

**bulwark**<sup>®</sup>

LUBRICANTS  
BEYOND EXPECTATIONS



PRODUCT  
DATA SHEET

# PASSENGER CAR OILS (PCO)

# COMMANDER PLUS 0W-16

**FULLY SYNTHETIC  
ULTRA LOW VISCOSITY & FUEL EFFICIENT  
PETROL ENGINE OIL**

**BULWARK COMMANDER PLUS** oil is fully synthetic, multi-grade Ultra Low Viscosity Fuel Efficient (ULVFE) motor oil engineered to meet the requirements of ultra-modern «downsized» engines equipped with Stop & Start technologies and hybrid engines which require very low viscous engine oils and seeking high performance and additional protection benefits. The product is intended for use in modern engines of passenger cars, pick-ups and light trucks including turbocharged & supercharged engines, which require ULVFE category oils.

**BULWARK COMMANDER PLUS SAE 0W-16** oil is manufactured using high-quality synthetic base stocks, premium and technologically advanced additive packages. Recommended for use in all-season operations, especially gasoline engines of cars from European, American, Japanese and other Asian manufacturers, which require oils with API SP performance levels in SAE 0W-16

#### PERFORMANCE LEVEL

- API SP
- ILSAC GF-6B

#### KEY BENEFITS

- Engine protection and cleanliness in severe urban driving conditions.
- Protection after treatment systems and reduces NOx, HC and CO in particular.
- Ultra-low viscosity together with special additives, makes cold engine starts easier
- Unique formulation demonstrates robustness specific to low speed premature ignition prevention.
- Excellent fuel economy benefits

#### TYPICAL CHARACTERISTICS

Properties	Test Methods	0W-16
Density @ 29.5°C, Kg/m3	ASTM D4052	0.848
Kinematic Viscosity @ 100°C cSt	ASTM D7042	7.32
Viscosity Index	ASTM D2270	168
Cold Cranking Viscosity at -35°C, mPa.s	ASTM D5293	3,560
Borderline Pumping Viscosity at -40°C, mPa.s	ASTM D4684	10,950
Sulphated Ash, %	ASTM D874	0.82
Flash Point, COC, °C	ASTM D92	232
Pour Point, °C	ASTM D97	-54
Total Base Number, mg KOH/g	ASTM D2896B	7.52

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

#### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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# COMMANDER 0W-20, 5W-20, 5W-16

**FULLY SYNTHETIC  
LOW VISCOSITY & EXTRA FUEL EFFICIENT  
PETROL ENGINE OIL**

**BULWARK COMMANDER** oils are fully synthetic, multi-grade Low Viscosity Extra Fuel Efficient (LVEFE) motor oils engineered to meet the requirements of ultra-modern downsized and hybrid engines seeking high performance and additional protection benefits. The product is intended for use in modern engines of passenger cars, pick-ups and light trucks including turbocharged & supercharged engines, which require LVEFE category oils.

**BULWARK COMMANDER** oils are manufactured using high-quality synthetic base stocks and technologically advanced premium additive packages. Recommended for use in all-season operations, especially gasoline engines of cars from European, American, Japanese and other Asian manufacturers, which require oils with performance levels API SP/RC (Resource Conserving) and SAE 0W-20, 5W-20 & 5W-16 viscosity.

#### PERFORMANCE LEVEL

- API SP / SP Plus
- ILSAC GF-6A

#### KEY BENEFITS

- Excellent fuel economy benefits.
- Protection after treatment systems and extends oil drain intervals.
- Ultra-low viscosity together with special additives, makes cold engine starts easier
- Unique formulation demonstrates robustness specific to low speed premature ignition prevention.

#### TYPICAL CHARACTERISTICS

Properties	Test Methods	0W-20	5W-20	5W-16
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.851	0.853	0.852
Kinematic Viscosity @ 100°C cSt	ASTM D7042	8.12	8.56	7.82
Viscosity Index	ASTM D2270	154	162	164
Cold Cranking Viscosity, mPa-s	ASTM D5293	3980 at -35°C	4100 at -30°C	4260 at -30°C
Borderline Pumping Viscosity, mPa-s	ASTM D4684	12,300 at -40°C	16,500 at -35°C	11,520 at -35°C
Sulphated Ash, %	ASTM D874	0.80	0.80	0.80
Flash Point, COC, °C	ASTM D92	232	228	234
Pour Point, °C	ASTM D97	-54	-48	-48
Total Base Number, mg KOH/g	ASTM D2896B	7.32	7.32	7.32

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

#### STORAGE

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# GLADIATOR FE 0W-20, 5W-20, 5W-30

**FULLY SYNTHETIC  
FUEL EFFICIENT  
PETROL ENGINE OIL**

**BULWARK GLADIATOR FE** oils are fully synthetic, multi-grade Fuel Efficient (FE) motor oils of the latest generation engineered to meet the requirements of additional fuel efficiency benefits. The product is intended for use in modern high-performance engines of passenger cars, pick-ups and light trucks including turbocharged & supercharged engines, which require Fuel Efficient (FE) category oils.

**BULWARK GLADIATOR FE** oils are manufactured using high-quality synthetic base stocks and technologically advanced premium additive packages. Recommended for use in all-season operations, especially gasoline engines of cars from European, American, Japanese and other Asian manufacturers, which require oils with API SN, ILSAC GF-5 performance levels with SAE 0W-20, 5W-20 or 5W-30 viscosity.

## PERFORMANCE LEVEL

- API SN/RC; ILSAC GF-5
- Dexos1
- ACEA C3
- MB 229.31, 229.51
- PORSCHE A40; VW 502.00/505.00
- BMW LL-04 and PSA B71 2290

## KEY BENEFITS

- Improved fuel economy with excellent low-temperature capabilities.
- Maximum engine protection against wear in severe urban driving conditions.
- Excellent detergency/dispersant properties prevent formation of deposit.
- Optimized for engines operating under high-load and varying engine speeds.
- Lower oil consumption, maintains higher oil pressure leading to longer engine life.
- Excellent oxidation stability ensures lower deposits and protects against wear.

## TYPICAL CHARACTERISTICS

Properties	Test Methods	0W-20	5W-20	5W-30
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.851	0.852	0.854
Kinematic Viscosity @ 100°C cSt	ASTM D7042	8.23	8.47	10.42
Viscosity Index	ASTM D2270	154	162	169
Cold Cranking Viscosity, mPa-s	ASTM D5293	4120 at -35°C	4800 at -30°C	5260 at -30°C
Borderline Pumping Viscosity, mPa-s	ASTM D4684	21,300 at -40°C	26,500 at -35°C	31,520 at -35°C
Sulphated Ash, %	ASTM D874	0.76	0.76	0.76
Flash Point, COC, °C	ASTM D92	222	228	236
Foam Stability	ASTM D892			
Seq I		0/0	0/0	0/0
Seq II		0/0	0/0	0/0
Seq III		0/0	0/0	0/0
Pour Point, °C	ASTM D97	-54	-48	-48
Total Base Number, mg KOH/g	ASTM D2896B	8.60	8.60	8.60

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

## STORAGE

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# GLADIATOR DP 5W-40

**FULLY SYNTHETIC  
DOUBLE PROTECTION  
PETROL ENGINE OIL**

BULWARK GLADIATOR DP oils are multi-grade fully synthetic motor oils of the latest generation suitable for use in modern engines of passenger cars, light commercial trucks, sport cars and vans including turbocharged and supercharged engines. They provide best in class wear protection and all-round superior performance.

BULWARK GLADIATOR DP 5W-40 oil is formulated using premium quality synthetic base oils and advanced high-performance additive packages. Recommended for use during all-season operations in gasoline engines of cars from European, American, Japanese and other Asian manufacturers, which require oils with API SN, ACEA A3/B4 performance levels and SAE 5W-40 viscosity.

## PERFORMANCE LEVEL

- API SN
- ACEA A3/B4
- MB 229.3, 229.5
- PORSCHE A40; VW 502.00/505.00;
- BMW LL-01
- RN 0700/0710
- PSA B71 2296

## KEY BENEFITS

- Excellent anti-oxidation & anti-corrosion properties provide protection to the engine against wear in severe operating conditions.
- Unique formulation minimizes oil consumption.
- Facilitates smoother engine operation at high loads and in “start-stop” mode.
- Easy cold start and excellent low-temperature properties, reduces engine start-up wear.
- Prevents the formation of high and low temperature deposits on the engine components.
- High BN reserve and retention allow use of high sulfur fuel.

## TYPICAL CHARACTERISTICS

Properties	Test Methods	5W-40
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.857
Kinematic Viscosity @ 100°C cSt	ASTM D7042	13.78
Viscosity Index	ASTM D2270	166
Cold Cranking Viscosity at -30°C, mPa-s	ASTM D5293	5060
Borderline Pumping Viscosity at -35°C, mPa-s	ASTM D4684	18,520
Sulphated Ash, %	ASTM D874	0.82
Flash Point, COC, °C	ASTM D92	242
Foam Stability	ASTM D892	
Seq I		0/0
Seq II		0/0
Seq III		0/0
Pour Point, °C	ASTM D97	-48
Total Base Number, mg KOH/g	ASTM D2896B	8.60

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# GLADIATOR CS 0W-40

**FULLY SYNTHETIC  
PAO BASED PETROL ENGINE OIL  
QUICK COLD START**

**BULWARK GLADIATOR CS** oils are advanced and latest generation fully synthetic multi-grade motor oils suitable for use in modern engines of passenger cars, light commercial trucks, sport cars and vans including turbocharged engines. The product is formulated using premium quality Poly Alpha Olefin base stocks and advanced technology additive packages to provide quick cold start, best in class start up wear protection, and all-round superior performance.

**BULWARK GLADIATOR CS 0W-40** is recommended for use during all-season operations, especially in extreme cold weather conditions below -30°C in passenger cars running on petrol fuel and made by European, Japanese, American and Asian manufacturers, which require API SN, ACEA A3/B4 performance levels and SAE 0W-40 viscosity.

