

## 155 MM ARTILLERY AMMUNITION

Technical data	155 MM HE EXTENDED RANGE ARTILLERY ROUND	155 MM HE EXTENDED RANGE WITH BASEBLEED ROUND
Type	extended range HE	extended range HE with basebleed
Round weight with fuze [kg]	40,30	43,55
Length with fuze [mm]	904,70	914,00
Explosive	TNT	TNT
Weight of explosive [kg]	10	10
Fuze	KZ984	KZ984
Min arming distance [m]	min 80	min 80
Velocity min/max [m/s]	334 dla 1 x BC-E / 968 dla 6 x TC-F	565 dla 3 x TC-F / 968 dla 6 x TC-F
Propellant charge	Bi-modular artillery charge system BMCS	Bi-modular artillery charge system BMCS
Number of propellant charges	max 6	-
Sets of propellant charges	1 x BC-E, 2 x BC-E, 3 x TC-F, 4 x TC-F, 5 x TC-F, 6 x TC-F	3 x TC-F, 4 x TC-F, 5 x TC-F, 6 x TC-F
Max range (for KRAB) [m]	8 400, 12 900, 15 400, 19 600, 24 500, > 30 000	15 400, 19 600, 24 500, > 40 000
Min range [m]	4 800	-
Igniter	M 82 G	M 82 G
Operation temperature range [°C]	-40 ÷ +55	-40 ÷ +55



## PRACTICE AIR BOMB



Technical data	PRACTICE BOMB SET LBCW-10
Type	training set
Length [mm]	640
Diameter [mm]	ø 110
Weight [kg]	13
Burning time of tracer [s]	≥ 40
Tracer colour	red
Light intensity of tracer [cd]	min 50 000
Delay time of tracer [s]	1
Temperature range [°C]	-55 ÷ +60

## 81 MM LAUNCHERS SYSTEM



Technical data	81 MM SMOKE GRENADE LAUNCHER SYSTEM ZWP-81
Launcher length [mm]	285
Internal diameter of barrel [mm]	ø 81
Weight of launcher [kg]	3,8
Current strength for operation [A]	2
Operation voltage [V]	27 + 2/-5
Feed	constant current generator



# AMMUNITION

ZAKŁADY METALOWE DEZAMET S.A.

## 98 MM MORTAR AMMUNITION



Technical data	98 MM SMOKE MORTAR BOMB	98 MM ILLUMINATING MORTAR BOMB
Type	smoke	illuminating
Weight [g]	10,55	10,37
Range min/max [m]	323/5485	277/5172
Muzzle velocity charge 1/full charge [m/s]	150/320	150/320
Smoking time [s]	min 150	-
Light intensity [cd]	-	min 600 000
Operation temperature range [°C]	-30 ÷ +50	-30 ÷ +50

## 120 MM MORTAR AMMUNITION

Technical data	120 MM HE MORTAR BOMB	120 MM SMOKE MORTAR BOMB	120 MM ILLUMINATING MORTAR BOMB
Type	HE mortar bomb	smoke	illuminating
Round weight/Projectile weight [kg]	19,20/16,10	17,10/14,36	17,10 / 14,46
Length [mm]	795	-	-
Range min/max [m]	750/10 000	300/8 000	300 / 8 000
Muzzle velocity with full charge [m/s]	510	360	360
Minimum distance of shooting with a flat track (straight ahead) [m]	150	-	-
Explosive	insensitive	-	-
Smoking time [s]	-	min 180	-
Lighting time [s]	-	-	58 ± 5
Parachute falling velocity [m/s]	-	-	5 ÷ 7
Light intensity [cd]	-	-	min 600 000
Operation temperature range [°C]	-40 ÷ +50	-30 ÷ +50	-30 ÷ +50



## FUZES



Technical data	ZGN	ZGM	MZR-60 M	MZR-96	UMZ-12	PMZ-10	KZ984
Type	bottom, impact	mechanical, impact	mechanically-electrical, time programmable	mechanically-electrical, warhead, time programmable	mechanical, warhead, impact dual mode	mechanical mortar, programmed inductively	mechanical, warhead, impact, dual action
Weight [g]	about 60	about 250	470	822	1520	600	700
Max height [mm]	-	-	-	-	-	-	143
Max diameter [mm]	ø 30	ø 40	-	-	-	-	ø 60
Arming distance min/max [m]	10/50	14/30	-	-	40/150	40/150	80/-
Mounting thread	M30 x 1	Sp 36,18 x 10 zw/1"	M45 x 1,5	M45 x 1,5	M 68 x 1,5	2" - 12 TPI UNF	2" - 12 UNS - 1A
Max length [mm]	30,80	96,30	-	-	-	-	-
Min programming time [s]	-	-	5	5	-	5	-
Max programming time [s]	-	-	99,98	99,98	-	-	-
Setting sequences [s]	-	-	0,02	0,02	-	-	-
Way of entering settings	-	-	from the warhead of the programmer	from the warhead of the programmer	-	-	-
Weight of explosive in booster [g]	-	-	4	20	48	16	21,5
Explosive	-	-	black powder	black powder	PBXN-5 / PBXW-11	black powder	Pentryt NP - 10
Delay time in short delay mode [s]	-	-	-	-	0,05	-	0,06
Min/Max load factor [g]	-	-	-	-	700/14 500	700/10 300	-
Min speed required for arming [m/s]	-	-	-	-	145	-	-
Operating temperature range [°C]	-	-	-30 ÷ +50	-30 ÷ +50	-40 ÷ +50	-30 ÷ +50	-40 ÷ +50



