



155 MM ERFB CARRIER SHELLS



- ILLUMINATING.
- SCREENING SMOKE.
- RED PHOSPHORUS.
- BASE BLEED OPTION.
- COMPATIBILITY - ALL 155MM 45 CALIBRE SYSTEMS.

Types of Shells

- Red Phosphorus
- Screening Smoke
- Illuminating
- Leaflet
- Radar Echo

Description

This is an extended range full bore (ERFB) 155 mm carrier shell which can accommodate a variety of payloads. These are deployed by base ejection using a precise electronic time fuze which ensures that deployment occurs at the optimum height above the designated target area. The closing plug at the base of the shell serves as the adaptor to which the boat tail is fitted in the standard configuration. However, a base bleed motor, which increases range by approximately 25 percent, is available and can easily be exchanged with the boat tail in the field. Range tables for both configurations are available. All types of shells have been subjected to stringent environmental testing and it has been shown that bump, vibration or temperature variation have no adverse effect on performance. This ammunition is compatible with all 155 mm 45 calibre artillery systems and has been qualified with the full range of charges in use. All carrier shells are ballistically matched with the High Explosive shell in the G5 and G6 ERFB weapon systems.

All shells have the following main parts:

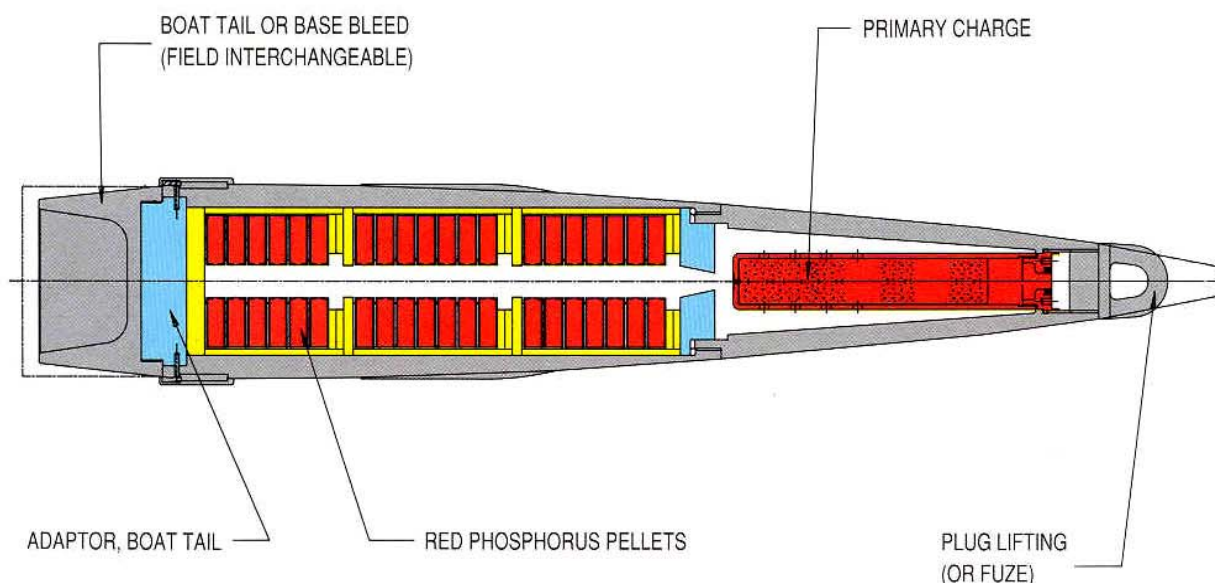
- Forged steel body with welded nubs and gilding metal driving band
- Aluminium nose containing ejection charge
- Base plug/adaptor
- Boat tail which is interchangeable with a Base Bleed Motor
- Lifting Plug which is replaced by a Time Fuze
- Appropriate payload



