

**DETERMINAZIONE
SPERIMENTALE DELLA
RESISTENZA AL TAGLIO**

DETERMINAZIONE SPERIMENTALE DELLA RESISTENZA AL TAGLIO

A) IN LABORATORIO

- 1. PROVE DI TAGLIO DIRETTO (DS)**
- 2. PROVE TRIASSIALI (TX)**

**CAMPIONI INDISTURBATI (ARGILLE LIMD)
CAMPIONI RICOSTITUITI (SABBIE E GHIAIE)**

B) IN SITO

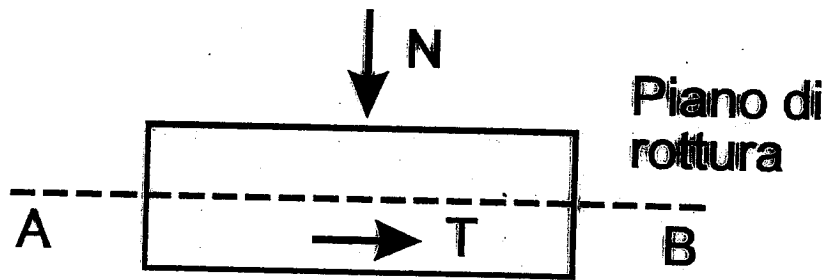
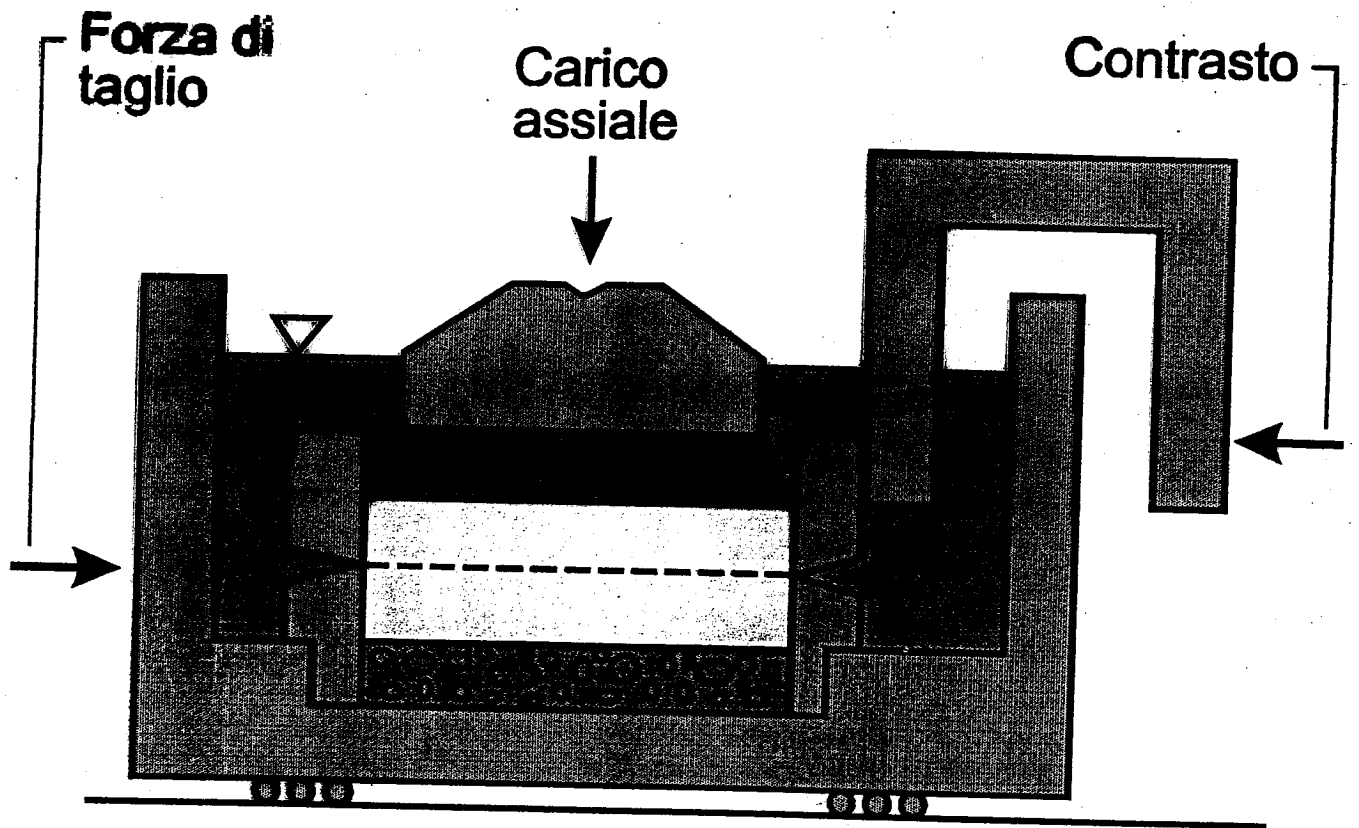
- 1. PROVE SCISSOMETRICHE (FVT)**
- 2. PROVE PENETROMETRICHE DINAMICHE (SPT)**
- 3. PROVE PENETROMETRICHE STATICHE (CPT)**

