

جمهوری اسلامی افغانستان
وزارت ترانسپورت

مشخصات فنی

پروژه: ساخت ماشین، تجهیزات و مواد خط انداز و جاده

Technical Specification
Road Marking Machine, Equipment, and Material

Section I

Material Specifications

1- Thermoplastic Road Marking Paint

Thermoplastic road marking paint, also called hot melt marking paint, is a kind of powder paint. When applied as road surface markings, a hot melt kettle is used to heat it to 200 °C, after which it is sprayed on the road surface. The coating then becomes a line after cooling. This paint is thick coating, wear-resistant, bright and reflective. Thermoplastic can be used very effectively for large Anti-skid areas on roads and pedestrian walkways by adding glass beads. It can be produced in any color and is great for car parks, factory walkways and many other areas. It's fast drying and can be driven over after just a few minutes.

Thermoplastic Road Marking includes Paint, with hot mix or drop on glass beads which create reflectivity.

The contractor should provide test reports of thermoplastic paint, glass bead from manufacturer company. Update test report of material should be submitted along with material.

Followings are technical specification for paint and glass bead

1.1. Composition

Below are based on AASHTO M249:

Description	Unit	White	Yellow
Binder (Resin + Oil)	%	≥18	19.4
Glass Beads Contents	%	30 – 40	30 – 40
Titanium Dioxide	%	≥10	-
Resin Type	-	Hydrocarbon	Hydrocarbon
Calcium Carbonate and inert fillers	%	≤42	-
Yellow Pigment			

- ⇒ Pigment material should be Titanium Dioxide
- ⇒ Sufficiently heat stable LEAD CHROMATE should be the yellow pigment used. Its content has to be such that to give a minimum of daylight reflectance of 45%.
- ⇒ Filler (Calcium Carbonate) should be made of Natural Chalk

1.2. Physical Characteristic:

Properties	White	Yellow
Specific gravity	≤ 2.15	≤ 2.15
Daylight reflectance at 45°/0°	≥ 75	≥ 45
Bond strength (MPa)	≥ 1.24	≥ 1.24
Cracking resistance	No cracks	No cracks
Impact resistance (J)	≥ 1.13	≥ 1.13
Luminance	>80	>80
Surface Drying time	≤ 4 min	≤ 4 min
Full Drying Time	≤ 10 min	≤ 10 min
Softening point (C°)	102.5±9.5	102.5±9.5
Flowability	≤ 18	≤ 21
Yellowness resistance	≤ 0.12	--
Flowability - Extended heating	≤ 28	≤ 28



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A. The iPre-mix Solid glass beads incorporated in the material comply to type 1 category of A-SHTO M 247 with the following properties:

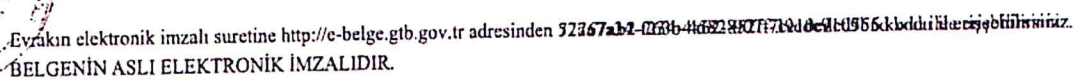
Minimum spherical beads by mass should be 75%

Minimum spherical beads by mass should be 75%

PACKING
The material is supplied in powder/granule form packed in approximately 25kg plastic sacks on pallets of approximately 1,000 kg.

Primer is primarily used to improve cohesion between road surface and thermoplastic paint. It uses on old asphalt surfaces, and concrete surface to create bonding between material and marking. Material should be consistent to thermoplastic paint, with following specifications:

- Usage: Road Marking Paint
- Application Method: Spray
- Material: Acrylic
- State: Liquid Coating
- Composition: Organic Material
- Application: Road Marking Thermoplastic Paint
- Color: Colorless

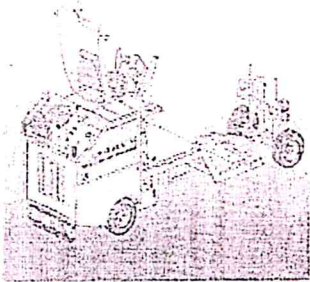


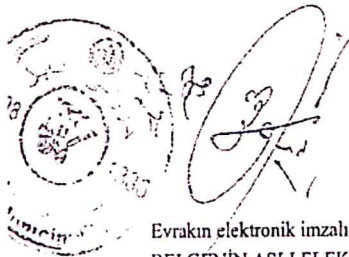
3- Self-Propelled Spray Application Thermoplastic Machine

The supplied machine should have one-seat slide drive and operator section. Section working on the left or right side. The spray plastic equipment on the machine should be able to apply lines of up to 40 cm width, depending on the set-up. The equipment should be used for the application of plain lines, angle and couple lines of different widths, as well as for simultaneous application of continuous and interrupted lines. The thermoplastic spray application equipment works via a pressure tank. The amount of material that is put on the road is set by the pressure of the tank and the air pressure of spraying.