## PERFORMANCE LEVEL

- API SN
- ACEA A3/B4
- MB 229.3, 229.5
- PORSCHE A40
- VW 502.00/505.00
- BMW LL-01
- RN 0700/0710
- PSA B71 2296

## KEY BENEFITS

- Easy cold start and excellent fluidity at low temperature provides engine start-up wear protection.
- Excellent anti-oxidation & anti-corrosion properties provide better engine protection in severe operating conditions and at varying loads.
- Advanced formulation minimizes oil consumption and aids in smoother engine operation in “start-stop” mode.
- Prevents the formation of high and low temperature deposits on the engine components.
- High quality acid neutralizing additives protects the engine from corrosion.

## TYPICAL CHARACTERISTICS

Properties	Test Methods	0W-40
Density @ 29.5°C, Kg/m3	ASTM D4052	0.850
Kinematic Viscosity @ 100°C cSt	ASTM D7042	13.51
Viscosity Index	ASTM D2270	176
Cold Cranking Viscosity at -35°C, mPa-s	ASTM D5293	4020
Borderline Pumping Viscosity at -40°C, mPa-s	ASTM D4684	12,320
Sulphated Ash, %	ASTM D874	0.82
Flash Point, COC, °C	ASTM D92	232
Foam Stability	ASTM D892	
Seq I		0/0
Seq II		0/0
Seq III		0/0
Pour Point, °C	ASTM D97	-54
Total Base Number, mg KOH/g	ASTM D2896B	8.60

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

## STORAGE

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# GLADIATOR SUV 5W-30

**FULLY SYNTHETIC  
ADVANCED ENGINE OIL  
SUVS & LIGHT TRUCKS**

**BULWARK GLADIATOR SUV** oil is fully synthetic, multi-grade oil specially designed for use in the latest generation of SUV, 4X4 and off-road light duty trucks running on diesel or petrol fuel. This product meets the requirements for offering fuel efficiency benefits and other additional protection in vehicles with high power output including turbocharged & supercharged engines.

**BULWARK GLADIATOR SUV SAE 5W-30** oil is manufactured using high-quality synthetic base stocks, and technologically advanced premium additive packages. Recommended for use in all-season operations, especially gasoline/diesel engines of SUVs from European, American, Japanese and other Asian manufacturers, which require oils with API SN, ACEA C3 performance levels and SAE 5W-30 viscosity. They can also be used in diesel engines fitted with Diesel Particulate Filters (DPF).

### PERFORMANCE LEVEL

- API SN
- ACEA C3
- Dexos 1

### KEY BENEFITS

- Improved fuel economy with excellent low-temperature capabilities.
- Maximum engine protection against wear in severe urban driving conditions.
- Excellent detergency/dispersant properties prevent formation of deposit.
- Optimized for engines operating under high-load and varying engine speeds.
- Lower oil consumption, maintains higher oil pressure leading to longer engine life.
- Excellent oxidation stability ensures lower deposits and protects against wear.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	5W-30
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.858
Kinematic Viscosity @ 100°C cSt	ASTM D7042	10.42
Viscosity Index	ASTM D2270	169
Cold Cranking Viscosity at -30°C, mPa-s	ASTM D5293	5260
Borderline Pumping Viscosity at -35°C, mPa-s	ASTM D4684	27,520
Sulphated Ash, %	ASTM D874	0.76
Flash Point, COC, °C	ASTM D92	236
Foam Stability	ASTM D892	
Seq I		0/0
Seq II		0/0
Seq III		0/0
Pour Point, °C	ASTM D97	-48
Total Base Number, mg KOH/g	ASTM D2896B	9.32

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# STORM S 5W-30, 5W-40

## SYNTHETIC PETROL ENGINE OIL

**BULWARK STORM S** oils are the latest generation multi-grade fully synthetic motor oils suitable for use in modern engines of passenger cars, pick-up and vans including turbocharged engines. The product is manufactured using premium quality synthetic base stocks and advanced technology additive packages to provide best in class anti-wear protection, improved cold start and superior all year-round performance.

**BULWARK STORM S 5W-30 and 5W-40** oils are recommended for use in gasoline engines of cars from Japanese, American and Korean automakers requiring API SN or SM, ACEA A3/B3, A3/B4 performance.

### PERFORMANCE LEVEL

- API SN/SM
- ACEA A3/B3, A3/B4
- MB 229.3
- VW 502.00/505.00
- RN 0700/0710

### KEY BENEFITS

- Good anti-oxidation & anti-corrosion properties provide greater protection to the engine components against wear in extreme operating conditions.
- Advanced formulation improves fuel economy.
- Enables easy cold start due to excellent low-temperature properties.
- Reduced high and low temperature deposits formation.
- Advanced acid neutralizing additives increases corrosion protection.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	5W-30	5W-40
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.857	0.859
Kinematic Viscosity @ 100°C cSt	ASTM D7042	10.82	14.12
Viscosity Index	ASTM D2270	162	172
Cold Cranking Viscosity at -30°C, mPa.s	ASTM D5293	5490	5890
Borderline Pumping Viscosity at -35°C, mPa.s	ASTM D4684	30,520	34,520
Sulphated Ash, %	ASTM D874	1.10	1.10
Flash Point, COC, °C	ASTM D92	232	242
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0
Pour Point, °C	ASTM D97	-42	-42
Total Base Number, mg KOH/g	ASTM D2896B	7.32	7.32

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### STORAGE

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# STORM ST 10W-30, 10W-40

## SYNTHETIC TECHNOLOGY PETROL ENGINE OIL

**BULWARK STORM ST** oils are multi-grade synthetic technology motor oils of the latest generation suitable for use in modern engines of passenger cars, light commercial trucks, sport cars and vans including turbocharged engines. The product is manufactured using a combination of premium quality synthetic and mineral base stocks and advanced technology additive packages to provide best in class anti-wear protection and improved cold start.

**BULWARK STORM ST 10W-30 and 10 W-40** oils are recommended for use in gasoline engines of cars from Japanese, American and Korean automakers requiring API SN or SM, ACEA A3/B3, A3/B4 performance level

### PERFORMANCE LEVEL

- API SN/SM;
- ACEA A3/B4
- MB 229.3, 229.5
- RN 0700/0710
- VW 502.00/505.00

### KEY BENEFITS

- Good anti-oxidation & anti-corrosion properties provide greater protection to the engine components against wear in extreme operating conditions.
- Enables easy cold start due to excellent low-temperature properties.
- Reduced high and low temperature deposits formation.
- Higher BN reserves and acid neutralizing additives increases corrosion protection.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-30	10W-40
Density @ 29.5°C, Kg/m3	ASTM D4052	0.857	0.858
Kinematic Viscosity @ 100°C cSt	ASTM D7042	10.62	14.72
Viscosity Index	ASTM D2270	165	169
Cold Cranking Viscosity at -25°C, mPa-s	ASTM D5293	5090	5360
Borderline Pumping Viscosity at -30°C, mPa-s	ASTM D4684	39,020	34,670
Sulphated Ash, %	ASTM D874	1.10	1.10
Flash Point, COC, °C	ASTM D92	234	238
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0
Pour Point, °C	ASTM D97	-42	-42
Total Base Number, mg KOH/g	ASTM D2896B	7.32	7.32

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### STORAGE

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# SUPRA 10W-30, 20W-50

## PREMIUM PETROL ENGINE OIL

**BULWARK SUPRA** oils are mainstream multi-grade mineral motor oils suitable for use in engines of passenger cars, light commercial trucks and vans including turbocharged engines. The product is manufactured using high quality mineral base stocks and advanced technology additive packages to provide the best anti-wear protection and all-round superior performance.

**BULWARK SUPRA 10W-30 and 20W-50** oils are recommended for use during all-season operations in gasoline engines of cars from Japanese, American and Korean manufacturers, where API SL performance is required.

### PERFORMANCE LEVEL

- API SL/CF

### KEY BENEFITS

- High antioxidation and better dispersant properties
- Low oil consumption.
- Minimizes wear and noise level (especially in older and worn engines) during extreme operational conditions.
- Excellent protection against corrosion.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-30	20W-50
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.878	0.885
Kinematic Viscosity @ 100°C cSt	ASTM D7042	10.25	18.50
Viscosity Index	ASTM D2270	136	127
Cold Cranking Viscosity, mPa-s	ASTM D5293	5190 at -25°C	8350 at -15°C
Borderline Pumping Viscosity, mPa-s	ASTM D4684	30,120 at -30°C	33,120 at -20°C
Sulphated Ash, %	ASTM D874	1.05	1.05
Flash Point, COC, °C	ASTM D92	232	248
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0
Pour Point, °C	ASTM D97	-42	-30
Total Base Number, mg KOH/g	ASTM D2896B	7.45	7.45

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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# MOTORCYCLE OILS (MCO)

# BLAZE S 4T 10W-40, 10W-50

## FULLY SYNTHETIC 4-STROKE MOTOR CYCLE OIL

**BULWARK BLAZE S 4T** oils are premium quality 4-stroke fully synthetic engine oils specifically designed for the new generation of premium motorcycles, scooters & mopeds. Blended with superior synthetic base stocks and high-performance additives to provide reliable protection for your engine by keeping it cooler, cleaner with improved and smoother clutch performance.

**BULWARK BLAZE S 4T SAE 10W-40 and 10W-50** oils are recommended for use in air and liquid cooled four-stroke motorcycle engines with combined engine and transmission units or separate gearboxes where a multi-grade fully synthetic 10W-40 or 10W-50, API SN and JASO MA2 performance levels are required.

### PERFORMANCE LEVEL

- API SN
- JASO MA2

### KEY BENEFITS

- High performance, long life oil hence reduced maintenance cost
- Better oxidation stability and detergency keeps engine cleaner
- Reduces engine heat, keeps it cooler helps reduce wear and extend engine life
- Provides smoother and better clutch performance
- Improved and better pick-up / acceleration

### TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-40	10W-50
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.858	0.853
Kinematic Viscosity @ 100°C cSt	ASTM D7042	14.12	18.12
Viscosity Index	ASTM D2270	169	179
Cold Cranking Viscosity at -25°C, mPa-s	ASTM D5293	5360	5060
Borderline Pumping Viscosity at -30°C, mPa-s	ASTM D4684	34,670	30,670
Sulphated Ash, %	ASTM D874	0.92	0.92
Flash Point, COC, °C	ASTM D92	238	252
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0
Pour Point, °C	ASTM D97	-42	-42
Total Base Number, mg KOH/g	ASTM D2896B	7.12	7.12

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# BLAZE ST 4T 10W-30

## SYNTHETIC TECHNOLOGY 4-STROKE MOTOR CYCLE OIL

**BULWARK BLAZE ST 4T** oils are premium quality 4-stroke synthetic technology blend engine oils specifically designed for the latest generation motorcycles, scooters & mopeds. They are blended using a combination of superior mineral and synthetic base stocks and high-performance additives to provide reliable protection to your engine by keeping it cooler, cleaner with improved and smoother clutch performance.

