Product Data

HEMPEL'S GALVOSIL 15780

HEMPEL'S LIQUID 15789 with HEMPEL'S ZINC METAL PIGMENT 97170

Description:
HEMPEL'S GALVOSIL 15780 is a two-component, medium-zinc, solvent-borne, self-curing inorganic zinc silicate coating. Applicable by airless spray.

Recommended use:
As a general purpose rust-preventing primer in paint systems for long-life protection of steel exposed to moderately to severely corrosive environment.

Service temperatures:
Maximum service temperature is depending on the subsequent coat.
See REMARKS overleaf.

Certificates/Approvals:
Meets the requirements laid down in ASTM A-490 Class "B" for Slip-Co-efficient and Creep Resistance.

Availability:
Part of Group Assortment. Local availability subject to confirmation.

PHYSICAL CONSTANTS:

Colours/shade nos:	Metal grey/19840
Finish:	Flat
Volume solids, %:	61 ± 1
Theoretical spreading rate:	12.2 m^2/litre - 50 micron 489 sq.ft./US gallon - 2 mils
Flash point:	14°C/57°F
Specific gravity:	2.4 kg/litre - 20.0 lbs/US gallon
Dry to touch:	30 (approx.) min. at 20°C/68°F (75% RH)
Fully cured:	16 (approx.) hours at 20°C/68°F (75% RH)
V.O.C.:	445 g/litre - 3.7 lbs/US gallon

Shelf life:
6 months (25°C/77°F) for liquid 15789 and 3 years for Hempel's zinc metal pigment 97170 (stored in closed container) from time of production.
Shelf life is dependent on storage temperature. Shelf life is reduced at storage temperatures above 25°C/77°F. Do not store above 40°C/104°F.
Shelf life is exceeded if the liquid is gelled or if the mixed product forms gels before application.

The physical constants stated are nominal data according to the HEMPEL Group's approved formulas. They are subject to normal manufacturing tolerances and where stated, being standard deviation according to ISO 3534-1.

APPLICATION DETAILS:
Consult separate APPLICATION INSTRUCTIONS

Mixing ratio for 15780:	Liquid 15789 : Hempel's zinc metal pigment 97170 4.1 parts by weight : 5.9 parts by weight (Mixing by volume - see REMARKS overleaf)		
Application method:	Airless spray	Air spray	Brush (touch-up)
Thinner (max.vol.):	08700 (30%)	08700 (50%)	08700 (10%)
Pot life:	4 hours (20°C/68°F)		
Nozzle orifice:	.019" - .023"		
Nozzle pressure:	100 bar/1500 psi *(Airless spray data are indicative and subject to adjustment)*		
Cleaning of tools:	THINNER 08700		
Indicated film thickness, dry:	50 micron/2 mils *(See REMARKS overleaf)*		
Indicated film thickness, wet:	75 micron/3 mils		
Recoat interval, min:	When fully cured		
Subsequent coat, max:	6 months		

Safety:
Handle with care. Before and during use, observe all safety labels on packaging and paint containers, consult HEMPEL Material Safety Data Sheets and follow all local or national safety regulations. Avoid inhalation, avoid contact with skin and eyes, and do not swallow. Take precautions against possible risks of fire or explosions as well as protection of the environment. Apply only in well ventilated areas.

