

***Abstract:***

*A new hot-dip Zn-5% Al steel sheet“ JFE ECOGAL*

\p/7 ' " Cn" cmq{/eqcvgf" uvgn" ujjgv" \*jgtgkpvgt." IH+0" Vjgug" ygtg"vcmgp"wr"cu"kuuwgu"kp"vjg"fgxgnqr o gpv"qh"δLHG" GEQ I CN®."

\*3+ "Uwthceg" U o qqvjpguu" \*Gzvtgpcn" Crrgctcpeg" qh" Uwt-face)

Vcmkpi" cfxcpcig" qh" gzegmgpv" hqt ocdknkv{ " qh" IH" this material had been produced and sold mainly as a base for prepainted steel sheets. However, because the spangle pattern, which is a non-uniform tortoise ujjgn/ujcrgf" rcvgtg" vjcv" hqt ou" fwtkpi" uqnfkLecvkqp" of the zinc coating, created irregularities (roughness) on the material surface,<sup>2)</sup> and also reduced the crrgctcpeg" qh" vjg" rtqfwev" chvgt" rckpvkpi." IH" eqwnf" not be used in applications in which a beautiful surface appearance was required.

(2) Dncemgkpi" Rjgpq o gppp"

Dgecwug" IH" ycu" rtqfwegf" wukpi" c" ejtq o cvg" vtgcvo gpv." nqec" dncemgkpi" qh" vjg" eqcvgf" uwthceg" qeewttgf" qxgt" vk o g0" Vjku" dncemgkpi" rjgpq o gppp" ycu" cnuq" cp" k o rgfk o gpv" vq" wug0" Vjg" dncemgkpi" rjgpq o gppp" kp" Zn-coated steel sheets is considered to be caused by e j g o k e c n" t g f w e v k p q h" v j g" \ p Q" L n o" k p" v j g" u w t h c e g" layer of the coating by the Al in the coating layer, which concentrates at the surface over time, resulting kp" vjg" hqt o cvkqp" qh" cp" qz{ i gp/fg r n g v g f" L n o" <sup>3)</sup>.

**2.2 Newly Improved Properties**

In addition to solving the above-mentioned problems qh" vjg" eqpxgpkqpcn" IH" vjg" hqnnq ykpi" swcnkv{ " rtqrgtvkgu" ygtg" k o r t q x g f" k p" v j g" p g y" δ L H G" G E Q I C N ® ."

(1) Eqttqkqp" Tgukvcpeg"

In order to meet higher durability requirements, in particular, the corrosion resistance of forming porvkqpu" ycu" k o r t q x g f" d{ " t g L p g o g p v" q h" e t c e m u" k p" v j g" coating in parts where forming is applied.

(2) Cnmckpg" Tgukvcpeg"

Hqt" fckt{ " hct o k p i l n x g u v q e m" c r r n k e c v k q p u." f w t c d k n k v { " k p" j k i j" c n m c k p g" g p x k t q p o g p v u" y c u" k o r t q x g f 0

(3) Ygnfcdknkv{ "

Ykvj" eqpxgpkqpcn" ejtq o cvg/htgg" eqpxgtukqp" vtgcvo gpvu." c" vjkem" Lno" ycu" cr r n k g f" v q" u g e w t g" e q t t q k q p"

qdugtxgf0"Kp"eqpvtcuv."vjg"uwthceg"qh"δLHG"GEQ I CN®" is uniform, smooth, and beautiful.

**Photo 2** shows scanning electron microscope images qh"vjg"eqcvkpi"uwthcegu0" Qp"vjg"uwthceg"qh"vjg"eqpxgp-vkqpcn" I H." \p/Cn" dkpct{"gwvgevke"et{uvcnu"jcxg"ugitg-gated, showing a spangle pattern, whereas a uniform uwthceg"jcu" hqtogf"qp"δLHG"GEQ I CN®," in which the \p/Cn" dkpct{"gwvgevke"et{uvcnu"ctg"tgŁpgf"cu" c" tguwnv"qh" the trace content of Mg.

### 3.2 Blackening Resistance

**Photo 3** shows the external appearance of specimens qh"δLHG"GEQ I CN®"cpf"eqpxgpvkqpcn" I H"chvgt" c" dncem-ening resistance test of chromate material (in which two 72" o o"uswctg"ycvgt/ygvvgf"urgekogpu"ygtg"uvcemgf"cpf" wrapped with a polyethylene sheet, and then exposed in a constant temperature, constant humidity chamber at 72ÅE." 2 ! ."" g

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cpf"vjg"ucetkLekcn"eqttqkqp"rtqvgevkqp"rgthqt o cpeg" y cu" improved.

**Photo 6** shows the appearance of corrosion in the rqtvkqp" uwdlgevgf" vq" 3:2Å" dgpfkpi" chvgt" c" EEV" \*LKU" I" 27;6." E/o gvjqf+" hqt" 4"222"jqwtu0" Cu" ku" engct" htq o" Rjqvq"8." δLHG" GEQ I CN® has satisfactory corrosion resistance, including formed portions.

### 3.5 Comparison of Corrosion Resistance of Post-Coated Materials

In structural applications and similar uses, there are cases in which so-called post-coating is performed by vjg" 1wz" ogvjqf" chvgt" c" uvtwevwtg" ku" gtgevgf" kp" qtfgt" vq" prevent corrosion of joints and cut-edges of steel sheets.

**Photo 7** ujqyu" vjg" crrgctcpeg" qh" eqttqkqp" qh" δLHG" GEQ I CN

welding is possible in a lower current range than with  
vjg" eqpxgpvkqpcn" IH" ej tq o cvg/vtgcvgf" o cvgtkc"n" fwg" vq"  
vjg"ej tq o cvg/htgg"eqpxgtukqp"vtgcvo gpv"Łno 0"Cu"c"tguwnv."  
reduced welding equipment costs and power costs can