GENERAL TECHNICAL DATA

Functional reliability		: 95% at a 90% confidence level
Maximum range (at sea level)	Boat Tail	: 30 km
	Base Bleed	: 38 km
Accuracy 50% zone in range (%)	Boat Tail	: ≤ 0,96
	Base Bleed	: ≤ 1,2
50% zone in azimuth (mils)	Boat Tail	: ≤ 2,0
	Base Bleed	: ≤ 2,5
Operational limits Muzzle velocity	Boat Tail	: 897 m/sec
	Base Bleed	: 895 m/sec
Gun Pressure	Boat Tail	: 350 MPa
	Base Bleed	: 375 MPa
Functional temperature range		-20°C to +60°C
Overall length	Boat Tail	: 843 mm
	Base Bleed	: 861 mm
Total mass	Boat Tail	: 42,84 to 45,34 kg
	Base Bleed	: 45,27 to 47,77 kg
Propulsion medium		: Charge M51, M52, M53
Fuze		: Electronic time M8611 (Std NATO thread 2-12 UNS/1B)
Payload ejection mode		: Base ejection

SHELL 155 mm RED PHOSPHORUS (RP)



Description

The payload consists of 120 small blocks of a pyrotechnic composition containing mainly red phosphorus (RP) which are ignited on ejection from the shell. When deployed at optimum height, these fall to the ground over an area approximately 250 m x 150 m.

Application

This shell has two applications which probably overlap in practice:

- i) Burning blocks falling on combustible material can cause a large number of local fires to develop, eventually covering a large area. In addition to damage, this may cause enemy personnel to evacuate the area.
- ii) In addition to creating smoke from these fires, phosphorus pyrotechnics are excellent smoke generators themselves. By laying down a pattern of shells, the movement or redeployment of own forces is screened from enemy observation.

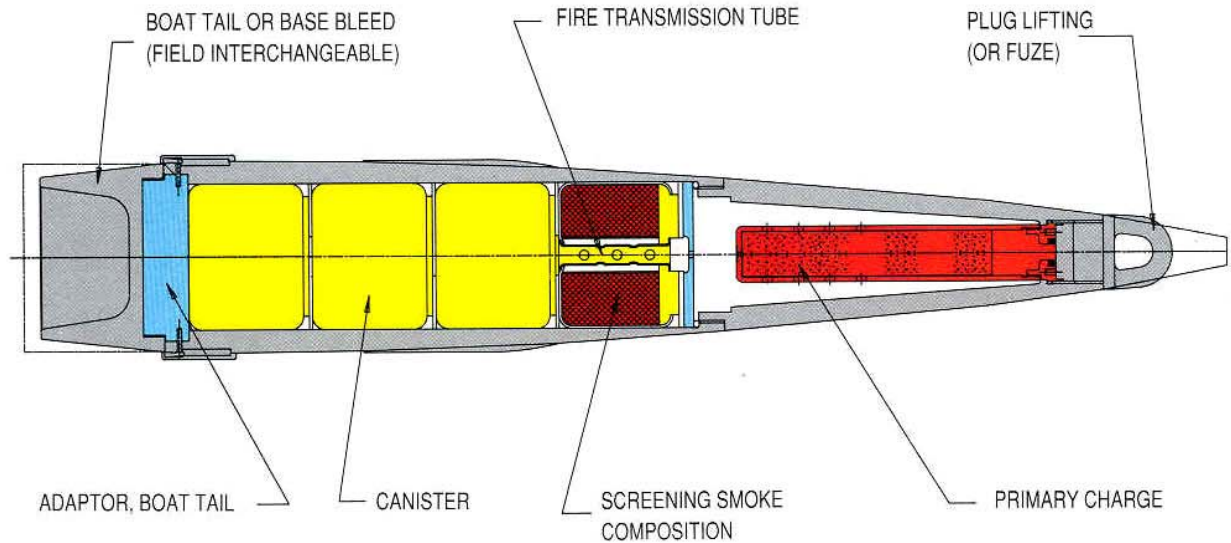
Note: This shell is a major advance over shells filled with white phosphorus used for similar purposes which, in addition to their safety problems, produce smoke only in one place and for a very limited duration.