A Test Certificate together with a Certificate of conformity of EU should be submitted while providing self-propelled thermoplastic road marking machine.

Part A. Road Marking Machine Specifications:

ROAD MARKING MACHINE FOR SPRAY-PLASTIC APPLICATION. PRESSURIZED MATERIAL TANK				
Technical Specifications and Equipment's.				
No.	Description	Quantity	Price	Image
1	Machine with Below Specifications: * Water-cooled turbo diesel engine 4 cyl. 2400 cm3 44 kW/59 hp @2700 rpm * Screw compressor, 1800 liters/min. * Pneumatic control panel. * Hydraulic pump. * Electric system 12 V * Hydrostatic, variable transmission 0-16 km/h. * Hydraulic piston pump, 40 cm3/omg. * Hydraulic oil tank, 50 liters. * Hydraulic piston motors with integrated electronic hydraulic disc brakes. * Diesel oil tank, 50 liters. * Pressurized glass bead tank, 115 liters /170 kg. * Diesel oil level gauge, water temperature gauge. - hour meter. * Working lights. * Drive and operator section with 1 seat, slideable left to right. * Tool box and fire extinguisher. * Pulse transmitter for control unit.	1.0		
	Reversing Alarm	1.0		
	Pointer, turning with steering	1.0		
	Hydraulic lifting system for pointer	1.0		



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BELGENİN ASLI ELEKTRONİK İMZALIDIR.

THERMOPLASTIC MATERIAL TANK
Spray-plastic tank 180 Litre
incl agitator hose and burner and heat
transfer plume

1.0

Spray plastic system

Heat transfer plume kit

1.0

Retainer for spray plastic
guns.
incl 2 pc of spray-plastic guns
complete with standard
nozzles. Incl. lifting system

1.0

Automatic glass bead gun,
incl holder & Ø12 valve seat

2.0

Hose kit for bead guns

1.0

LINE CONTROL SYSTEM

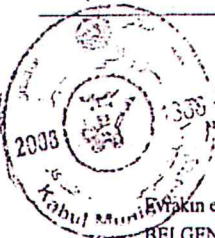
Manufacturer @ LineMaster
Control unit for line marking,
with GPS included
Efficient control and easy
adjustment of all
road marking tasks, from line
application
and Premarking to reporting
and invoicing.
* Storage of 99 different line
types - arranged
in up to 30 marking programs
*usb connection for exchange
of data
* 8" display, clear and easy
reading of data
* Choice of language

1.0

Manufacturer Online@ -data in
the cloud:
It is an online platform that
allows user to easily get an
overview of the Marking
machine activity. Also, it must
be free of charge for the first 6
months.
Diagnostic data from the
Machine is stored
on the Manufacturer's Online
platform, so user can always
access this data and generate
reports by accessing user
Manufacturer Company Online
account.
All data should be stored for
minimum 5 years.
User should also be able to