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SURFACE PREPARATION:	Remove oil and grease, etc. with suitable detergent. Remove salt and other contaminants by (high pressure) fresh water cleaning. Abrasive blasting with sharp abrasive to minimum Sa 2½ with a surface profile equivalent to Rugotest No. 3, BN10, Keane-Tator Comparator, min. 3.0 G/S, or ISO Comparator rough Medium (G). In case of new steel to be exposed to no more than medium aggressive (industrial) environment and without any extraordinary demands to lifetime, a surface preparation degree of SSPC-SP6 may suffice. Consult separate APPLICATION INSTRUCTIONS.
APPLICATION CONDITIONS:	From 0°C/32°F to 40°C/104°F. Curing needs minimum 65% relative humidity and is very retarded at lower temperatures. Furthermore consult separate APPLICATION INSTRUCTIONS.
SUBSEQUENT COAT:	According to specification. Recoating is expected to take place within 6 months after application of HEMPEL'S GALVOSIL 15780.
REMARKS:	**Certificates** are issued under the former quality number 1578.
Service temperature:	HEMPEL'S GALVOSIL 15780 may be used for high temperature service if overcoated with HEMPEL'S SILICONE ALUMINIUM 56910. In such a case it will be resistant to permanent dry temperatures up to 500°C/932°F. In case of cyclic service conditions with regular periods of low and high temperatures it is recommended to keep the maximum temperature below 400°C/752°F.
Note:	If used as anticorrosive protection **under insulation** of high temperature equipment it is very important that NO moisture can penetrate during slowdown periods. This to avoid risk of "wet corrosion" when the temperature rises.
Film thicknesses:	50 micron/2 mils dry film thickness is recommended, but 75 micron/3 mils dry film thickness (125 micron/5 mil wet) may be specified, this will alter spreading rate and may influence drying time and recoating interval. (The dry film thickness range does not take into account the correction factors for rough surfaces as listed in ISO 19840).
Mixing:	When mixing part of the content in a can the mixing ratio on volume should be made as follows: Measure 8.0 parts of liquid 15789 and then add Hempel's zinc metal pigment 97170 up to a total of 10.0 parts by volume.
Thinning:	For application at high temperatures, a special thinner is available.
Recoating:	Recoating intervals are strongly dependent on both temperature and humidity. Deviations from the standard conditions may shorten or prolong the recoating intervals. Full curing will be obtained after: 0°C/32°F and min. 75% RH: 3 days 10°C/40°F and min. 75% RH: 36 hours 20°C/68°F and min. 75% RH: 16 hours (a certain curing does take place at temperatures below 0°C/32°F, but at an extreme low speed). Furthermore consult separate APPLICATION INSTRUCTIONS.
Note:	**HEMPEL'S GALVOSIL 15780 is for professional use only.**
ISSUED BY:	HEMPEL A/S - 1578019840CO0015

For product description refer to product data sheet

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Scope:

This application instruction covers surface preparation, application equipment and application of HEMPEL'S GALVOSIL 15780.

For optimum performance, the following is recommended:

Steel work:

All welding seams must have a surface finish which ensures that the quality of the paint system will be maintained in all respects. Holes in welding seams, undercuts, cracks, etc. should be avoided. If found, they must be remedied by welding and/or grinding.

All weld spatters must be removed.

All sharp edges must be removed or rounded off in such a way that the specified film thickness can be build-up on all surfaces. The radius of the rounding should be approximately 1-2 mm. Any laminations must be removed.

The steel must be of first class quality and should not have been allowed to rust more than corresponding to grade B of ISO 8501-1:2007.

Note: Porous surfaces such as certain types of cast iron cannot be properly protected with zinc silicate. Pit-corroded steel (Grade D of ISO 8501-1:2007) may also be difficult to protect with a zinc silicate.

All steel work (including welding, flame cutting, grinding) must be finished before the surface preparation starts.

Surface preparation:

Prior to abrasive blast cleaning of the steel, remove oil and grease and other contamination with a suitable detergent followed by fresh water high pressure hosing. Alkali deposits on new welding seams as well as possible soap traces from pressure testing (tanks) are removed by fresh water wash (scrubbing with stiff brushes).

Abrasive blasting with sharp abrasive to min. Sa 2½, ISO 8501-1: 2007.
Surface profile equivalent to Rugotest No. 3, min. BN 10 Keane-Tator Surface Comparator, G/S min 3.0 or ISO 8503/1 rough Medium (G).

In case of new steel to be exposed to no more than medium aggressive (industrial) environment and without any extraordinary demands to lifetime, a surface preparation degree of SSPC-SP6 may suffice.

Use steel grit, aluminium silicate or similar sharp edged abrasive of a good quality free of foreign matters, soft particles and the like. Control for absence of contamination according to separate guidelines.

The compressed air must be dry and clean. The compressor must be fitted with suitable oil and water traps.

Steel grit with a particle size of 0.2-1.0 mm or aluminium silicate of 0.4-1.8 mm will usually create the desired surface profile when the air pressure measured behind the nozzle is 6-7 bars/85-100 psi.

When blasting is completed, remove residual grit and dust.

Note: Lower surface profile than specified will cause reduced adhesion and increased tendency to mud cracking. On the other hand too high surface profile (steel grit) should be avoided as this may introduce a risk of pin-point rusting.

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Shopprimed surfaces:

If HEMPEL'S SHOPPRIMER ZS 15890 or other zinc silicate product is used for preliminary protection, abrasive sweep intact surface before final coating with GALVOSIL 15780 to remove accumulated dirt and zinc salts and to ensure adhesion.

Application:

GALVOSIL 15780 can be applied by conventional spray (pressure pot type), airless spray or brush.

