machined Products
BW FINEPRESS 250	25	1~5	★ Multi-platen press of battery case	
BW FINEPRESS 330W	10	5	★ Press of thin film of aluminum (for home appliances)	
BW FINEPRESS 300	16	5		
BW FINEPRESS 550	55	5	★ Press of external materials of automobile – Good degreasing	
BW FINEPRESS 3000E	59	5~10		
BW FINEBLANK 150S	22	5~10	★ Low viscosity type – for complex process of fine blanking	
BW FINEPRESS 3000D	114	5~10	★ Deep drawing oil of excellent extreme performance ★ General process of drqsing, press, and bending	
BW FINEPRESS 3000G	142	10~15		
BW FINEPRESS 1500	235	10~15		
BW FINEPRESS 3000MW	41	10~15	★ Automobile parts requiring anti-rust and extreme prossure resistance	
BW FINEPRESS 3000MS	56	10~15		
BW FINEPRESS 2000SB	80	10~15	★ Refrigerator compressor cases press	
BW FINEPRESS 2000SA	100	10~15		

\* The properties and shapes may be changed without prior notice for quality improvement.



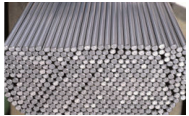
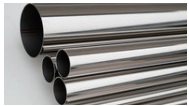
| Drawing Oil

Recommendation for Applications

Thickness (mm)	Material			
	Aluminum	Copper & Copper alloy	Hot Rolled Coil	Stainless Steel
0.1~0.5	FINEDRAW 1800	FINEDRAW 620	FINEDRAW 4500	FINEDRAW 3800
0.5~1.0				FINEDRAW 5800
1.0~3.0	FINEDRAW 1100			FINEDRAW 600
3.0~6.0	FINEDRAW 1100	FINEDRAW 1100		
6.0~12.0	FINEDRAW 3000	FINEDRAW 3000	FINEDRAW 4000	
12.0~20.0	–	–	FINEDRAW 3000	

Main Products

1) Neat Drawing Oil (for Wires and Rods)


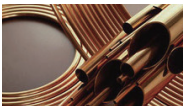
Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Load Capacity (kgf/cm <sup>2</sup> )	Applications★ and Properties┐	Machined Products
BW FINEDRAW 1800	15.2	1~5	– Only for timeline of Al – good lubrication and chip precipitation	
BW FINEDRAW 620	48	1~5		
BW FINEDRAW 1100	112	1~5	★ Drawing of Cu and Al wire, bar, hexagon bar	
BW FINEDRAW 3000	395	5	– No discoloration of material after heat treatment – Good oxidative stability and lubrication for improved surface roughness	
BW FINEDRAW 4000	350	15 <	★ Drawing of carbon steel and alloy steel (round bar, hexagon bars, cold drawn bar)	
BW FINEDRAW 4500	300	15 <		
BW FINEDRAW 600	1,920	15 <	★ Drawing of rods such as SUS and heat resisting steel ★ Internal oil for cold pilgering	

\* The properties and shapes may be changed without prior notice for quality improvement.






# Metal Forming Oil

## 2) Water-soluble Drawing Oil (For Pipes)

Items	pH (X2)	Viscosity (mPa.s,25℃)	Applications★ and Properties┐	Machined Products
BW PIPEDRAW 60	9.4	—	— Good emulsification stability and anti-rusting	
BW PIPEDRAW 207	9.6	2,500	— Excellent drawing even in low concentration (brix 5%) — Maximum reduction rate (35%) according to the use concentration — Emulsification stability is maintained even after pretreatment agent is mixed	
BW PIPEDRAW 265	9.6	—	— Good emulsification stability and drawing	
BW PIPEDRAW 400W	9.1	—	★ Drawing of process copper and copper alloy — Designed to minimize the effect of emulsification when acid treatment is mixed — Good emulsification stability and lubrication for long-term use	

\* Buhmwoo water-soluble drawing oil are used for drawing of automobiles and structural pipes, which are applied by diluting with water.  
\* The properties and shapes may be changed without prior notice for quality improvement.

Items	Kinematic Viscosity (40℃,mm²/s)	Load Capacity (kgf/cm²)	Applications★ and Properties┐	Machined Products
BW FINEPUNCH 33	1.4	56	★ Al fin press oil for air conditioner — Low smell and good lubrication — No residue after dryness	
BW FINEPUNCH 99	1.7	57		
BW FINEPUNCH 503	1.5	58	★ Milling oil only for aluminum heat exchangers of automobiles	
BW FINEPUNCH 505	2.3	117		
BW FINEPUNCH 507	4.7	139		
BW FINEPUNCH 3000	1.4	54	★ Expansion of copper pipes for air conditioners ★ Available for press and tapping of motor cores and thin aluminum sheets — Low smell and no residue afer expansion	


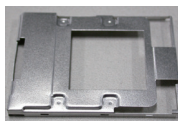
\* The properties and shapes may be changed without prior notice for quality improvement.

## | Quick Dry Stamping Oil

### Recommendation for Applications

Thickness (mm)	Materials			
	Aluminum	Copper & Copper Alloy	Cold Rolled Steel Sheet	Stainless Steel
0.1~0.5	FINEPUNCH 33 FINEPUNCH 503	FINEPUNCH 3000 FINEPUNCH 10A	FINEPUNCH 20A	FINEPUNCH 70
0.5~1.0	FINEPUNCH 50SA FINEPUNCH 505	FINEPUNCH 590	FINEPUNCH 1M	
1.0~3.0	FINEPUNCH 99 FINEPUNCH 507	FINEPUNCH 212	FINEPUNCH 70	FINEPUNCH 212