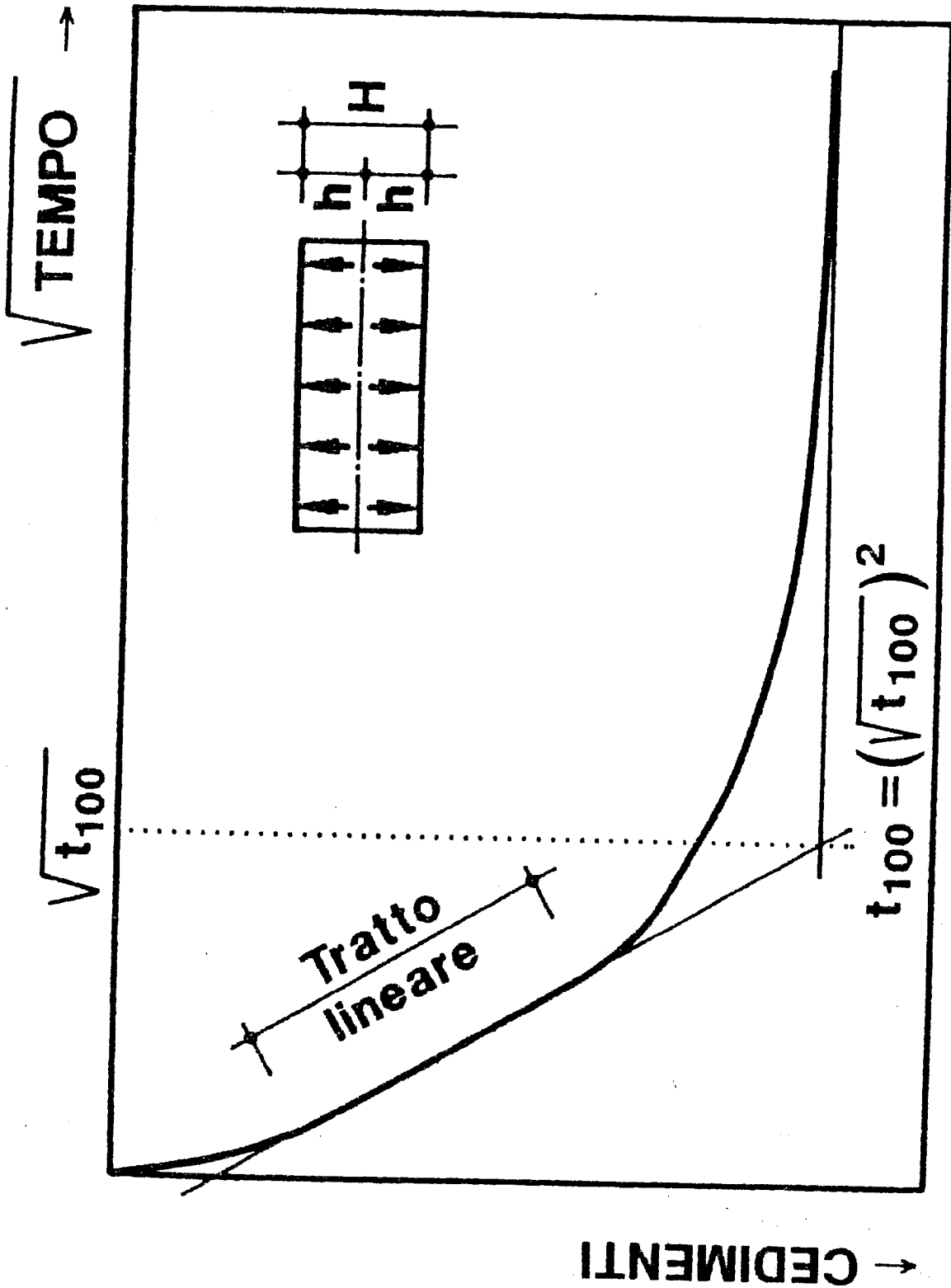
ALTRI TIPI DI INDAGINE

DETERMINAZIONE SPERIMENTALE DELLA RESISTENZA AL TAGLIO

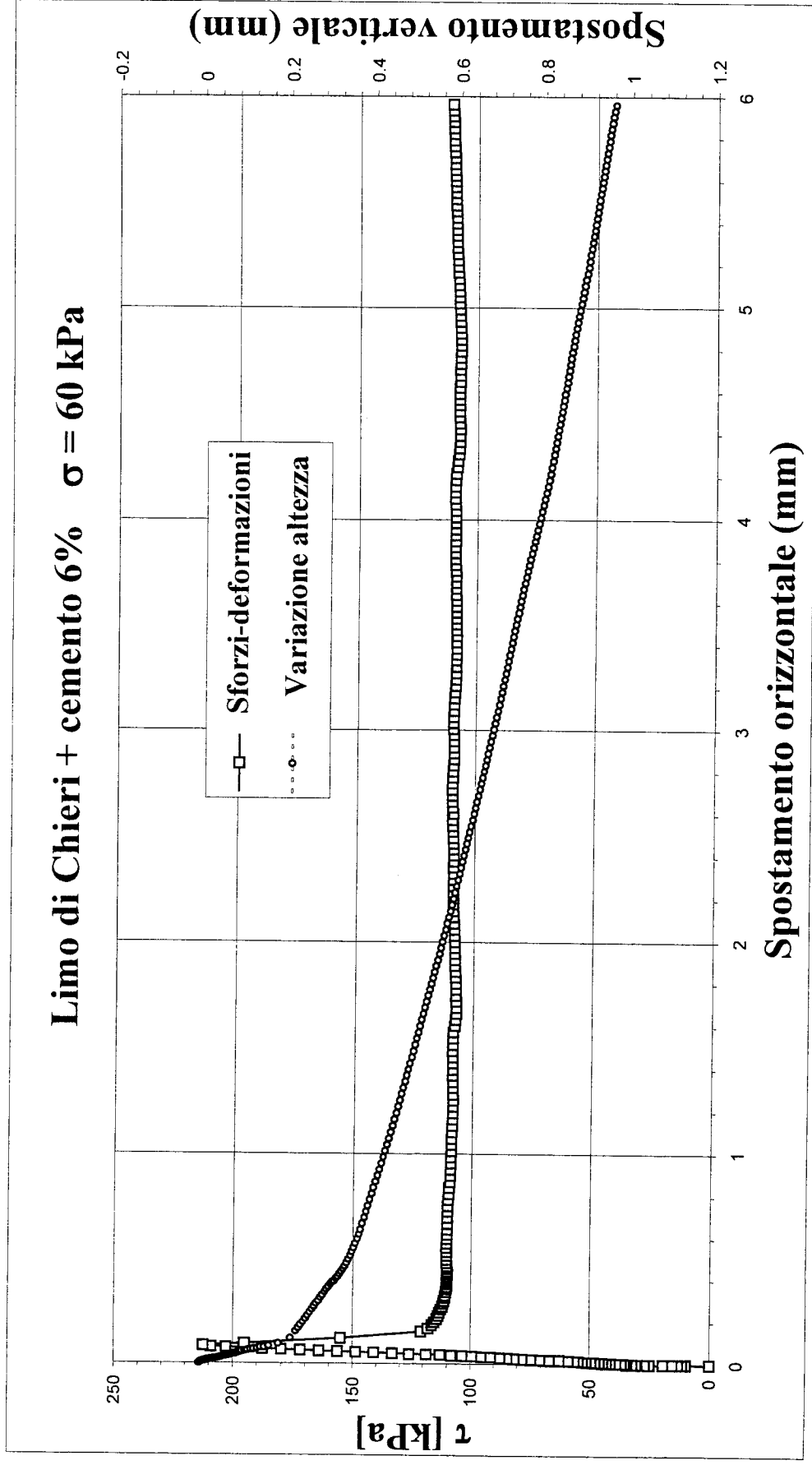
IN LABORATORIO

- 1. CONSOLIDAZIONE (RIPRISTINO DELLE TENSIONI
GEOSTATICHE,)**
- 2. ROTTURA O TAGLIO (APPLICAZIONE DELLO
STRESS-PATH SIGNIFICATIVO)**





RISULTATI DI PROVE DI TAGLIO DIRETTO (PROVINI INTATTI)



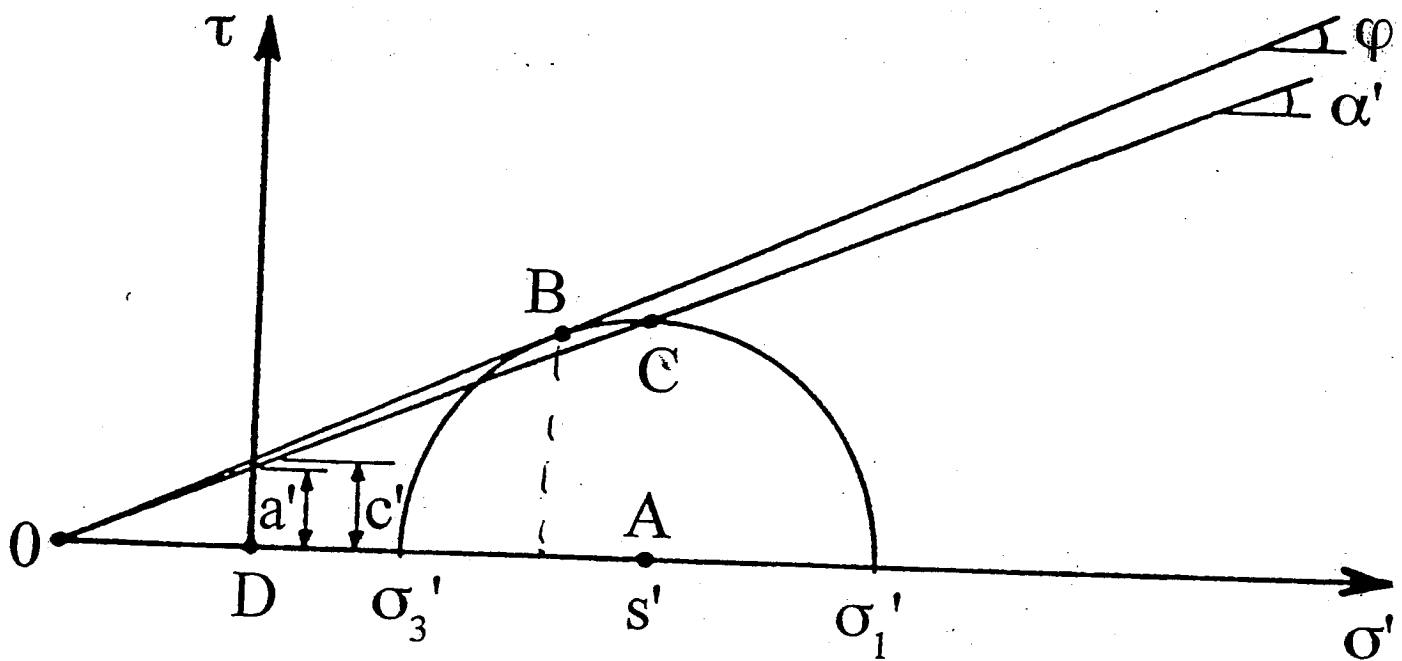
INTERPRETAZIONE DELLE PROVE DI TAGLIO DIRETTO

1^a ALTERNATIVA: piano orizzontale corrisponde al piano di massima obliquità, i.e. $(\sigma'_1/\sigma'_3)_{\max}$

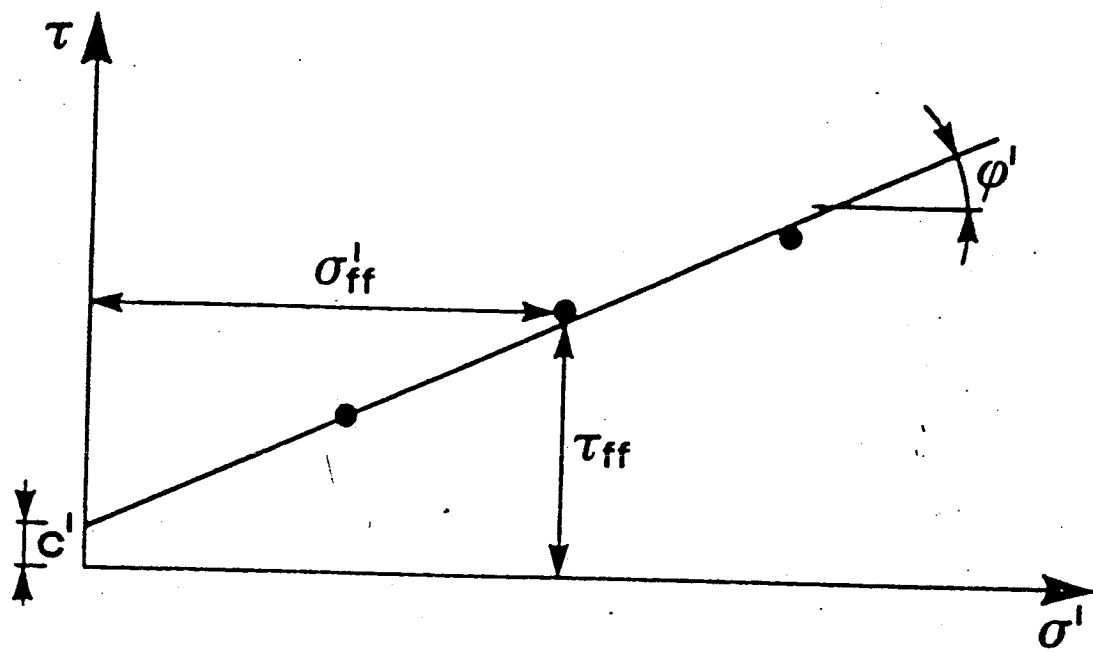
$$\therefore \frac{N}{A} = \sigma'_{ff} ; \quad \frac{T}{A} = \tau_{ff} ; \quad \tau_{ff} = c' + \sigma'_{ff} \tan \varphi'$$

