

MODE OF FAILURE

Shear movement took place along both joint surfaces and a combined shear and tension failure occurred through the intact material.

SAMPLE NO. 36

d = 25 mm

L = 74 mm

W = 24,2 kN



SAMPLE NO. 37

d = 25 mm

L = 74 mm

W = 24,3 kN

MODE OF FAILURE

Shear took place along both joint surfaces. Through the intact material a combined shear and tension failure took place, whose failure surface was approximately along the most direct path between the two joint ends.

SAMPLE NO. 38

d = 25 mm

L = 74 mm

W = 28,0 kN



MODE OF FAILURE

Shear movement occurred along both joint surfaces. The combined shear and tension failure surface, through the intact material, closely followed the shortest path between the two joint ends.

MODE OF FAILURE

Shear took place along the joint surfaces. There was a tension fracture through the intact material between the joints.

FAILURE LOAD

This sample failed as the arm was being lowered onto it. Its failure load can, therefore, be stated as less than 2,7 kN.



SAMPLE NO. 39

d = 25 mm

L = 0 mm

MODE OF FAILURE

Shear movement took place along both joint surfaces and there were two tension fractures through the intact material.

FAILURE LOAD

This sample failed as the arm was being lowered onto it. Its failure load can, therefore, be stated as less than 2,7 kN.

SAMPLE NO. 40

d = 25 mm

L = 0 mm





SAMPLE NO. 41

Joint pieces slipped during
casting

W - not recorded

MODE OF FAILURE

Shear occurred along both joint surfaces. A combined shear and tension failure through the intact material left a failure surface marked with striations.

SAMPLE NO. 42

d = 25 mm

L = 0 mm



MODE OF FAILURE

Shear movement took place along the joints and a tension fracture occurred through the intact material.

FAILURE LOAD

This sample failed as the arm was being lowered onto it i.e. failure load less than 2,7 kN.

MODE OF FAILURE

Shear occurred along both joints. A tension fracture occurred through the intact material between the joints.

SAMPLE NO. 43

$d = 25$ mm

$L = 0$ mm

$W = 13,6$ kN

MODE OF FAILURE

Shear movement took place along both joint surfaces and a combined shear and tension failure took place through the intact material between the joints. The corner broke off at a later stage, just before the sample was photographed.

SAMPLE NO. 44

d = 25 mm

L = 36 mm

W = 17, 9 kN





SAMPLE NO. 45

d = 25 mm

L = 36 mm

W = 61,9 kN

MODE OF FAILURE

Shear movement took place along both joint surfaces and a combined shear and tension failure took place through the intact material, leaving a failure surface close to the direct path between the two joint ends.

SAMPLE NO. 46

d = 25 mm

L = 36 mm

W = 14,0 kN



MODE OF FAILURE

Shear movement took place along both joint surfaces. A combined shear and tension fracture took place through the intact material between the joints.

MODE OF FAILURE

Shear movement took place along both joint surfaces. The combined shear and tension failure through the intact material has left marked striations on its failure surface.

SAMPLE NO. 47

d = 25 mm

L = 36 mm

W = 49,4 kN

MODE OF FAILURE

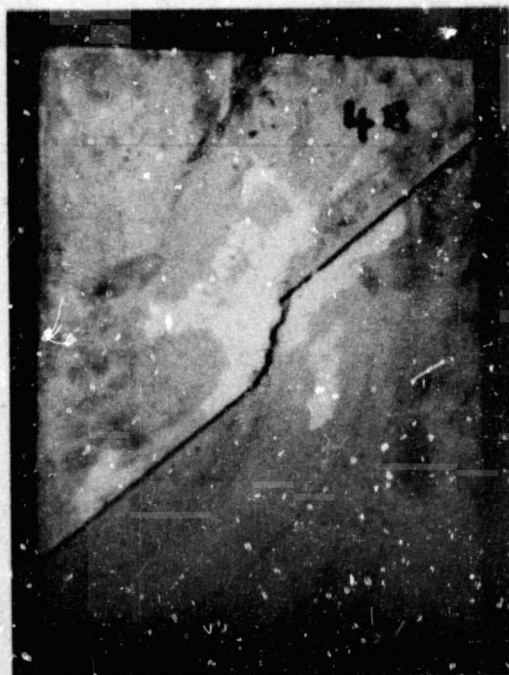
Shear movement took place along both joint surfaces. The combined shear and tension failure through the intact material left striations on the failure surface.

SAMPLE NO. 48

d = 25 mm

L = 36 mm

W = 13,6 kN





SAMPLE NO. 49

d = 25 mm

L = 74 mm

W = 52,4 kN

MODE OF FAILURE

Shear movement took place along both joint surfaces. A combined shear and tension failure took place through the intact material between the joints.

SAMPLE NO. 50

$$\alpha = 40^\circ$$

$$\psi = 87^\circ$$

$$S = 38 \text{ mm}$$

$$t = -25 \text{ mm}$$

$$W = 13,2 \text{ kN}$$

MODE OF FAILURE

Peak load was reached and a crack formed along the ψ -joint. The sample had not failed but the load had reduced. Further load was applied. Shear took place along both α -joints and through the intact material up to the ψ -joint, along which the sample separated.



SAMPLE NO. 51

Joint pieces slipped during
casting

$$\psi = 84^{\circ}$$

$$W = 17,2 \text{ kN}$$

NODE OF FAILURE

Shear movement took place along both α -joints and separation took place along the ψ -joint. A combined shear and tension fracture occurred through the intact material. This failure surface bears striations.

