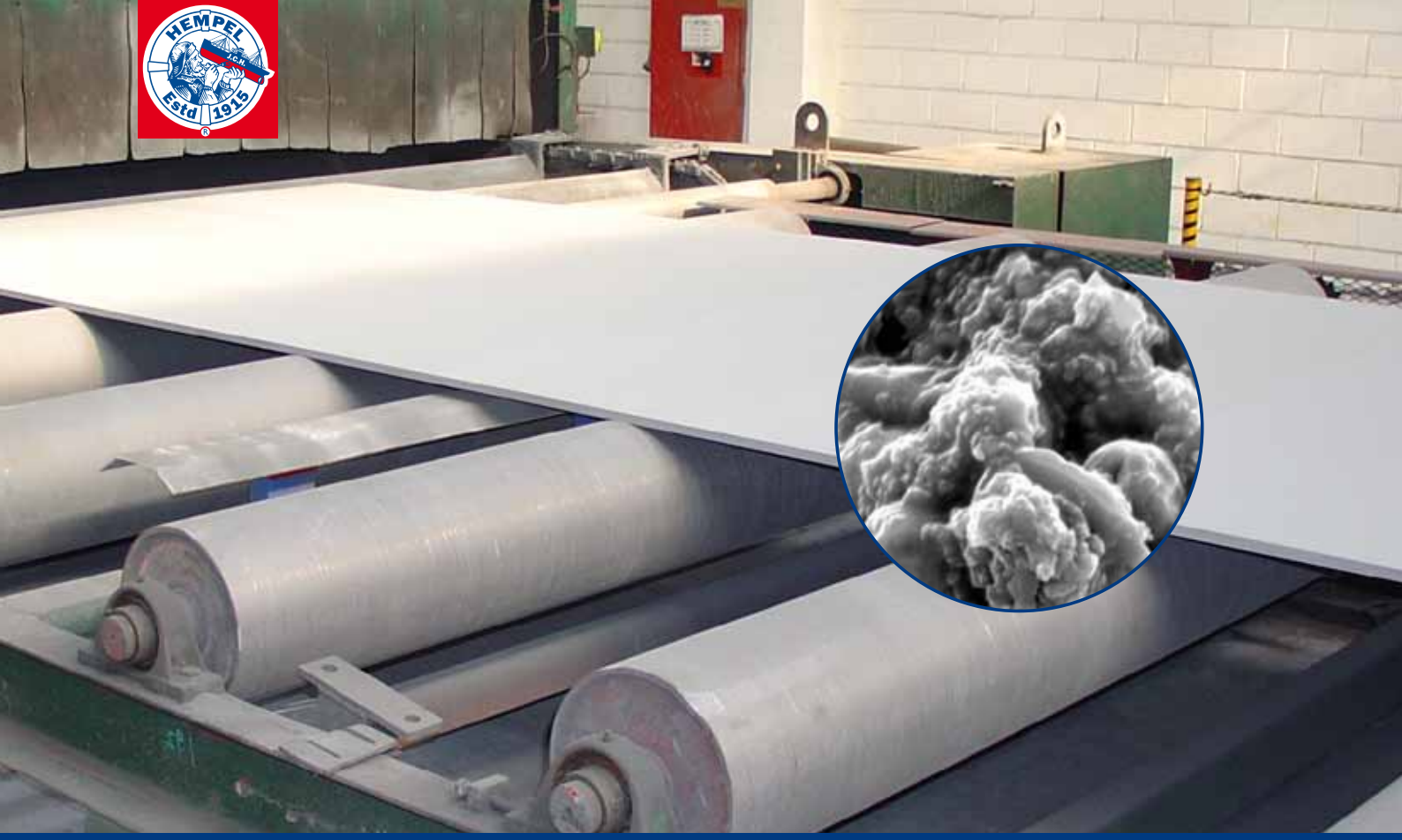


HEMPEL'S SHOPPRIMERS

High technology range

HEMPEL

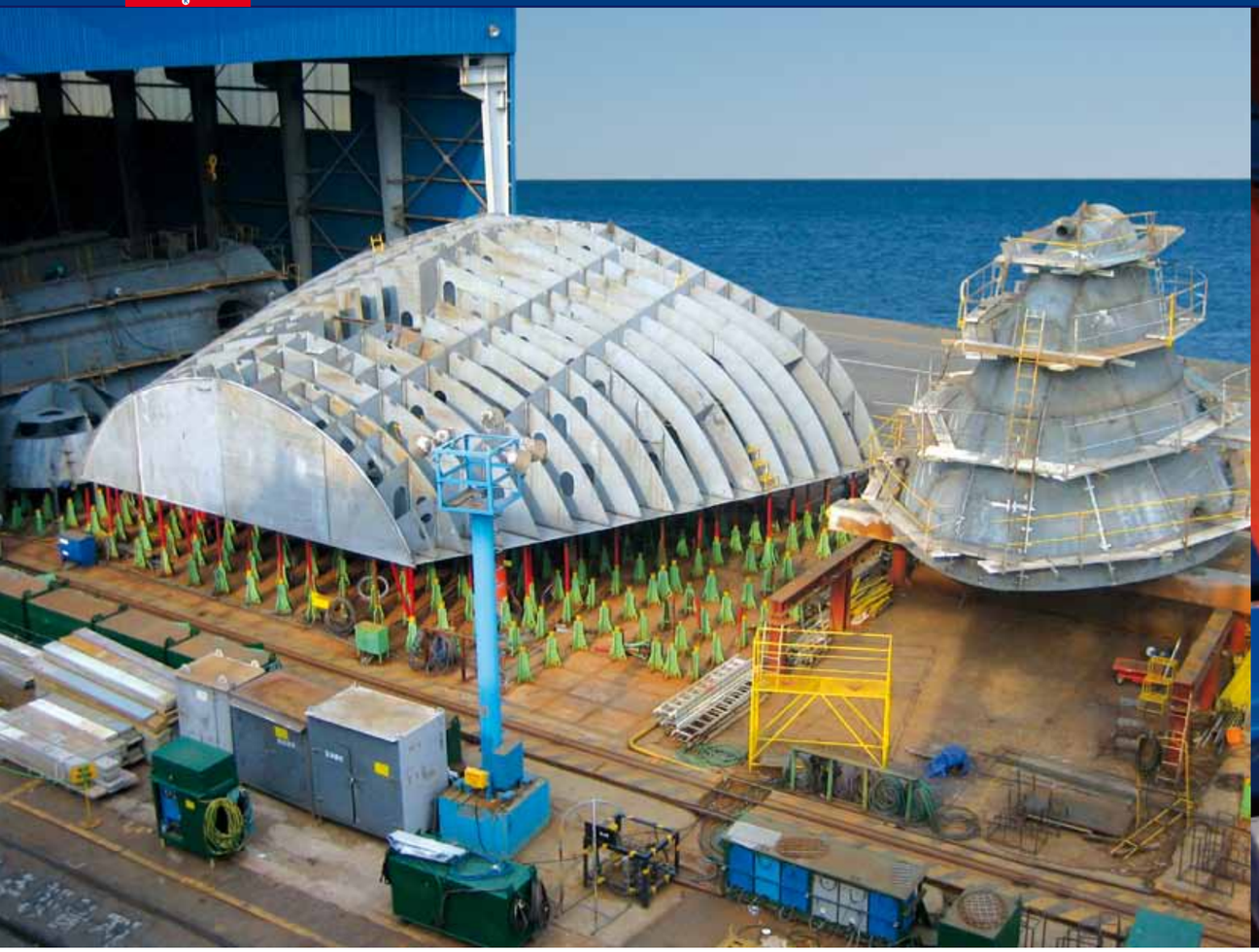
HEMPEL'S SHOPPRIMERS

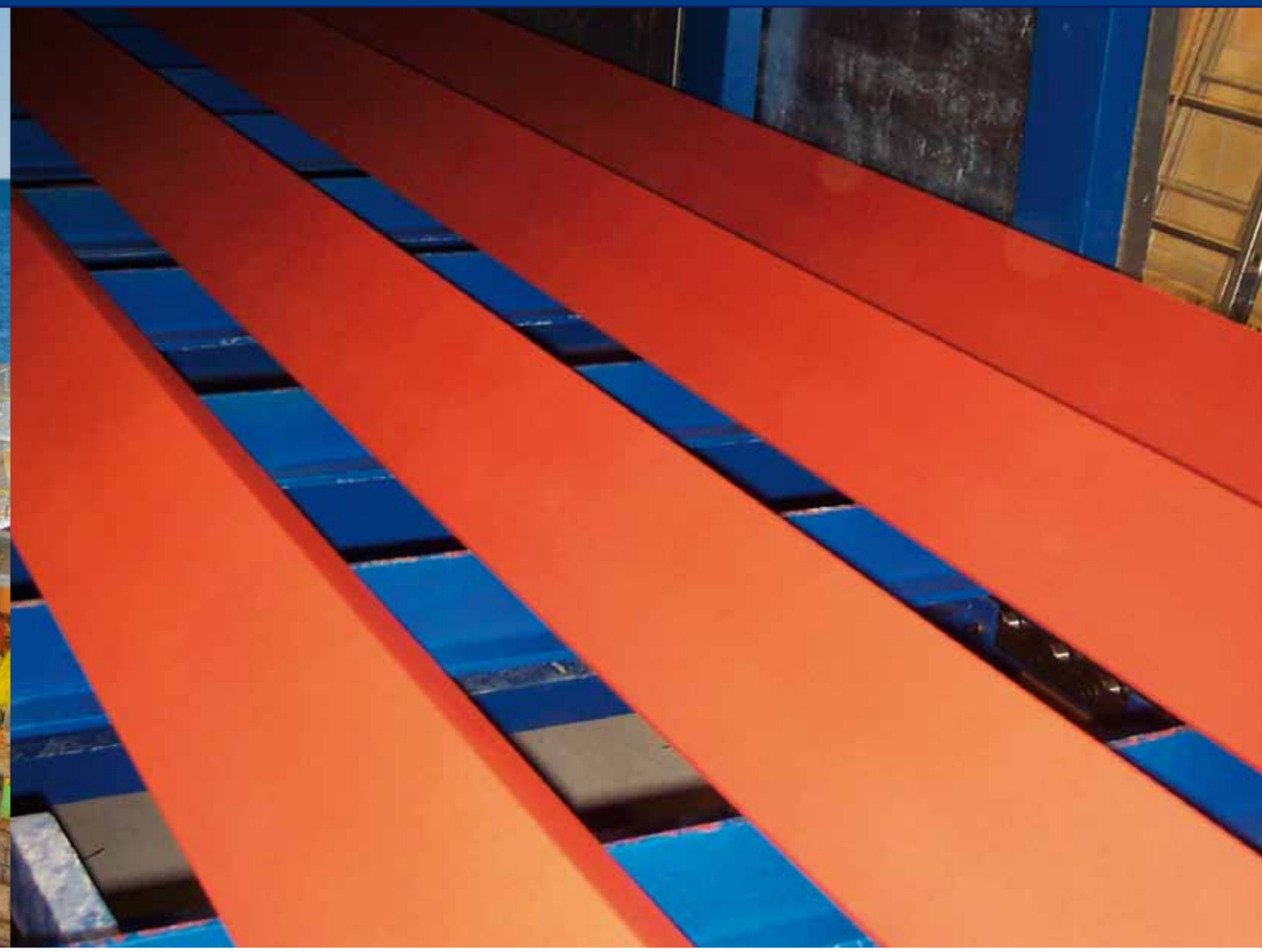
High technology range

HEMPEL'S SHOPPRIMER ZS 15820
HEMPEL'S SHOPPRIMER ZS 15890
HEMPEL'S SHOPPRIMER E 15275
HEMPEL'S SHOPPRIMER E 15280
HEMPEL'S SHOPPRIMER ZS 18230
HEMUCRYL SHOPPRIMER 18250
HEMUDUR SHOPPRIMER 18580

Shopprimers are thin coatings that are applied on blast-cleaned steel to provide temporary corrosion protection for steel components during production, storage, transport, and the subsequent construction periods.

Choosing a shopprimer with the right characteristics for your project will help you to optimise your production processes.





MARINE

In the marine field, modern cutting and welding techniques have over time changed the way shipyards look upon shopprimers. This technological change, in turn, has influenced shopprimer development.
Ever increasing productivity demands mean that building periods are becoming shorter and shorter. Optimizing productivity can give a modern shipyard the competitive edge it needs. Consequently, the potential effect on the productivity is often the deciding factor when choosing a shopprimer. Further, regulations are also now effectively influencing the choice of shopprimers, such as the IMO-PSPC*, which stipulates demands for performance and the decision which type of shopprimer can be used in the Marine new building market. Also VOC regulations and the aim to reduce solvent emissions can affect the choice.