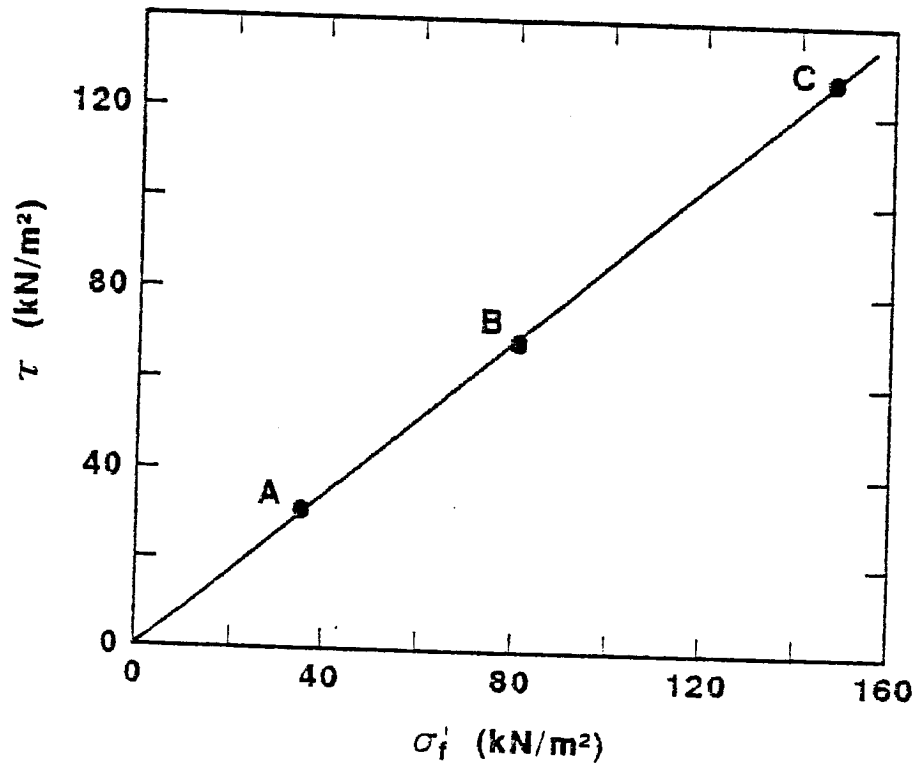
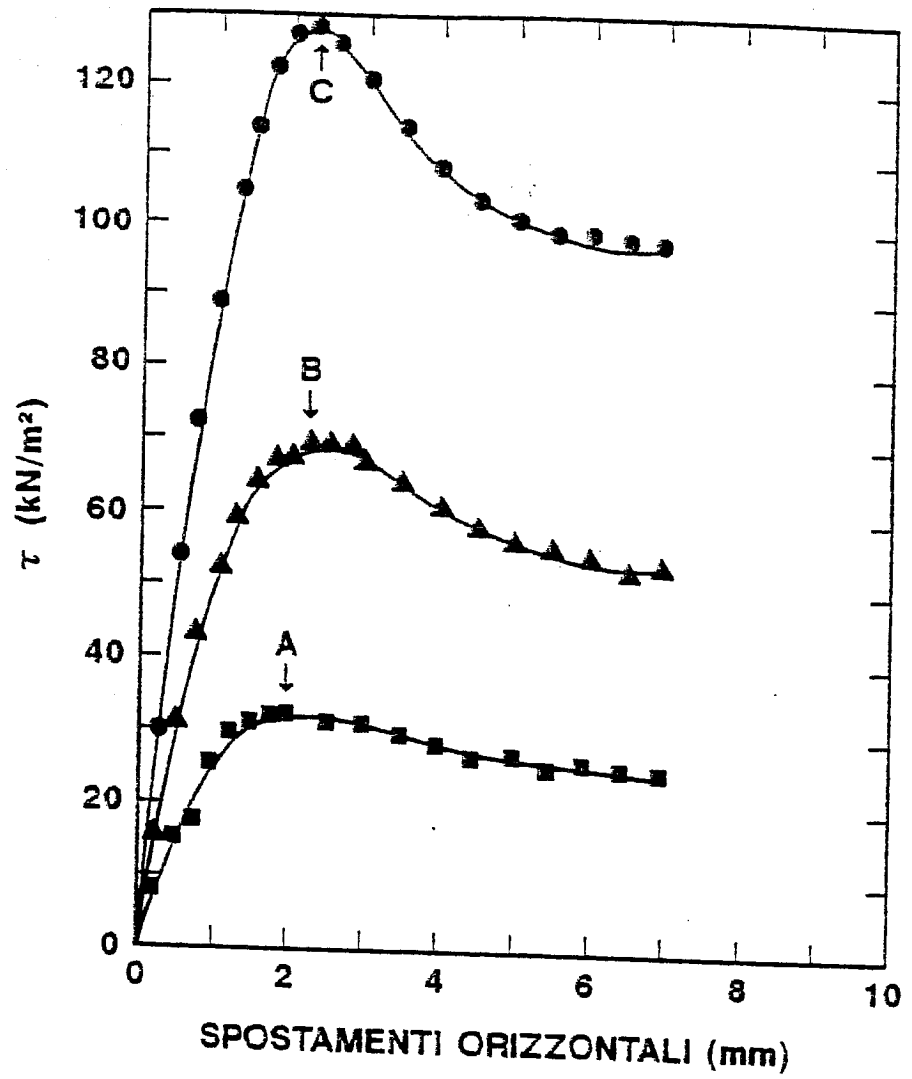
2^a ALTERNATIVA: piano orizzontale corrisponde al piano di taglio massimo, i.e. $\frac{1}{2}(\sigma'_1 - \sigma'_3)_{\max}$

$$\therefore \frac{N}{A} = s' ; \quad \frac{T}{A} = t ; \quad t = a' + s' \sin \varphi'$$

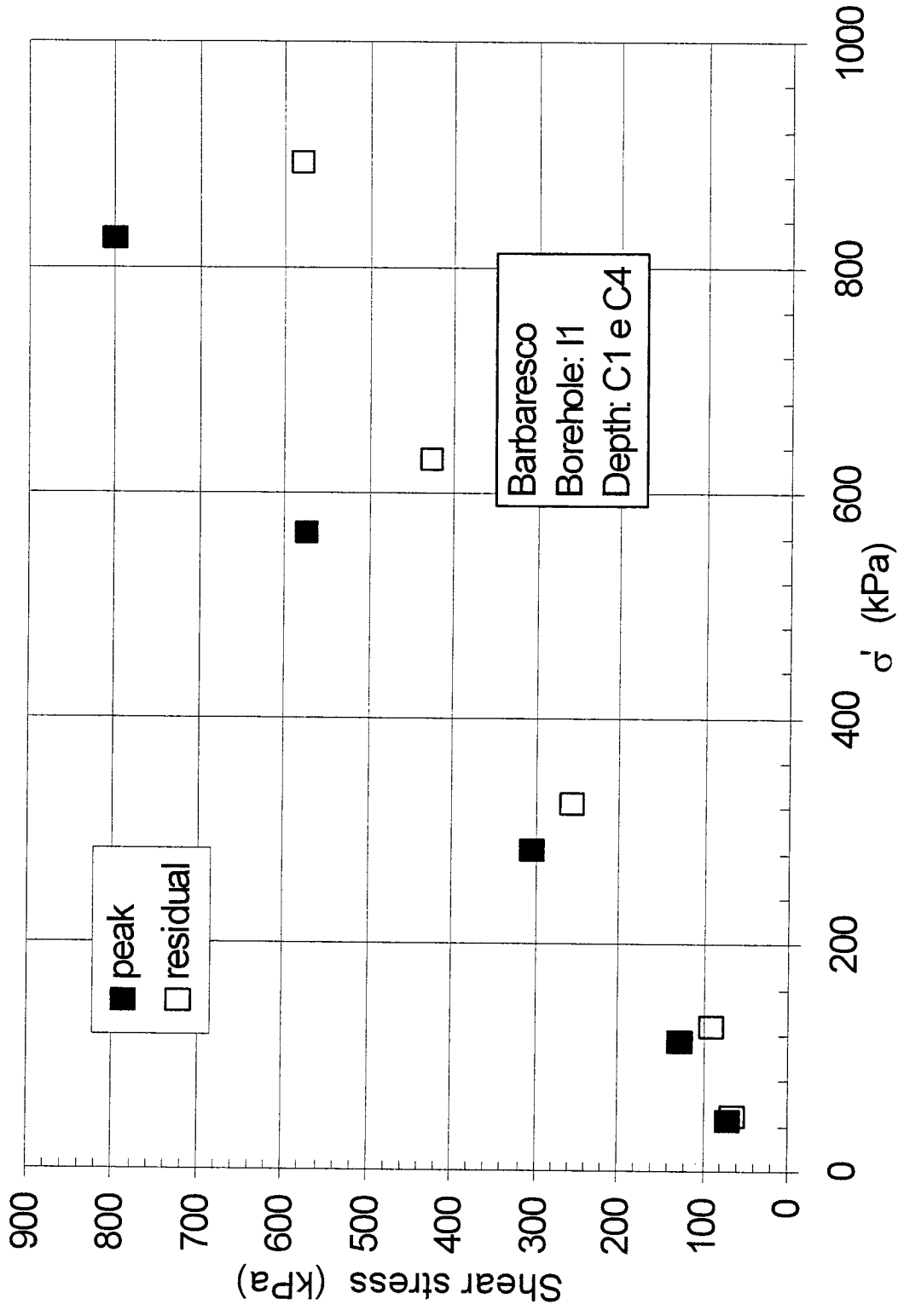


$$AC = \tau_{max} = \frac{1}{2}(\sigma'_1 - \sigma'_3) \quad AB = \tau_{ff} = \frac{1}{2}(\sigma'_1 - \sigma'_3) \cos \varphi'$$

