
Strength of Composite Pipe with Spiral Rib

(Shunso Kikukawa) (Kohzo Akahide) (Yasuhiko
Ueki) (Taishi Tsukahara)

:

(1) 8 mm
(2)

(3)

Synopsis :

This study deals with the applicability of a newly developed pipe, which has spiral ribs on its inner surface, thereby making it a composite structure. Mechanical properties of the composite pipe were investigated through push-out, compression and bending tests. Main conclusions obtained are as follows; (1) Bond stress can satisfy the ordinarily required value for the composite pipe having ribs more than 8 mm high. (2) Nominal bond stress increases steadily with increasing the number of ribs. (3) Structural member made of spiral ribbed pipes and concrete can be designed and used as a fully integrated body

(c)JFE Steel Corporation, 2003

Strength of Composite Pipe with Spiral Rib

要旨

[The following text is heavily obscured by horizontal black bars and is therefore illegible.]

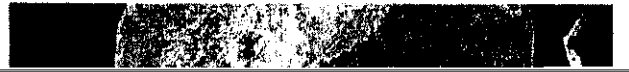
Table 1 Mechanical properties and chemical composition of pipe

Mechanical properties			Chemical composition (wt %)				
<i>Y_P</i> (MPa)	<i>T_S</i> (MPa)	<i>E_l</i> (%)	C	Si	Mn	P	S
275	461	41	0.16	0.18	0.57	0.014	0.016

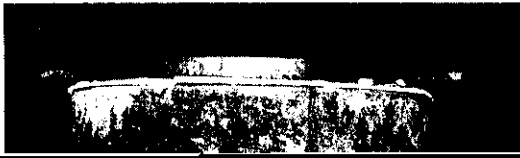


Table 2 Specimens used

Table 3 Bond stresses obtained from the push-out tests



試料番号	平均接着応力 (MPa)	標準偏差 (MPa)
SP-10	1.12	0.15
SP-11	1.15	0.18
SP-12	1.18	0.20
SP-13	1.20	0.22
SP-14	1.22	0.24
SP-15	1.25	0.26
SP-16	1.28	0.28
SP-17	1.30	0.30
SP-18	1.32	0.32
SP-19	1.35	0.35
SP-20	1.38	0.38



$$P_{\max} = A_s \sigma_s + A_c \sigma_c \dots \dots \dots (2)$$

ここに、 A_s : 鋼管部断面積

A_c : コンクリート部断面積

σ_s : 鋼管柱の座屈強度

形が大である。この理由は、単に鋼管にコンクリートを打設したのみでは通常の RC 造と同様、比較的初期の荷重段階で引張側コンクリートに亀裂が入ってしまい、全断面が有効に作用しなかったためと推定する。

6 リブ付合成鋼管の試作

6.1 造 管

“spiral ribbed pipe”

Coil	Size (mm)	Mechanical properties			Chemical composition (wt %)				
		YP (MPa)	TS (MPa)	El (%)	C	Si	Mn	P	S
KPH 42	9 t × 1 305 W	294	481	37	0.16	0.20	0.61	0.025	0.014

Table 6 Conditions of rib welding

7 結 論

- (4) リブ本数増加にともない、合成鋼管の付着応力度が増加する。

内面リブでコンクリートとの付着力を向上させた合成鋼管の構造

リートが一体的に動作すると考えられて設計できる。