*PSPC = Performance Standard for Protective Coatings. IMO Resolution MSC.215(82)

Hempel's competences

Hempel has developed a range of shopprimers that meet the essential demands from today's shipyards both from a performance and legislative perspective. This assortment comprises products compatible with the modern welding and cutting techniques presently in use. In co-operation with some of the largest shipyards in the world, Hempel has proven that we possess the necessary know-how to adjust both shopprimer plants and shopprimer solutions to satisfy the yards' individual demands.

INDUSTRY

The demands to shopprimer products in the industrial field are often quite different from the marine segment. Modern steel mills deliver steel plates according to each end-user's specification. Meanwhile, the primary requirements from smaller steel shops, who attend to shoppriming themselves, are for an easy application, a good corrosion protection, quick handling, and a problem-free flow. The demands in relation to welding and cutting are normally not as high as in the marine field. In some cases, however, advanced processes such as laser cutting or laser welding are used – and that again requires special knowhow and product properties. Similarly to the marine segment VOC regulations are also becoming more significant for the shopprimer choice.

Hempel's competences

Hempel has for many years supplied shopprimers for all kinds of industrial uses all over the world. During this time, Hempel has studied the needs of the industrial segment and built up a base of essential experience and practical know-how. In cases where a standard product or procedure will not suffice, it is oftentimes possible to adjust plants and products or to develop special solutions tailored to particular customer processes.

REQUIREMENTS OF SHOPPRIMERS

The shopprimer must protect the steel during the months of construction. At the same time, it must not negatively influence cutting and welding processes. High productivity is key to success, and that is influenced not only by correctly setting a number of parameters in shopprimer plants (such as steel temperature, speed of steel plates, gun geometry, nozzle pressure, and nozzle size), but also by the specific paint's application properties. Proper surface preparation in accordance with the shopprimer's specifications is critical. Very important today, too, are environmental demands and stringent new VOC regulations. These must always be considered when choosing an optimal coating solution.

To meet these requirements, each process in the shopprimer plant must be carefully considered.

CORROSION PROTECTION

The main reason for applying a shopprimer is to protect the steel against corrosion. That protection must be effective during the periods of storage and fabrication until the specified coating system is applied. The choice of shopprimer is therefore determined first and foremost by the corrosivity of the environment and length of the period during which protection in this environment is necessary. The possibility for use and compatibility with cathodic protection can also be an important factor.

WELDING

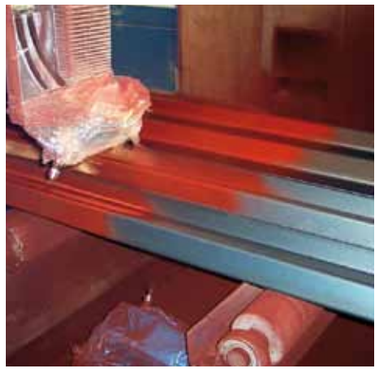
Productivity in steel construction is closely connected to welding speed. The maximum welding speed for achieving a perfect weld can be affected by the generic type of shopprimer and dry film thickness. The introduction of automatic welding (MIG/MAG) has increased productivity compared to stick welding (MMA or SMAW). Besides being more productive, automatic welding results in less exposure of the welders to any toxic welding fumes.

CUTTING

High cutting speed and quality are important in modern steel processing. Cutting a shopprimed steel can be done at the same speed and to the same quality as cutting a bare sandblasted steel. This applies to all methods of cutting and for all types of Hempel's shopprimers applied in the recommended dry film thicknesses. For all methods of cutting, however, high quality cuts at the highest possible speed demand careful adjustment of the cutting parameters.

SECONDARY SURFACE PREPARATION

The shop primers ability to withstand corrosive attacks as well as the mechanical wear and tear, spillage, water and other exposure during the construction phase minimizes the need for secondary surface preparation, which is costly and takes time. A certain level of secondary surface preparation is always needed, but for intact shopprimed surfaces, the specified coating system may be applied after a proper cleaning of any accumulated contaminants. In some cases, however, a more thorough secondary surface preparation is called for – e.g. when coating chemical cargo tanks or applying heavy-duty systems. In these cases, the shopprimer must be subjected to a hard sweeping or removed completely.