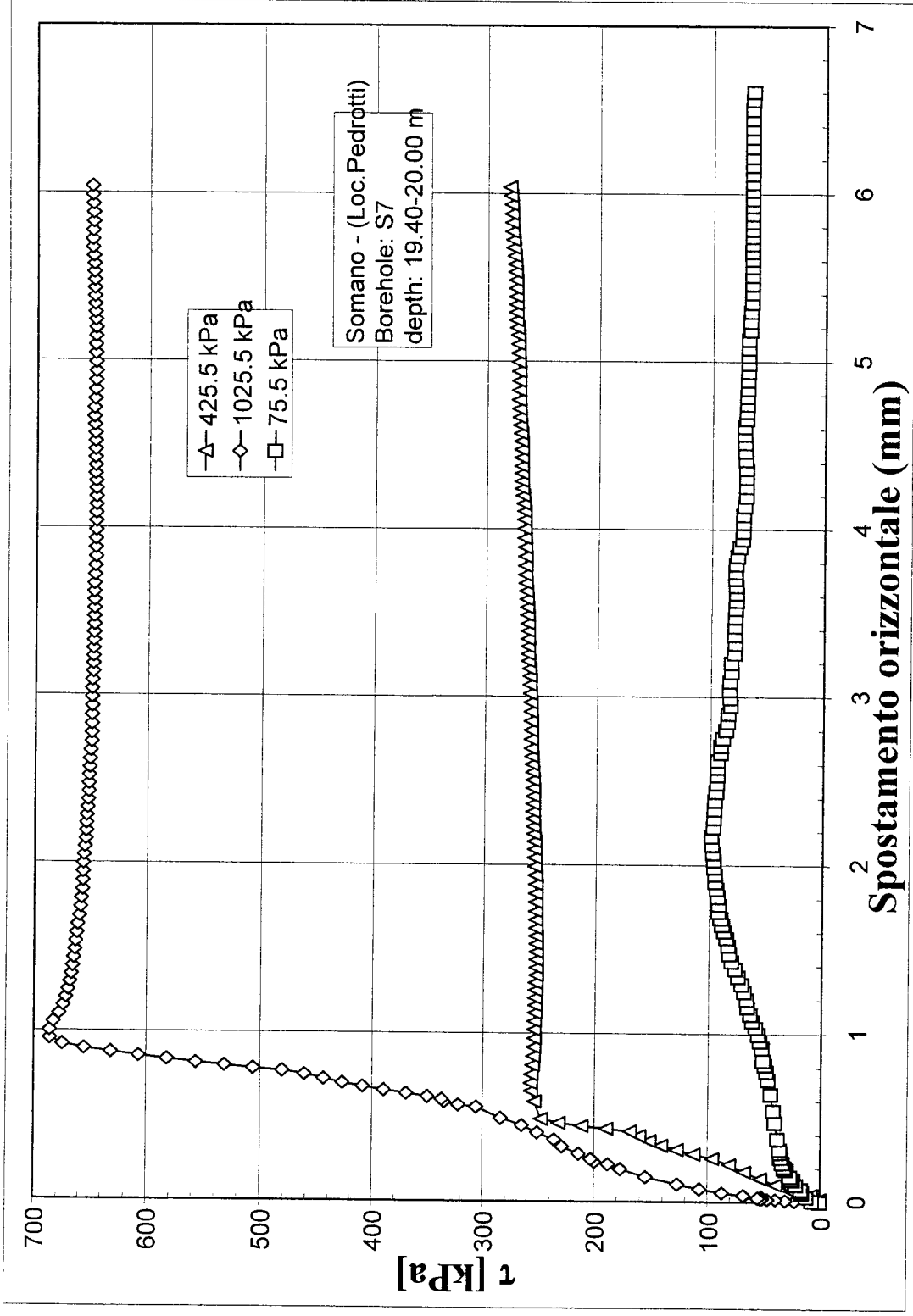




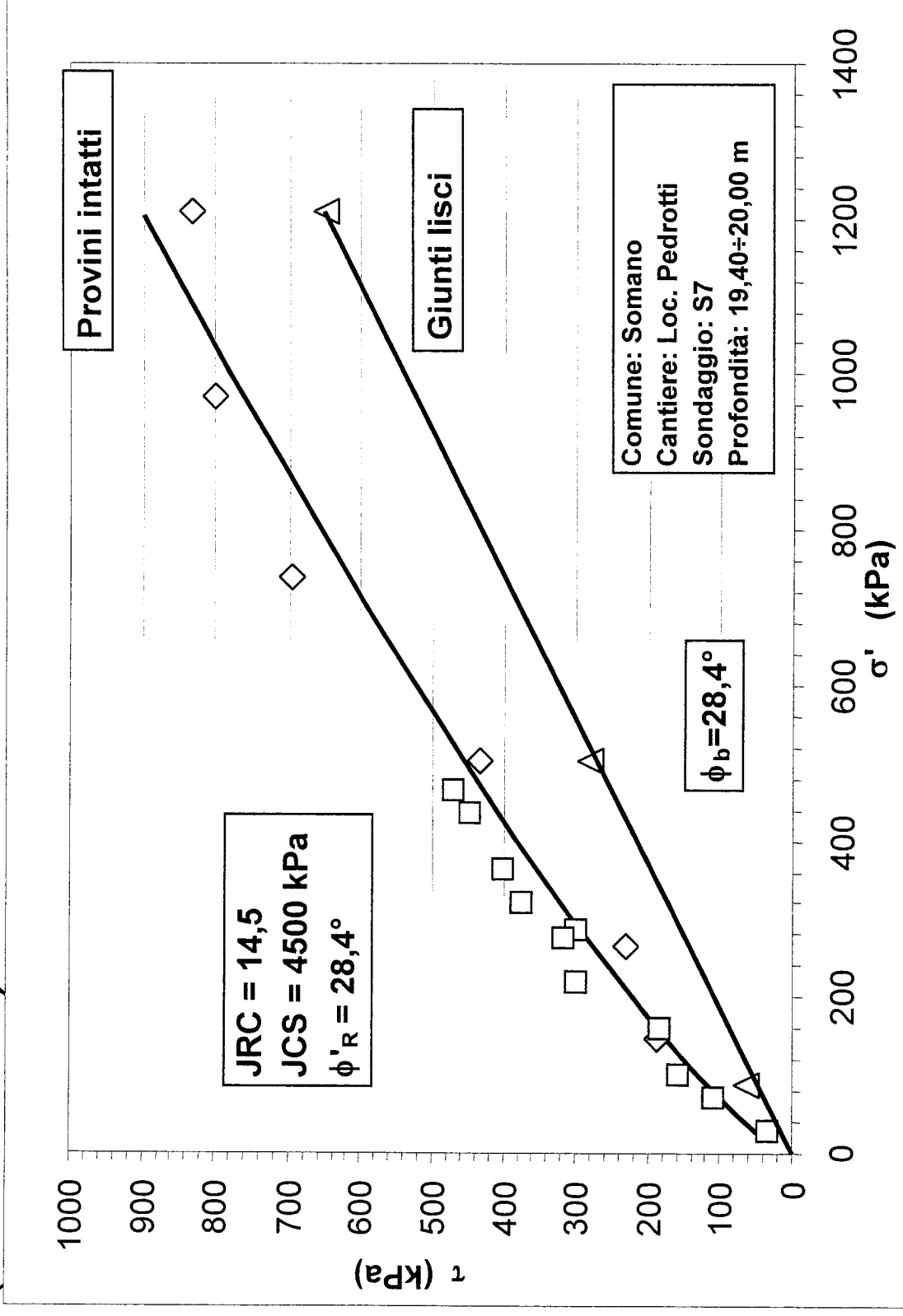
INVILUPPO DI ROTTURA



PROVE DI TAGLIO DIRETTO (GIUNTI PIANI E LISCI)

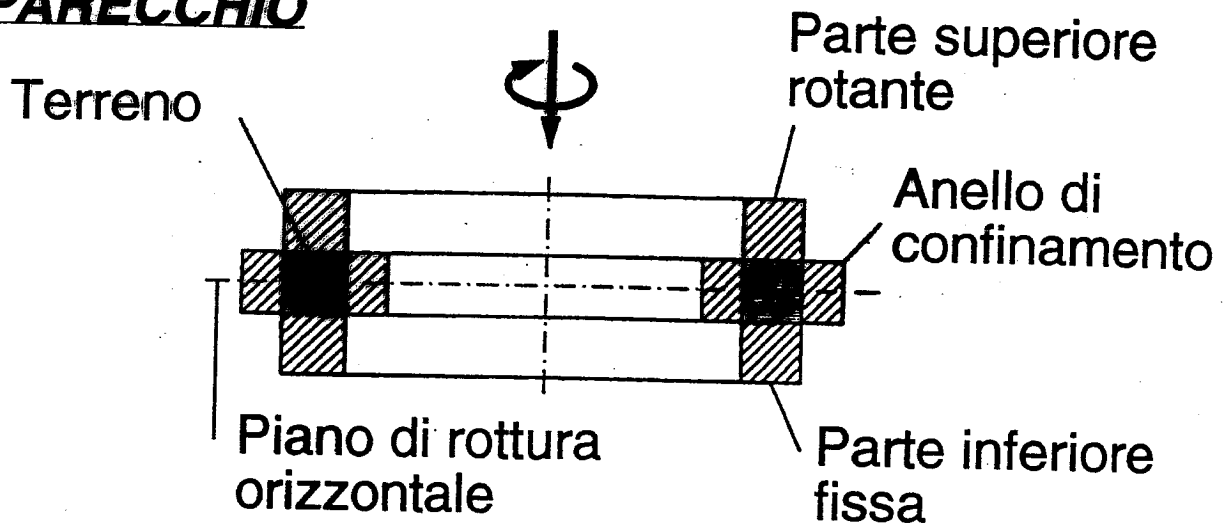


INVILUPPO DI ROTTURA - RESIDUO (SOMANO)