Technical Data

Burning temperature of RP composition	: Approx. 900 °C
Burning time	: 50 sec minimum 70 sec nominal
Pyrotechnic mass	: 4 kg
Optimum height of deployment	: 250 m
Smoke colour	: White/grey
Mass of shell	: 43,5 kg nominal
Composition	: Red Phosphorus/Fuel/ Oxidiser/Binder

SHELL 155 mm SCREENING SMOKE



Description

The payload consists of four large canisters containing an HC composition, which is very effective in producing dense screening smoke. These are ignited on ejection from the shell and fall to the ground some distance apart. After a short time, smoke from these individual sources combines to form a dense screen.

Application

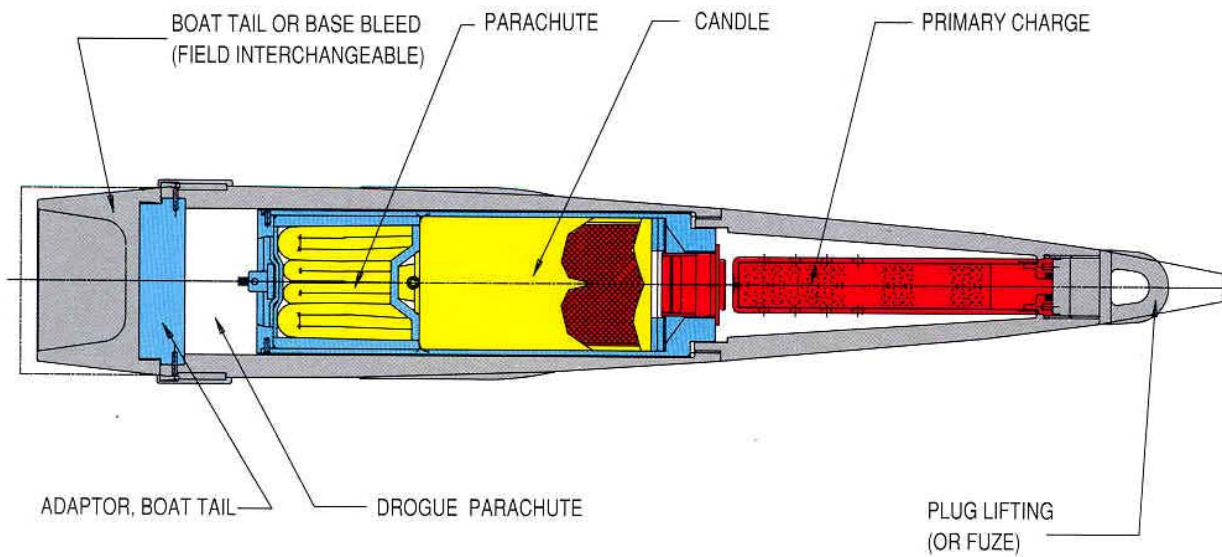
These shells are normally used to mask the movement or redeployment of own forces from enemy observation, thereby neutralizing direct enemy fire.

Technical Data

Burning time	: 90 – 120 sec
Pyrotechnic mass	: 6 kg
Optimum height of deployment	: 400 m
Smoke colour	: White/grey
Mass of shell	: 43,5 kg nominal
Composition	: Hexachloroethane type



SHELL 155 mm ILLUMINATING



Description

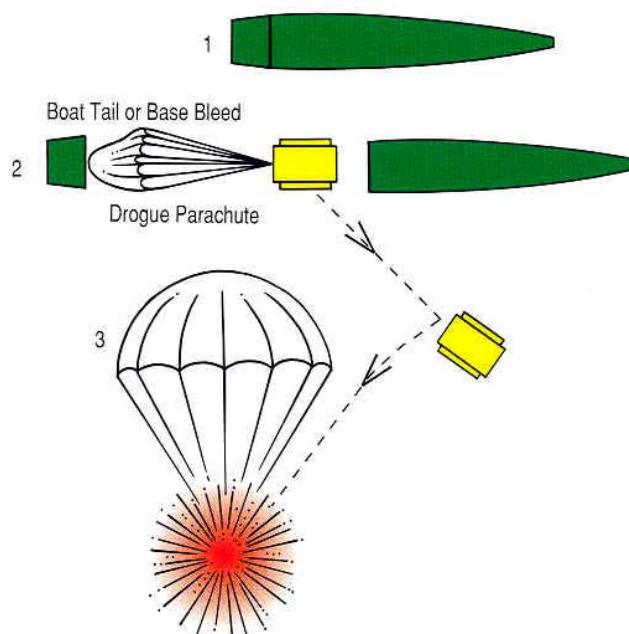
The payload is an illuminating candle attached to a parachute. Because this cannot be successfully ejected directly from the shell due to the high spin and velocity which still occur at the moment of deployment, this payload is contained within a steel canister with its own delayed ejection charge. When the canister is ejected, the delay ignites and simultaneously a drogue parachute deploys and anti-rotation fins open on the canister, drastically reducing velocity and rotation of the canister before the flare and parachute are ejected from it.