APPLICATION PROPERTIES

Good application properties can increase production speed and minimise additional costs. Productivity is enhanced by, among other factors, good automatic spraying properties with minimum dry spray formation, proper film formation with no defects, quick drying time, long pot life, and compatibility with standard application equipment.

ENVIRONMENTAL AND LEGISLATIVE ISSUES

It is important that the shopprimer does not produce harmful degradation products during cutting and welding. Further, shopprimer plants are today under ever-increasing pressure from stringent legislation regarding solvent emissions. With their minimal dust formation and low or no solvents, Hempel's waterborne shopprimers have significantly reduced environmental impact. While solvent-based shopprimers typically have low solids volume, and consequently high VOC content, waterborne shopprimers comply with emerging emission and worker-health legislation as well as they are not subject to emission taxation. These shopprimers also offer good solutions without any negative impact on temporary corrosion protection.

HEMPEL'S SHOPPRIMERS

Hempel has a complete shopprimer assortment for protecting steel in different conditions. The products meet various application parameters and the range of legal requirements affecting various shopprimer users. With both solvent-based and waterborne zinc silicate and epoxy shopprimers, we can cover each customer's performance criteria. The needs may vary from those of a small application shop to those of a large steel mill or huge and modern shipyard with high productivity demands.

HIGH TECHNOLOGY SHOPPRIMERS

Our collective knowledge of shopprimer technology is complemented with extensive research and development, testing, and practical experience in all the fields of corrosion protection, shopprimer line adjustment, cutting and welding techniques etc. All Hempel's high technology shopprimer concepts result from an intelligent combination of elements from these areas. All products have been extensively tested to document product performance.

HEMPEL'S SHOPPRIMER ZS 15820

is a two-component, solvent borne zinc silicate shopprimer.

- **Optimum welding and cutting properties**
- Optimum heat resistance
- Minimum secondary surface preparation
- Excellent corrosion protection and productivity
- Excellent application properties
- IMO - PSPC type approved

Typical use: Construction steel in Marine & Protective segments

HEMPEL'S SHOPPRIMER ZS 15890

is a two-component, solvent borne zinc silicate shopprimer.

- **Optimum corrosion protection and productivity**
- Extensively certified and long track record
- Minimum secondary surface preparation
- Excellent heat resistance
- Excellent welding and cutting
- Excellent application properties
- IMO - PSPC type approved

Typical use: Construction steel in Marine & Protective segments

HEMPEL'S SHOPPRIMER ZS 18230

is a two-component, water borne, self-curing inorganic silicate shopprimer.

- **VOC free Zn-silicate**
- Environmental compliance
- Excellent cutting welding
- Excellent heat resistance

Typical use: Construction steel in Marine & Protective segments, where no or low VOC is important due to health & safety considerations or regulations

ETHYL SILICATE

WATER BORNE

SHOPPRIMERS

EPOXY POLYAMIDE

HEMPEL'S SHOPPRIMER E 15275

is a two-component epoxy polyamide shopprimer, pigmented with zinc phosphate rust-inhibiting pigments.

- **Good cutting and welding/ for automatic application**
- Good AC properties
- Suitable for atmospheric conditions

Typical use: Construction steel in mainly Protective segmants, automatic application

HEMPEL'S SHOPPRIMER E 15280

is a two-component epoxy polyamide primer, pigmented with zinc phosphate rust-inhibiting pigments.

- **Good cutting and welding/ for manual application**
- Good AC properties
- Suitable for atmospheric conditions

Typical use: Construction steel in mainly Protective segments, manual application

HEMUDUR SHOPPRIMER 18580

is a two-component water borne epoxy-amineadduct based shopprimer.

- **Low VOC Shopprimer**
- User friendly
- Environmental compliance
- Economical protection for atmospheric conditions

Typical use: Construction steel in mainly Protective segments, where no or low VOC is important due to health & safety considerations or regulations

HEMUCRYL SHOPPRIMER 18250

is a one-component water borne acrylic based shopprimer.