### Main Products

Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Load Capacity (kgf/cm <sup>2</sup> )	Applications★ and Properties┐	Machined Products
BW FINEPUNCH 20A	1.2	56	★ Punching oil for magnetic steel and motor core – Low smell and good working property – Small residue after heat treatment	
BW FINEPUNCH 50SA	1.3	49		
BW FINEPUNCH 1M	1.5	57		
BW FINEPUNCH 10A	2.2	108		
BW FINEPUNCH 212	3.1	100	★ High speed punching like STS – Good extreme pressure	
BW FINEPUNCH 70	2.8	57	★ Punching oil for copper and copper alloy – Good lubrication and no discoloration	
BW FINEPUNCH 590	2.8	57		

## | Wire Drawing Oil

### Main Products



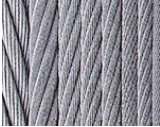
#### 1) Neat Cutting Oil

Items	Kinematic Viscosity (40℃,mm²/s)	Load Capacity (kgf/cm²)	Applications★ and Properties┐	Machined Products
BW FINEDRAW 3800	21.2	170	★ For fine-medium lines of STS wire — Excellent extreme pressure, resistand, available for high-speed (4000 rpm of faster) facility	
BW FINEDRAW 2000	20	190	★ For fine-medium lines of STS wire — Good chip separation and heat stability, and little emitting smoke during process	
BW FINEDRAW 5800	29	170	★ Medium-thick line of STS wire — Good lubrication and heat-stability — For lifetime increase of dies	

\* The properties and shapes may be changed without prior notice for quality improvement.

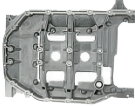



# Metal Forming Oil

## 1) Water-soluble Drawing Oil

Items	pH (10%)	Recommended Concentration (Brix,%)	Applications★ and Properties™	Machined Products
BW WIRE 515A	9.7	6~10	★ Wire drawing for medium & thick lines of copper (alloy) – Good lubrication	
BW WIRE 510L	10.5	6~10	★ Multi-drawing of copper wire (alloy) – Suitable for single and concentration tanks – Good washing (separation of copper powder) for equipment cleanliness	
BW WIRE 550L	10.5	6~10		
BW WIRE 820	9.4	5~10	★ Synthetic Zn steel drawing – Mineral-free design – Good equipment waxing due to little Zn elution – Transparent exterior and good lubrication for good surface roughness	
BW WIRE 810	9.2	5~10		
BW WIRE 858D	9.5	4~6	★ Zn steel drawing – Good lubrication – Little zinc elution	
BW WIRE 858DA	10.0	4~6		
BW WIRE 300EP	9.8	5~15	★ Zn steel drawing – Lifetime increase of dies and good wire surface roughness	

\* The properties and shapes may be changed without prior notice for quality improvement.

## | Die Casting Mold Release Agents

Items	Recommended Concentration (Brix,%)	Dilution Ratio	Applications★ and Properties™	Machined Products
BW DIE LUBE 2000FX	0.2~0.5	50:1~00:1	★ Generally applicable for medium sized machine – Wax and mineral oil-free design – Good heat resistance and washing – Good equipment washing and waste water process	
BW DIE LUBE 990 Series	0.2~0.5	50:1~100:1	★ Generally applicable for large-size machines such as 6-speed cases – Mineral oil-free design – Good application at low-high temperature – Applicable for circulation system	
BW DIE LUBE 5000 Series	0.4~0.6	50:1~100:1	★ Applicable to equipment with high pressure, high temperature and heavy load such as cylinder block – Mineral oil-free design – Suitable for mist spray facilities	
BW DIE LUBE 7000	0.05~0.1	100:1~200:1	★ Applicable to equipment with high pressure, high temperature and heavy load such as cylinder block – Anti-stiction design – High performance at low concentration (200:1)	
DIE LUBE-2000M	0.5~0.9	30:1~50:1	★ Applicable to magnesium casting, and general facilities – Suitable for releasing the parts which require polishing, and casting such as cellphones and laptops	




\* The properties and shapes may be changed without prior notice for quality improvement.

## | Plunger Oil (Nongraphitic Based)

Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Flashing Point (℃,COC)	Applications★ and Properties™
BW FINEPLUNGER 50KN	36	300	★ For facilities of medium load capacity – Oil based type with no graphite little emitting smoke at high temperature – Low viscosity, good lubrication at high temperature, and good
BW FINEPLUNGER 100	80.4	240	★ For facilities of high load capacity – Oil based type with no graphite – Good lubrication, good wetting and discoloration of surface
BW FINEPLUNGER 300	330	270	★ For general use – Oil based type no graphite – Excellent lubrication, and little heat generation during operations – Appropriate viscosity adjustable for each season
BW FINEPLUNGER 400	476	310	
BW FINEPLUNGER 500	540	315	

\* The properties and shapes may be changed without prior notice for quality improvement.

## | Special Machining Oil

Items	Recommended Concentration (Brix,%)	Applications★ and Properties™	Machined Products
BW P-WP2	43~46	★ Anti-spatter during welding of automobile body – Water soluble emulsion type (2-compound) anti spot oil – Good degreasing and anti-spatter	
BW SPOT CLEAN EX-1	3~5 Undiluted solution	★ Anti-spatter during welding of automobile body ★ For swirl – Water soluble type (1-compound) anti spot oil	
BW HF-150HD	Undiluted solution	★ For hydro forming – Can be diluted according to the external / internal process – Good Ewtreme pressure sesistance and lubrication – Eco-friendly synthetic based for good anti-septicity – Good emulsification stability and filtering	
BW WIRE 200R	3~5	★ For direct connection screw rolling – Good washing and lubrication – Better environment improvement than oil-type	

\* The properties and shapes may be changed without prior notice for quality improvement.



More than just a quenchant!  
Realize your process optimization  
with Buhmwoo.