Application

Since it has a low rate of descent, the candle continues to give good ground illumination over a wide area during its total burning time. This could facilitate redeployment of own forces but is more likely to be used for surveillance of enemy movement which might otherwise go undetected in darkness.

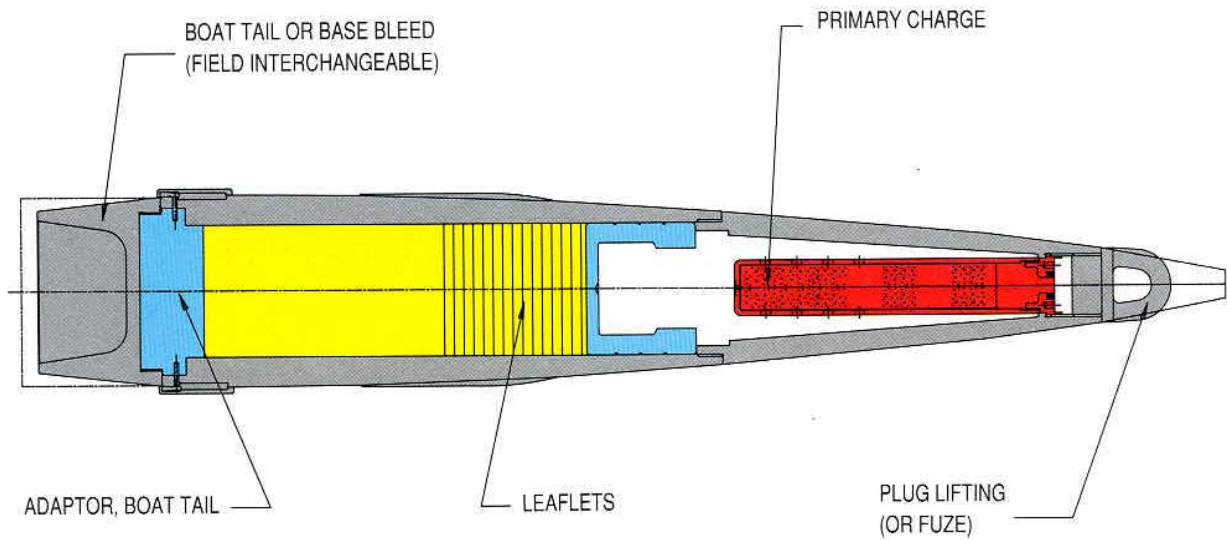
Technical Data

Burning time	: 90 sec minimum 120 sec nominal
Luminosity	: 750 000 Cd minimum 1 million Cd nominal
Pyrotechnic mass	: 2,4 kg
Rate of descent	: Approx. 5 m/sec
Delay time	: 5 – 11 seconds
Optimum height of deployment	: 900 m
Mass of shell	: 44 kg nominal
Composition	: Magnesium/Sodium Nitrate/Binder



- 1 Illuminating shell
- 2 Fuze initiation and primary payload ejection, deceleration and spin reduction.
- 3 Flare and main parachute ejected and flare ignition

