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Manufacturing Processes and Products of Steel Pipes and Tubes in JFE Steel†

J >P> J RO> H^qpr j f'· K>D>E> J > Vrq^h^'/

Abstract:

GCB Pqbbi lmbo^qbp j ^krc^`qrofkd c^`fifqfbp clo pb^j ibpp mfmbp ^ka s^oflrp qvmbp lc tbiaba mfmbp fk loabo ql obpmlka ql ^ tfab o^kdb lc `rpql j bo obnrfob j bkqp+ Afp* qfk`qfsb molar`qp ^ka j ^krc^`qrofkd mol`bppbp fk`irab i^odb af^j bqbo) eb^sv t^ii bib`qof` obpfpq^k`b tbiaba %BOT& mfmb clo ifkbmfmbp) RLB mfmb clo efde pqobkdqe) efde mboclo j ^k`b ifkbmfmbp) ^ka efde mboclo j ^k`b) efde clo j ^_fifqv tbiaba pqbbi qr_bp rpba fk ^rql j lqfsb m^oqp+ Qefp m^mbo mobpbkqp ^k lrqifkb lc qeb afpqfk`qfsb cb^qrobp lc qeb j ^krc^`qrofkd mol`bppbp ^q GCB Pqbbi) qldbqebo tfqe obmobpbkq^qfsb pqbbi mfmb ^ka qr_b molar`qp+*

1. Introduction

>p ^ obpriq lc qeb j bodbo lc qeb clo j bo H^t^p^hf Pqbbi ^ka clo j bo KHH fk >mofi /--0) qeb pqbbi mfmb ^ka qr_b j ^krc^`qrofkd pvpqb j ^q qeb kbtiv*`ob^qba GCB Pqbbi t^p bum^kaba ql fk`irab clro afpqof`qp) qeb @ef_^ Afpqof`q ^ka Hbfefk Afpqof`q lc B^pq G^m^k Tlohp) Crhr* v^j ^ Afpqof`q lc Tbpq G^m^k Tlohp) ^ka @efq^ Tlohp pmb`f^ifwba fk mfmb j fiip+ Tfqe ^ molar`q ifkb bk`l j* m^ppfkd pb^j ibpp mfmb ^ka tbiaba mfmbp) fk`irafkd _rqq tbiaba mfmb) bib`qof` obpfpq^k`b tbiaba %BOT& mfmb) RLB mfmb) ^ka pmfo^i tbiaba mfmb) GCB Pqbbi prmmifbp ^ii j ^glo qvmbp lc pqbbi mfmb ^ka qr_b molar`qp ^ka e^p bpq^_ifpeba ^ pvpqb j tef`e fp `^m^_ib lc obpmlkafkd ql ^ tfab o^kdb lc `rpql j bo obnrfob j bkqp+

Fk ª p`^i vb^o /--1) qeb `l j m^kv$p ^kkr^i molar`qflk lc ^ii qvmbp lc pqbbi mfmbp ^ka qr_bp t^p ^mmoluf j ^qbiv .+52 j fiiflk qlkp+

2. Distinctive Features of Steel Pipes and Tubes at JFE Steel

2.1 Pipe and Tube Manufacturing System

GCB Pqbbi lmbo^qbp j ^krc^`qrofkd c^`fifqfbp clo pb^j* ibpp mfmb ^ka tbiaba mfmb ^q fqp B^pq G^m^k Tlohp) Tbpq G^m^k Tlohp) ^ka @efq^ Tlohp+

+ Abmbkafkd lk qeb j ^krc^`qrofkd mol`bpp) tbiaba mfmbp `^k _b afsfaba fkql qeobb `i^ppbp _v tbiafkd j bqela) f+b+) ^o` tbiafkd) bib`qof` obpfp* q^k`b tbiafkd) ^ka _rqq tbiafkd+ Mfmbp j ^krc^`qroba _v qeb ^o` tbiafkd j bqela `^k _b croqebo afsfaba fkql RLB mfmb) _bkafkd mobpp mfmb) ^ka pmfo^i tbiaba mfmb) abmbkafkd lk afccbobk`bp fk qeb clo j fkd j bqela+ > j lkd tbiaba mfmbp) elq oliiba pqbbi pebbq fp rpba ^p qeb j ^qb* of^i clo bib`qof` obpfpq^k`b tbiafkd qr_b) _rqq tbiaba qr_b) ^ka pmfo^i qr_b) tefib pqbbi mi^qbp ^ob rpba ^p j ^qb* of^i clo RLB ^ka _bkafkd mobpp molar`qp+