Quenching Oil Classification by KS M 2170

Types		Applications
Type 1	#1	Quenching of materials easy to be hardened
	#2	Quenching of materials hard to be hardened
Type 2	#1	Hot bath quenching at around 120℃
	#2	Hot bath quenching at around 160℃
Type 3	#1	Tempering at around 150℃
	#2	Tempering at around 200℃

Types		Kinematic Viscosity cSt (mm²/s)		Flash Point (°C)	Ignition Point (°C)	Moist-ure (%)	Cooling Performance						Stability			
							Oil Temperature (80°C)		Oil Temperature (120°C)		Oil Temperature (160°C)					
		40°C	100°C				Character-istic Temp. (°C)	400°C Cooling Time (sec.)	Character-istic Temp. (°C)	400°C Cooling Time (sec.)	Character-istic Temp. (°C)	400°C Cooling Time (sec.)	Viscosity Ratio	Residual Carbon Increase (%)		
1	#1	30 ↓	-	180 ↑	200 ↑	0.05 ↓	480 ↑		-	-	-	-	1.5 ↓	1.5 ↓		
	#2	26 ↓		170 ↑	190 ↑		580 ↑	5.0 ↓ 4.0 ↓						2.0 ↓		
2	#1	-	20 ↓	200 ↑	220 ↑	0.1 ↓	-	-	500 ↑	5.0 ↓	600 ↑	6.0 ↓	1.4 ↓			
	#2		35 ↓	250 ↑	280 ↑				-	-						
3	#1	-	30 ↓	230 ↑	250 ↑				-	-	-	-	-	-	1.4 ↓	1.5 ↓
	#2		50 ↓	280 ↑	310 ↑											

Quenchant Selection

Types	COLD OIL (KS Type 1)				SEMI-HOT (KS Type 2-#1)	HOT OIL (KS Type 2-#2)				Polymer Quenchant
Use	@40℃, mm²/S				@100℃, mm²/S					
	10 >	10~15	15~25	25~35	5~15	15~20	20~25	25~30	30~40	
Sealed Oil Tank – High Oil Temp. Treatment		●	●	●	●	●	●		●	
					●	●				
Open Oil Tank – Brightness Treatment			●	●						●
			●	●	●	●				
Vacuum Quenching Furnace			●	●	●	●			●	
Nitrocarburizing			●		●	●			●	
Tempering				●					●	
Induction Hardening										●

Main Products

1) Polymer Quenchant

Product	Specific Gravity (15/4℃)	Kinematic Viscosity (40℃,mm²/s)	pH (10% Diluted)	Concentration for Use (vol%)	Applications★ and Properties┐
POLY QUENCH BW-510	1.086	500	8.0 ↑	5~20	★ For spray cooling for induction hardening, and for direct quenching – Water-like cooling property – Excellent defoaming and anti-decomposition
POLY QUENCH BW-550	1.066	310	8.0 ↑	5~25	★ For direct quenching, and spray cooling for induction hardening – Oil-like cooling property – Excellent defoaming and anti-decomposition

\* The specification and properties could be changed without prior notice for quality improvement.

2) Quenching Oil

2-1. KS Type 1

Items	KS Spec.	Kinematic Viscosity (40℃,mm²/s)	Flashing Point (COC,℃)	Characteristic Temperature (℃)	Oil Temp. for Use (℃)	Applications★ and Properties┐
MEDIUM QUENCH BW-1180K	Type 1-#1	21.5	↑ 200	500	50 ~90	★ Direct or carburizing quenching of alloy steel – Recommended for induction hardening of alloy steel – Excellent anti-oxidation
MEDIUM QUENCH BW-1100		22.0	↑ 200	550	50 ~ 90	★ Quenching of spring steel (plate and coil spring) ★ Quenching of carburized alloy steel and die steel

Items	KS Spec.	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Flashing Point (COC,℃)	Characteristic Temperature (℃)	Oil Temp. for Use (℃)	Applications★ and Properties™
HIGH QUENCH BW-1270	Type 1-#2	17.5	↑ 200	615	50 ~ 90	★ For quenching of small parts, and induction hardening of carbon steel - Effective to increase the hardness of large products, and to decrease hardness distribution in quenching of carburized carbon steel.
HIGH QUENCH BW-1280		18.5	↑ 200	615	50 ~ 90	★ Suitable for quenching of bolts, medium and large sized forged parts and quenching of carburized carbon and alloy steel - Long-term stability of brightness and cooling
HIGH QUENCH BW-1290		19.5	↑ 200	620	50 ~ 90	★ Suitable for reducing deformation in quenching of carburized pressed parts and forged parts - Long-term stability of brightness and cooling

\* The specification and properties could be changed without prior notice for quality improvement.

2-2. KS Type 2

Items	KS Spec.	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Flashing Point (COC,℃)	Characteristic Temperature (℃)	Oil Temp. for Use (℃)	Applications★ and Properties™
SEMI-HOT BW-2000	Type 2-#1	7.8	230	590	80~100	★ Quenching of carburized pressed parts and shafts - Good performance for satisfying core hardness with low deformation at medium bath temp
SEMI-HOT BW-2100S		8.2	240	600	80~120	★ Quenching of small and medium-sized bearings - Increasing hardenability with low deformation of parts, Long-term stability of brightness
SEMI-HOT BW-2110		12	245	610	90~120	★ Quenching of medium and large-sized bearing races, and of small-sized carburized gears and shafts ★ Carbo-nitriding of pressed parts
BRIGHT MARTEMPER BW-2200	Type 2-#2	19.5	275	630	120~150	★ Quenching of gears and large-sized thin bearing races ★ Quenching of thin carburized pressed parts and shafts ★ Suitable for quenching of carburized shafts - Minimizing deformation and long-term stability of brightness
BRIGHT MARTEMPER BW-2300		32	320	650	130~170	★ Carburizing and carbonitriding of large gears, and of shafts requiring low deformation - Suitable for the martempering at high temperature

\* The specification and properties could be changed without prior notice for quality improvement.