SHELL 155 mm LEAFLET



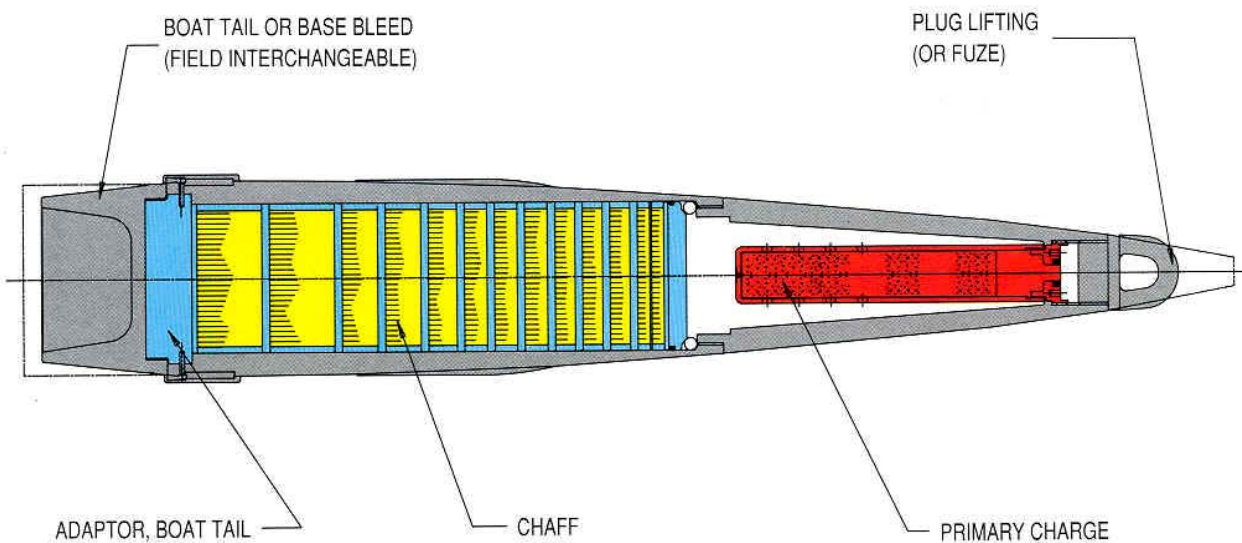
Description

The message to be delivered is printed on circular paper discs approximating the internal diameter of the shell. Using the purpose-designed equipment supplied, approximately 3 000 discs are packed tightly into the shell before the closing plug is fitted. This is a simple operation designed to be carried out in the field, facilitating the rapid distribution of a specific message. On ejection from the shell, the discs float down over a wide area.

Application

This shell provides a safe method of communicating with enemy forces or local inhabitants in areas under enemy occupation. It could be used to disseminate propaganda, disinformation, or instructions.

SHELL 155 mm RADAR ECHO



SHELL 155 mm RADAR ECHO (CONTINUED)

Description

This shell consists of four main parts: a forged steel body with a payload cavity, an aluminium nose containing an ejection charge, a payload of 13 chaff modules containing different lengths of chaff and a boat tail which can be exchanged for a base bleed motor in the field to increase the range by approximately 25%. On activation of a suitable timing fuze, the payload is ejected from the shell and the chaff is dispersed in cloud formation over a target area.

Application

The shell is designed to produce a scattering effect on enemy radar to deny target acquisition. Each shell contains approximately 4,0 kg of chaff.

This shell can be qualified to suit specific customer requirements.

PACKAGING



Packaging

Four shells per sub-pallet and eight shells per main pallet, securely attached by easily removable straps.

Main pallet dimensions

Width	: 480 mm
Length	: 800 mm
Height	: 1 020 mm
Gross Weight	: 420 kg

Alternative packaging can be supplied to customer's requirements.

Pictured above are the sub-pallet which holds four shells and a pallet holding 24 shells. The main photograph (above left) shows the eight shell main pallet.

SWARTKLIP PRODUCTS

A Division of Denel (Pty) Ltd

Swartklip Products has been engaged in the manufacture, fundamental research, design, development and proofing of pyrotechnics and explosive devices for nearly half a century. Our range of products includes a comprehensive selection of riot control, high explosive and phosphorus devices as well as pyrotechnics for signalling, screening, illumination, training, simulation and battle-field application. **Swartklip Products** is a division of **Denel (Pty) Ltd** catering to the needs and stringent standards of international Armed Forces.

Swartklip Products has gained worldwide recognition as a leader in its field. This reputation is due to an uncompromising insistence on the highest possible quality standards for all products and services.

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