1.0

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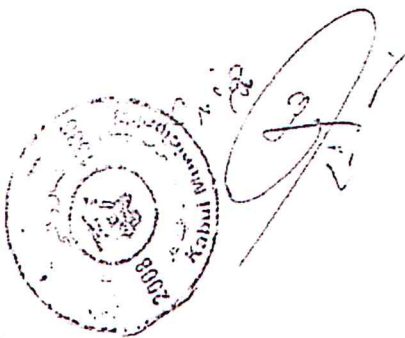
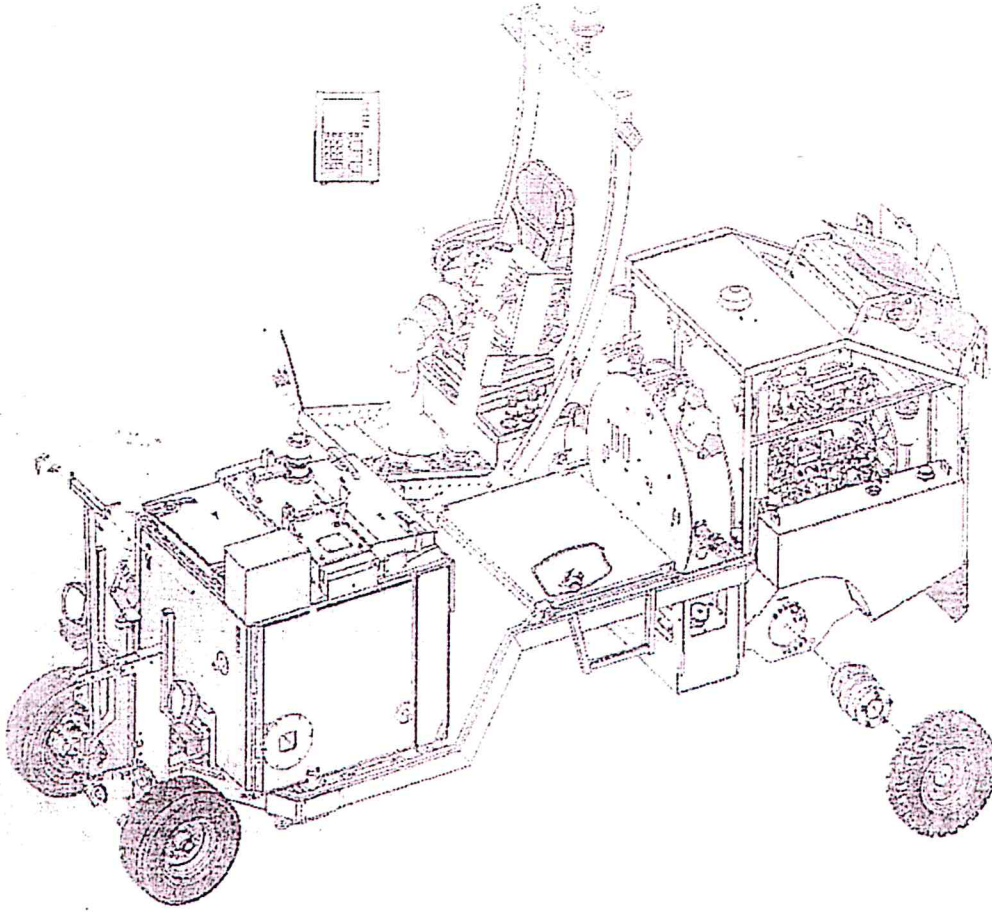
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BELGENİN ASLİ ELEKTRONİK İMZALIDIR.

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Safety package gauntlets, forehead

6 protection with face shield, 6 reflector

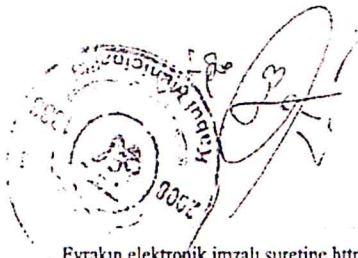
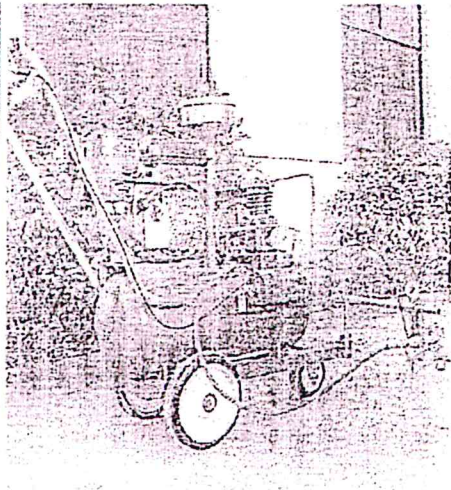
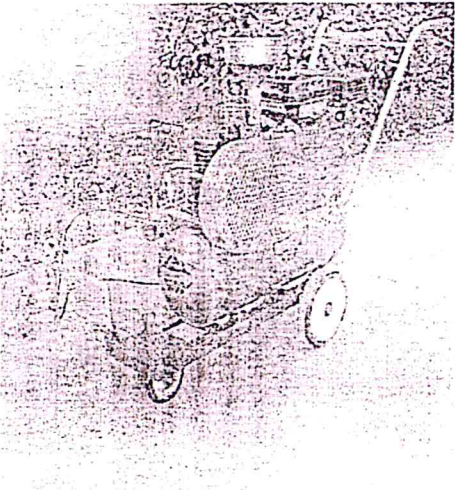
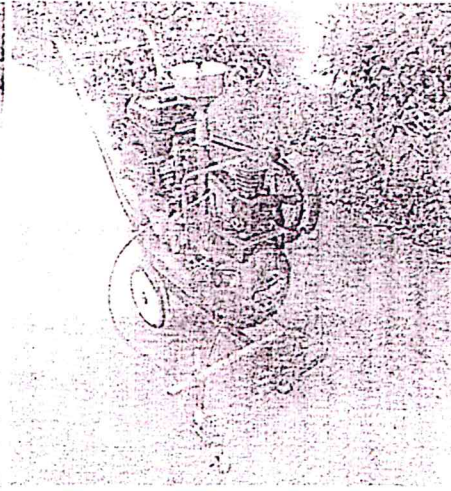
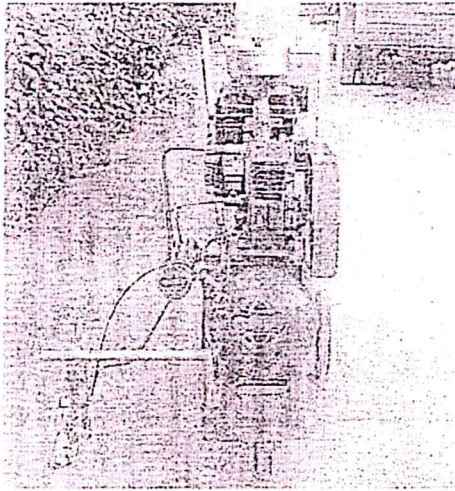
vests, hard hat