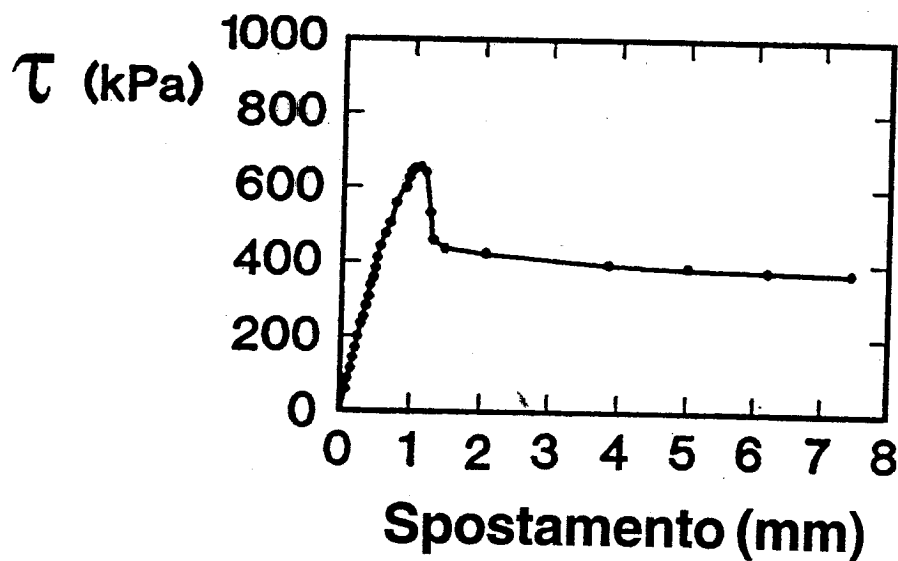


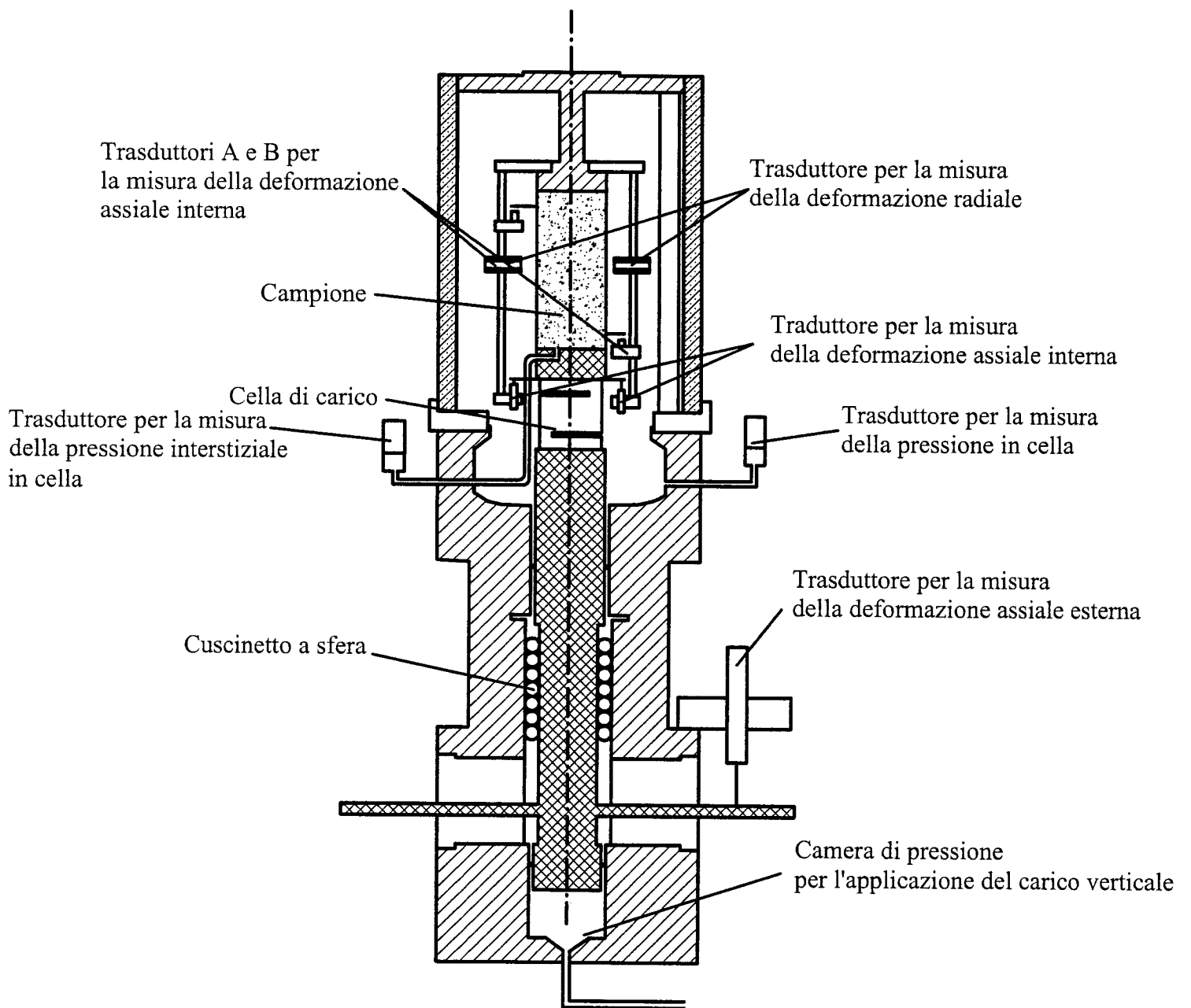
APPARECCHIO DI TAGLIO TORSIONALE PER LA VALUTAZIONE DELL'ANGOLO DI RESISTENZA AL TAGLIO RESIDUO

APPARECCHIO

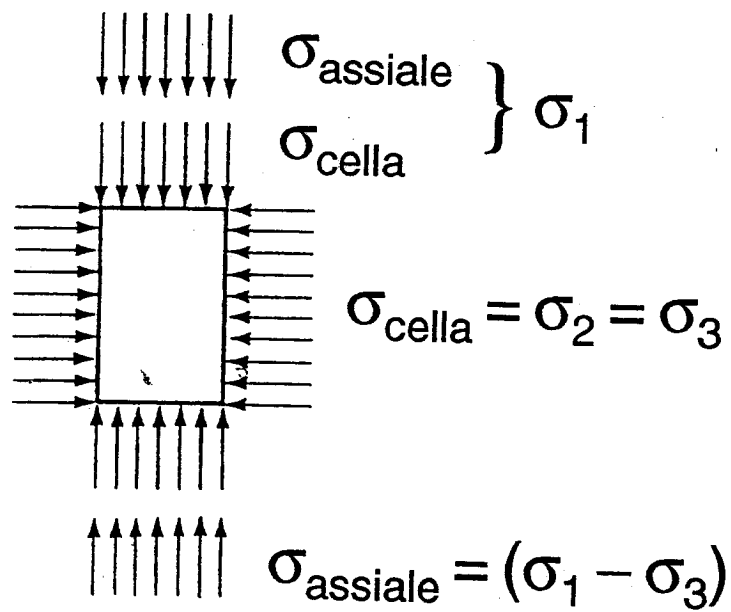
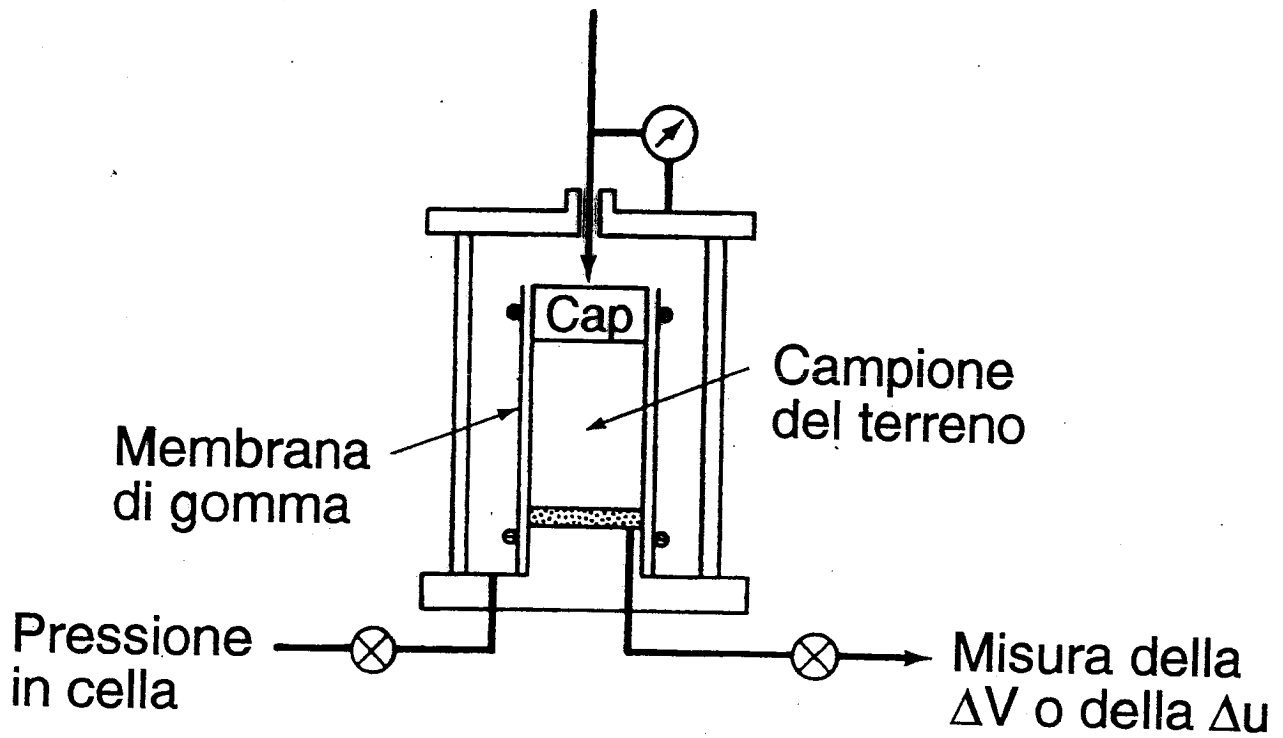


CURVA SFORZO DI TAGLIO - SPOSTAMENTO





APPARECCHIO TRIASSIALE



STRESS-PATHS PROVE TRIASSIALI: CONVENZIONI DI SEGNO

1. Piano t-s'

a. $t = \frac{\sigma_a - \sigma_r}{2}; s' = \frac{\sigma'_a + \sigma'_r}{2}; s = \frac{\sigma_a + \sigma_r}{2}$