- **Waterborne One-component**
- User friendly
- Environmental compliance
- Suitable for atmospheric conditions

Typical use: Atmospheric exposure e.g. structural steel and OEM, where no or low VOC important due to health & safety considerations or regulations

PRODUCT DATA

PRODUCT	Generic type	Standard colour*/ Shade number:	Volume solids %	VOC g/l	Drying time (at 20 °C)	Recommended DFT on smooth plate	Protection time (month)	Weldability fair, good, very good, excellent	Cutability fair, good, very good, excellent
HEMPEL'S SHOPPRIMER 15820	Zinc silicate	Grey/19840	28%	665	4-5 minutes	10-20 µm	4-6	Excellent	Excellent
HEMPEL'S SHOPPRIMER 15890	Zinc silicate	Reddish Grey/19890 Grey/19840	28%	620	4-5 minutes	10-25 µm	6-12	Excellent	Excellent
HEMPEL'S SHOPPRIMER E 15275	Epoxy polyamide	Red/50890	26 %	640	6 minutes	20-25 µm	3-5	Good	Very good
HEMPEL'S SHOPPRIMER E 15280	Epoxy polyamide	Red/50890	22%	640	5-10 minutes	15 -25 µm	3-5	Good	Very good
HEMPEL'S SHOPPRIMER ZS 18230	Waterborne zinc silicate	Grey/19840	38%	0	3 min (40 °C)	20 µm	4-12	Excellent	Excellent
HEMUCRYL SHOPPRIMER 18250	Waterborne acrylic	Red/50710	34%	40	3 min	20-25 µm	3-5	Fair	Excellent
HEMUDUR SHOPPRIMER 18580	Waterborne epoxy	Red/51320	30%	55	3 min	20-25 µm	3-5	Good	Very good

*Other shades available according to local assortments

Please consult the individual product data sheets for further details.

CERTIFICATION

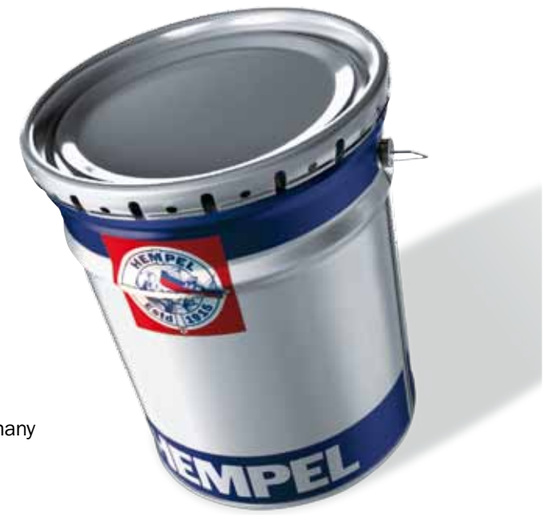
Hempel's shopprimers are certified by the major classification societies for weld quality and have been assigned fume and other health certificates.

A list of authorities that approved various our products as a welding primer:

- Lloyd's Register of Shipping (LR)
- American Bureau of Shipping (ABS)
- Det Norske Veritas (DNV)
- Germanischer Lloyd (GL)
- Korean Register of Shipping
- Bureau Veritas (BV)
- Registro Italiano Navale, (RINA)
- Maritime Register of Shipping, Russia
- Russian Welding Institute

Other certificates/reports obtained by Hempel:

- Welding Fumes: Schweisstechnische Lehr- und Versuchsanstalt (SLV) Germany
- Welding Fumes: FORCE, Denmark
- Flame cutting fumes: FORCE
- Health certificate: Russian Register of Shipping



WORLDWIDE APPLICATIONS LIST

Hempel's shopprimer products have an extensive track record and proven performance spread over millions and millions of square meters of steel worldwide. Among others, they are used by these companies:

Duferco Clabecq S.A, BE
Euroblast, BE
Ellimetal N.V., BE
Straalco Klein Overpelt, BE
ASMAR, Astilleros Y Maestranzas de la Armada, CL
GSI, Guangzhou Shipyard, CN
ZPMC, Zhenhua Port Machinery Co Ltd,CN
Wenchong Shipyard, CN
Noell Port Machinery Co Ltd, CN
Shanghaiguan San Qiao Bridge Factory, CN
Xian Baoji Bridge Factory, CN
Wuhan Shipyard Bridge Fabrication, CN
Foshan Oujin Metal Prefabrication Factory, CN
Brodosplit Shipyard, HR
3. Maj Ship yard, HR
Uljanik Shipyard, HR
Brodotrogir D.D., HR
Koncar metalne konstrukcije, HR
Bladt Industries A/S, Aalborg, DK
Lind (OSS), DK
Dansteel A/S, DK
Lemvigh-Müller A/S - Skjern, DK
Rautaruukki Oy (RUUKKI), FI
Thyssenkrupp Steel, DE
G.H.K. Industriekonservierung Gmbh & Co.Kg, DE
Ostsee-Strahl-Zentrum Gmbh & Co. Kg, DE
Schmidt Oberflächentechnik Gmbh & Co.Kg, DE
J.J. Sietas Kg Schiffswerft Gmbh U. Co, DE
Strahl Lack 2000 Gmbh, DE
Ilsenburger Grobblech Gmbh, DE
Mesa Metall-Stahlbau Gmbh, DE
Keba Konservierung Kellershofen Gmbh & Co. Kg, DE
Volkswerft Stralsund Gmbh Abt. Kcf, DE
AS Elme, EST
Cochin Shipyard Ltd, IN
Bharati Shipyard Ltd, IN
Mazagon Dock Ltd, IN
P.T Pal Shipyard, ID
Pt Gunung Raja Paksi, ID

