



» Industrial surface treatment

# MILITARY TECHNOLOGY



**COLORLAK**  
founded in 1925

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# SURFACE TREATMENT OF MILITARY TECHNOLOGY

In this material, we provide customers with an overview of the use of coating systems (CS) for surface treatment (ST) of various military technology (tanks, combat vehicles, trucks, containers, but also aircraft and helicopters) of equipment and materials.

For this purpose both ARMY Coating Systems (I and II) are approved and certified by the Brno Military Research Institute and are also contained in ČOS 801001 (Czech Defence Standard).

## ARMY - protective masking coating systems

The ARMY Painting System (I and II) is designed for the exterior surface treatment of Czech Army technology, equipment and materials. The U2500 paint system integrates anticorrosive protection with a camouflage effect in the visible and near-infrared range of electromagnetic radiation, with increased resistance to degradation by mechanical and atmospheric influences and the effects of special cleaning processes.

The U2056 paint system integrates anticorrosive protection with a camouflage effect in the visible and near-infrared range of electromagnetic radiation, with increased resistance to degradation by mechanical and atmospheric influences and the effects of special cleaning processes.





### System ARMY I: Structure of protective and camouflage coating system in the field of IR spectrum, using paint U2500:

name	trade name	shade	total dry thickness
<b>SYNOREX</b> reactive two-component paint	S2008	C0600	8-12 µm
<b>EPAX</b> special epoxy priming anti-corrosion two-component	S2320	C0600	25-30 µm
<b>ARMY</b> special polyurethane two-component matt top coat	U2500	.... *	90-120 µm

\* shades offered are listed directly on the product U2500

### System ARMY II: Structure of protective and camouflage coating system in the field of IR spectrum, using paint U2056:

name	trade name	shade	total dry thickness
<b>SYNOREX</b> reactive two-component paint	S2008	C0600	8-12 µm
<b>EPAX</b> special epoxy priming anti-corrosion two-component	S2320	C0600	25-30 µm
<b>AXAPUR</b> polyurethane two-component matt top coat	U2056	.... *	90-120 µm

\* shades offered are listed directly on the product U2056

### System III: Structure of protective and camouflage coating system in the field of IR spectrum, use outside the AČR (Armed forces):

name	trade name	shade	total dry thickness
<b>SYNOREX</b> reactive two-component paint	S2008	C0600	8-12 µm
<b>EPAX</b> special epoxy priming anti-corrosion two-component	S2320	C0600	25-30 µm
<b>ARMY</b> special polyurethane two-component matt top coat	U2500	.... *	90-120 µm
or <b>AXAPUR</b> polyurethane two-component matt top coat	U2056	.... *	90-120 µm

\* shades offered are listed directly on the product U2500 or U2056

to enhance protection and to unify the gloss, use ultra-matt varnish:

<b>ARMY</b> special polyurethane two component ultra-matt varnish	U1500	C0000	20-30 µm
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\* consult usage of U1500 with COLORLAK technicians





# PRESENTATION OF INDIVIDUAL COATING MATERIALS

## S2008/C0600 SYNOREX

reactive two-component paint

### Composition

S2008 is dispersion of inorganic pigments in solution of synthetic resins in organic solvents

### Use

Two-component reactive paint S 2008 SYNOREX is intended for special industrial purposes. It is used where for technical reasons it is not possible to use anti-corrosion coating free of zinc chromate, i.e. in the aerospace and automotive industries only for the protection of parts of motor vehicles exposed to increased activity of chemicals. S2008 is designed especially for zinc, aluminium and its alloys to improve adhesion and corrosion resistance. Hardened mixture S2008 etches metals and forms a well-grounded (adhesive) layer between the substrate and other coatings.

### Application

Prior to processing, the paint must be adjusted according to ČSN 67 0810 (e.g. control of label data, mixing and eventually filtering of diluted material). Stir the paint S2008 thoroughly before use and then harden in a weight ratio of 4 parts of paint U2008 : 1 part of hardener S6011. Hardened mixture is used not sooner than after 30 minutes after mixing the two components. Paint mixture workability is 8 hours. Thin by S6010. Apply only in one layer by brush, dipping, spraying on dry, clean, degreased, not corroded metal in dry layer thickness 12 µm the most. In this thickness the coat is not opaque and the underlying material is visible. Another coat of paint with air-drying or stoving (maximum burning temperature 140 °C) can be applied after 2 hours of drying. Optimal ambient and surface temperature during application is 15-25 °C.

### Shade

S2008 is produced in non-standardized shade C0600 - yellow. Contains 4.86 % ZN and 0.77 % Cr. When mixing the paint with hardener specific colour shade changes occur usually.