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## 40 X 46 MM LV AMMUNITION



Technical data	NGO-N1	NGC-N	NGC1-40	NGC2-40	NGM1-40	NGM2-40	NGO5-N	NGHB-N	NGD-N	NGDR-N	NGZ-N	NGK-N
Type	HE with self-destruct mechanism	target practice	practice round	practice with tracer	practice-marker	practice-marker with tracer	illuminating	flash-bang	smoke	multi-smoke	incendiary	multi-rubber balls
Weight [g]	277	255	277	277	277	277	225	240	300	300	300	180
Length [mm]	99	101,9	99	99	99	99	123,5	105	123,5	123,5	123,5	123,5
Muzzle velocity [m/s]	82 ± 2	78	82 ± 2	76 ± 2	76 ± 2	76 ± 2	76	76 ± 2	82	82	82 ± 2	-
Range [m]	min 370	min 370	min 370	min 370	min 370	min 370	> 180	-	min 370	min 100	min 370	-
Smoking time [s]	-	-	-	-	-	-	-	min 25	min 25	-	-	-
Generated bang [dB]	-	-	-	-	-	-	-	127,5	-	-	-	-
Time of tracer smoking [s]	-	-	-	min 8	-	min 8	-	-	-	-	-	-
Delay time [s]	-	-	-	-	-	-	4	-	4 ÷ 5	4 ÷ 5	4 ÷ 5	-
Colour of tracer	-	-	-	red	-	red	-	-	-	-	-	-
Luminous colour	-	-	-	-	-	-	yellow	-	-	-	-	-
Marker colour	-	-	-	-	orange	orange	-	-	-	-	-	-
Number of fragments	min 200	-	-	-	-	-	-	-	-	-	-	-
Lethal radius [m]	5	-	-	-	-	-	-	-	-	-	-	-
Area of destruction [m]	-	-	-	-	-	-	-	-	-	-	-	1/1 at the shooting distance 5 m; 2/2 at the shooting distance 15 m
Number of balls	-	-	-	-	-	-	-	-	-	-	-	25
Diameter of ball [mm]	-	-	-	-	-	-	-	-	-	-	-	ø 15
Ball weight [g]	-	-	-	-	-	-	-	-	-	-	-	2,15
Operation temperature range [°C]	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50

## GRENADE LAUNCHERS

Technical data	40 MM SINGLE SHOT GRANADE LAUNCHER GSBO-40	40 MM SINGLE SHOT UNDER BARREL GRANADE LAUNCHER GPBO-40
Type	single shot LV	single shot LV
Type of ammunition	40 x 46 mm LV	40 x 46 mm LV
Length [mm]	498	418
Width [mm]	70	98
Size with sight inserted/extended [mm]	209/317	220/328
Length of the sight [mm]	125	125
Barrel length [mm]	250	250
Number of grooves in the barrel	6	6
Weight [g]	~ 2365 [weight of sight 150]	~ 1915 [weight of sight 150]
Rate of fire [pc/min]	5 ÷ 7	5 ÷ 7
Muzzle velocity depending of the round [m/s]	82 (round NGO-N1)	82 (round NGO-N1)
Range with radius 36° [m]	430	430
Operation temperature range [°C]	-50 ÷ +55	-50 ÷ +55