**BULWARK BLAZE ST 4T SAE 10W-30** oils is recommended for use in air and liquid cooled four-stroke motorcycle engines with combined engine and transmission units or separate gearboxes where a multi-grade synthetic technology API SN and JASO MB performance levels are required.

### PERFORMANCE LEVEL

- API SN
- JASO MB

### KEY BENEFITS

- Higher performance, longer oil life hence reduced maintenance cost
- Better oxidation stability and detergency keeps engine cleaner
- Reduces engine heat, keeps it cooler helps reduce wear and extend engine life
- Provides smoother and better clutch performance

### TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-30
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.857
Kinematic Viscosity @ 100°C cSt	ASTM D7042	10.62
Viscosity Index	ASTM D2270	165
Cold Cranking Viscosity at -25°C, mPa-s	ASTM D5293	5090
Borderline Pumping Viscosity at -30°C, mPa-s	ASTM D4684	39,020
Sulphated Ash, %	ASTM D874	0.82
Flash Point, COC, °C	ASTM D92	234
Foam Stability	ASTM D892	
Seq I		0/0
Seq II		0/0
Seq III		0/0
Pour Point, °C	ASTM D97	-42
Total Base Number, mg KOH/g	ASTM D2896B	7.52

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# BLAZE M 4T

## 10W-30, 20W-40, 20W-50

### PREMIUM 4-STROKE MOTOR CYCLE OIL

**BULWARK BLAZE M 4T** oils are high quality 4-stroke mineral engine oils specifically designed for motorcycles, scooters & mopeds. They are manufactured using superior hydrocracked mineral base stocks and high-performance additives to provide reliable protection to your engine by keeping it cooler, cleaner with smoother clutch performance.

**BULWARK BLAZE M 4T SAE 10W-30, 20W-40 and 20W-50** oils are recommended for use in air cooled four-stroke motorcycle engines with combined engine and transmission units where API SL and JASO MA performance levels are required.

#### PERFORMANCE LEVEL

- API SL
- JASO MA

#### KEY BENEFITS

- Better oxidation stability and detergency keeps engine cleaner
- Reduces engine heat, keeps it cooler and helps extending engine life
- Provides smoother and better clutch & engine performance

#### TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-30	20W-40	20W-50
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.878	0.882	0.885
Kinematic Viscosity @ 100°C cSt	ASTM D7042	10.98	14.50	18.50
Viscosity Index	ASTM D2270	145	132	137
Cold Cranking Viscosity	ASTM D5293	5890 at -25°C	7850 at -15°C	8350 at -15°C
Borderline Pumping Viscosity	ASTM D4684	32,010 at -30°C	30,120 at -20°C	33,120 at -20°C
Sulphated Ash, %	ASTM D874	1.05	1.05	1.05
Flash Point, COC, °C	ASTM D92	228	242	254
Foam Stability	ASTM D892			
Seq I		0/0	0/0	0/0
Seq II		0/0	0/0	0/0
Seq III		0/0	0/0	0/0
Pour Point, °C	ASTM D97	-42	-30	-30
Total Base Number, mg KOH/g	ASTM D2896B	7.50	7.50	7.50

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

#### STORAGE

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# COMMERCIAL VEHICLE OILS (CVO)



# HERCULES PREMIUM XLA 10W-30, 10W-40, 15W-40

**FULLY SYNTHETIC  
SUPER ULTRA HIGH PERFORMANCE  
DIESEL ENGINE OIL (SUHPD)**

**BULWARK HERCULES PREMIUM XLA** oil is fully synthetic, high performance, Super Ultra High-Performance Diesel engine oil (SUHPD) designed to meet latest ACEA requirements and more challenging OEM specifications for Euro 6 commercial diesel vehicles equipped with EGR, SCR & NOx reduction systems and with diesel particulate filters (DPF).

**BULWARK HERCULES PREMIUM XLA** products are manufactured using optimized combination of synthetic base oils with premium additives to provide proven & reliable long drain interval and all year-round performance. It is a low SAP oil recommended for use with Ultra Low Sulphur Diesel (ULSD) in turbo-charged high speed 4-stroke diesel engines deployed in off-highway and on-highway applications including mining & construction industry, where ACEA E9 & API CK-4 oils are specified.

## PERFORMANCE LEVEL

- API CK-4
- ACEA E9-16
- MB 228.31
- MTU Type 2.1
- CAT ECF-3; Cummins CES 20086
- Volvo VDS 4.5, Mack EOS 4. &, Renault RLD-3
- Detroit DDC93K222
- MAN M3775
- Deutz DQC III-10 LA

## KEY BENEFITS

- Lower maintenance costs from minimized piston crown deposits.
- Lower maintenance costs from minimized piston crown deposits.
- Lower multi-grade viscosities ensure improved oil circulation and reduced friction at start-up and maximum lubricity at higher operating temperatures.
- Excellent oxidation stability & BN retention ensure negligible oil degradation and improves oil service life in turn providing longer drain intervals.
- Lower oil consumption due to high shear stable VI improvers and low volatile synthetic base fluids.

## TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-30	10W-40	15W-40
Density @ 29.5°C, Kg/m3	ASTM D4052	0.854	0.860	0.877
Kinematic Viscosity @ 100°C cSt	ASTM D7042	10.67	14.12	14.5
Viscosity Index	ASTM D2270	145	161	142
Cold Cranking Viscosity at -25°C, mPa-s	ASTM D5293	5700	6080	5900'@-20° C
Borderline Pumping Viscosity at -30°C, mPa-s	ASTM D4684	24,800	27,800	26,500 @-15°
Sulphated Ash, %	ASTM D874	1.03	1.03	1.03
Flash Point, COC, °C	ASTM D92	228	246	238
Foam Stability	ASTM D892	-	-	-
Seq I		-	-	-
Seq II		-	-	-
Seq III		-	-	-
Pour Point, °C	ASTM D97	-42	-39	-36
Total Base Number, mg KOH/g	ASTM D2896B	10	10	10

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

## STORAGE

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# HERCULES PREMIUM LA 10W-40, 15W-40

## SYNTHETIC SUPER HIGH PERFORMANCE DIESEL ENGINE OIL (SHPD)

**BULWARK HERCULES PREMIUM LA** oils are fully synthetic, Super High-Performance Diesel engine oils (SHPD) designed to meet latest ACEA requirements and more challenging OEM specifications for Euro 6 commercial diesel vehicles equipped with EGR, SCR & NOx reduction systems and with diesel particulate filters (DPF).

**BULWARK HERCULES PREMIUM LA 10W-40 and 15W-40** are manufactured using optimized combination of synthetic base oils with premium additives to provide proven & reliable long drain interval and all year-round performance. Recommended for use with Ultra Low Sulphur Diesel (ULSD) in turbo-charged high speed 4-stroke diesel engines deployed in off-highway and on-highway applications including the mining & construction industry, where ACEA E9 & API CJ-4 oils are specified.

### PERFORMANCE LEVEL

- API CJ-4
- ACEA E9-16
- API SN
- MB 228.31
- MTU Type 2.1
- CAT ECF-3
- Cummins CES 20081
- Volvo VDS 4, Mack EO -O PP &, Renault RLD-3
- Detroit DDC93K218
- Deutz DQC III-10 LA

### KEY BENEFITS

- Lower maintenance costs from minimized piston crown deposits.
- Low viscosity ensures improved oil circulation and reduced friction at start-up and maximum lubricity at higher operating temperatures.
- Excellent oxidation stability & BN retention ensure negligible oil degradation and improves oil service life in turn providing Longer drain intervals.
- Lower oil consumption due to high shear stable VI improvers and low volatile synthetic base fluids.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-40	15W-40
Density @ 29.5°C, Kg/m3	ASTM D4052	0.862	0.871
Kinematic Viscosity @ 100°C cSt	ASTM D7042	14.12	14.52
Viscosity Index	ASTM D2270	159	144
Cold Cranking Viscosity, mPa-s	ASTM D5293	4080 at -25°C	5810 at -20°C
Borderline Pumping Viscosity, mPa-s	ASTM D4684	24,800 at -30°C	27,800 at -25°C
Sulphated Ash, %	ASTM D874	0.72	0.72
Flash Point, COC, °C	ASTM D92	246	242
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0
Pour Point, °C	ASTM D97	-42	-39
Total Base Number, mg KOH/g	ASTM D2896B	7.85	7.85

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# HERCULES LD 10W-40

**SYNTHETIC TECHNOLOGY  
LONG DRAIN  
DIESEL ENGINE OIL**

**BULWARK HERCULES** oils are synthetic blend, long drain Super High-Performance Diesel engine oils (SHPD) designed to meet latest ACEA requirements and more challenging OEM specifications for Euro 4 & 5 compliant diesel vehicle equipped with EGR, SCR & NOx reduction systems. Not recommended for engines with diesel particulate filters (DPF).

**BULWARK HERCULES LONG DRAIN 10W-40** is manufactured using optimized combination of synthetic and mineral base oil with premium additives to provide proven & reliable long drain interval and all year-round performance. Recommended for use in naturally aspirated and turbo-charged high speed 4-stroke diesel engines deployed in off-highway and on-highway applications including the mining & construction industry, where ACEA E4, E7 & API CI-4 oils are specified.

## PERFORMANCE LEVEL

- API CI-4
- ACEA E4, E7-12
- MB 228.5
- MAN M3277, 3377
- VOLVO VDS-3; RENAULT RLD-2
- MTU TYPE 3
- Cummins CES 20077/78
- JASO DH-1; GLOBAL DHD-1

## KEY BENEFITS

- Lower maintenance costs from minimized piston crown deposits and prevents damage to bore.
- SAE 10W-40 multi-grade viscosity ensures improved oil circulation and reduced friction at start-up and maximum lubricity at higher operating temperatures.
- Excellent oxidation stability & BN reserves ensure negligible oil degradation and improves oil service life in turn providing Longer drain intervals.
- Lower oil consumption due to high shear stable VI improvers and low volatile synthetic base fluids.

## TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-40
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.859
Kinematic Viscosity @ 100°C cSt	ASTM D7042	13.90
Viscosity Index	ASTM D2270	162
Cold Cranking Viscosity at -25°C, mPa-s	ASTM D5293	5180
Borderline Pumping Viscosity at -30°C, mPa-s	ASTM D4684	27,800
Sulphated Ash, %	ASTM D874	1.38
Flash Point, COC, °C	ASTM D92	242
Foam Stability	ASTM D892	
Seq I		0/0
Seq II		0/0
Seq III		0/0
Pour Point, °C	ASTM D97	-42
Total Base Number, mg KOH/g	ASTM D2896B	12.85

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

## STORAGE

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# HERCULES HD 15W-40, 20W-50

## PREMIUM HEAVY-DUTY DIESEL ENGINE OIL (HDDEO)

**BULWARK HERCULES HD** oils are high performance, heavy duty multi-grade mineral diesel engine oils of the latest generation. They are specifically designed to lubricate a wide range of diesel engines equipped with EGR, SCR & NO<sub>x</sub> reduction systems requiring API CI-4 or ACEA E7 performance requirements and more challenging OEM specifications.

**BULWARK HERCULES HD 15W-40 and 20W-50** are manufactured using premium hydrocracked mineral base stocks and high-performance additives to provide reliable and superior all year-round performance. It is recommended for use in naturally aspirated and turbo-charged high speed 4-stroke diesel engines without diesel particulate filters (DPF) deployed in commercial road transport and off highway applications, where standard drain interval API CI-4 oils are specified.

### PERFORMANCE LEVEL

- API CI-4, CH-4/SL
- ACEA E7
- MB 228.3
- MAN M3275-1
- MTU TYPE 2
- VOLVO VDS-3; RENAULT RLD-2
- CUMMINS CES 20077/78
- JASO DH-1; GLOBAL DHD-1

### KEY BENEFITS

- High performance hydrocracked base oil and balanced metallic detergent/dispersant additive reduces maintenance costs and maintain excellent engine cleanliness in all service conditions.
- Improved BN reserves and acid neutralizing additives supports use of diesel with varying Sulphur content and provides optimum engine protection.
- Preserves the oil performance and stays in grade till the end of service life as a result of excellent and optimized combination of additive & shear stable VI Improver.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	15W-40	20W-50
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.878	0.884
Kinematic Viscosity @ 100°C cSt	ASTM D7042	14.52	18.72
Viscosity Index	ASTM D2270	142	132
Cold Cranking Viscosity at -20°C, mPa-s	ASTM D5293	6480	7200@-15° C
Borderline Pumping Viscosity at -25°C, mPa-s	ASTM D4684	28,800	33,740@-20° C
Sulphated Ash, %	ASTM D874	1.20	1.20
Flash Point, COC, °C	ASTM D92	236	248
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0
Pour Point, °C	ASTM D97	-39	-30
Total Base Number, mg KOH/g	ASTM D2896B	10.35	10.35

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# HERCULES MULTI 15W-40, 20W-50

## MULTI-GRADE DIESEL ENGINE OIL

**BULWARK HERCULES MULTI** series oils are superior multi-grade diesel engine oils specially designed to lubricate a wide range of 4-stroke naturally aspirated and turbocharged diesel engines requiring API CF-4 or lower performance requirements usually older fleet of light, medium and heavy-duty commercial vehicles.

**BULWARK HERCULES MULTI 15W-40 and 20W-50** are manufactured using superior hydrocracked mineral base stocks and high-performance additives to provide excellent anti-oxidation, anti-wear properties and reliable all year-round performance. Recommended for use in older generation diesel engines which are widely used on road transport and off-road equipment.

### PERFORMANCE LEVEL

- API CF-4, CF
- MB 228.1

### KEY BENEFITS

- High anti-oxidation and dispersant properties
- Reduced oil consumption, wear and noise level (in older high mileage and worn engines) during severe operation conditions.
- Excellent protection against wear & corrosion.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	15W-40	20W-50
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.889	0.892
Kinematic Viscosity @ 100°C cSt	ASTM D7042	14.72	18.90
Viscosity Index	ASTM D2270	136	127
Cold Cranking Viscosity, mPa-s	ASTM D5293	6400 at -20°C	8850 at -15°C
Borderline Pumping Viscosity, mPa-s	ASTM D4684	27,800 at -25°C	42,800 at -20°C
Sulphated Ash, %	ASTM D874	1.30	1.30
Flash Point, COC, °C	ASTM D92	236	252
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0
Pour Point, °C	ASTM D97	-36	-27
Total Base Number, mg KOH/g	ASTM D2896B	10.1	10.1

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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# HERCULES MONO SAE 40, SAE 50

## MONO-GRADE DIESEL ENGINE OIL

**BULWARK HERCULES MONO** series oils are superior mono-grade diesel engine oils specially designed to lubricate a wide range of 4-stroke naturally aspirated diesel engines requiring API CF-4 or lower performance requirements usually older fleet of light, medium and heavy-duty commercial vehicles.

**BULWARK HERCULES MONO SAE 40 and SAE 50** are manufactured using superior paraffinic mineral base oils and high-performance additives to provide excellent anti-oxidation, anti-wear properties and reliable all year-round performance. Recommended for use in diesel engines which are widely used on road transport and off-road equipment, where mono grade lubricants are required.

### PERFORMANCE LEVEL

- API CF-4, CF-2, CF
- MB 228.1

### KEY BENEFITS

- High anti-oxidation and dispersant properties
- Reduced oil consumption, wear and noise level (in older high mileage and worn engines) during severe operation conditions.
- Excellent protection against wear & corrosion.
- Higher viscosity base oils help maintain oil pressure at all driving conditions.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	40	50
Density @ 29.5 °C, Kg/m <sup>3</sup>	ASTM D4052	0.894	0.898
Kinematic Viscosity @ 100°C cSt	ASTM D7042	15.50	19.50
Viscosity Index	ASTM D2270	97	95
Sulphated Ash, %	ASTM D874	1.40	1.40
Flash Point, COC, °C	ASTM D92	248	260
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0
Pour Point, °C	ASTM D97	-18	-15
Total Base Number, mg KOH/g	ASTM D2896B	12.0	12.0

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### STORAGE

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# TRACTOR OIL 15W-40

## SUPER TRACTOR OIL UNIVERSAL (STOU)

**BULWARK TRACTOR OILS** are superior multi-grade multi-function oils specifically designed to lubricate most parts (engines included - up to API CG-4) on farm machinery - especially the tractors from most manufacturers requiring STOU (Super Tractor Oil Universal) Oils.

**BULWARK TRACTOR OIL SAE 15W-40** is suitable to use on most farm equipment – gasoline and diesel engines, transmission, clutch units, wet brakes, hydraulic systems, mechanical final drives and power take-offs especially on tractors. It has improved extreme pressure properties which provide superior protection against wear. Resistance to oxidation and thermal degradation is outstanding and ensures protection against sludge and varnish deposits & resists foaming. It also performs well in 4WD manual transmissions. However, it is not suitable for use on equipment with heavily loaded drives where the manufacturers specify EP oils of API GL-5.

### PERFORMANCE LEVEL

- API CG-4,
- API GL-4
- CATERPILLAR: TO-2

### KEY BENEFITS

- Anti-wear protection & multi-grade performance - suitable for all year use
- Higher detergency and excellent dispersant properties keep the engine cleaner and free from sludge's and deposits in severe applications
- Special friction modifier component allows smooth operation minimizes squawk and chatter in wet brake systems and PTOs
- Reduces wear of gears, pumps and hydraulic valves
- High level of oxidation resistance and lubricant stability ensures longer oil life
- Provides efficient engagement of power take off clutches, thereby minimizing wear
- Excellent protection against corrosion & rust formation

### TYPICAL CHARACTERISTICS

Properties	Test Methods	15W-40
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.878
Kinematic Viscosity @ 100°C cSt	ASTM D7042	14.30
Viscosity Index	ASTM D2270	139
Cold Cranking Viscosity at -20°C, mPa-s	ASTM D5293	5300
Sulphated Ash, %	ASTM D874	1.30
Flash Point, COC, °C	ASTM D92	232
Foam Stability	ASTM D892	
Seq I		0/0
Seq II		0/0
Seq III		0/0
Pour Point, °C	ASTM D97	-39
Total Base Number, mg KOH/g	ASTM D2896B	10.70

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# ANCILLARIES

(TRANSMISSION OILS, HYDRAULICS,  
GREASES, COOLANTS)



# ATF IID

## AUTOMATIC TRANSMISSION FLUID

**BULWARK ATF IID** lubricants are Synthetic Technology, Automatic Transmission Fluids (ATF) designed for use in automatic or semi-automatic transmissions and torque converters of passenger cars, light commercial vehicles, industrial vehicles and other applications, where the manufacturer recommends use of an ATF with GM DEXRON - IID performance level.

**BULWARK ATF IID** is suitable for use in manual gear boxes where an ATF fluid is recommended. It is also suitable for use in hydrostatic transmissions, power steering, hydraulic systems when a fluid type GM DEXRON - IID is required.

### PERFORMANCE LEVEL

- GM DEXRON® IID
- FORD MERCON
- ALLISON C-4
- CAT TO-2

### KEY BENEFITS

- High viscosity index and excellent viscosity retention in operation.
- Excellent thermal stability and resistance to oxidation.
- Excellent pour point.
- Provides smoother and improved gear shifting

### TYPICAL CHARACTERISTICS

Properties	Test Methods	II D
Density @ 15 °C Kg/m <sup>3</sup>	ASTM D4052	0.867
Kinematic Viscosity @ 100°C cSt	ASTM D7042	7.25
Viscosity Index	ASTM D2270	165
Pour Point, °C	ASTM D97	-39
Flash Point, COC, °C	ASTM D92	206
Foam Stability	ASTM D892	
Seq I		0/0
Seq II		0/0
Seq III		0/0
Color ASTM	ASTM D1500	L7.5
Color Appearance		Red
Brookfield Viscosity at -40 °C, mPa·s	ASTM D2983	24,000

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# ATF IIIH

## SYNTHETIC AUTOMATIC TRANSMISSION FLUID

**BULWARK ATF IIIH** lubricants are Synthetic Automatic Transmission Fluids manufactured using high quality synthetic base oils and special additives that limit oil degradation caused by high operating temperatures while providing extended life to fluid and transmission components.