## S2320/C0600 EPAX

epoxy priming anti-corrosion two-component special paint

### Composition

S2320 is dispersion of pigments and anticorrosive components in solution of low-molecular epoxy resin in organic solvents with addition of additives.

### Use

S2320 EPAX is designed for use of priming coating under epoxy and polyurethane coating systems on metal surfaces, i.e. steel, aluminium, zinc etc. for exterior use, such as coating of Czech Army technology. In the coating system, it provides excellent adhesion to metal surfaces and high corrosion protection.

### Application

Prior to processing, the paint must be adjusted according to ČSN 67 0810 (e.g. control of label data, mixing and eventually filtering of diluted material). Stir the paint thoroughly before use and then mix with the hardener in a weight ratio of 6 parts of paint S2320 : 1 part of hardener S7302. Apply the paint by brush or spray to a clean, dry and degreased surface in a uniform layer at 15-25 °C. If necessary, thin by S6300 thinner. Clean all tools immediately after painting with S6300 solvent, because dried paint is difficult to remove. Paint mixture workability is 5 hours the most.

### Shade

The paint is produced in non-standardized shade C0600 - yellow, without heavy metals.



## U 2500/... \* ARMY

special polyurethane two-component matt top coat

### Composition

Top paint U2500 is dispersion of special mixtures of inorganic and organic pigments and fillers in solution of synthetic binders in organic solvents with additives.

### Use

U2500 ARMY is designed for making highly matt top coats of coating systems for surface treatment of exterior surfaces of military equipment, weapons and materials of Czech Army, with demand on integration of anticorrosive protection, masking effect in the visible and near infra-red spectrum of electromagnetic radiation. As a part of the proven coating systems is particularly suitable for the realization of top coating and anticorrosive protection of steel surfaces and aluminium alloys, but also to finish products of wood and selected engineering plastics and concrete, which are exposed to the full range of atmospheric corrosion effects. It is especially designed to the realization of coating systems with improved resistance to mechanical damage effects and impact of technology environments.

### Application

Prior to processing, the paint must be adjusted according to ČSN 67 0810 (e.g. control of label data, mixing and eventually filtering of diluted material). After thorough stir, mix the U2500 ARMY with hardener in weight ratio 5 parts of U2500 : 1 part of hardener U7001. Apply by spraying with compressed air, high pressure spraying or brush onto a surface provided with a paint made of primer or basic anticorrosive paint suitable for the construction material. For steel or aluminium alloy surfaces priming anticorrosive coat of paint based on S2320 or S2008 is required.

Thinner U6002 is used for dilution to corresponding application consistency. The recommended flow time from the cup accor-

ding to ČSN EN ISO 2431 (nozzle diameter 4 mm) for application by spraying with compressed air is 30-40 s, for application by brush 50-60 s. The U2500 layer dries at ambient temperature (optimally at 20 °C) very fast, drying can be accelerated by increasing the temperatures up to 60 °C. Low temperature and high relative humidity (over 55 %) during application and drying lowers the drying speed and can cause different coating defects. Paint defects can occur even when the topcoat is diluted to a non-recommended application consistency or diluted with an unsuitable thinner. Next layer of U2500 top paint can be applied after 30-60 minutes of drying at 21-25 °C. Paint mixture workability is 5 hours the most.

### Shade

U2500 is produced in one quality in shades free of heavy metals and in accordance with the requirements for the shade of top paint according to ČOS 801001. The shades can be produced in a quality with or without masking near the infra-red range of electromagnetic radiation.

	shade	trade name
U2500	black	C1999
	sand yellow	C2090
	light green	C5140
	dark green	C5330
	khaki green	C5454
	RAL 6031 Bundeswehr	R6031

Other shades can be made according to NATO specifications or other specifications in quality with or without masking in the near infra-red range of electromagnetic radiation or according to customer requirements.

## U1500/C0000 ARMY

special polyurethane two component ultra-matt varnish

### Composition

U1500 is colloidal solution of synthetic resins in organic solvents with additives.

### Use

U1500 ARMY varnish is designed for re-spray of top coat of paints designed for military use ARMY U2500 or AXAPUR U2056, where it increases overall resistance and unifies the degree of matt of deformation fields.

### Application

Prior to processing, the varnish must be adjusted according to ČSN 67 0810 (e.g. control of label data, mixing and eventually filtering of diluted material). Stir the varnish thoroughly before

use and then mix with the hardener in a weight ratio of 5 parts of varnish U1500 : 1 part of hardener U7001. The varnish does not have to be diluted before use. Thinner U6002 can be used if needed. After 20 minutes the mixture is ready for application by spray. Apply in one layer to pre-prepared clean and dry topcoat of U2500 or U2056 at 18-22 °C and low relative air humidity. Paint mixture workability is at least 5 hours at temperatures around 20 °C. Clean all tools immediately after use by U6002 thinner because the dried varnish is hard to remove.

