

Underground Bulk Explosives

UNDERGROUND BULK EMULSIONS

UG100
UG200
UG300

Series	UG100		UG200		UG300	
Products	UG100	UG101S	UG200	UG201S	UG300	UG300S
Sensitiser	GE50 (Green)	GS30 (Blue)	GS15 (Green)	GE30 (Blue)	GS15 (Green)	GE30 (Blue)
	GS15 (Green)		GS30 (Green)		GS30 (Green)	
	GS30 (Blue)		GS50 (Blue)		GS50 (Blue)	
	GS50 (Blue)		GS60 (Pink)		GS60 (Pink)	
	GS60 (Pink)		GS85 (Pink)		GS85 (Pink)	
	GS85 (Pink)		GS95 (Green)		GS95 (Green)	
	GS95 (Green)		GS125 (Green)		GS125 (Green)	
	GS123 (Green)					
Cap Sensitive	Yes	No	Yes	No	Yes	No
Minimum Hole Diameter	32 mm	45 mm				

UG100 Series



AEL's UG100 base emulsion is used in underground mining applications where horizontal charging is prevalent. The UG100 series of emulsions are cap sensitive and ideal for most geological conditions. Energy output can be varied to address difficult breaking conditions. The base UG100 underground emulsion has excellent water resistance with a yellow to white appearance. The sensitised UG100 product adopts the colour of the sensitiser for easy identification and verification of the sensitising process. Sensitised UG100 has a Velocity of Detonation (VOD) in excess of 4000 m/s (subject to confinement and ground conditions).

APPLICATION

UG100 is suitable in all underground small diameter holes in development, stoping and other blasting environments.

- Charging procedures must be followed at all times
- UG100 is NOT for use in surface mines. UG100 should not be used in reactive ground conditions

FEATURES

- Safe to handle
- At the face mixing and manufacturing of explosives that become sensitised inside the blast-hole
- A range of densities to choose from to vary energy output
- High VOD

INITIATION

- UG100 is cap sensitive, but Pentolite boosters can be used when the critical density is exceeded per respective hole diameter
- The use of detonating cord and/or packaged explosives as primers is not recommended

SPECIAL PRECAUTIONS

Base emulsions are classified as a 5.1 Oxidiser and are not sensitive to normal stimuli, but under certain conditions they can explode, and may result in accidental detonation.

- Handle with care
- Although UG100 does not burn easily it must be kept clear of flames and intense heat
- Application temperature range is 0 °C to 55 °C

STORAGE

- The shelf life of the base emulsion is 12 weeks from the date of manufacture
- Maximum sleep time for the UG100 product is 7 days
- The shelf life of the aqueous sensitiser is 6 months from the date of manufacture
- The emulsion and sensitiser should be stored separately

BEST PRACTICE

- Priming is required when critical densities are exceeded
- Base emulsion and sensitiser must be stored separately
- Avoid horizontal pumping exceeding 50 m in length

PRODUCT SERIES	
UG100 PUMPABLE EMULSION PRODUCT	
Minimum Hole Diameter (mm)	25
Water Resistance	Excellent
VOD (m/s)	4000-5500
Sensitised Product Density (g/cm ³)	1.00-1.16
Sensitiser	GS15 (MCU Units) Gassing Solution (Dependent on density requirement with PCU pump variant)
Pumping Stages	6
Primer	8 D Detonator
Ideal Delivered Energy (MJ/kg) @ 100 Mpa	2.2-2.4
*RWS @ 100 Mpa	98-102
*RBS @ 100 Mpa	148-152

Notes:

1. In-hole density requirements vary with application, hole-diameter and hole-length. Please contact your regional sales office for assistance in finding the best product fit for your application
 2. Primer size is dependent on hole diameter. Please contact your regional sales office for guidance on primer selection
- * The Relative Weight and Bulk Strengths are relative to ANFO (=100 %) at a density of 0.80 g/cm³. The figures have been determined using the VIXEN-i detonation code

Transport (UN Classification)

Base Emulsion: Class 5.1, UN No. 3375, AMMONIUM NITRATE EMULSION
 Emulsion Product: Class 1.1D, UN No. 0241, EXPLOSIVE, BLASTING, TYPE E

UG101S Series



AEL's UG101S base emulsion is used for charging in up-holes, ring blasting and development. This niche formulation, often referred to as "Sticky Emulsion", was specifically developed for its ability to remain in the up-hole charged blasting column which is commonly found in ring blasting applications. The product is a honey coloured emulsion and is fully water resistant. The base emulsion, classified as non- explosive, is mixed with an aqueous sensitiser to form explosives in the blast-hole. Sensitised UG101S product has a Velocity of Detonation (VOD) in excess of 4000 m/s (subject to confinement and ground conditions).