Maximizing the efficiency of your process! Buhmwoo's eco-friendly industrial lubricants will make it happen.

| Hydraulic Fluids

Main Products

1) Mineral Oil

Types	Product Series	Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Viscosity Index	Flash Point (COC,℃)	Pour Point (℃)	Copper Corrosion (100℃x3hrs)
General ISO-L-HL Type	BW HYDRO BL-Series	BL-22	22	100	210	-27.5	1A
		BL-32	32	100	210	-27.5	1A
		BL-46	46	100	220	-27.5	1A
		BL-68	68	100	230	-27.5	1A
		BL-100	100	100	240	-25	1A
Wear Resistant ISO-L-HM Type	BW HYDRO BH-Series	BH-22	22	120	230	-30	1A
		BH-32	35	115	230	-30	1A
Wear Resistant ISO-L-HM Type	BW HYDRO BH-Series	BH-46	46	115	230	-30	1A
		BH-68	68	110	230	-30	1A
		BH-100	100	105	240	-25	1A
	BW HYDRO BHP-Series	BHP-32	32	120	230	-35	1A
		BHP-46	46	120	240	-32.5	1A
		BHP-68	68	120	250	-30	1A
High Viscosity Index ISO-L-HV Type	BW HYDRO BV-Series	BV-32	32	min. 150	min. 210	-40	1A
		BV-46	46	min. 150	min. 210	-40	1A
		BV-68	68	min. 150	min. 210	-40	1A

\* The properties and shapes may be changed without prior notice for quality improvement.



2) Fire Resistant (Polyol Ester, ISO-L-HFDU type)

Series	Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Viscosity Index	Flash Point (COC,℃)	Pour Point (℃)	Copper Corrosion (100℃x3hrs)
BW HYDRO BFE-Series	BFE-346	46	180	min. 275	max. -20	1A
	BFE-356	56	180	min. 275	max. -20	1A
	BFE-368	68	180	min. 275	max. -20	1A

\* Applicable to : Fluor elastomer(Viton®), PTFE(Teflon®), NBR(Buna-N), AU(Polyurethane)  
\* Non-applicable to : phenol resin  
\* The properties and shapes may be changed without prior notice for quality improvement.

3) Fire Resistant (Water-glycol, ISO-L-HFC type)

Series	Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Viscosity Index	Water Content (%)	Pour Point (℃)	pH
BW HYDRO BWG-Series	BWG-138	38	min. 200	40	-50	9.7
	BWG-146	46	min. 200	40	-50	9.7
	BWG-156	56	min. 200	40	-50	9.7

\* Applicable to : NBR (Buna-N), Fluor elastomer (Viton®), PTFE (Teflon®), Corfam  
\* Non-applicable to : Zn, Al, Mg, Cd, AU (Urethane), Nylon fiber, Leather, Cork, Paper, inner painting for tanks  
\* The properties and shapes may be changed without prior notice for quality improvement.

| Slideway Lubricant

Tackiness	Series	Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Flash Point (COC,℃)	Pour Point (℃)	Copper Corrosion (100℃x3hrs)
o	BW WAY BSH-Series	BSH-32	32	220	-30	1B
		BSH-68	68	220	-30	1B
		BSH-220	220	240	-20	1B
x	BW WAY BS-Series	BS-32	32	220	-30	1B
		BS-68	68	220	-30	1B
		BS-220	220	240	-20	1B

\* The properties and shapes may be changed without prior notice for quality improvement.

| Gear Oil

Series	Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Flash Point (COC,℃)	Pour Point (℃)	Copper Corrosion (100℃x3hrs)
BW GEAR BHG-Series	BHG-68	68	min. 220	-27.5	1B
	BHG-100	100	min. 220	-25	1B
	BHG-150	150	min. 220	-22.5	1B
	BHG-220	220	min. 220	-20	1B
	BHG-320	320	min. 220	-17.5	1B
	BHG-460	460	min. 220	-15	1B
	BHG-680	680	min. 220	-15	1B

\* The properties and shapes may be changed without prior notice for quality improvement.

| Machine Oil

Type	Series	Items	Kinematic Viscosity (40℃,mm <sup>2</sup> /s)	Viscosity Index	Flash Point (COC,℃)	Pour Point (℃)	Copper Corrosion (100℃x3hrs)
ISO-L-HL Type	BW MULTI BM-Series	BM-22	22	100	210	-30	1A
		BM-32	32	100	210	-30	1A
		BM-46	46	100	220	-30	1A
		BM-68	68	100	230	-27.5	1A
		BM-100	100	100	240	-25	1A
		BM-150	150	100	250	-22.5	1A
		BM-220	220	100	260	-20	1A
		BM-320	320	100	270	-17.5	1A
MILD EP Type with Extreme Pressure	BW MULTI BM-EX Series	BM-460	460	100	280	-15	1A
		BM-22EX	22	100	210	-30	1B
		BM-32EX	32	100	210	-30	1B
		BM-46EX	46	100	220	-30	1B
		BM-68EX	68	100	230	-27.5	1B
		BM-100EX	100	100	240	-25	1B
		BM-150EX	150	100	250	-22.5	1B
		BM-220EX	220	100	260	-20	1B
		BM-320EX	320	100	270	-17.5	1B
		BM-460EX	460	100	280	-15	1B

\* The properties and shapes may be changed without prior notice for quality improvement.

| Spindle Oil

Series	Items	Kinematic Viscosity (40℃,mm²/s)	Flash Point (COC,℃)	Pour Point (℃)	Copper Corrosion (100℃x3hrs)
BW SPIN-Series	BW SPIN-2	1.6	96	-10	1B
	BW SPIN-2H	2	108	-7.5	1B
	BW SPIN-5	5	120	-25	1B
	BW SPIN-7	7	160	-40	1B
	BW SPIN-10	10	176	-40	1B
	BW SPIN-15	15	180	-40	1B
	BW SPIN-22	22	210	-40	1B

\* The properties and shapes may be changed without prior notice for quality improvement.

| Heat Transfer Fluid

Series	Items	Kinematic Viscosity (40℃,mm²/s)	Flash Point (COC,℃)	Pour Point (℃)	Copper Corrosion (100℃x3hrs)
BW THERM Series	BW THERM 32	32	min. 220	max. -15	1B
	BW THERM 46	46	min. 230	max. -15	1B

\* The properties and shapes may be changed without prior notice for quality improvement.