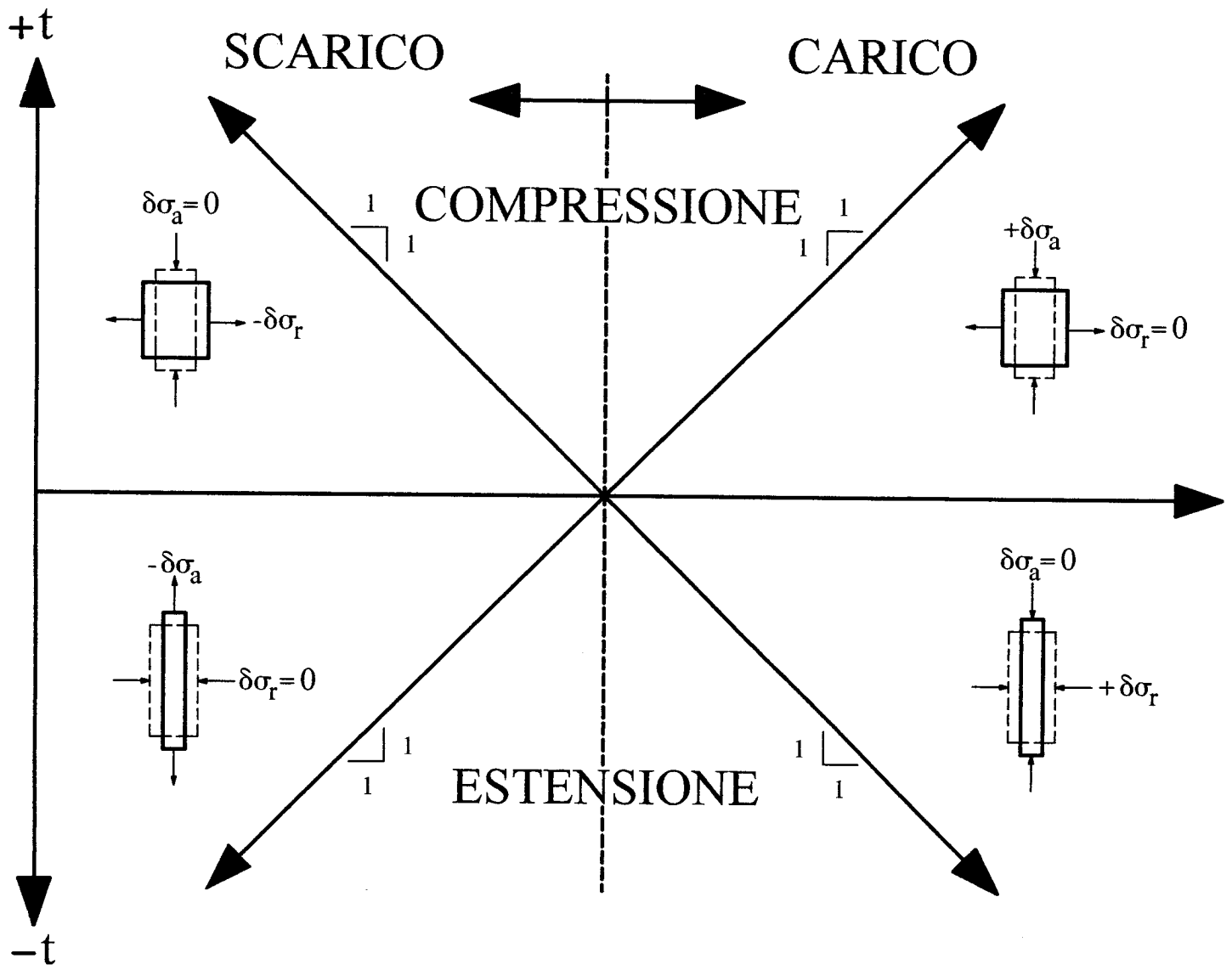
b. $\varepsilon_\gamma = (\varepsilon_a - \varepsilon_r); \varepsilon_v = (\varepsilon_a + \varepsilon_r)$

2. Piano p'-q

a. $p' = p - u = \frac{\sigma'_a + 2\sigma'_r}{3}; p = \frac{\sigma_a + 2\sigma_r}{3}$

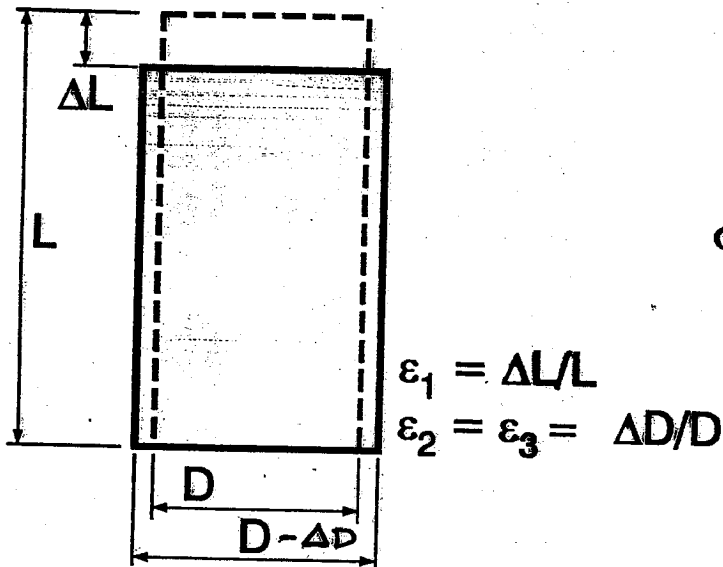
b. $\varepsilon_v = \varepsilon_a + 2\varepsilon_r$

c. $q = \sigma_a - \sigma_r; \varepsilon_s = \frac{2}{3}(\varepsilon_a - \varepsilon_r)$

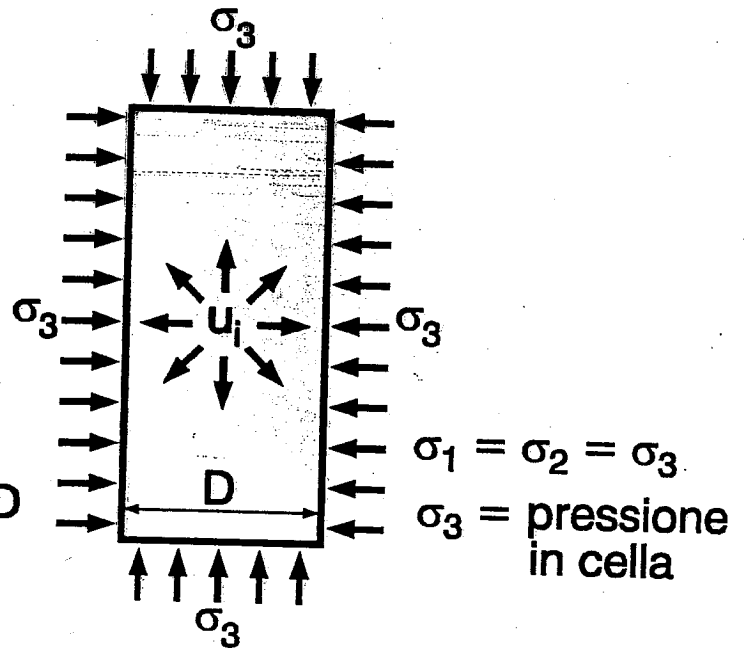


PROVA DI COMPRESSIONE TRIASSIALE SFORZI E DEFORMAZIONI

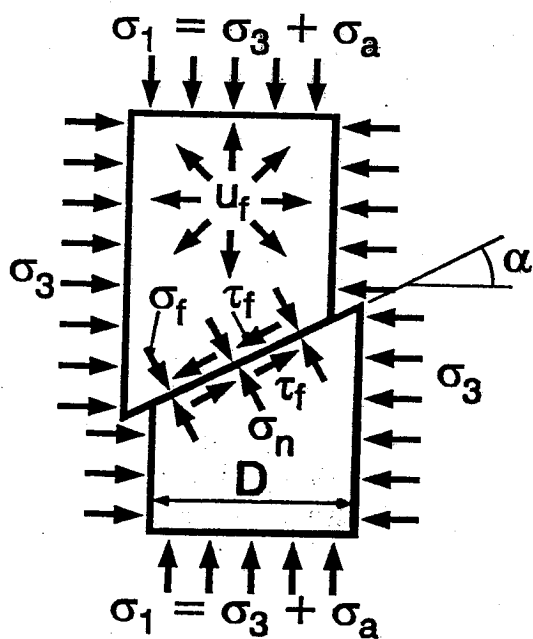
a. Deformazioni principali



b. Pressione in cella



c. Tensioni principali a rottura



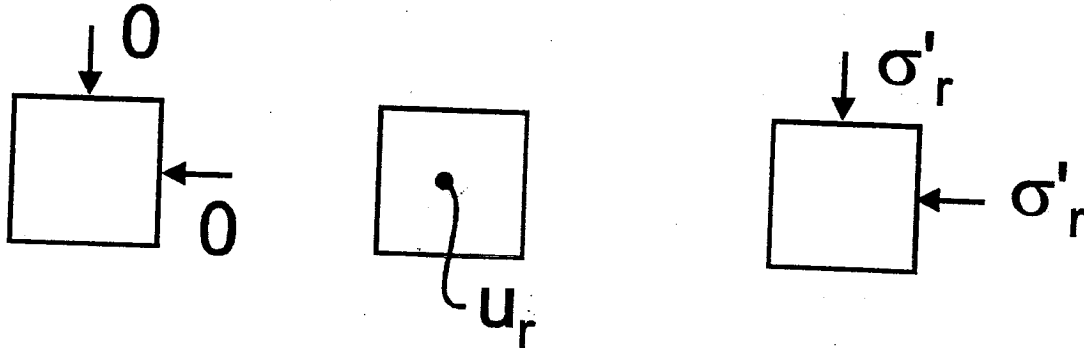
σ_a = sforzo assiale
detto anche
tensione deviatorica
 $\sigma_1 - \sigma_3$