**BULWARK ATF IIIH** is designed for use in modern automatic transmission and power transmission systems where GM Dexron® IIIH and Ford Mercon® fluids are specified or required.

**IMPORTANT NOTE:** This fluid is not recommended where a type F (Ford) lubricant is required, hence should not be used.

### PERFORMANCE LEVEL

- GM DEXRON® IIIH
- FORD MERCON
- ALLISON C-4
- ALLISON TES 389

### KEY BENEFITS

- High viscosity index and excellent viscosity retention in operation.
- Excellent thermal stability and resistance to oxidation.
- Excellent pour point.
- Provides smoother, improved gear shifting and enhanced clutch life.
- Contains anti-swelling properties that protects seals during high temperature
- Compatible with all seal material.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	III H
Density @ 15 °C Kg/m <sup>3</sup>	ASTM D4052	0.843
Kinematic Viscosity @ 100°C cSt	ASTM D7042	7.55
Viscosity Index	ASTM D2270	195
Pour Point, °C	ASTM D97	-54
Flash Point, COC, °C	ASTM D92	202
Foam Stability	ASTM D892	
Seq I	ASTM D892	0/0
Seq II		0/0
Seq III		0/0
Color ASTM	ASTM D1500	L7.5
Color Appearance		Red
Brookfield Viscosity at -40 °C, mPa·s	ASTM D2983	10,800

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### STORAGE

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# TRANSMISSION GL-5 75W-90

## SYNTHETIC PREMIUM MULTIGRADE TRANSMISSION OIL

**BULWARK TRANSMISSION GL-5** is a high-quality synthetic transmission oil designed for use in differentials, manual transmissions, axles, transfer cases and other automotive gear boxes. It is blended with high quality synthetic base oils providing outstanding gear synchronizing and lubrication of bearings together with excellent extreme pressure and cold flow properties.

**BULWARK TRANSMISSION GL-5 75W-90** multi-grade synthetic gear lubricant is suitable for use in transmission systems of passenger cars, light, medium and heavy commercial vehicles operating under wide range of temperature and operating conditions requiring the use of synthetic, 75W-90, API GL-5 gear oils.

**IMPORTANT NOTE:** This oil is not recommended for use in manual gearboxes with brass synchronizers.

### PERFORMANCE LEVEL

- API GL-5 / MT-I
- MAN 342 M2 (160,000 Km)
- ZF TE-ML 05A, 7A, 12E, 16B-D, 17B, 19B

### KEY BENEFITS

- Trouble-free performance
- Increased load-carrying capability with outstanding protection against low-speed/high torque wear.
- Excellent thermal and oxidation stability helps extend gear and bearing life.
- Excellent rust and corrosion protection help reduce wear and prolongs component life.
- Good anti-foam characteristics maintain film-strength for reliable lubrication at varying speeds.
- Provides excellent low temperature protection.
- Enhanced friction reduction properties improve fuel economy.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	75W-90
Density @ 15 °C Kg/m <sup>3</sup>	ASTM D4052	0.857
Kinematic Viscosity @ 100°C cSt	ASTM D7042	15.10
Viscosity Index	ASTM D2270	180
Pour Point, °C	ASTM D97	-54
Flash Point, COC, °C	ASTM D92	228
Foam Stability	ASTM D892	
Seq I		0/0
Seq II		0/0
Seq III		0/0
Brookfield Viscosity at -54 °C, mPa·s	ASTM D2983	40,800

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# TRANSMISSION GL-5 80W-90, 85W-140

## PREMIUM MULTI-GRADE TRANSMISSION OIL

**BULWARK TRANSMISSION GL-5** is a series of high-quality multi-grade transmission oils designed for use in differentials, manual transmissions and other automotive gear boxes. They are blended with high quality mineral paraffinic base oils providing outstanding gear protection and lubrication of bearings together with excellent extreme pressure and good cold flow properties.

**BULWARK TRANSMISSION GL-5 80W-90 and 85W-140** are superior multi-grade mineral gear lubricants designed to use in drive axles of passenger cars, light, medium and heavy commercial vehicles operating under wide range of temperature and operating conditions. Not recommended for use in manual gearboxes with brass synchronizers.

### PERFORMANCE LEVEL

- API GL-5
- ZF TE-ML 05A, 7A, 12E, 16B-D, 17B, 19B, 21A

### KEY BENEFITS

- Trouble-free performance.
- Increased load-carrying capability with outstanding protection against low-speed/high torque wear.
- Excellent thermal and oxidation stability helps extend gear and bearing life.
- Excellent rust and corrosion protection help reduce wear and prolongs component life.
- Good anti-foam characteristics maintain film-strength for reliable lubrication at varying speeds.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	80W-90	85W-140
Density @ 15 °C Kg/m <sup>3</sup>	ASTM D4052	0.887	0.898
Kinematic Viscosity @ 100°C cSt	ASTM D7042	15.50	25.70
Viscosity Index	ASTM D2270	101	97
Pour Point, °C	ASTM D97	-33	-27
Flash Point, COC, °C	ASTM D92	232	244
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0
Brookfield Viscosity, mPa·s	ASTM D2983	84,000 at -26°C	98,000 at -12 °C

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# TRANSMISSION GL-4 90 EP, 140 EP

## MONO-GRADE TRANSMISSION OIL

**BULWARK TRANSMISSION GL-4** is a series of high-quality mono-grade transmission oils designed for use in differentials, manual transmissions and other automotive gear boxes. They are blended with high quality mineral paraffinic base oils providing outstanding gear protection and lubrication of bearings together with excellent extreme pressure properties.

**BULWARK TRANSMISSION GL-4 90 EP and 140 EP** oils are high quality mineral paraffinic gear lubricants designed to use in drive axles of passenger cars, light, medium and heavy commercial vehicles requiring the use of API GL-4 performance.

### PERFORMANCE LEVEL

- API GL-4

### KEY BENEFITS

- Trouble-free performance
- Increased load-carrying capability with outstanding protection.
- Excellent thermal and oxidation stability helps extend gear and bearing life.
- Excellent rust and corrosion protection help reduce wear and prolongs component life.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	90 EP	140 EP
Density @ 15 ° Kg/m3	ASTM D4052	0.890	0.903
Kinematic Viscosity @ 100°C cSt	ASTM D7042	16.14	26.50
Viscosity Index	ASTM D2270	96	95
Pour Point, °C	ASTM D97	-15	-15
Flash Point, COC, °C	ASTM D92	236	250
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# UTTO

## UNIVERSAL TRACTOR TRANSMISSION OIL

**BULWARK UNIVERSAL TRACTOR TRANSMISSION OIL (UTTO)** is a modern-day transmission oil for the latest generation of tractors, off-highway and construction equipment. In the new age of clean running, low emissions, ad blue, low saps and low ash, technology has caused the transmission oil and engine oil to be separated unlike in the olden days, where one oil - Super Tractor Oil Universal (STOU) - was used for all applications on tractors and off-highway equipment including as an engine oil.

**BULWARK UNIVERSAL TRACTOR TRANSMISSION OIL** is designed to lubricate transmissions, differentials, final-drive planetary gears, wet-brakes and hydraulic systems of tractors, off-highway and construction equipment. This oil also boasts of long drain and high work-hour oil change intervals.

**IMPORTANT NOTE:** UTTO doesn't meet the specifications required for modern engine oils, hence this product is not recommended to be used as engine oil.

### PERFORMANCE LEVEL

- API GL-4
- CAT TO-4
- Allison C-4

### KEY BENEFITS

- Specially formulated for agricultural use, suitable for low speed/high torque
- Superior dispersant properties keep the gearbox, differential, and hydraulic system clean and in good condition
- Special extreme pressure additives protects the driveline components.
- Suitable for lubrication of gearbox, differential, hydraulic system and wet brakes in farm equipments.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	10W	30	50
Density @ 15 °C Kg/m <sup>3</sup>	ASTM D4052	0.867	0.880	0.889
Kinematic Viscosity @ 100 °C cSt	ASTM D7042	6.50	10.50	18.50
Viscosity Index	ASTM D2270	104	96	95
Pour Point, °C	ASTM D97	-39	-18	-15
Flash Point, COC, °C	ASTM D92	218	234	256
Foam Stability	ASTM D892			
Seq I		0/0	0/0	0/0
Seq II		0/0	0/0	0/0
Seq III		0/0	0/0	0/0
Brookfield Viscosity mPa·s	ASTM D2983	34,000 at -40 °C,	–	–
Total Base Number, mg KOH/g	ASTM D2896B	8.00	8.00	8.00

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### STORAGE

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# HYDRAULIC AW 32, 46, 68, 100

## PREMIUM ANTI-WEAR HYDRAULIC OIL

**BULWARK HYDRAULIC AW** series is formulated with highly refined paraffinic base oils and provide excellent anti-wear protection, oxidation, corrosion inhibition and demulsibility, as well as aeration and foam suppression. In general, hydraulic systems due to the nature of their operation, experience accelerated wear and need to be protected by super clean, high quality anti-wear hydraulic oils.

**BULWARK HYDRAULIC AW** are high quality, anti-wear fluids available in ISO VG 32, 46, 68 and 100 and recommended for use on applications such as hydraulic systems with vane, piston or gear-type pumps, especially where typical pressure range at source exceeds 700psi. They can also be used to lubricate lightly loaded reciprocating compressors.