| Air Compressor Oil

Series	Items	Kinematic Viscosity (40℃,mm²/s)	Flash Point (COC,℃)	Pour Point (℃)	Copper Corrosion (100℃x3hrs)
BW COMP-Series	BW COMP-32SE	32	230	max. -35	1B
	BW COMP-46SE	46	240	max. -35	1B
	BW COMP-68S	68	240	max. -30	1B
	BW COMP-100S	100	250	max. -30	1B

\* The properties and shapes may be changed without prior notice for quality improvement.

| Vacuum Pump Oil

Series	Items	Kinematic Viscosity (40℃,mm²/s)	Flash Point (COC,℃)	Pour Point (℃)	Copper Corrosion (100℃x3hrs)
BW VPL-Series	BW VPL-68	68	250	-30	1B
	BW VPL-100	100	250	-30	1B

\* The properties and shapes may be changed without prior notice for quality improvement.

| Dry Film Chain Lubricant

Series	Items	Kinematic Viscosity (40℃,mm²/s)	Flash Point (COC,℃)	Pour Point (℃)	Appearance (Visual Inspection)
BW MCL-Series	BW MCL 40	4.6	min. 120	-25	Black Suspension
	BW MCL 100	12.5	min. 120	-25	Black Suspension

\* The properties and shapes may be changed without prior notice for quality improvement.

| Door-closer Oil

Series	Items	Kinematic Viscosity (40℃,mm²/s)	Viscosity Index	Flash Point (COC,℃)	Pour Point (℃)
BW DOORCLOSER Series	BW DOORCLOSER 40	43	min. 210	min. 200	max. -45
	BW DOORCLOSER 60	63	min. 210	min. 200	max. -40

\* The properties and shapes may be changed without prior notice for quality improvement.





World-foremost steel products produced with World-top rolling oil.

TOTAL SOLUTION for your business

In 1976, Buhmwoo succeeded in producing the first ever rolling oil in Korea. With accumulated experience and detailed field know-how for 41 years, Buhmwoo provides total solution for rolling equipment and up and down rolling process.

- ▼ 2012 World-class Product Award for Cold Rolling Oil

– Awarded by the Ministry of Trade, Industry and Energy, and KOTRA
- ▼ 2014 World-class Product Award for Wet Temper Fluids

– Awarded by the Ministry of Trade, Industry and Energy, and KOTRA



Hot Rolling Oil

Hot Rolling Oil is used to protect the surface of work roll and to enhance the quality and productivity of hot rolled steel sheets through decrease of roll force.

Uses of Hot Rolling Oil

- Roughing Mill
- Adamite Roll
- High-Cr Roll
- Finishing Mill
- High Speed Steel (HSS) Roll
- STS (EDGE)

Main Products of Hot Rolling Oil

Items	Kinematic Viscosity (mm <sup>2</sup> /sec,40℃)	Acid Value (mgKOH/g)	Saponification Value (mgKOH/g)	Flashing Point (℃)	Applications
BW HOTROL 90K	100	9	70	Above 200	Roughing mill, Finishing mill, HSS
BW HOTROL 60HD	150	14	100	Above 200	Finishing mill, HSS, HI-Cr
BW HOTROL 90AD	200	Below 10	105	Above 200	Roughing mill, Finishing mill, HSS

Rolling Process Additives

Items	Functions	Applications
Pickling inhibitor	Over-pickling prevention, Maintenance of surface quality of pickling steel sheet	Application by pouring in appropriate proportion to the effective concentration and input amount of recycled and new hydrochloric acid
Pickling accelerator	Enhance of pickling due to improved scale removal speed	Application by pouring an appropriate amount in proportion to the effective concentration of hydrochloric acid
Carbon sedimentation inhibitor	Prevention of carbon sedimentation by addition of organic sulfur	Inunction by mixing and diluting with rinse fluid after degreasing

Main Additives

Types	Items	Color (ASTM)	pH (TAP,1%)	Flashing Point (℃)	Applications
Pickling Inhibitor	AP-30	4 MAX.	8.5	-10 MAX.	For hydrochloric acid
	A-7H	1 MAX.	9.2	-10 MAX.	For hydrochloric acid
	HAP-30DK	4 MAX.	6.4	-25	For hydrochloric acid and pickling acceleration
Pickling Accelerator	SUN SPEED PA-7	1 MAX.	7	-10 MAX.	Pickling accelerator
carbon deposit preventer Inhibitor	MBT-NA	-	10.1	-	-

Cold Rolling Oil

Cold rolling oil is used to enhance the surface quality through lubrication and cooling frictional heat and plastic deformation heat generating during the cold rolling process.

Superior quality of Buhmwoo's cold rolling oil is known well, which is proved by being awarded as the Next Generation World-class Product of Korea at the Korean World-class Product Award 2012.

Classifications of Cold Rolling Oil

- By dilution (water-soluble and neat)
  - By rolling mill types (TCM, RCM, Z-Mill, SPM)
  - By materials (steel, stainless steel, electrical steel sheet, and non-ferrous metals such as aluminum)
- By thickness (high-speed thin plate, and sheet)
  - By up and down process (MC, CAL, BAF, CGL)
  - By ingredients of rolling oil (oil base, synthetic ester, and mineral base)

Classification	Circulation Type	Composition	Rolling Mills	Applications
Neat	Circulation type	Mineral based	Reverse Mill	General steel, high alloy steel sheet, stainless steel, high carbon steel
Water-soluble	Direct type	Oil and fat based	PCM	Galvanized steel sheet, special steel, BP, high tensile steel
	Circulation Type	Mineral based	Reverse Mill	General steel, stainless steel, electrical steel sheet, high carbon steel
		Oil and fat based, mixed, and ester based	Reverse Mill, PCM	General thin steel sheet, automotive steel sheet, BP, high carbon steel, electrical steel sheet