Conventional Spray equipment: Standard industrial spray equipment with mechanical agitator and pressure regulators, air filters, and water traps.

Air hose:	10 mm (3/8") internal diameter.
Material hose:	13 mm (1/2") internal diameter.

Hoses should be as short as possible, preferably not longer than 10 metres/30 feet.

Pot pressure:	2.5-5 bar (35-70 psi)
Atomization pressure:	1.5-2.5 bar (20-35 psi)
Nozzle orifice:	1.8-2.2 mm (.070"-.085")

(Spray-data are indicative and subject to adjustment).

Thinning, if required: max. 50% of THINNER 08700.

The pressure pot must be placed at the same level as or at a higher level than the spray gun when spraying, owing to the weight of the material. Alternatively a piston-pump (e.g. 10:1) may be used instead of the pressure pot. This will facilitate the use of longer hoses or having the spray gun at a higher level than the pump.

When painting undersides, the spray gun will need intermittent cleaning with THINNER 08700 to prevent clogging of the nozzle.

With conventional spray application regulation of the pot and the atomizing air pressures can be made as follows:

1. Shut off the atomizing air.

2. Regulate the pressure in the pot so that the material reaches approximately 60 cm/20" horizontally out from the gun before falling to the ground.

3. Turn on the atomizing air using lowest possible pressure.

Airless spray equipment: A large, slow-working pump is preferred, e.g 30:1, with a pump capacity of 8-12 litres/minute. The in-line filter should be 60 mesh.

Gaskets:	Teflon
Nozzle orifice:	.019" through .023".
Fan angle:	40° through 70°.
Nozzle pressure:	100-150 bar (1400-2100 psi).

(Spray data are indicative and subject to adjustment).

Thinning, if required: max. 30% of THINNER 08700.

Wet film thickness:

Wet film thickness must be checked immediately after application, but can be used as a rough guidance only because of the fast drying.

Thinning:

The amount of thinning necessary will depend upon prevailing conditions: Temperature, humidity, wind/ventilation, method of spraying, spray equipment, etc.

Too little thinning will typically lead to dry-spray and too much thinning to sagging and settling of zinc particles in the can or in the spray hoses.

In the case of a high level of thinning and/or long stops in application, the mixed paint must be recirculated to avoid settlement of zinc particles in the spray hoses.

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Note:

The coating **must** be wet and smooth just after application. Besides correct spray technique, the amount of thinner added must be selected securing this optimum film formation.

Cleaning of equipment:

All equipment must be cleaned thoroughly with THINNER 08700 after use.

Additionally for conventional spray-guns:
In the case of short stops, prevent packing of zinc around the needle by placing the spray gun in THINNER 08700 and let some air pass the spray gun. In the case of longer stops, clean the spray gun with THINNER 08700.

Mixing:

a. Do not open packings until immediately before use. The entire content of the two packings must be used for each batch to ensure a correct mixture. Leftovers in the packings cannot be used later. Protect HEMPEL'S ZINC METAL PIGMENT 97170 against moisture before mixing.

b. Before mixing, shake or stir the GALVOSIL 15789 LIQUID very thoroughly.

c. Pour HEMPEL'S ZINC METAL PIGMENT 97170 slowly down into the LIQUID with constant mechanical stirring. **Do not mix in the reverse order.** Continue stirring until the mixture is free of lumps.

d. Strain the mixture through a screen, 60 - 80 mesh (250 - 160 DIN Norm. 4188).

Pot life:

4 hours (20°C/68°F)

Temperature of paint:

In a hot climate it is important that the cans with LIQUID are kept out of the sun and that the temperature of the liquid is kept below 30°C/86°F in order to avoid excessive dry spray.

Stripe coating:

All places difficult to cover properly by spray should be stripe coated with brush immediately before spray application - if necessary also after spray application.

Microclimate:

(Actual climatic conditions at substrate).

During application: minimum surface temperature 0°C/32°F. Maximum recommended temperature approx. 40°C (approximately 104°F), but higher steel temperatures will be possible provided dry-spray is avoided by extra thinning and proper spray application. In extreme cases reduction of dry film thickness may also be necessary.

If the surface temperature is higher than the ambient temperature, the relative humidity at the surface will be lower than ambient - this will affect the rate of curing. Wetting of the coated surface with fresh water may in such cases be required in order to accelerate or in some cases even enable curing.

Steel temperature has to be above the dew point. As a rule of thump a steel temperature 3°C (5°F) above the dew point can be considered safe.