### PERFORMANCE LEVEL

- DIN 51524-2
- ISO 11158 L-HM, HV
- ASTM D 6158 HM, HV
- Eaton-Vickers 35VQ25A for M-2950-S (Mobile) and I-286-S (Stationary),
- Parker Hannifin (Denison) HF-0, HF-1, HF-2.
- Cincinnati Machine P-68, P-69, P-70.
- AFNOR NF E 48-603 HM, HV

### KEY BENEFITS

- All BULWARK hydraulic grades meet the requirements of leading hydraulic system manufacturers
- Excellent oxidation stability provides good service life in high pressure service.
- Excellent protection against corrosion of both copper and steel
- Minimum viscosity change over a wide temperature range.
- The special foam suppressant minimizes both foaming and aeration problems.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	32	46	68	100
Specific Gravity @ 15 °C	ASTM D4052	0.881	0.882	0.886	0.889
Kinematic Viscosity @ 40 °C cSt	ASTM D445	31.50	46.00	65.10	98.70
Viscosity Index	ASTM D2270	124	124	122	120
Flash Point, COC, °C	ASTM D92	226	228	234	246
Pour Point, °C	ASTM D97	-33	-30	-30	-27
TAN mg KOH/g	ASTM D974	0.42	0.42	0.42	0.42
Foaming Tendency/Foam Stability	ASTM D892				
Seg I		0/0	0/0	0/0	0/0
Seg II		0/0	0/0	0/0	0/0
Seg III		0/0	0/0	0/0	0/0
Color	ASTM D1500	L1.0	L1.5	L2.0	L2.5
Oxidation (TOST)	ASTM D943	>3000	>2500	>2500	>2000

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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# HYDRAULIC ST 32, 46, 68, 100

## STANDARD ANTI-WEAR HYDRAULIC OIL

**BULWARK HYDRAULIC ST** series is formulated with paraffinic base oils and provide anti-wear protection, oxidation, corrosion inhibition and demulsibility.

**BULWARK HYDRAULIC ST** are high quality, anti-wear fluids available in ISO VG 32, 46, 68 and 100 and recommended for use in light and medium duty automotive & industrial applications. They can also be used in light loaded reciprocating compressors and in gearboxes where non-EP lubricants are required.

### PERFORMANCE LEVEL

- DIN 51524
- ISO 11158 L-HM
- ASTM D 6158 HM

### KEY BENEFITS

- Good oxidation stability provides good service life in high pressure service.
- Excellent protection against corrosion of both copper and steel
- Minimum viscosity changes over a wide temperature range.
- The special foam suppressant minimizes both foaming and aeration problems.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	32	46	68	100
Specific Gravity @ 15 °C	ASTM D4052	0.884	0.886	0.889	0.892
Kinematic Viscosity @ 40 °C cSt	ASTM D445	32.0	45.40	66.90	99.30
Viscosity Index	ASTM D2270	96	95	95	95
Flash Point, COC, °C	ASTM D92	218	224	226	236
Pour Point, °C	ASTM D97	-24	-18	-18	-15
TAN mg KOH/g	ASTM D974	0.62	0.62	0.62	0.62
Foaming Tendency/Foam Stability	ASTM D892				
Seg I		0/0	0/0	0/0	0/0
Seg II		0/0	0/0	0/0	0/0
Seg III		0/0	0/0	0/0	0/0
Color	ASTM D1500	L1.5	1.5	L2.0	L2.5
Oxidation (TOST)	ASTM D943	>1200	>1200	>1200	>1200

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# GREASE MP 2,3

## LITHIUM - MULTI-PURPOSE

**BULWARK GREASE MP** series is multi-purpose, light duty lithium greases produced from paraffinic base oils, lithium thickener and oxidation & corrosion inhibitors for use in automotive and industrial applications where mild EP or Non-EP greases are required. They come in two consistencies – NLGI 2 and NLGI 3.

**BULWARK GREASE MP** series is recommended for use in general bearings, shaft joints, ball joints, water pump bearings and similar other applications. They can be used with normal operating temperature up to 100°C

### PERFORMANCE LEVEL

- DIN KP2K-10 , KP3K-10
- ISO L-XCCHB 2, L-XCCHB 3

### KEY BENEFITS

- Resistance to water wash out, retain grease in place in wet environments
- Protect metal surface from rust and corrosion in moist environments.
- Prevent dust and dirt from reaching into the moving parts.
- Good oxidation and thermal stability.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	MP2	MP3
Consistency	NLGI	2	3
Thickener Type		Lithium	Lithium
Color	Visual	Amber	Amber
Operating Temperature, °C		10 to 100	10 to 100
Worked Penetration at 25°C, 1/10 mm	ASTM D217	265-295	220-250
Dropping Point, °C	ASTM D566	190	190
Base Oil Viscosity at 40 °C, cSt	ASTM D445	180	180
Copper Strip Corrosion, 24h, 100°C	ASTM D4048	2a	2a
4-Ball, Scar Dia, mm	ASTM D2266	0.65	0.65

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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# GREASE EP 2,3

## LITHIUM - EXTREME PRESSURE

**BULWARK GREASE EP** series is a multi-purpose, extreme pressure grease produced from high quality paraffinic base oils and specialty lithium thickener. These greases are fortified with high performance additives for improving performance and operating under severe friction conditions.

**BULWARK GREASE EP** series is recommended for use in automotive, industrial and mining applications such as rolling and sliding bearings, hub bearings and lubrication of the components made of non-ferrous metals, wheel bearings, shaft joints, ball joints, water pump bearings and other applications where use of NLGI #2 or NLGI #3 class of lubricant with EP properties is recommended.

**BULWARK GREASE EP** series have good tribological features and can operate within a wide temperature service range from -10 °C to +120 °C under varying loads, and while in contact with water and wet environment conditions. These greases are formulated to provide good thermal and structure stability during use or in storage, hence have soft consistency and smooth structure.

### PERFORMANCE LEVEL

- DIN KP2K-10 , KP3K-10
- ISO L-CCCHB 2, L-CCCHB 3

### KEY BENEFITS

- Prevents sticking and seizure of components.
- Protect metal surface from rust and corrosion in moist environments.
- Excellent EP properties extend service life.
- Good anti-corrosion properties, resistance to water wash out, retain grease in place in wet environments.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	EP 2	EP 3
Consistency	NLGI	2	3
Thickener Type		Lithium	Lithium
Color	Visual	Straw Brown	Straw Brown
Operating Temperature, °C		-10 to +120	-10 to +120
Worked Penetration at 25°C, 1/10 mm	ASTM D217	265-295	220-250
Dropping Point, °C	ASTM D566	>200	>200
Base Oil Viscosity at 40 °C, cSt	ASTM D445	180	180
Copper Strip Corrosion, 24h, 100°C	ASTM D4048	1b	1b
4-Ball, Scar Dia, mm	ASTM D2266	0.45	0.45
4-Ball, Weld Load, Kg	ASTM D2596	250	250

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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# GREASE HT 2,3

## LITHIUM COMPLEX - HIGH TEMPERATURE

**BULWARK GREASE HT** series is a high temperature, multi-purpose EP grease based on complex lithium soap, highly refined mineral oil offering good stability to oxidation. These greases contain high-performance, Anti-wear (AW), extreme pressure (EP), anti-corrosion and anti-oxidation additives. Along with their excellent tribological features, they can operate under heavy mechanical loads and even while in frequent contact with water.

**BULWARK GREASE HT** is recommended to use in wheel bearings of the passenger and commercial vehicles, bearings of industrial fans, electric motors, couplings, clutches, shafts, compressors, pumps and other industrial equipment. Also suitable for use in centralized lubrication systems in construction, mining, lumbering, and agricultural machinery where use of HT grease with NLGI #2 or 3 class is recommended.

**BULWARK GREASE HT** service temperature ranges from -20 up to +160°C., comes in brown color and has moderate soft consistency and homogeneous structure. This grease can be applied manually with brush or spatula, as well as through individual lubrication system at the temperatures down to -20°C.

### PERFORMANCE LEVEL

- DIN KP2P-20 , KP3P-20
- ISO L-XCEHB 2, L-XCEHB 3

### KEY BENEFITS

- Excellent high-temperature properties with very good anti-corrosion properties.
- Excellent load carrying capacity at low temperatures.
- Resistance to shock and vibrational loads.
- High water resistance, excellent adhesion and long-term service life.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	HT2	HT3
Consistency	NLGI	2	3
Thickener Type		Lithium Complex	Lithium Complex
Color	Visual	D. Brown	D. Brown
Operating Temperature, °C		-20 to +160	-20 to +160
Worked Penetration at 25°C, 1/10 mm	ASTM D217	265-295	220-250
Dropping Point, °C	ASTM D2265	>250	>250
Base Oil Viscosity at 40 °C, cSt	ASTM D566	200	200
Copper Strip Corrosion, 24h, 100°C	ASTM D4048	1b	1b
4-Ball, Scar Dia, mm	ASTM D2266	0.35	0.35
4-Ball, Weld Load, Rgf	ASTM D2596	400	400

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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# BRAKE FLUID DOT 3

## BRAKE & CLUTCH FLUID

**BULWARK BRAKE FLUID DOT 3** is a superior quality glycol ether-based fluid with advanced corrosion inhibitors suitable for use in disc and drum brakes and hydraulic clutch systems where a non-petroleum-based DOT 3 fluid is specified and provides extended service life. It is not recommended where DOT 4, Super DOT 4 or DOT 5 brake fluids are specified.

### DIRECTIONS TO USE

The brake fluid is hygroscopic and must be stored in tightly sealed containers. After removal of brake fluid, the containers must be closed immediately. BULWARK BRAKEFLUID DOT 3 has a shelf life of at least three years when stored in original closed, airtight containers at temperatures of maximum 40 °C.

### PERFORMANCE LEVEL

- SAE J 1703
- FMVSS 116 DOT 3

### KEY BENEFITS

- Product contains multi-metal corrosion inhibitors which gives engine excellent protection for ferrous & non-ferrous metals.
- Universal use, widely compatible with other DOT 3 brake fluids.
- Provides extended service life.
- Minimal swelling of rubber components.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	DOT 3
Appearance	Visual	Clear & Bright
Density @ 29.5°C	ASTM D 4052	1.018
Viscosity @ 100°C, cSt	ASTM D 445	2.0
Viscosity @ 40°C, cSt	ASTM D 445	1275
WERBP, °C	ASTM D 1120	148
Boiling Point, °C	ASTM D 1120	255

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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# BRAKE FLUID DOT 4

## BRAKE & CLUTCH FLUID

**BULWARK BRAKE FLUID DOT 4** is a premium quality glycol ether & borate ester-based fluid with advanced corrosion inhibitors recommended for use in brake systems specifically for modern braking systems with electronic control systems such as combined with ABS, ASC and ESP/DSC. Its Low viscosity and higher boiling point provide better braking efficiency.

