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Development of New Coloured Polyurethane Elastomer-Coated Heavy-Duty Steel

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Synopsis :

New coloured polyurethane elastomer coated steel structures with top coating of acrylic urethane have been developed for marine and harbor environments. Polyurethane elastomer coatings contain a little aliphatic isocyanates, which have colour-change resistance, together with aromatic isocyanates and chelate agents, which restrain the

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advent of diquinone imide structures formed by a photocatalysed autoxidation process. Acrylic urethane as a top coating consists of aliphatic isocyanates and aliphatic

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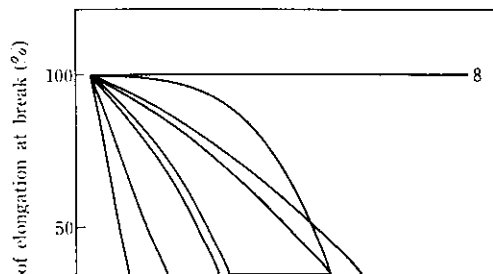
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acrylic polyols and colour pigments. Surface treatment and the polyurethane elastomer coating layer have good adhesion, good mechanical properties and anticorrosion properties. The top layer of acrylic urethane has good weathering properties. This new coloured polyurethane elastomer coated steel can be used for marine and harbor structures to meet both an added safety for ship sailing and environmental colour harmony.

Application of a thick organic coating (film thickness: 0.5 to 1.0 mm) such as tar epoxy, over a zinc-rich prim-

polyurethane elastomer have excellent anticorrosion properties⁶⁻⁸⁾.

Consequently, Kawasaki Steel developed and began marketing **KPP pile** (Kawasaki plastic-coated pipe pile), **KP sheet pile** (Kawasaki precoated sheet pile), and **KP sheet pipe pile** (Kawasaki precoated sheet pipe pile) as civil engineering and construction materials for marine, harbor, and river structures between 1984 and 1985.



inhibitor and an ultraviolet light absorber are added to

Table I. Effect of aromatic and aliphatic isocyanates

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on curing properties of polyurethanes

Table 2 Compositions of polyurethane elastomer

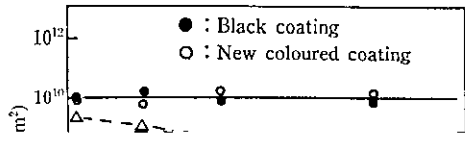
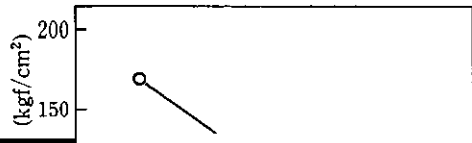
Table 3 Effect of surface treatment on heavy duty

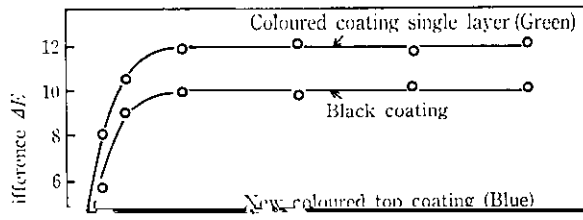
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Table 4 Environmental degradation factors and coat-

steel structures

Elastomer-Coated Heavy-Duty Steel





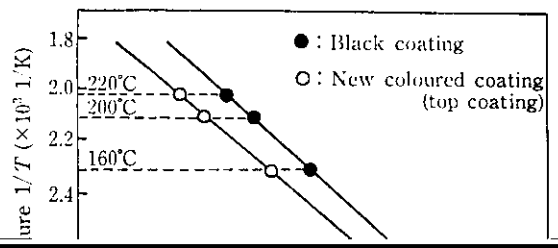
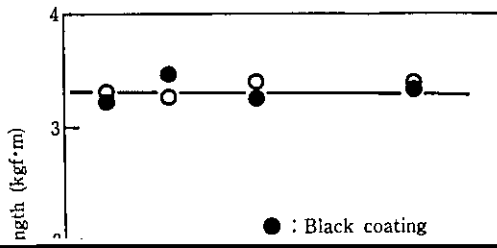
Coloured coating
single layer
(Dark blue)

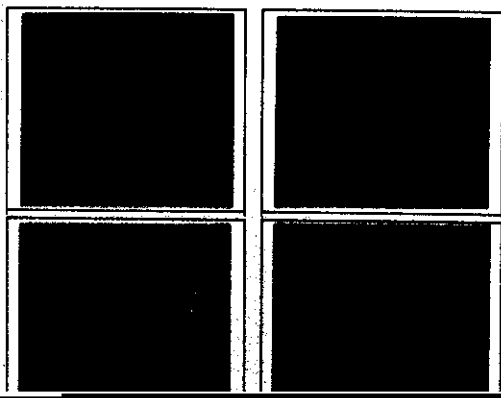
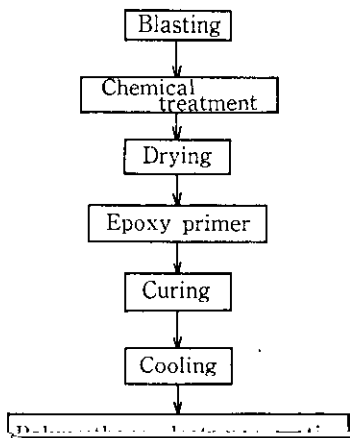
(Green)

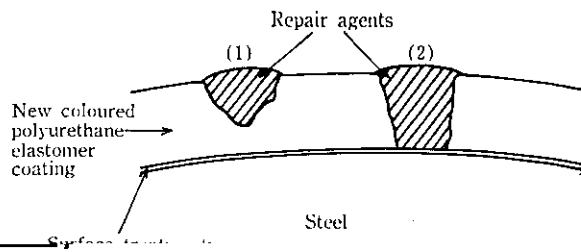


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coat to 5 or less after 8 000 h (corresponding to 40 years of weathering) in a weatherometer.

(4) The heat resistant service life of the coloured coating is more than 40 years at 80°C.

With this coloured polyurethane elastomer coating, it is possible to provide, for example, blue, yellow, green, brown, and gray top coat colours by adding colour pig-