Main Products of Cold Rolling Oil

1) Water-soluble Cold Rolling Oil

Items	Kinematic Viscosity (mm <sup>2</sup> /sec,40℃)	Acid Value (mgKOH/g)	Saponification Value (mgKOH/g)	pH (D/1.5%)	Applications
BW SYINROL 100P	49	14	210	4.5	BP, CR
BW SYINROL 500K	54	6	202	4.0	BP, CR
BW SYINROL 660AD	55	16	207	4.0	BP, CR
BW SYINROL 300K	40	8	170	4.2	Automotive steel sheet, CR
BW SYINROL 429K	40	8	170	4.2	Automotive steel sheet, CR
BW SYINROL 900HD	43	5.0	190	5.4	Automotive steel sheet, CR
BW SYINROL 800HD	52	4	171	4.3	Automotive steel sheet, CR
BW SYINROL 288P	60	15	205	4.0	CR, Automotive steel sheets, STS
BW SYINROL 600DB	53	8	185	5.7	CR
BW SYINROL 205S	50	7	200	6.7	CR
BW SYINROL 900PZ	45	5.5	80	8.4	Electrical steel sheets
BW SYINROL 200TP(S)	35	5	140	8.7	Electrical steel sheets
BW SYINROL 300ID	48	9	164	5.7	MC, CR

Items	Kinematic Viscosity (mm <sup>2</sup> /sec,40℃)	Acid Value (mgKOH/g)	Saponification Value (mgKOH/g)	pH (D/1.5%)	Applications
BW MCR-220HK	30	12	60	6.8	MC, special steel
BW MCR-700HK	34	7	55	7.5	MC, special steel
BW MCR-600	51	10	170	6.8	MC, special steel

2) Neat Cold Rolling Oil

Items	Kinematic Viscosity (mm <sup>2</sup> /sec,40℃)	Flash point (COC,℃)	Saponification Value (mgKOH/g)	Applications
BW LEN J	11	175	45	STS, general steel
BW KC-17BK	7.9	170	30	STS, high carbon steel
BW KC-39NT	10.7	175	30	High carbon steel, general steel
BW KC-30SS	8.9	165	30	High carbon steel, general steel
BW KC-30EK	10.9	180	44	Copper and copper alloy steel
BW KC-30C	12	175	40	Copper and copper alloy steel
BW KC30EPS	7.2	160	44	Copper and copper alloy steel
BW AR-95	2.2	-	-	Aluminum
BW AR-30	1.6	90	-	Aluminum
BW AR-32	1.8	90	-	Aluminum
BW AR-34	2.3	106	-	Aluminum
BW AR-180D	6.5	170	170	Aluminum rolling additive
BW AR-140D	-	110	256	Aluminum with rolling additive
BW AR-100D	-	127	-	Aluminum rolling additive
BW FW-300C	24.8	135	-	Aluminum rolling additive
BW MR-300	107	250	150	Magnesium



Wet Temper Fluids

Wet temper oil is used for temper rolling process of finishing the surfaces of annealed steel sheets or hop-dip coated steel sheets with high roughness roll. Having excellent cleaning and anti-rustings, these are classified into wet temper oil for galvanized steel sheets and that for general steel sheets. These fluids diluted with ion-exchange water are sprayed directly to steel sheets and rolls.

Classifications of Wet Temper Fluids

- By applicable processes (for CR and CG)

Main Products of Wet Temper Fluids

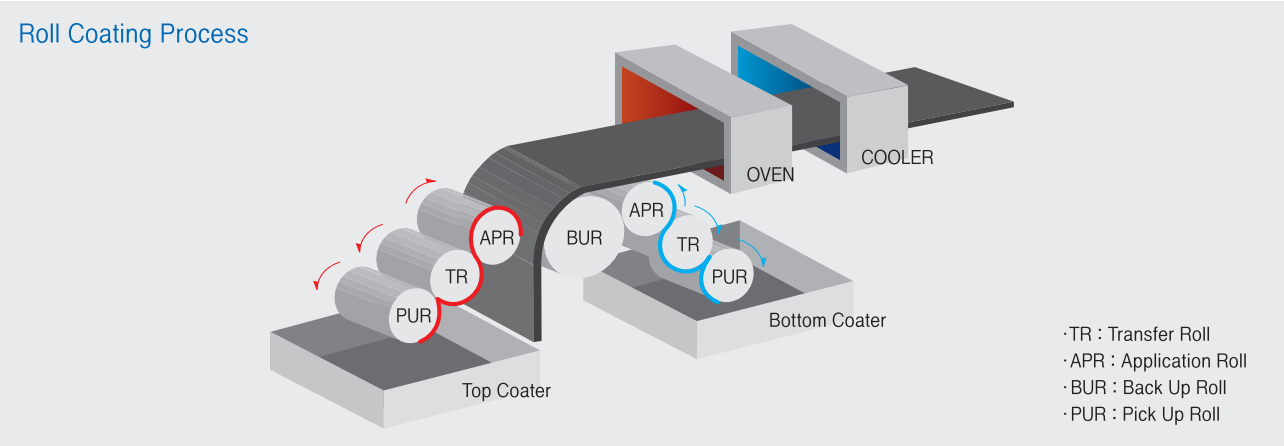
1) Wet Temper Fluids for Steel Sheets (CR)

Items	pH (D/I,5%)	Brix (Undiluted)	Friction Coefficient (D/I,10%)	Surface Tension (D/I,10%)	Applications
BW SP-860/P	9.8	31	0.38	41	CR, STS
BW SP-860/K	10.3	25.4	0.38	41	CR, Automotive steel sheet
BW SP-890	9.8	32	0.37	43	CR
BW SP-990HD	10.6	24.4	0.38	41	CR

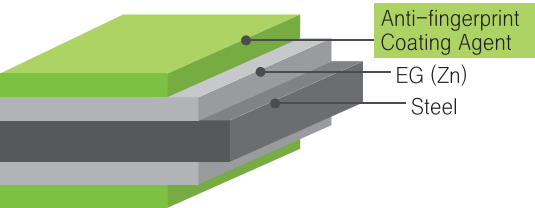
2) Wet Temper Fluids for Galvanized Steel Sheets (CG)

Items	pH (D/I,5%)	Brix (Undiluted)	Friction Coefficient (D/I,10%)	Applications
BW SPG97	8.5	20	0.32	GI, GA
BW SPG-01	8.5	22	-	GI, GA
BW SPG201US	8.7	26	0.23	GI, GA
BW SPG-901	8.8	20.4	-	GI, GA
BW SPG-255SA	8.6	20.4	-	GI, GA
BW SPG-205SI	8.9	15	-	GI, GA

As a top leader of surface treatment technology, Buhmwoo provides you with the most advanced technology and higher value.