APPLICATION

UG101S is suitable for up-holes, ring blasting and development. Priming at the toes of the holes is required in up-holes/rings. The product is pumped using mobile charging units (MCU/Jumbo) developed for use with the UG101S product.

- Charging procedures must be followed at all times
- UG101S is NOT for use in surface mines. UG101S should not be used in reactive ground conditions

FEATURES

- Safe to handle
- At the face mixing and manufacturing of explosives that become sensitised inside the blast-hole
- High VOD
- Shorter charging times
- Excellent resistance to water
- Variable density to suit in-situ conditions. (As an optional extra on the MCU's)
- Suitable in up-hole application

INITIATION

- UG101S is not cap sensitive and the use of Pentolite boosters are recommended as per respective hole diameter
- The use of detonating cord and/or packaged explosives as primers is not recommended

SPECIAL PRECAUTIONS

Base emulsions are classified as a 5.1 Oxidiser and are not sensitive to normal stimuli, but under certain conditions they can explode, and may result in accidental detonation.

- Handle with care
- Although UG101S does not burn easily it must be kept clear of flames and intense heat
- Application temperature range is 0 °C to 55 °C

STORAGE

- The shelf life of the base emulsion is 12 weeks from the date of manufacture
- Maximum sleep time for the UG101S product is 7 days
- The emulsion and sensitiser should be stored separately

BEST PRACTICE

- Boosters should be used in up-holes
- Priming is required in development
- Base emulsion and sensitiser must be stored separately
- Avoid horizontal pumping exceeding 50 m in length

PRODUCT SERIES	
UG101S PUMPABLE EMULSION PRODUCT	
Minimum Hole Diameter (mm)	45
Water Resistance	Excellent
VOD (m/s)	4000-5500
Sensitised Product Density (g/cm ³)	1.00-1.10
Sensitiser	GS30
Pumping Stages	4
Primer	150g booster
Ideal Delivered Energy (MJ/kg) @ 100 Mpa	2.0-2.2
*RWS @ 100 Mpa	88-92
*RBS @ 100 Mpa	134-138

Notes:

1. The availability of the above offering is subject to MCU configuration
 2. In-hole density requirements vary with application, hole-diameter and hole-length. Please contact your regional sales office for assistance in finding the best product fit for your application
 3. Primer size is dependent on hole diameter. Please contact your regional sales office for guidance on primer selection
- * The Relative Weight and Bulk Strengths are relative to ANFO (=100 %) at a density of 0.80 g/cm³. The figures have been determined using the VIXEN-i detonation code

Transport (UN Classification)

Base Emulsion: Class 5.1, UN No. 3375, AMMONIUM NITRATE EMULSION
 Emulsion Product: Class 1.1D, UN No. 0241, EXPLOSIVE, BLASTING, TYPE E

UG201S Series



AEL's UG201S base emulsion is used for charging in up-holes, ring blasting and development. This formulation is enhanced to withstand harsh high ambient temperatures and still maintain a good shelf life. The product is a honey coloured emulsion and is fully water resistant. The base emulsion, classified as non- explosive, is mixed with an aqueous sensitiser to form explosives in the blast-hole. Sensitised UG201S product has a Velocity of Detonation (VOD) in excess of 4000 m/s (subject to confinement and ground conditions).

APPLICATION

UG201S is suitable for up-holes, ring blasting and development. Priming at the toes of the holes is required in up-holes/rings. The product is pumped using mobile charging units (MCU/Jumbo) developed for use with the UG201S product.

- Charging procedures must be followed at all times
- UG201S is NOT for use in surface mines UG201S should not be used in reactive ground conditions

FEATURES

- Safe to handle
- At the face mixing and manufacturing of explosives that become sensitised inside the blast-hole
- High VOD
- Shorter charging times
- Excellent resistance to water
- Variable density to suit in-situ conditions. (As an optional extra on the MCU's)
- Suitable in up-hole application

INITIATION

- UG201S is not cap sensitive and the use of Pentolite boosters are recommended as per respective hole diameter
- The use of detonating cord and/or packaged explosives as primers is not recommended

SPECIAL PRECAUTIONS

Base emulsions are classified as a 5.1 Oxidiser and are not sensitive to normal stimuli, but under certain conditions they can explode, and may result in accidental detonation

- Handle with care
- Although UG201S does not burn easily it must be kept clear of flames and intense heat
- Application temperature range is 0 °C to 55 °C

STORAGE

- The shelf life of the base emulsion is 12 weeks from the date of manufacture
- Maximum sleep time for the UG201S product is 7 days
- The shelf life of the aqueous sensitiser is 6 months from the date of manufacture
- The emulsion and sensitiser should be stored separately