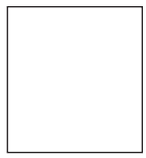
GCB Pqbbi$p mfmb ^ka qr_b j ^krc^`qrofkd c^`fifqfbp `l j mofpb lkb RLB ifkb b^`e ^q B^pq G^m^k Tlohp ^ka Tbpq G^m^k Tlohp) lkb BOT ifkb ^q B^pq G^m^k Tlohp ^ka clro BOT ifkbp ^q @efq^ Tlohp) lkb pmfo^i tbiaba mfmb ifkb ^q Tbpq G^m^k Tlohp) ^ka qtl pb^j ibpp mfmb ifkbp ^q @efq^ Tlohp+ **Table 1** peltp qeb j ^krc^`qrofkd c^`fifqfbp clo mfmb ^ka qr_b molar`qflk ^q GCB Pqbbi+

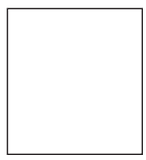
Qeb pfwb o^kdb lc qeb mfmb ^ka qr_b molar`qp fk GCB Pqbbi fp pel tk fk **Fig. 2**+ Qeb ^s^fi^_ib pfwb o^kdb afccbop arb ql afccbobk`bp fk j ^qbof^ip ^ka mol`bppfkd ^ka clo j* fkd j bqelap+ >mmolmof^qb rpb lc b^`e molar`q qvmb `lo* obpmlkafkd ql qeb ^mmif`^qflk fp f j mloq^kq+

- Lofdfk^iiv mr_ifpeba fk *GCB DFEL* Kl+ 6 %>rd /--2&) m+ .¬3

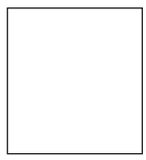
'· Ao+ Bkd+)
Pq^cc Dbkbo^i J ^k^dbo)
Qr_ri^o Molar`qp ?rpfkbpp Mi^kkfkd Abmq+)
GCB Pqbbi

'/ Dbkbo^i J ^k^dbo) Qr_ri^o Molar`qp
?rpfkbpp Mi^kkfkd Abmq+)
GCB Pqbbi





Continuo



Qeb afpqfk`qfsb cb^qrobp lc GCB Pqbbi$p mfmb ^ka qr_b j ^krc^`qrofkd qb`eklildfbp ^ob lrqifkba fk qeb cliil t* fkd+

2.2 Seamless Pipes and Tubes

GCB Pqbbi e^p q t l pb^ j ibpp mfmb j ^krc^`qrofkd ifkbp ^q @efq^ Tlohp) qeb p j ^ii*af^ j bqbo pb^ j ibpp mfmb j fii rpfkd qeb J ^kkbp j ^kk mfbo`fkd, j ^kaobi j fii mol`bpp ^ka qeb j bafr j *af^ j bqbo pb^ j ibpp mfmb j fii rpfkd qeb J ^kkbp j ^kk mfb`fkd,mird j fii mol`bpp+ Qeb p j ^ii* af^ j bqbo j fii molar`bp mfmbp ^ka qr_bp t fqe lrqbo af^ j bqbop rm ql .44+5 j j %2´&) t efib qeb j bafr j *

kbuq*dbkbo^qflk molar`qp+ Fk m^oqf`ri^o) GCB t^p qeb ªopq fk qeb tloia ql molar`b U.-- ^q qeb j^pp molar`qflk ibsbi ^ka `lkar`q `lkpqor`qflk qbpqp lc qefp molar`q fk ifkbmfmb+

Lkb bu^j mib lc qeb ^mmif`^qflk lc GCB Pqbbi$p lrq* pq^kafkd pqbbi j^hfkd qb`eklildv fp ifkbmfmb clo plro pbosf`b) tef`e obnrfobp ^as^k`ba fk`irpflk `lkqoli+ Qefp fp ^ qb`eklildv clo mobsbkqfkd qeb mebkl j bklk lc evaoldbk fkar`ba `o^`hfkd %`o^`hfkd arb ql evaoldbk mbkbqo^qflk fk pqbbi& fk bksfolk j bkqp tef`e `lkq^fk E/P) ^ka qerp fp buqob j biv f j mloq^kq clo pb`rofkd qeb p^cbqv lc ifkbmfmbp[4&]+

3.2.2 Heavy wall, high strength, high toughness

linespaipe(pRW h≈2onUppes , ,