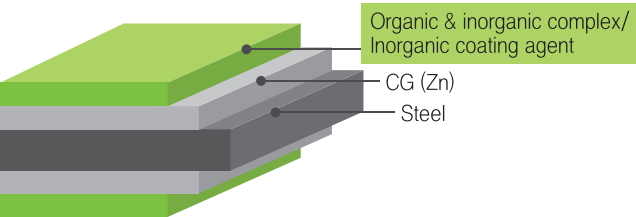
Surface Treatment Agents for EGI



This fluid is made from compound resin which provides Non-Cr eco-friendly, water based, thermosetting, organic and inorganic properties. Application of this agent makes electrolytic galvanized iron sheets (EGI) have anti-corrosion, anti-fingerprint and multi-functions.

Classification	Materials	Main Functions	Coating Method	Thermosetting Method	Thermosetting Temperature (PMT, °C)	Optimal Coating Amount (mg/m <sup>2</sup> )	Applications
General Anti-fingerprint	EGI Phosphate	Anti-corrosion, anti-fingerprint, chemical resistance, machinability, high temperature and humidity resistance	ROLL COATING	Hot blast, induction heating, NIR	80~180	1,000~1,500	Home appliances, computer, OA equipment, coating of interior and exterior metal sheets
Conductivity Anti-fingerprint	EGI	Anti-corrosion, anti-fingerprint, chemical resistance, machinability, high temperature and humidity resistance, conductivity			80~180	800~1,200	
Anti-corrosion Coating	EGI	Anti-corrosion, chemical resistance, film removal, high temperature and humidity resistance			80~100	800~1,200	Coating of automotive interior metal sheets

Surface Treatment Agents for CGI

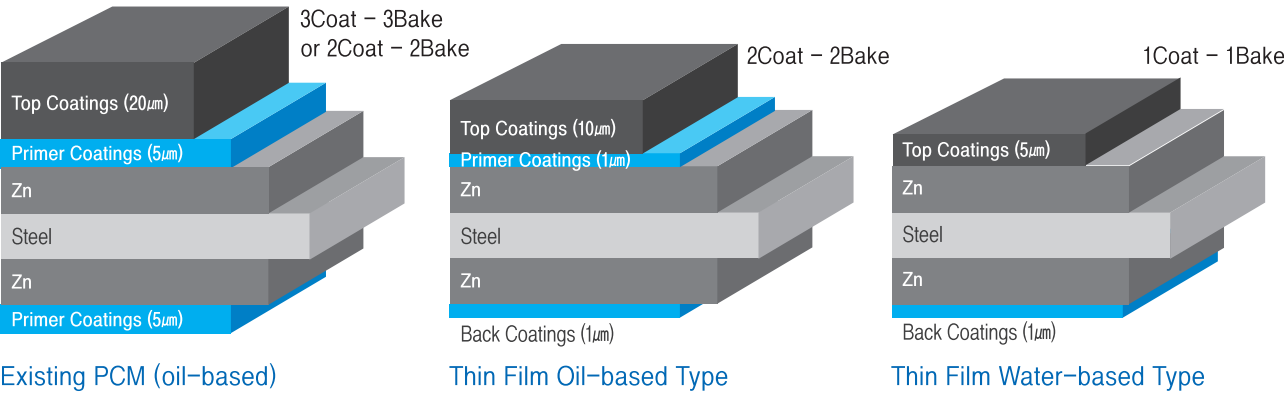


This solution is made of compound resin which provides Non-Cr environmentally friendly, water based, thermosetting at low temperature, organic and inorganic properties. By the application of the agent, hot dip galvanized steel sheets(CGI/HGI/HDG) have anti-corrosion, machinability and multi-functions.

Classification	Materials	Main Functions	Coating Methods	Thermosetting Methods	Thermosetting Temperature (PMT, °C)	Optimal Coating Amount (mg/ m²)	Applications
Anti-corrosion coating (Organic/ inorganic complex type)	CGI HGI	Anti-corrosion, anti-fingerprint, chemical resistance, machinability, high temperature and humidity resistance	ROLL COATING	Hot blast, induction heating, NIR	50~150	1,000~1,200	Construction materials, automobiles, home appliances, computer, OA equipment, coating of interior and exterior metal sheets
Anti-corrosion coating (Inorganic type)		Anti-corrosion, anti-fingerprint, chemical resistance, high temperature and humidity resistance, conductivity				400~800	

Surface Treatment Agents for Galvanized Iron (EGI/CGI)

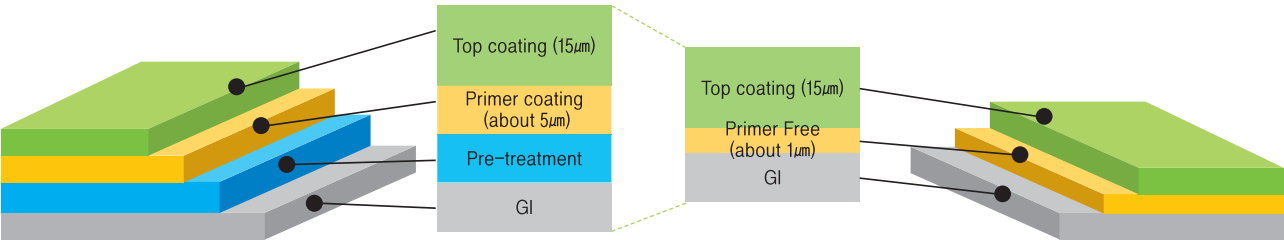
This fluid is made from compound resin which provides eco-friendly, water or oil based, thermosetting, and organic and inorganic properties. Application of this agent makes galvanized steel sheets (EGI/CGI) have black coloring, anti-corrosion, chemical resistance and machinability. This eco-friendly product contributes to the reduction of processing cost, creating thin film differently from existing products with thick film (about 30µm) and with thermosetting at a high temperature.