BEST PRACTICE

- Boosters should be used
- Priming is required in development
- Base emulsion and sensitiser must be stored separately
- Avoid horizontal pumping exceeding 50 m in length

PRODUCT SERIES	
UG201S PUMPABLE EMULSION PRODUCT	
Minimum Hole Diameter (mm)	45 mm
Water Resistance	Excellent
VOD (m/s)	3700-5000
Typical In-hole Density (g/cm ³)	1.10-1.15
Sensitiser	GS30
Pumping Stages	4
Primer	150g booster
Ideal Delivered Energy (MJ/kg) @ 100 Mpa	2.0-2.2
*RWS @ 100 Mpa	86-90
*RBS @ 100 Mpa	130-134

Notes:

1. The availability of the above offering is subject to MCU configuration
 2. In-hole density requirements vary with application, hole-diameter and hole-length. Please contact your regional sales office for assistance in finding the best product fit for your application
 3. Primer size is dependent on hole diameter. Please contact your regional sales office for guidance on primer selection
- * The Relative Weight and Bulk Strengths are relative to ANFO (=100 %) at a density of 0.80 g/cm³. The figures have been determined using the VIXEN-i detonation code

Transport (UN Classification)

Base Emulsion: Class 5.1, UN No. 3375, AMMONIUM NITRATE EMULSION
 Emulsion Product: Class 1.1D, UN No. 0241, EXPLOSIVE, BLASTING, TYPE E

UG300 Series

Reactive ground



AEL's UG300 base emulsion is used in underground mining applications where horizontal charging is prevalent. The UG300 series of emulsions are cap sensitive and was specifically designed for reactive geological conditions. The base UG300 underground emulsion have excellent water resistance with a yellow to white appearance. The sensitised UG300 product adopts the colour of the sensitiser for easy identification and verification of the sensitising process. Sensitised UG300 has a Velocity of Detonation (VOD) in excess of 4000 m/s (subject to confinement and ground conditions).

APPLICATION

UG300 is delivered by bulk in a tanker, with its sensitiser stored in a separate container at the back of the tanker. The emulsion and sensitiser are offloaded into a silo and tank respectively on-site.

- Charging procedures must be followed at all times
- UG300 series can be used in horizontal holes
- UG300 is NOT for use in surface mines
- UG300 can be used in reactive ground conditions with pyrite levels less than 6 %, dependent on compatibility testing

FEATURES

- Safe to handle
- At the face mixing and manufacturing of explosives that become sensitised inside the blast-hole
- A range of densities to choose from to vary energy output

INITIATION

- UG300 is cap sensitive, but Pentolite boosters can be used when the critical density is exceeded per respective hole diameter
- The use of detonating cord and/or packaged explosives as primers is not recommended

SPECIAL PRECAUTIONS

Base emulsions are classified as a 5.1 Oxidiser and are not sensitive to normal stimuli, but under certain conditions they can explode, and may result in accidental detonation.

- Handle with care
- Although UG300 does not burn easily it must be kept clear of flames and intense heat
- Application temperature range is 0 °C to 55 °C

STORAGE

- The shelf life of the base emulsion is 12 weeks from the date of manufacture
- The shelf life of the aqueous sensitiser is 6 months from the date of manufacture
- The emulsion and sensitiser should be stored separately

BEST PRACTICE

- Priming is required when critical densities are exceeded
- Base emulsion and sensitiser must be stored separately
- Avoid horizontal pumping exceeding 50 m in length
- Sleeping of blasts is not recommended

PRODUCT SERIES	
UG300 PUMPABLE EMULSION PRODUCT	
Minimum Hole Diameter (mm)	45 mm
Water Resistance	Excellent
VOD (m/s)	3700-5000
Sensitised Product Density (g/cm ³)	1.00-1.13
Sensitiser	GS15 (MCU Units) Gassing Solution (Dependent on density requirement with PCU pump variant)
Pumping Stages	6
Primer	8 D Detonator
Ideal Delivered Energy (MJ/kg) @ 100Mpa	1.9-2.1
*RWS @ 100 Mpa	71-75
*RBS @ 100 Mpa	103-107

Notes:

1. In-hole density requirements vary with application, hole-diameter and hole-length. Please contact your regional sales office for assistance in finding the best product fit for your application
 2. Primer size is dependent on hole diameter. Please contact your regional sales office for guidance on primer selection
- * The Relative Weight and Bulk Strengths are relative to ANFO (=100 %) at a density of 0.80 g/cm³. The figures have been determined using the VIXEN-i detonation code

Transport (UN Classification)