GRANDEZZE CHE SI MISURANO DURANTE LE PROVE TRIASSIALI

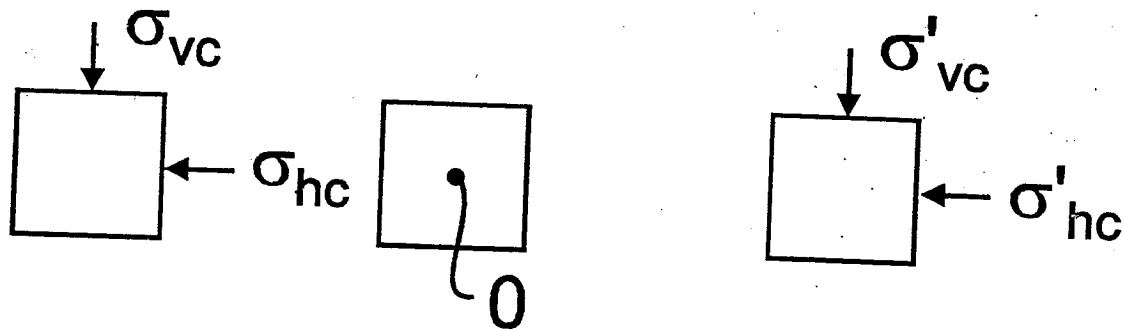
- FASE DI CONSOLIDAZIONE (U, C)
 - a. Tensioni di consolidazione (σ_a, σ_r) (UU, CU, CD)
 - b. Deformazione assiale (ε_a) (UU, CU, CD)
 - c. Deformazione volumetrica (ε_v) (CU, CD)
 - d. Deformazione radiale (ε_r) (CU, CD)
 - e. Sovrapressione interstiziale (du) (UU)
- FASE DI ROTTURA
 - a. (σ_a, σ_r) (UU, CU, CD)
 - b. (ε_a) (UU, CU, CD)
 - c. (ε_v) (ε_r) (CD)
 - d. (du) (UU, CU)

PROVA CD DI COMPRESSIONE PER CARICO

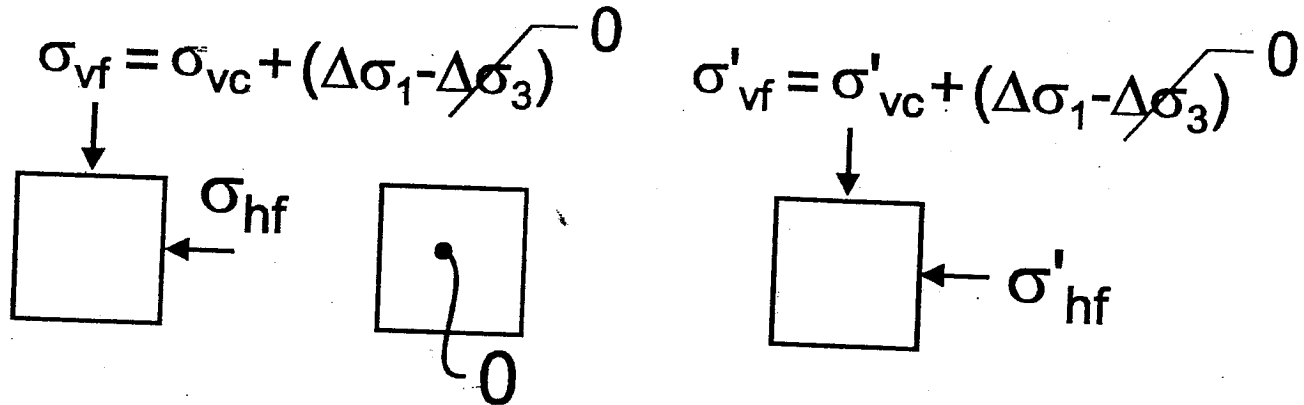
Campione indisturbato:



Fine consolidazione:



A rottura:



