

« - 11: »
« -11: ».- 2015.- .1, .2.- .66-69

• •

,
, 20-30
,
:

« » ()
(HSLA steels)

(*V, Nb, Ti*)

[1-6]. , ,

[6].

[6-8],

() () ,

() « »
(~10°C)
500°C - 750°C
550°C - 600°C ,

[5, 7-

10].

— 3 : ,
() . — . ,
, — . ,

() .

2 .

()

, 750°C – 850°C ,

(V,Nb,Ti [C,N])

HSLA

C). HSLA

N -

), 2)

(Mn, Ni, Cr

(0.1-0.2%
: 1)
; C
(V, Ti, Nb B).
(S,P, Zr, Ca).

HSLA

HSLA

(ITT)

HSLA

[16].

0.1%

(T_{GC}-

T_{RXN}

).

HSLA

HSLA

(0.0005% B)

(Ni, Mo)

(AlN)

(T_{5%})

(+)

Ar₃

()

+

Ae₃

(-)

-

).

C-Mn

(FEM)

[5].

(X52)

[6].

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