4- Primer Sprayer Machine

Primer sprayer machine is used for spraying primer to improve cohesion between road marking paint and road surface. It can obviously prevent the peeling off of marking lines. Concrete road and asphalt road surfaces must be crimed beforehand in the operating site with a roller.

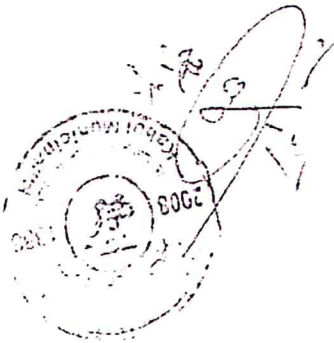
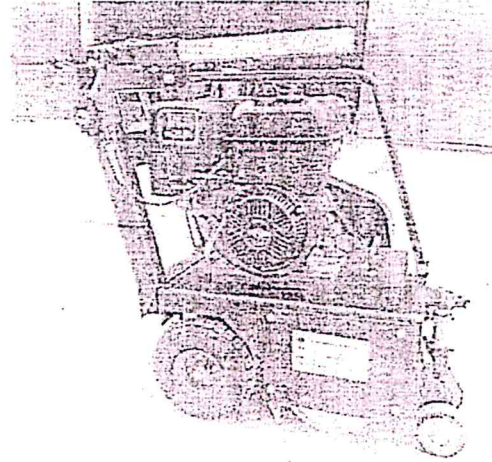
No.	Description	
1	Dimension	1400*620*940 mm
2	Weight	75 kg
3	Engine	5.5 HP
4	Engine Type	Honda Petrol (or equivalent)
5	Air Compressor	0.3m ³ /min
6	Pressure	0.8 mpa
7	Spraying Width	100-450 mm
8	Primer tank Capacity	50 kg



5- Road Marking Line Removal Machine

Road marking line remover is used for removing the waste or broken marking lines before marking new ones. It scrapes off marking lines through the spinning cutting head at the bottom of the machine. The cutting head is replaceable. The machine should be able to remove the marking lines thoroughly, with minimize damage to the road surface. Also, machine should have ability of removing thermoplastic and cold paint clearly in short time. The supplied machine should have following specifications:

No	Description	
1	Size (LxWxH)	1180*630*950 mm
2	Weight	255 kg
3	Engine Rated Power	13 HP
4	Removing Speed	3600r/min
5	Removal Cutter lifetime	200 hours 8000-10000 m ²
6	Rotation Speed	3600r/min
7	Working Width	100-300 mm
8	Removing Depth	0-3 mm
9	Driving method	Self-propelled
10	Fuel Consumption	230g/h
11	Shaft number of drum	1 piece per drum
12	Drum number	6
13	Size of drum	128*83 mm
14	Size of per cutter	63*8 mm
15	Number of cutter	78 pieces



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Section II

1. Training for Self-Propelled Spray Application - Thermoplastic Machine

Training on maintenance and application of Self-Propelled Spray Application Thermoplastic Machine should be provided to contractor for Road Marking work. The sessions should contain theoretical and practical information regarding the machine and should be held in Kabu for at least 3 days.

The training should cover at least the following sessions:

- Application types / Materials / Equipment and functioning.
- Line control / Computer functioning / Simulator training.
- Technical issues and maintenance of the machine.
- Planning of road marking and calculating the material need.
- Marking up the road / Pre-marking.