Elmelit, LT
Makstil A.D., MK
Hest 2000, MK
Staal-straal Brabant B.V. NL
Ruukki Profiler AS, NO
Norsk St I AS, NO
Stocznia Szczecińska Nowa, PL
Huta S.Częstochowa, PL
Gdynia Shipyard, PL
Betamar Spółka Z O.O., PL
Gsr Gdańsk, PL
Hurtinex Bydgoszcz, PL
Gryfia Shipyard, PL
Crist Gdańsk, PL
Estaleiros Navais Viana Do Castelo (ENVC) PT
Baltijskij zavod, OAO, RU
Vyborgskij SSZ, OAO, RU
Kostromskoj SSZ, OAO, RU
Kurganhimmash, OAO, RU
Almaz MZ, OAO, RU
Okskaja sudoverf', OAO, RU
Jaroslavskij SSZ, OAO, RU
Zavod Nizhegorodskij teplohod, OAO, RU
Neva-Metall Trjejd, OOO, RU
Nevskij SSZ, OAO, RU
Kamskij SSZ, OAO, RU
RM-Stil, OAO, RU
3 Internacionala SSRZ, OAO, RU
Krasnye Barrikady SSZ, OAO, RU
Rostsel'mash, OOO, RU
RR-MNP, OOO, RU
Inprom, OAO, RU
Sosnovskij SZ, OAO, RU
Severstal' SMC-Kolpino, ZAO, RU
Zvezdochka CS, OAO, RU
Cwt Engineering Pte Ltd, SG
Sinip Steel Industries (S) Pte Ltd, SG
Aswell (F.E.) Pte Ltd, SG
See Hup Seng Limited, SG

Asl Shipyard Pte Ltd., SG
Jurong Autoblast Services Pte Ltd, SG
Super Galvanising Pte Ltd, SG
Slovenské Lodenice Komarno a.s, SK
KTD, SRB
Sistemas Especiales De Metalizacion (SEM), ES
Imprimacero S.A., ES
Olan, S.A., ES
Freire Hnos. S.A., ES
Arcelor Distribucion Norte, ES
Astilleros De Vigo, S.A., ES
SSAB, SE
Gemak Gemi Inşaat San. Ve Tic. A.Ş., TR
Tersan Tersanec.Taşım.San.Tic.A.Ş., TR
Sedef Gemi Inşaati A.Ş., TR
Yardimci, TR
Celik Tekne, TR
Furtrans Denizcilik Tic Ve San As, TR
Besiktas Denizcilik, TR
ÇDAŞ Çelik Enerji Ters. Ulaşim San., TR
Tuzla Gemi, TR
Erdemir Ere Ii Demir Ve Çelik Fab., TR
Gemini Denta Gemi Inşaa Nak.Tic.A.Ş, TR
Rmk Marine Gemi Yapim San.Ve Den.Ta, TR
Alaybeyo Iu Metal San. Ve Tic. A.Ş., TR
Corus Ltd, UK
Ojsc Damen Shipyards Okean, UA
61 Communards Shipyard, UA
Kherson ShipYayd; UA
Avgust Ltd Mariupol, UA
Dneprmetalservis, UA
Sevmorzavod, UA
Nam Trieu Ship Building Industry Company (Nasico), VN
Pha Rung Shipyard Company, VN
Bason Shipyard-Ho Chi Minh City, VN
Saigon Shipbuilding Industry Company

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