### DIRECTIONS TO USE

The brake fluid is hygroscopic and must be stored in tightly sealed containers. After removal of brake fluid, the containers must be closed immediately. **BULWARK BRAKEFLUID DOT 4** has a shelf life of at least three years when stored in original closed, airtight containers at temperatures of maximum 40 °C.

### PERFORMANCE LEVEL

- SAE J 1704, 1703
- FMVSS 116 DOT 4

### KEY BENEFITS

- Extremely low viscosity at low temperatures
- Product contains multi-metal corrosion inhibitors which gives engine excellent protection for ferrous & non-ferrous metals.
- Compatible with other DOT 4 brake fluids.
- Exceptional lubricity performance and thermal stability provides extended service life.
- Superior elastomer compatibility.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	DOT 4
Appearance	Visual	Clear & Bright
Density @ 29.5°C	ASTM D 4052	1.07
Viscosity @ 100°C, cSt	ASTM D 445	2.0
Viscosity @ 40°C, cSt	ASTM D 445	1100
WERBP, °C	ASTM D 1120	160
Boiling Point, °C	ASTM D 1120	265
Flash Point, °C	ASTM D 92	124

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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# COOLANT 30

**STANDARD ENGINE COOLANT  
PRE-DILUTED - READY TO POUR  
DO NOT ADD WATER**

**BULWARK COOLANTS** are premium quality, long-life performance cooling agents for the cooling system. They are designed with Ethylene Glycol, highly de-ionized water and contains multi-metal corrosion inhibitors which gives engine excellent protection against rust and corrosion. They protect against freezing, overheating, cavitation and provide extended service life.

**BULWARK COOLANT 30** is recommended for round the year use in cooling systems of Cars, Trucks, LCV'S, Tractors Earthmovers and stationary engines. Its anti-rust, anti-corrosion additive components developed to meet the requirements of modern gasoline and light duty diesel engines provide corrosion protection to all the engine components and minimizes the engine damage by raising the boiling point of diluted coolant.

### DIRECTIONS TO USE

This product is a ready to use pre-mixed fluid hence should not be diluted further with water. It is recommended to top up with same pre-mixed coolant, in extreme emergency refilling the radiator by adding equal amounts of distilled or demineralized water to the concentrate is possible.

Available in Premix 30% and Premix 50% variants and in 4L, 5L and 205L Drums

### PERFORMANCE LEVEL

- JIS K 2234
- ASTM D3306

### KEY BENEFITS

- Product contains multi-metal corrosion inhibitors which gives engine excellent protection against rust and corrosion.
- Protects against freezing, overheating and cavitation.
- Provides extended service lite

### TYPICAL CHARACTERISTICS

Properties	Test Methods	30%
COLOR		GREEN
Density @15°C	ASTM D4052	1.031
Boiling Point, °C (Undiluted)	ASTM D1120	106
Freezing Point, °C	ASTM D3321	-20
Reserve Alkalinity	ASTM D1121	6.5
Ph vol. % in water		8.2

PS: The above information is typical data and an indication based on current production.It does not constitute a specification.

### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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# COOLANT 50

**PREMIUM ENGINE COOLANT  
PRE-DILUTED - READY TO POUR  
DO NOT ADD WATER**

**BULWARK COOLANTS** are premium quality, long-life performance cooling agents for the cooling system. They are designed with Ethylene Glycol, highly de-ionized water and contains multi-metal corrosion inhibitors which gives engine excellent protection against rust and corrosion. They protect against freezing, overheating, cavitation and provide extended service life.

**BULWARK COOLANT 50** is recommended for round the year use in cooling systems of Cars, Trucks, LCV'S, Tractors Earthmovers and stationary engines. Its anti-rust, anti-corrosion additive components developed to meet the requirements of modern gasoline and light duty diesel engines provide corrosion protection to all the engine components and minimizes the engine damage by raising the boiling point of diluted coolant.

### DIRECTIONS TO USE

This product is a ready to use pre-mixed fluid hence should not be diluted further with water. It is recommended to top up with same pre-mixed coolant, in extreme emergency refilling the radiator by adding equal amounts of distilled or demineralized water to the concentrate is possible.

Available in Premix 30% and Premix 50% variants and in 4L, 5L and 205L Drums

### PERFORMANCE LEVEL

- JIS K 2234
- ASTM D3306

### KEY BENEFITS

- Product contains multi-metal corrosion inhibitors which gives engine excellent protection against rust and corrosion.
- Protects against freezing, overheating and cavitation.
- Provides extended service life

### TYPICAL CHARACTERISTICS

Properties	Test Methods	50%
COLOR		GREEN
Density @15°C	ASTM D4052	1.065
Boiling Point, °C (Undiluted)	ASTM D1120	110
Freezing Point, °C	ASTM D3321	-36
Reserve Alkalinity	ASTM D1121	6.9
Ph vol. % in water		8.5

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

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INDUSTRIAL PRODUCTS



# iGEAR CLP 68, 100, 150, 220, 320, 460

## PREMIUM INDUSTRIAL GEAR OIL

**BULWARK iGEAR CLP OILS** are high quality gear lubricants for heavy loaded industrial gearboxes and bearings. These oils are manufactured using carefully selected high viscosity Index base oils with advanced sulphur-phosphorus extreme pressure additives. Its optimal ratio of EP properties and anti-friction protection capabilities allow using these oils effectively in various components and gear units of industrial equipment.

**BULWARK iGEAR CLP OILS** are recommended for industrial gearboxes and units with steel gears, where EP oils are required. The applications also include bearings, wheel, worm and screw gears in different industrial equipment, as well as oil circulation and mist and splash lubricating systems.

### PERFORMANCE LEVEL

- DIN 51517-3 CLP
- ANSI/AGMA 9005-E02 (EP)
- ISO 12925-1 CKD
- US Steel 224

### KEY BENEFITS

- Excellent EP properties and anti-friction capabilities allow using these oils on various applications and components of industrial equipment
- Provides protection to wide range of gear boxes industrial equipment.
- The formula provides excellent low temperature fluidity and exceptional resistance to degradation at high temperatures.
- Prevents welding, scuffing and galling of the gear teeth at their contact points.
- Provide exceptional oil life and deposit control and resistance to thermal/oxidative and chemical degradation.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	68	100	150	220	320	460
Density at 29.5 kg/m <sup>3</sup>	ASTM D4052	0.887	0.888	0.891	0.893	0.898	0.904
Kinematic viscosity at 40°C, cSt	ASTM D445	67.1	99.7	146.5	216.1	326.4	464.2
Kinematic viscosity at 100°C, cSt	ASTM D445	8.61	11.24	14.43	18.69	24.45	31.1
Viscosity Index	ASTM D2270	99	98	96	96	96	97
Flash Point, COC, °C	ASTM D92	232	242	246	256	262	270
Pour Point, °C	ASTM D97	-24	-24	-24	- 21	-18	-18
Form Tendency/ Form Stability	ASTM D892						
Seg I		0/0	0/0	0/0	0/0	0/0	0/0
Seg II		0/0	0/0	0/0	0/0	0/0	0/0
Seg III		0/0	0/0	0/0	0/0	0/0	0/0

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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# iCOMPRESSOR VDL

## 32, 46, 68, 100, 150, 220

### PREMIUM COMPRESSOR OIL

**BULWARK iCOMPRESSOR VDL OILS** are high quality mineral compressor oils designed to meet the latest lubricant requirements for modern oil-filled high-power air and/or natural gases screw, rotary and piston type compressors from leading manufacturers working on light as well as heavy duty operations. They are manufactured using premium quality solvent refined base stocks and highly effective additive packages to ensure good protection against oxidation, wear, foaming and possess good seals compatibility. The oils also help to reduce sludge formation in compressor discharge lines.

**BULWARK iCOMPRESSOR VDL OILS** possess excellent performance capabilities enabling compressor operation over wide operating temperature range in severe conditions. Suitable for use in air and/or natural gases screw, rotary and piston type compressors with maximum temperature of final compression stage up to 220°C (at fitting) and in circulation systems operating at elevated temperatures. Also recommended in circulation systems for lubrication of plain and rolling bearing. A wide range of ISO viscosity grades (ISO VG 32-220) helps in choosing an optimal solution for various compressors considering their operating conditions and duty cycle as per OEM recommendations.

**Note: This product can be used as Zinc Free Hydraulic Oils in certain applications**

#### PERFORMANCE LEVEL

- DIN 51506 (VDL)
- ISO 6743

#### KEY BENEFITS

- Suitable for use in multiple type compressors – air, natural gas, screw, rotary & piston type of compressors
- Excellent protection against oxidation, wear and foaming
- Possesses excellent seal compatibility

#### TYPICAL CHARACTERISTICS

Properties	Test Methods	32	46	68	100	150	220
Density at 29.5°C kg/m <sup>3</sup>	ASTM D4052	0.878	0.878	0.882	0.887	0.891	0.897
Kinematic viscosity at 100°C, cSt	ASTM D445	5.25	6.81	8.64	11.62	14.95	19.17
Kinematic viscosity at 40°C, cSt	ASTM D445	30.75	46.7	68.2	107.8	159.1	227.7
Flash Point, COC, °C	ASTM D92	224	232	242	246	248	262
Pour Point, °C	ASTM D97	-39	-39	-36	-30	-27	-27
Form Tendency/ Form Stability	ASTM D892						
Seg I		0/0	0/0	0/0	0/0	0/0	0/0
Seg II		0/0	0/0	0/0	0/0	0/0	0/0
Seg III		0/0	0/0	0/0	0/0	0/0	0/0
Copper Corrosion (3hrs at 100°C)	ASTM D130	1a	1a	1a	1b	1b	2a

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#### STORAGE

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# iTURBINE TDG 32, 46 & 68

## PREMIUM TURBINE OIL

**BULWARK iTURBINE TDG OILS** are high quality conventional turbine oils that combine excellent aging stability at higher operating temperatures, excellent air release, quick water separation and excellent corrosion inhibition. These oils are free from Zinc, chlorine, PCB and PCT.