## 40 x 53 MM HV AMMUNITION



Technical data	NGA-0	NGKO	NGKO-RF	NGAC	NGAC-T	NGA-M	NGA-MT
Type	HE SD	HEDP	HEDP Air-Burst round with Radio Frequenced fuze	BALL-TP	BALL-TP-T	practice marker	practice marker with tracer
Weight [g]	353	363	363	363	363	363	363
Length [mm]	max 112	max 112	max 112	max 112	max 112	max 112	max 112
Muzzle velocity V24 [m/s]	237 ± 8	237 ± 8	237 ± 8	237 ± 8	237 ± 8	237 ± 8	237 ± 8
Max defeat radius [m]	≤ 20	15	15	-	-	-	-
Effective lethal radius [m]	≥ 3	5	5	-	-	-	-
Fragmentation density [pcs/m²]	min 2	min 2	min 2	-	-	-	-
Range [m]	≥ 1800	2200	2200	2000	2000	2000	2000
Marker	-	-	-	-	-	fluorescent powder	fluorescent powder
Colour of marker	-	-	-	-	-	orange	orange
Tracer	-	-	-	-	red	-	red
Smoking time [s]	-	-	-	-	min 8	-	min 8
Penetration [mm]	-	min 50 of armour plate	min 50 of armour plate	-	-	-	-
Fuze	PDS0451	MK 443 Mod0	radio programmed	-	-	-	-
Arming time[s]	-	-	0,43/20	-	-	-	-
Arming distance [m]	18 ÷ 40	18 ÷ 40	18 ÷ 40	-	-	-	-
Self-destruction [s]	14 ÷ 20	> 20	> 20	-	-	-	-
Weight of explosive [g]	52	41	41	-	-	-	-
Primer	FED 215	FED 215	FED 215	FED 215	FED 215	FED 215	FED 215
Propellant	nitrocellulose (NC)	nitrocellulose (NC)	nitrocellulose (NC)	nitrocellulose (NC)	nitrocellulose (NC)	nitrocellulose (NC)	nitrocellulose (NC)
Propellant weight [g]	4,5	~ 4,5	~ 4,5	~ 4,5	~ 4,5	~ 4,5	~ 4,5
Operation temperature range [°C]	-40 ÷ +55	-40 ÷ +63	-32 ÷ +63	-40 ÷ +55	-40 ÷ +55	-40 ÷ +55	-40 ÷ +55

## 60 MM MORTAR AMMUNITION



Technical data	O-LM60	D-LM60	S-LM60
Type	high explosive	smoke	illuminating
Weight [g]	2000	2210	2200
Max muzzle velocity [m/s]	173	169	169
Range min/max [m]	75/2300	212/1867	212/1867
Number of fragments	min 1500	-	-
Defeat radius [m]	15	-	-
Fuze	ZGM	MZR-60M	MZR-60M
Smoking time [s]	-	min 80	-
Illuminating time [s]	-	-	min 50
Luminous [cd]	-	-	min 200 000
Operation temperature range [°C]	-40 ÷ +50	-30 ÷ +50	-30 ÷ +50

## HAND GRENADES

Technical data	RG0-88	RGZ-89
Type	defensive	offensive
Height of unarmed grenade [mm]	max 73,7	max 98
Diameter of grenade [mm]	max ø 57	max ø 59
Weight of unarmed grenade [g]	440	325 ± 5
Body of the grenade	steel plate	plastic (polyamide)
Diameter of the socket under fuze [mm]	~ ø 10	~ ø 10
Explosive material	heksogen (RDX)	heksogen (RDX)
Weight of explosive [g]	60	106
Fragmentation material	steel balls	aluminium insert – helically coiled wire
Number of fragments	~ 1150	~ 860
Dimension of fragments [mm]	ø 5/32'	3 x 3,5 x 5
Fuze	UZGRM, mechanical	UZGRM, mechanical
Fuze delay [s]	3,2 ÷ 4	3,2 ÷ 4
Length of fuze [mm]	max 99,5	max 99,5
Lethal radius [m]	5	5
Operation temperature range [°C]	-40 ÷ +50	-40 ÷ +50



## RIFLE GRENADES



Technical data	GNPO	NGD-93	NGZ-93	NGOS-93
Type	HEAP	smoke	incendiary	illuminating
Weight [g]	410	455	456	466
Length [mm]	279	226	228	314
Diameter of stabilizer wings [mm]	ø 60	ø 60	ø 60	ø 60
Diameter of the warhead [mm]	ø 40	ø 52	ø 52	ø 43
Penetration [mm]	min 80	-	-	-
Range [m]	min 240	min 200	min 200	min 150
Weight of the fragment [g]	0,26	-	-	-
Time of smoking [s]	-	min 50	-	-
Dimensions of the smoke screen after 10 s since detonation [m]	-	20 x 3	-	-
Filling	-	based on hexachloroethane	based on ferric oxide	based on sodium nitrate and magnesium powder
Time of burning [s]	-	-	min 30	-
Illuminating height [m]	-	-	-	min 100
Falling velocity [m/s]	-	-	-	max 5
Time of illuminating [s]	-	-	-	min 20
Luminous intensity [cd]	-	-	-	min 50 000
Illuminating colour	-	-	-	white or yellow
Operation temperature range [°C]	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50	-40 ÷ +50