Base Emulsion: Class 5.1, UN No. 3375, AMMONIUM NITRATE EMULSION
 Ammonium Nitrate Porous Prill: Class 5.1, UN No 1942, AMMONIUM NITRATE
 Emulsion Product: Class 1.1D, UN No. 0241, EXPLOSIVE, BLASTING, TYPE E

UG300S Series Reactive ground



AEL's UG300S base emulsion is used for charging in up-holes, ring blasting and development. This formulation is referred to as "Sticky Emulsion" and was specifically developed for its ability to remain in the up-hole charged blasting column which is within reactive ground blasting conditions. The product is a honey coloured emulsion and is fully water resistant. The base emulsion, classified as non-explosive, is mixed with an aqueous sensitiser to form explosives in the blast-hole. Sensitised UG300S product has a Velocity of Detonation (VOD) in excess of 4000 m/s (subject to confinement and ground conditions).

APPLICATION

UG300S is delivered by bulk in a tanker, with its sensitiser stored in a separate container at the back of the tanker. The emulsion and sensitiser are offloaded into a silo and tank respectively on-site.

- Charging procedures must be followed at all times
- UG300S series can be used Up-holes/ring blasting and development
- UG300S is NOT for use in surface mines
- UG300S can be used in reactive ground conditions with pyrite levels less than 6 %, dependent on compatibility testing

FEATURES

- Safe to handle
- At the face mixing and manufacturing of explosives that become sensitised inside the blast-hole
- A series of explosive blends to choose from with various strengths and densities

INITIATION

Base emulsions are classified as non-detonable and are not sensitive to normal stimuli, but under certain conditions they can explode, and may result in accidental detonation.

- UG300S is not cap sensitive and the use of Pentolite boosters are recommended as per respective hole diameter
- The use of detonating cord and/or packaged explosives as primers is not recommended

SPECIAL PRECAUTIONS

Base emulsions are classified as a 5.1 Oxidiser and are not sensitive to normal stimuli, but under certain conditions they can explode, and may result in accidental detonation.

- Handle with care
- Although UG300S does not burn easily it must be kept clear of flames and intense heat
- Application temperature range is 0 °C to 55 °C

STORAGE

- The shelf life of the base emulsion is 12 weeks from the date of manufacture
- The shelf life of the aqueous sensitiser is 6 months from the date of manufacture
- The emulsion and sensitiser should be stored separately

BEST PRACTICE

- Boosters should be used in up-holes
- Priming with a pentolite booster is required in development
- Base emulsion and sensitiser must be stored separately
- Avoid horizontal pumping exceeding 50 m in length
- Sleeping of a blast is not recommended due to reactive ground conditions

PRODUCT SERIES	
UG300S PUMPABLE EMULSION PRODUCT	
Minimum Hole Diameter (mm)	45 mm
Water Resistance	Excellent
VOD (m/s)	3700-5000
Sensitised Product Density (g/cm ³)	1.00-1.13
Sensitiser	GS30
Pumping Stages	4
Primer	150 g booster
Ideal Delivered Energy (MJ/kg) @ 100 Mpa	1.9-2.1
*RWS @ 100 Mpa	71-75
*RBS @ 100 Mpa	103-107

Notes:

1. The availability of the above offering is subject to MCU configuration
 2. In-hole density requirements vary with application, hole-diameter and hole-length. Please contact your regional sales office for assistance in finding the best product fit for your application
 3. Primer size is dependent on hole diameter. Please contact your regional sales office for guidance on primer selection
- * The Relative Weight and Bulk Strengths are relative to ANFO (=100 %) at a density of 0.80 g/cm³. The figures have been determined using the VIXEN-i detonation code

Transport (UN Classification)

Base Emulsion: Class 5.1, UN No. 3375, AMMONIUM NITRATE EMULSION
 Ammonium Nitrate Porous Prill: Class 5.1, UN No 1942, AMMONIUM NITRATE
 Emulsion Product: Class 1.1D, UN No. 0241, EXPLOSIVE, BLASTING, TYPE E

Compatibility Matrix

DONOR						
	UG100	UG101S	*UG200	UG201S	UG300	UG300S
Magnum® Buster Gel	X	X	X	X	X	X
Magnum® 365 Gel	X	X	X	X	X	X
Magnum® Control	X	X	X	X	X	X
Magnum® Frag	X	X	X	X	X	X
Magnum® Plus	X	X	X	X	X	X
Shock Tube Uni-Delay LP	X					
Shock Tube Multi LPD	X					
Shock Tube Multi SPD	X					
**Electronic Delay Detonators	X					
Instantaneous Electric Detonator (IED)	X					
Pentolite Primers	X	X	X	X	X	X

* UG200 can be manufactured as a permitted product (requiring PE Permitted and Statsafe Detonators as a donor only)

** All variants