### Shade

The varnish is produced in one quality, transparent, in colour according to raw material used, ultra-matt.





# U 2056/....\* AXAPUR

polyurethane two-component matt top coat

## Composition

Dispersion of pigments and special matt component in solution of saturated polyester resins in organic solvents with additives.

## Use

AXAPUR U2056 is designed for making matt top coats of coating systems for surface treatment of exterior surfaces of various techniques, equipment and means of transport, aircraft military equipment, weapons and materials of Czech Army, with demand on integration of anticorrosive protection, masking effect in the visible and near infra-red spectrum of electromagnetic radiation. As part of the proven coating systems U2056 is particularly suitable for the realization of top coating and anticorrosive protection of steel surfaces and aluminium alloys, but also to finish products of wood and selected engineering plastics and concrete, which are exposed to the full range of atmospheric corrosion effects. It is especially designed to the realization of coating systems with improved resistance to mechanical damage effects, chemical cleansing and impact of technology environments.

## Application

Prior to processing, the paint must be adjusted according to ČSN 67 0810 (e.g. control of label data, mixing and eventually filtering of diluted material). After thorough stir, mix the U2056 AXAPUR with hardener in weight ratio 4 parts of U2056 : 1 part of hardener U7002. Apply by spraying with compressed air, high pressure spraying or brush onto a surface provided with a paint made of primer or basic anticorrosive paint suitable for the construction material. For steel or aluminium alloy surfaces priming anticorrosive coat of paint based on S2320 or S2008 is required.

Thinner U6002 is used for dilution to corresponding application consistency. The recommended flow time from the cup

according to ČSN EN ISO 2431 (nozzle diameter is 4 mm) for application by spraying with compressed air is 20-30 s in three layers at an interval of 30 minutes, for application by brush 50-60 s. The U2056 layer dries at ambient temperature (optimally at 20 °C) very fast, drying can be accelerated by increasing the temperatures up to 60 °C. Low temperature and high relative humidity (over 55 %) during application and drying lowers the drying speed and can cause different coating defects. Paint defects can occur even when the coat is diluted to a non-recommended application consistency or diluted with an unsuitable thinner. Next layer of U2056 paint can be applied after 30-60 minutes of drying at 20-25 °C. Paint mixture workability is 5 hours the most.

## Shades

U2056 is produced in one quality in shades free of heavy metals and in accordance with the requirements for the shade of top paint according to ČOS 801001. The shades can be produced in a quality with or without masking near the infra-red range of electromagnetic radiation.

	shade	trade name
U2056	black	C1999
	sand yellow	C2090
	light green	C5140
	dark green	C5330
	khaki green	C5454
	RAL 6031 Bundeswehr	R6031

Other shades can be made according to NATO specifications or other specifications in quality with or without masking in the near infra-red range of electromagnetic radiation or according to customer requirements.



# APPLICATION OF THE COATING SYSTEMS

## Surface treatment

The optimum pre-treatment of the surface of the steel elements and structures (workshop operation) is carried out by means of blasting to the Sa 2.5 degree. For galvanized steel and aluminium elements, this is an adequate way of pre-treatment - most often sufficient cleaning and degreasing and lightwei-

ght sanding. Any reasonable weak blasting is performed only rarely. Depending on the possibilities and availability, and after consultation with the manufacturer, it is possible to accept manual cleaning up to St degree. 3.

## Application of CS ARMY I with U2500

### Phase I:

The application of a complete permanent anticorrosive coating system, with a masking effect in the visible and near infra-red range of the electromagnetic radiation spectrum, is always performed under the prescribed - standard conditions on the entire outer metal surface. The system is always finished with the prescribed top layer U2500/Z1C5330 (or other shade). The coating system is sprayed. This complete coating system must be applied even to the entire surface of additionally mounted metal parts.

### Phase II:

The already prepared surface (phase I) is then finished with a finishing coat in the form of a masking pattern according to the designs elaborated by the Military Technical Institute of Brno. To make the masking pattern, stated shades of top paint U2500 are used.

In the first phase, only one layer of U2500 is applied to the surface in dark green (Z1C5330) with an overlap on the metal surface coating system of at least 5 cm. The deformation pattern on the entire surface of the technology is completed by applying one layer (two layers only when the desired covering power is

not achieved) in light green (Z1C5140) and black (Z1C1999). The thickness of the layers of these finishing coats must be in the range of 30 to 40  $\mu\text{m}$  and their adhesion to the substrate of the grade 0. It is necessary to ensure the overlap of each colour-distinct area of at least 5 cm on each other.