**BULWARK iTURBINE TDG OILS** can be used on steam and gas turbines and several other applications including circulation & bearing lubrication system or hydraulics (with Zinc & Zinc-Free) or light & medium duty Industrial gear & Bearing Oils operating under severe conditions.

**Note:** These turbine oils are not suitable to use if the OEM recommends use of turbine oils with extreme pressure (EP) and anti-wear properties. Please send us your enquiry with OEM specifications for such high-performance Turbine oils, which are available with BULWARK only on a subject to enquiry basis.

### PERFORMANCE LEVEL

- DIN 51515-1 TD
- SIEMENS TLV 901304

### KEY BENEFITS

- Multi-use product and provides excellent aging stability
- Excellent air release and quick water separation & corrosion inhibition
- Zinc free product.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	32	46	68
Density at 15°C, kg/m <sup>3</sup>	ASTM D4052	0.878	0.880	0.883
Viscosity at 40 °C, cSt	ASTM D445	32.07	46.78	66.34
Viscosity at 100°C, cSt	ASTM D445	5.37	6.83	8.51
Pour point, °C	ASTM D97	-24	-24	-21
Flash point COC, °C	ASTM D92	228	232	238
Viscosity Index	ASTM D2270	100	100	98
Air release at 50°C, Minute	ASTM D3427	2	2	3
Oxidation (TOST)	ASTM D943	>2200	>2000	>1800
Form Tendency/Form Stability	ASTM D892			
Seg I		0/0	0/0	0/0
Seg II		0/0	0/0	0/0
Seg III		0/0	0/0	0/0
Water Separability at 54 °C	ASTM D1401			
Time for Separation, min		8	10	12
Volume of layer (oil - water - emulsion), ml		42-38-0	42-38-0	42-38-0
Copper Corrosion (3 hrs at 100 °C)	ASTM D130	1b	1b	1b

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### STORAGE

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CLASSIC PRODUCTS

# CLASSIC PC 10W-40\*, 15W-40, 20W-40 & 20W-50

## MULTI-GRADE PETROL ENGINE OIL

**BULWARK CLASSIC PC** range oils are standard multi-grade motor oils suitable for use in older engines of passenger cars, light commercial trucks and vans. The product is manufactured using high quality base stocks and proven additive packages to provide the best anti-wear protection and all-round superior performance.

**BULWARK CLASSIC PC** series are recommended for use during all-season operations in gasoline engines of cars from Japanese, American, European and Korean manufacturers.

### PERFORMANCE LEVEL

- API SG/SF/SD/SC/SB

### KEY BENEFITS

- High anti-oxidation and better dispersant properties
- Minimizes wear and noise level (especially in older and worn engines) during extreme operational conditions.
- Good protection against corrosion.
- Higher BN reserves

### TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-40*	15W-40	20W-40	20W-50
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.876	0.882	0.888	0.891
Kinematic Viscosity @ 100°C cSt	ASTM D7042	13.76	13.90	13.96	17.76
Viscosity Index	ASTM D2270	142	130	124	121
Cold Cranking Viscosity, mPa-s	ASTM D5293	6080 at -25°C	6480 at -20°C	8680 at -15°C	9080 at -15°C
Borderline Pumping Viscosity, mPa-s	ASTM D4684	43,800 at -30°C	48,800 at -25°C	47,800 at -20°C	51,100 at -20°C
Sulphated Ash, %	ASTM D874	1.25	1.25	1.25	1.25
Flash Point, COC, °C	ASTM D92	242	244	246	252
Foam Stability	ASTM D892				
Seq I		0/0	0/0	0/0	0/0
Seq II		0/0	0/0	0/0	0/0
Seq III		0/0	0/0	0/0	0/0
Pour Point, °C	ASTM D97	-42	-33	-27	-27
Total Base Number, mg KOH/g	ASTM D2896B	6.20	6.20	6.20	6.20

\* Synthetic Technology

PS: The above information is typical data and an indication based on current production. It does not constitute a specification.

### STORAGE

All packages should be stored under cover. Where outside storage is unavoidable, drums should be laid horizontally to avoid the possible ingress of water and the obliteration of drum markings. Products should not be stored above 60°C, exposed to hot sun or freezing conditions.

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## CLASSIC MC

# 10W-40\* , 10W-50\* , 15W-50, 20W-40 & 20W-50

### MULTI-GRADE 2 & 3-WHEELER ENGINE OIL

**BULWARK CLASSIC MC** range oils are standard multi-grade 4T oils suitable for use in older engines of 2 & 3-wheeler vehicles, which includes scooters, motorcycles and 3-wheeler auto rickshaws. The product is manufactured using high quality base stocks and proven additive packages to provide the best anti-wear & clutch protection and all year-round superior performance.

**BULWARK CLASSIC MC** oils are recommended for use during all-season operations in gasoline engines of 2 & 3-wheeler vehicles, where API SG/SF/SD/SC/SB performance with one of the above viscosities are specified.

#### PERFORMANCE LEVEL

- API SG/SF/SD/SC/SB

#### KEY BENEFITS

- High anti-oxidation and better dispersant properties
- Minimizes wear and noise level (especially in older and worn engines) during extreme operational conditions.
- Good protection against corrosion.
- Improved Clutch performance.

#### TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-40*	10W-50*	15W-50	20W-40	20W-50
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.876	0.886	0.882	0.888	0.891
Kinematic Viscosity @ 100°C cSt	ASTM D7042	13.76	17.30	13.90	13.96	17.56
Viscosity Index	ASTM D2270	142	146	130	124	121
Cold Cranking Viscosity, mPa-s	ASTM D5293	6080 at -25°C	5980 at -25°C	6480 at -20°C	8680 at -15°C	9080 at -15°C
Borderline Pumping Viscosity, mPa-s	ASTM D4684	43,800 at -30°C	46,900 at -30°C	48,800 at -25°C	47,800 at -20°C	51,100 at -20°C
Sulphated Ash, %	ASTM D874	1.25	1.25	1.25	1.25	1.25
Flash Point, COC, °C	ASTM D92	242	254	244	246	252
Foam Stability	ASTM D892					
Seq I		0/0	0/0	0/0	0/0	0/0
Seq II		0/0	0/0	0/0	0/0	0/0
Seq III		0/0	0/0	0/0	0/0	0/0
Pour Point, °C	ASTM D97	-42	-42	-33	-27	-27
Total Base Number, mg KOH/g	ASTM D2896B	6.20	6.20	6.20	6.20	6.20

\* Synthetic Technology

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#### STORAGE

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# CLASSIC CT 10W-40\*, 15W-40, 20W-40 & 20W-50

## MULTI-GRADE DIESEL ENGINE OIL

**BW CLASSIC CT** range oils are standard multi-grade diesel engine oils suitable for use in older engines of passenger cars, light & heavy commercial trucks and vans. The product is manufactured using high quality base stocks and proven additive packages to provide the best anti-wear protection and all-round superior performance.

**BW CLASSIC CT** oil series are recommended for use during all-season operations in diesel engines of cars, trucks & other off-road equipment's from Japanese, American, European and Korean manufacturers.

### PERFORMANCE LEVEL

- API CE/CD/CC/CB

### KEY BENEFITS

- Improved anti-oxidation and better dispersant properties
- Minimizes wear and noise level (especially in older and worn engines) during extreme operational conditions.
- Good protection against corrosion
- Higher BN reserves to fight acid formation.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	10W-40*	15W-40	20W-40	20W-50
Density @ 29.5°C, Kg/m3	ASTM D4052	0.876	0.882	0.888	0.891
Kinematic Viscosity @ 100°C cSt	ASTM D7042	14.76	14.90	14.96	18.76
Viscosity Index	ASTM D2270	140	131	122	120
Cold Cranking Viscosity, mPa-s	ASTM D5293	6180 at -25°C	6680 at -20°C	8980 at -15°C	9180 at -15°C
Borderline Pumping Viscosity, mPa-s	ASTM D4684	45,800 at -30°C	49,800 at -25°C	44,800 at -20°C	43,100 at -20°C
Sulphated Ash, %	ASTM D874	1.45	1.45	1.45	1.45
Flash Point, COC, °C	ASTM D92	244	246	248	256
Foam Stability	ASTM D892				
Seq I		0/0	0/0	0/0	0/0
Seq II		0/0	0/0	0/0	0/0
Seq III		0/0	0/0	0/0	0/0
Pour Point, °C	ASTM D97	-42	-33	-27	-27
Total Base Number, mg KOH/g	ASTM D2896B	8.20	8.20	8.20	8.20

\* Synthetic Technology

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### STORAGE

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# CLASSIC MONO SAE 40, 50

## MONO-GRADE DIESEL ENGINE OIL

**BW CLASSIC MONO** range oils are standard mono-grade diesel engine oils suitable for use in older engines of passenger cars, light & Heavy commercial trucks and vans. The product is manufactured using high quality base stocks and proven additive packages to provide the best anti-wear protection and all-round superior performance.

**BW CLASSIC MONO** oil series are recommended for use during all-season operations in diesel engines of cars, trucks & other off-road equipment's from Japanese, American, European and Korean manufacturers.

### PERFORMANCE LEVEL

- API CE/CD/CC/CB

### KEY BENEFITS

- Improved anti-oxidation and better dispersant properties
- Minimizes wear and noise level (especially in older and worn engines) during extreme operational conditions.
- Good protection against corrosion
- Higher BN reserves to fight acid formation.

### TYPICAL CHARACTERISTICS

Properties	Test Methods	40	50
Density @ 29.5°C, Kg/m <sup>3</sup>	ASTM D4052	0.887	0.890
Kinematic Viscosity @ 100°C cSt	ASTM D7042	14.36	18.16
Viscosity Index	ASTM D2270	96	97
Sulphated Ash, %	ASTM D874	1.45	1.45
Flash Point, COC, °C	ASTM D92	248	258
Foam Stability	ASTM D892		
Seq I		0/0	0/0
Seq II		0/0	0/0
Seq III		0/0	0/0

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### STORAGE

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