SAMPLE NO. 52

$$\alpha = 39\frac{1}{2}^{\circ}$$

$$\psi = 87^{\circ}$$

$$S = 33 \text{ mm}$$

$$t = - 25 \text{ mm}$$

$$W = \text{not recorded}$$

MODE OF FAILURE

shear took place along both α -joints while separation occurred along the ψ -joint. A very nice two-dimensional shear took place through the intact material.

SAMPLE NO. 53

$$\alpha = 39\frac{1}{2}^{\circ}$$

$$\psi = 86\frac{1}{2}^{\circ}$$

$$S = 35 \text{ mm}$$

$$t = - 25 \text{ mm}$$

$$W = 20,0 \text{ kN}$$

MODE OF FAILURE

Shear took place along both α -joints while separation occurred along the ψ -joint. A very nice two-dimensional shear took place through the intact material.

SAMPLE NO. 54

$$\alpha = 39^{\circ}$$

$$\psi = 86\frac{1}{2}^{\circ}$$

$$S = 32 \text{ mm}$$

$$t = 0 \text{ mm}$$

$$W = 9,9 \text{ kN}$$

MODE OF FAILURE

Shear took place along both α -joints. Separation took place along the top part of the ψ -joint while a combined shear and tension fracture occurred through the intact material.

SAMPLE NO. 55

$$\alpha = 38\frac{1}{2}^{\circ}$$

$$\psi = 85\frac{1}{2}^{\circ}$$

$$S = 40 \text{ mm}$$

$$t = -25 \text{ mm}$$

$$W = 21,1 \text{ kN}$$

MODE OF FAILURE

Shear movement occurred along both α -joints. A very little separation occurred near the top of the ψ -joint while a combined shear and tension failure left striations on the failure surface through the intact material.

SAMPLE NO. 56

$$\alpha = 39^{\circ}$$

$$\psi = 87^{\circ}$$

$$S = 32 \text{ mm}$$

$$t = 0 \text{ mm}$$

$$W = 9,9 \text{ kN (approx.)}$$

MODE OF FAILURE

As the load was increased, a crack developed upwards from the top of the bottom joint. Fracture occurred suddenly. Shear took place along both α -joints but there was no separation along the ψ -joint. Instead a combined shear and tension failure took place around the back of the joint piece and through the intact material,

SAMPLE NO. 57

Joint pieces slipped during casting.

$$\psi = 86^{\circ}$$

$$W = 10,4 \text{ kN}$$

MODE OF FAILURE

A crack started to develop upwards from the top of the bottom crack at a load of about 9,9 kN. Failure then took place by shearing along both α -joints, separating along part of the ψ -joint and by a combined shear and tension failure through the intact material, including the actual ψ -joint piece.

SAMPLE NO, 58

$\alpha = 39^0$
 $\psi = 87^0$
 $S = 59 \text{ mm}$
 $t = 25 \text{ mm}$
 $W = 12,7 \text{ kN}$

MODE OF FAILURE

Shear movement took place along both α -joints. Separation took place along nearly the whole length of the ψ -joint and a combined shear and tension failure took place through the intact material.

SAMPLE NO, 59

$\alpha = 39^0$
 $\psi = 87^0$
 Joints slipped during
 casting
 $W = 15,7 \text{ kN}$

MODE OF FAILURE

Shear movement took place along both α -joints. There was no separation along the ψ -joint, possibly because of its position. A combined shear and tension fracture took place through the intact material between the joints and also through the intact material in the top corner near the joint end.

SAMPLE NO. 60

$\alpha = 40^0$

$\psi = 86^0$

$S = 59 \text{ mm}$

$t = 25 \text{ mm}$

$W = 18,1 \text{ kN}$

MODE OF FAILURE

At a load of 13,3 kN a branch crack became noticeable at the top of the bottom α -joint. Failure occurred by shearing along the α -joints, separating along part of the ψ -joint and combined shear and tension fracture through the intact material.

SAMPLE NO. 61

$\alpha = 39,1^0$

$\psi = 86^0$

$S = 59 \text{ mm}$

$t = 25 \text{ mm}$

$W = 22,7 \text{ kN}$

MODE OF FAILURE

Shear movement and separation took place along the joints as expected. A combined shear and tension failure took place through the intact material between the joints.

MODE OF FAILURE

A crack formed downwards from the bottom of the top joint. Failure then occurred by shearing along the joints and through the intact material.

A piece spalled off one side of the intact material, between the joints.

The joint piece broke off later.

SAMPLE NO. 62

$$\alpha = 50^\circ$$

$$k = 0,8$$

$$W = 18,8 \text{ kN}$$

$$L_1 = 0 \text{ mm}$$

$$L_2 = 142 \text{ mm}$$

$$L_3 = 71 \text{ mm}$$

$$L_4 = 142 \text{ mm}$$

$$L_5 = 0 \text{ mm}$$

MODE OF FAILURE

Shear movement occurred along both joint surfaces as well as through the intact material. Striations were left on the shear failure surface through the intact material.

SAMPLE NO. 63

$$\alpha = 40^\circ$$

$$k = 0,8$$

$$W = 25,4 \text{ kN}$$

$$L_1 = 0 \text{ mm}$$

$$L_2 = 119 \text{ mm}$$

$$L_3 = 59 \text{ mm}$$

$$L_4 = 119 \text{ mm}$$

$$L_5 = 0 \text{ mm}$$



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