Classification	Materials	Main Functions	Coating Methods	Thermosetting Methods	Thermosetting Temperature (PMT, °C)	Optimal Coating Amount (mg/ m²)	Applications	Processing Step
Oil-based	EGI/CGI	Black coloring, anti-corrosion, chemical resistance, machinability	ROLL COATING	Hot blast, induction heating	210~230	Top coating : 9~11 Primer coating : 1~1.2	Coating of exterior metal sheets for home appliances	3Coat - 3Bake or 2Coat - 2Bake
Water-based		VOC Free, thin film, black coloring, anti-corrosion, chemical resistance, machinability			180~190	5~6		1Coat - 1Bake

Surface Treatment Agents for Colored Steel Sheet Coating (Primer-free)

This primer-free coating agent is used to give the anti-corrosion function and better look to hot dip galvanized sheet sheets, Galvalume steel sheets, aluminum-coated steel sheets, electrolytic galvanized steel sheet, etc. Steel sheets are coated with primer-free agent and top coating only because pre-treatment and primer coating layers are integrated. Differently from the 3-layer coating of pre-treatment, primer coating and top coating, this process enables to function even on thin films which intergrated primer free coating layer with reduction of electric power consumption and colored steel sheet production cost.



Required Specifications

Required Function		SPEC	Test Methods
Coating amount	TOP	15 µm	- Using a dry film thickness measuring system, - Primer Free
	Primer Free	1 µm	- Dry film weight
Wear Resistance (MEK)		over 50 times	- Checking coating disbondment and color difference after rubbing by using methylethylketone
Pencil Hardness		above F	- Checking hardness by using Mitsubishi pencil standardized for each hardness level
Impact Resistance		No crack	- Using Dupont impact resistance tester - Checking paint cracks or coating disbondment after dropping a 500g weight from a 500mm-high point
CCT		GOOD	- Checking coating disbondment with Erichsen 6mm & tape after CCT
Machinability (T-Bend)		2T-crack	- Checking the result of tape desquamation after 2T-bending
Anti-corrosion (500hrs)	No corrosion		- Anti-corrosion test of plates
	5mm		- Anti-corrosion test after X-cut
	20mm		- Edge anti-corrosion test



# Eco-friendly Fruit & Vegetable Cleaner – vegeAQUA

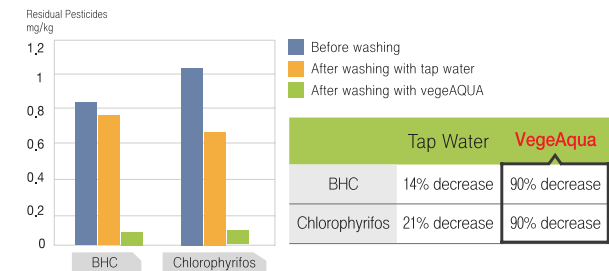
The finest way to wash your fruits & vegetables!  
Easily get rid of pesky waxy residues with vegeAQUA.

vegeAQUA is a new concept of fruit and vegetable cleanser without any added chemicals such as a surfactant. This product refined through state-of-the-art technology not only cleans contaminants such as pesticides residue with anion and special mineral but also removes harmful germs such as colon bacillus, salmonella, and vibrio through its sterilizing action.

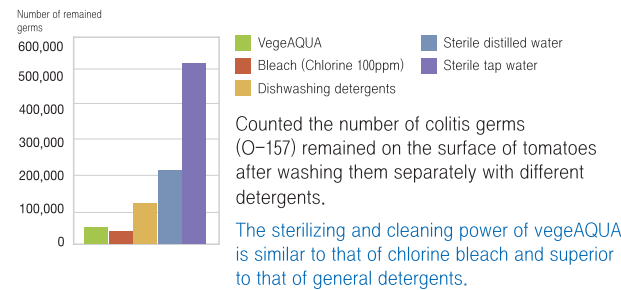


## Sterilizing & Cleaning Power Test

· Sterilizing & Cleaning Power Test with Tomatoes



· Pesticides Removal Effect



## vegeAQUA's Distinguished Features

Classification	VegeAqua	Dishwashing Detergents	Chlorine Bleach	Alkaline Ionic Water
Basic Composition	-OH (Anion)	Alkaline chemicals, surfactant	Sodium hypochlorite	-OH(Anion)
Sustainability	Semi-permanent	Semi-permanent	Semi-permanent	3 hours
Features	Sterilizing and cleaning power	Cleaning power	Sterilizing power	Weak cleaning power
Harmfulness to Human Body	Harmless	Harmful	Harmful	Harmful
Skin Irritation	None	Irritative	Very irritative	Irritative
Foaming	None	Excessive foaming	Little foaming	No

## vegeAQUA at WHOLE FOODS MARKET

vegeAQUA is selling at Whole Foods Market, the world's biggest premium market selling high-quality organic food, owing to its outstanding eco-friendly property and sterilizing/cleaning power. Furthermore, it is the first Korean cleaner which acquired green on Eco-Scale of the market being the highest level in their rating system for ecofriendly products.



▲ Most Ecofriendly Class 'Green' at Whole Foods Market

Whole Foods Market categorizes the products into 4 classes, Red, Orange, Yellow, and Green, on the basis of about 360 evaluation items. The closer to the green the needle of a scale is, the more eco-friendly a product is.



Global Reach



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