In confined spaces, supply an adequate amount of fresh air during application and drying to assist solvent evaporation. Ventilation for this purpose is recommended to be a minimum corresponding to a few air shifts per hour along all surfaces. However, avoid ventilators blowing directly onto the freshly applied paint.

After application until complete curing: Minimum steel temperature 0°C/32°F, relative humidity minimum 65%.

Curing time:

Curing is dependent on (steel) temperatures and relative humidity.

At 20°C/68°F and 75% RH, curing requires approximately 16 hours. At lower temperatures and relative humidity, curing time will be considerably prolonged.
See Product Data Sheet.

The coating will resist light showers after 1-2 hours at 20°C (68°F) and 75% relative humidity.

To accelerate curing at lower humidity hose down surface with fresh water 1-2 hours after application and keep surface constantly wet until curing is complete.

Complete curing can be checked by rubbing the coating with a rag soaked in THINNER 08700. If the coating remains unaffected, the curing is complete and ready for recoating.

Film thickness, primer and full paint system:

Permanent protection, with topcoat:

Preferably 50 micron (2 mils) dry; however, 75 micron (3 mils) dry, may be specified. In case of a long-term durable paint system, the total thickness of the subsequent system is to be at least 150 micron (6 mils) dry.

Special care should be taken to ensure proper thickness on welding seams, edges, corners, ribs, etc.

Extra coat (recoating by itself):

Too low film thicknesses can be made good by applying an extra coat, of diluted HEMPEL'S GALVOSIL 15780. This should be done before full curing is obtained, ie during the curing period with low relative humidity. Light sandpapering of the surface is recommended in order to remove any spray dust before overcoating takes place. Vacuum cleaning should be carried out if necessary. Dilute the extra coat approximately 20-25%.

There is a risk of mud cracking or peeling if applied in too high film thickness (more than approx. 125 micron/5 mils dry film thickness).

Spreading rate:

	Micron	(Mils)	m^2/litre	(sq.ft./US gallon
Theoretical:	50	(2)	12.2	(489)
(on smooth surface):	75	(3)	8.1	(326)
Practical (consumption	50	(2)	6.8	(272)
factor 1.8):	75	(3)	4.5	(181)

Recoating (with other paints):

For recoating advanced paint systems shall be used, e.g. HEMPADUR.

Recoating is expected to take place within 6 months after application of GALVOSIL 15780.

Recoating interval:

When fully cured (see CURING TIME).

Non-weathered zinc silicate coatings are porous, and popping may occur in the subsequent coat. The best way to avoid popping is to apply a mist coat in the first pass of the topcoat. Let the air escape and apply the rest of the topcoat.

Some of HEMPEL's products will substantially reduce the risk of popping when applied directly on top of the zinc silicate. See painting specification.

Topcoating procedures depend on the condition of the surface as described below:

1. **Intact zinc silicate with sporadic formation of "white rust".**

   a. Remove oil, grease, dirt etc. by detergent wash.

   b. Remove "white rust" by high pressure water jetting with fresh water (250-300 bar (3625-4350 psi) at a nozzle distance of 15-20 cm (6-8")).

If the surface is only slightly contaminated, corresponding to 1-2 months of exposure in a mild climate, hosing down of the surface and scrubbing with stiff brushes (nylon) may be more practical.
Make sure that the film is through dry before recoating.

2. **Zinc silicate surface with extreme formation of "white rust" which cannot be removed as described above.**

   a. Remove oil, grease and dirt by a detergent wash (or solvent wash).

   b. Sandsweeping for removal of contaminants. Thorough removal of dust by vacuum cleaning.

   c. Touch up with a solvent borne GALVOSIL quality or a HEMPADUR ZINC primer type.

3. **Damaged areas, burns, weld spatter, etc.**

   a. Remove oil, grease and dirt by a detergent wash (or solvent wash).

   b. Remove weld spatters.

   c. Blasting to min. Sa 2½, thorough removal of dust by vacuum cleaning.

   d. Restore the zinc layer with a solvent borne GALVOSIL quality or a HEMPADUR ZINC primer type.

Safety: Handle with care. Before and during use, observe all safety labels on packaging and paint containers, consult HEMPEL Material Safety Data Sheets and follow all local or national safety regulations. Avoid inhalation, avoid contact with skin and eyes, and do not swallow. Take precautions against possible risks of fire or explosions as well as protection of the environment. Apply only in well ventilated areas.

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