The finishing coat must be applied within 72 hours of finalizing the metal surface coating system. If this time interval is not met, the surface of the paint system must be roughened with abrasive grinding or medium grain paper (400) underneath the finishing coat, has to be cleaned of the abrasive and any other dirt or degreased. Otherwise, especially after a longer period of time, the interlayer adhesion of the finishing coat may be reduced.

The finished paint coating system and anticorrosion protection can be exposed to full operational stress after 14 days of drying at about 20 °C. In this period, it is necessary to avoid primarily its mechanical stress during this period.

Due to the lower hardness of the rubber lining, it is necessary to assume a greater frequency of damage to the topcoat on this surface by mechanical effects than on the metallic surface.

Recommended (standard) time sequence of application of individual layers of paint (standard application and drying conditions apply):

trade name	number of layers	total layer	drying
S2008	1	8-12 $\mu\text{m}$	min. 2 hours
S2320	1	25-30 $\mu\text{m}$	optimum is 8 hours (30-50 minutes is enough when spraying)
U2500	3	90-120 $\mu\text{m}$	when spraying "wet in wet" it is 30-60 minutes

## Application of CS ARMY II with U2056

The application of a complete permanent anticorrosive coating system, with a masking effect, is always performed under the prescribed - standard conditions on the entire outer metal surface. The system is always finished with the prescribed top layer U2056/.... (shade according to request). The coating system is sprayed. This complete coating system must be applied even to the entire surface of additionally mounted metal parts.

The finished paint coating system and anticorrosion protection can be exposed to full operational stress after 14 days of drying at about 20 °C. In this period, it is necessary to avoid primarily its mechanical stress during this period.

Due to the lower hardness of the rubber lining, it is necessary to assume a greater frequency of damage to the topcoat on this surface by mechanical effects than on the metallic surface.

Recommended (standard) time sequence of application of individual layers of paint (standard application and drying conditions apply):

označení	počet vrstev	celková vrstva	zasychání
S2008	1	8-12 $\mu\text{m}$	min. 2 hours
S2320	1	25-30 $\mu\text{m}$	optimum is 8 hours (30-50 minutes is enough when spraying)
U2500	3	90-120 $\mu\text{m}$	when spraying "wet in wet" it is 30-60 minutes







ČESKÁ REPUBLIKA

**ÚŘAD PRO OBRANNOU STANDARDIZACI, KATALOGIZACI  
A STÁTNÍ OVĚŘOVÁNÍ JAKOSTI**

  
 vydává podle zákona č. 309/2000 Sb., § 30 odst. 5

**OSVĚDČENÍ**

č. 43/7-2017

pro

**COLORLAK, a.s.**  
Tovární 1076, 686 03 Staré Město  
IČ: 49444964

**o shodě systému jakosti s požadavky  
ČSN EN ISO 9001:2016  
ČOS 051672 (AQAP 2110)**

Rozsah platnosti:

Vývoj, výroba a prodej nátěrových, fasádních, interiérových  
a podlahových hmot, hydroizolačních a zateplovacích  
systémů.

1. Toto osvědčení vydává Úř OSK SOJ na základě auditu systému jakosti provedeného v době od 17.10.2017 do 18.10.2017. Úřad neodpovídá za změny v systému jakosti, ke kterým by u dodavatele došlo po vydání tohoto Osvědčení.  
 2. Toto osvědčení platí výhradně pro prověřovanou oblast činnosti a nesmí být použito pro jinou oblast činnosti, než pro kterou je vydáno.  
 3. Úřad neodpovídá za neoprávněné použití Osvědčení dodavatelem, ani za škody, které by jak oprávněným, tak neoprávněným použitím vznikly třetí straně.  
 4. Toto Osvědčení nenahrazuje záruku za kvalitu výrobku, a odpovědnost za vady a škody, které dodavatelé vypisují v obecně platných právních předpisech, ani nenahrazuje úřední přezkoušení podle jiných obecně platných právních předpisů.

Toto osvědčení platí do: **31.10.2020**

U dodavatelů potravin je oprávněnost používání tohoto osvědčení vázána soustavným dodržováním hygienických norem a doporučení k zásobování ACR potravinami vydaným v protokolu kontrolního orgánu vojenské veterinární služby.

V Praze dne: 20.11.2017



  
 Ing. Martin Dvořák, Ph.D.  
ředitel Úř OSK SOJ