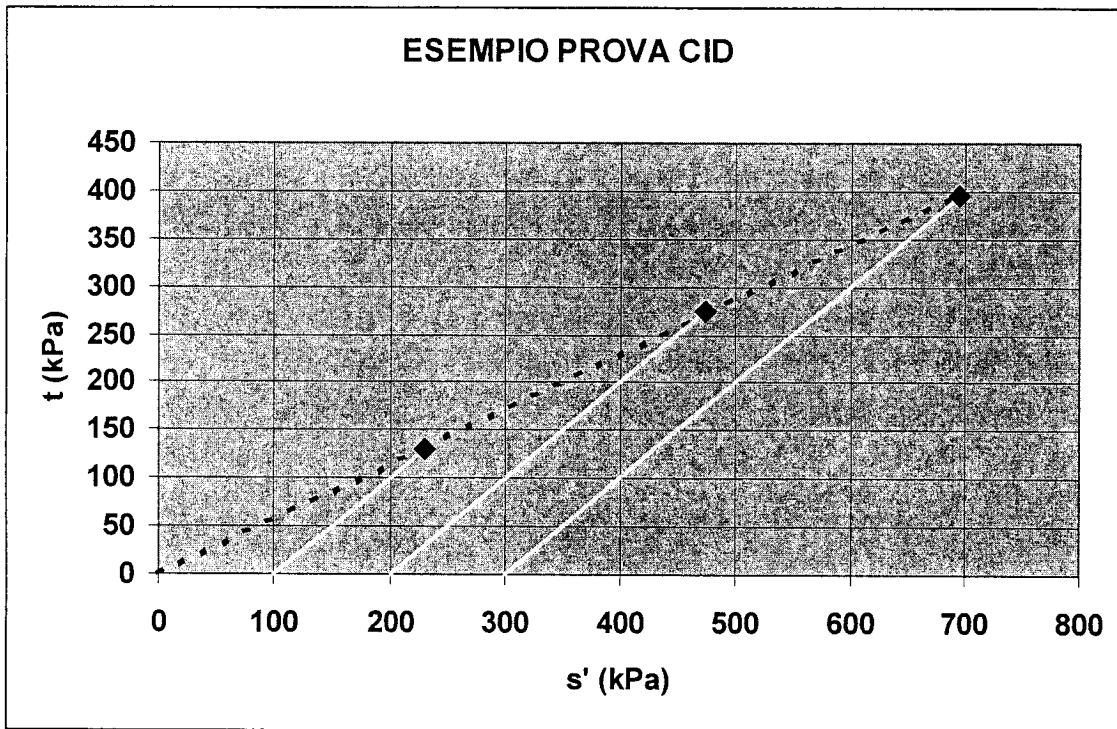
Tensioni totali

Tensioni interstiziali

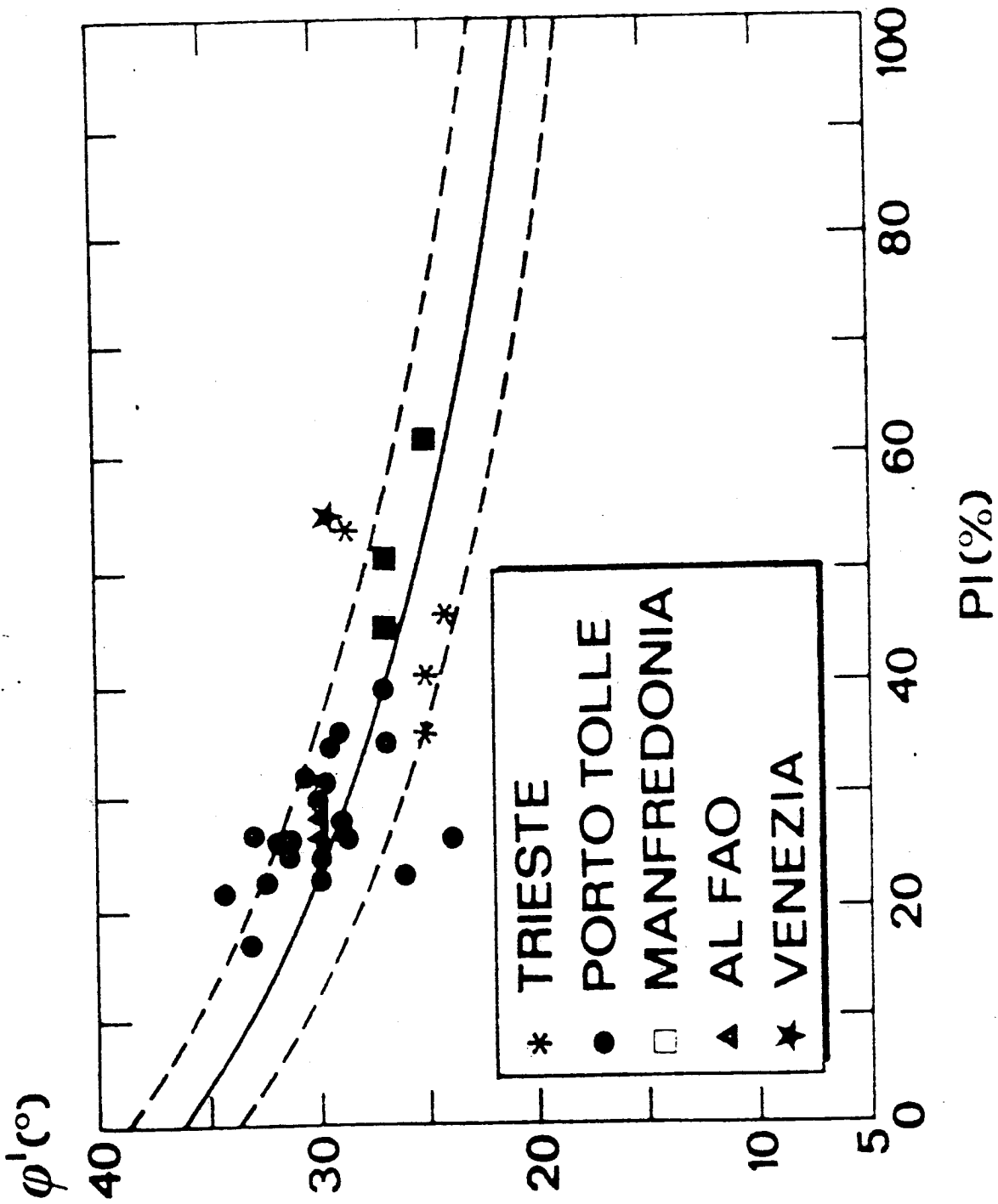
Tensioni efficaci

ESEMPIO PROVA CID

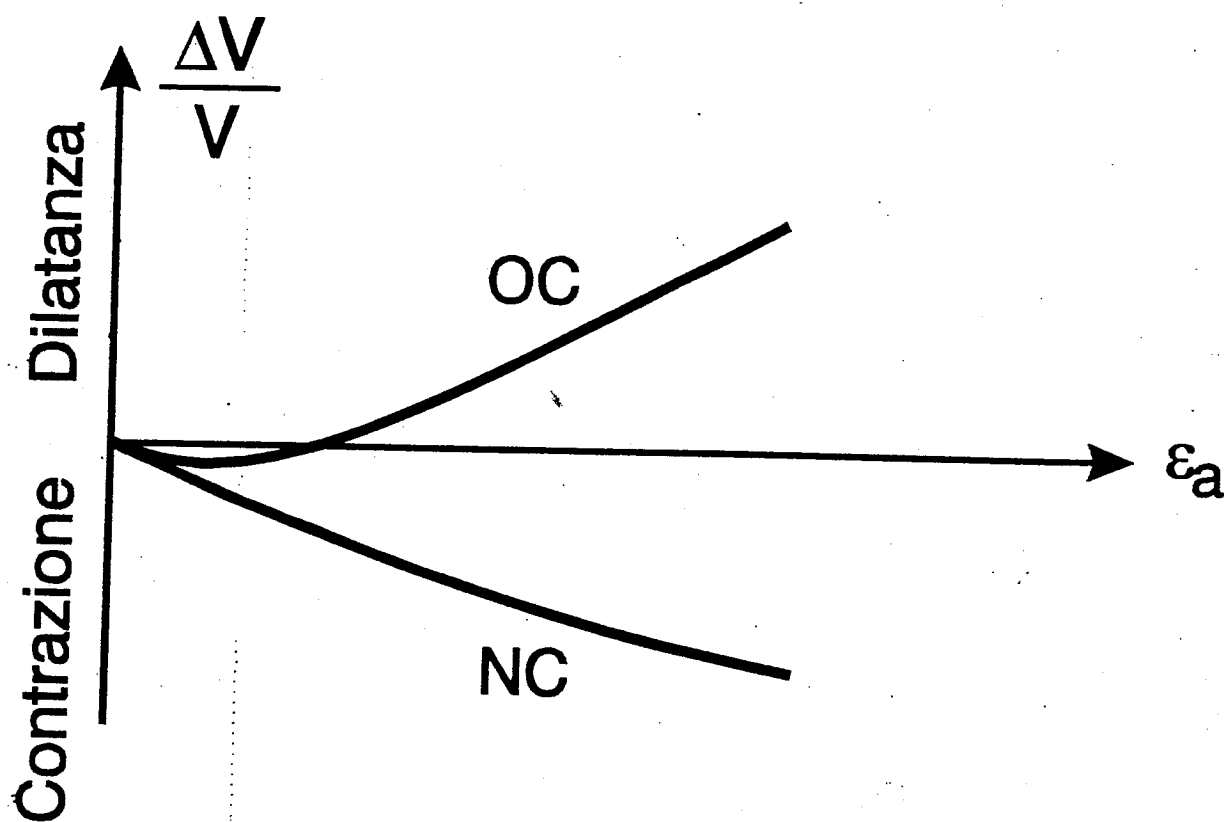
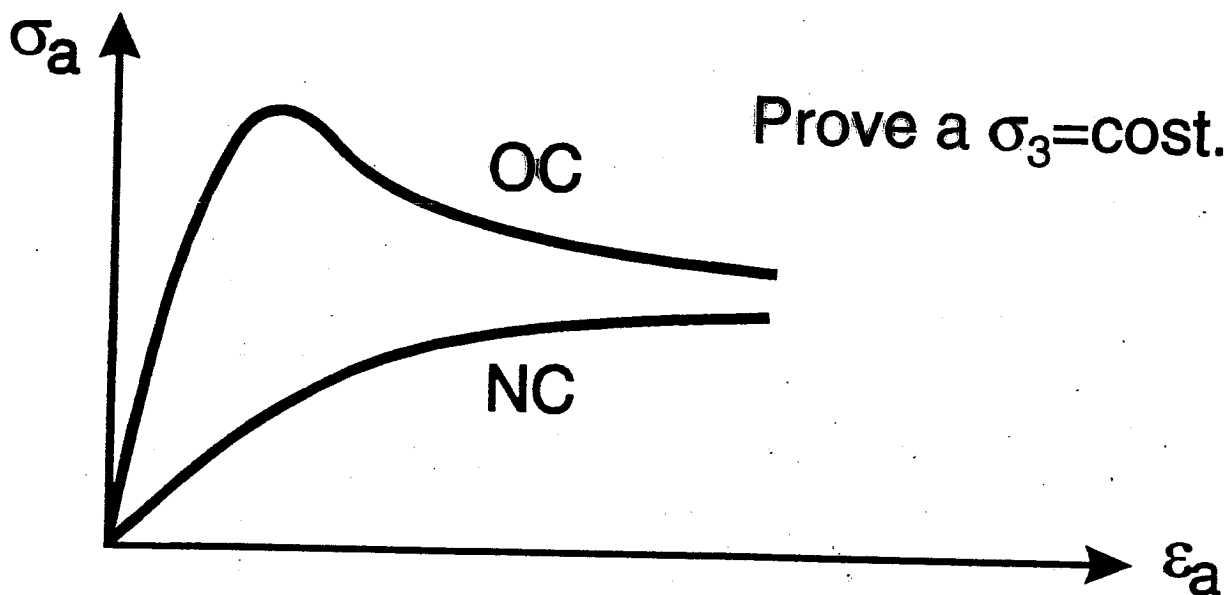
$\sigma'_{hc} = \sigma'_{hf}$ (kPa)	σ'_{vf} (kPa)	s' (kPa)	t (kPa)
100	360	230	130
200	750	475	275
300	1090	695	395



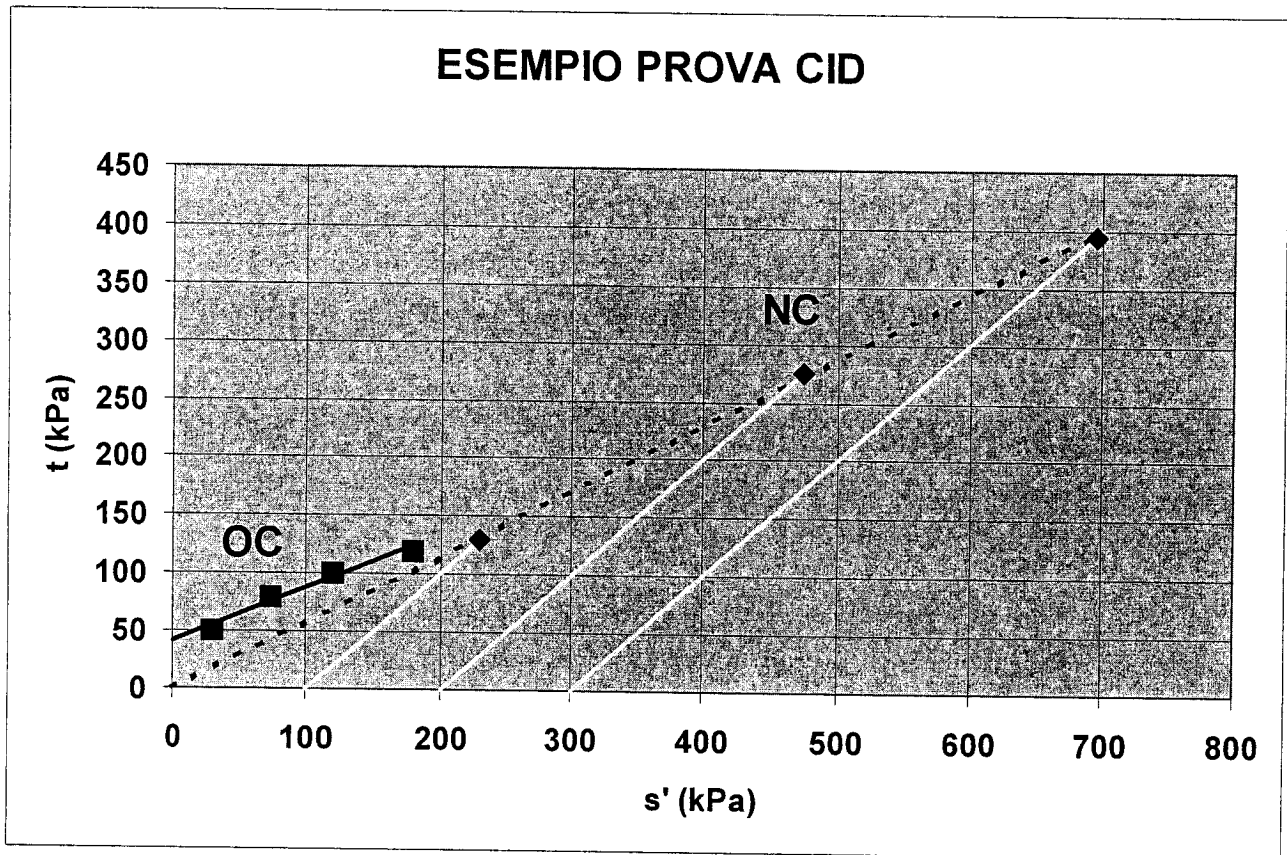
ϕ	α
ϕ ($^{\circ}$)(rad)	α ($^{\circ}$)(rad)
35 0.61	29.8 0.52



CURVE SFORZI-DEFORMAZIONE E VARIAZIONI DI VOLUME DA PROVE CD NEI TERRENI ARGILLOSI NC E OC

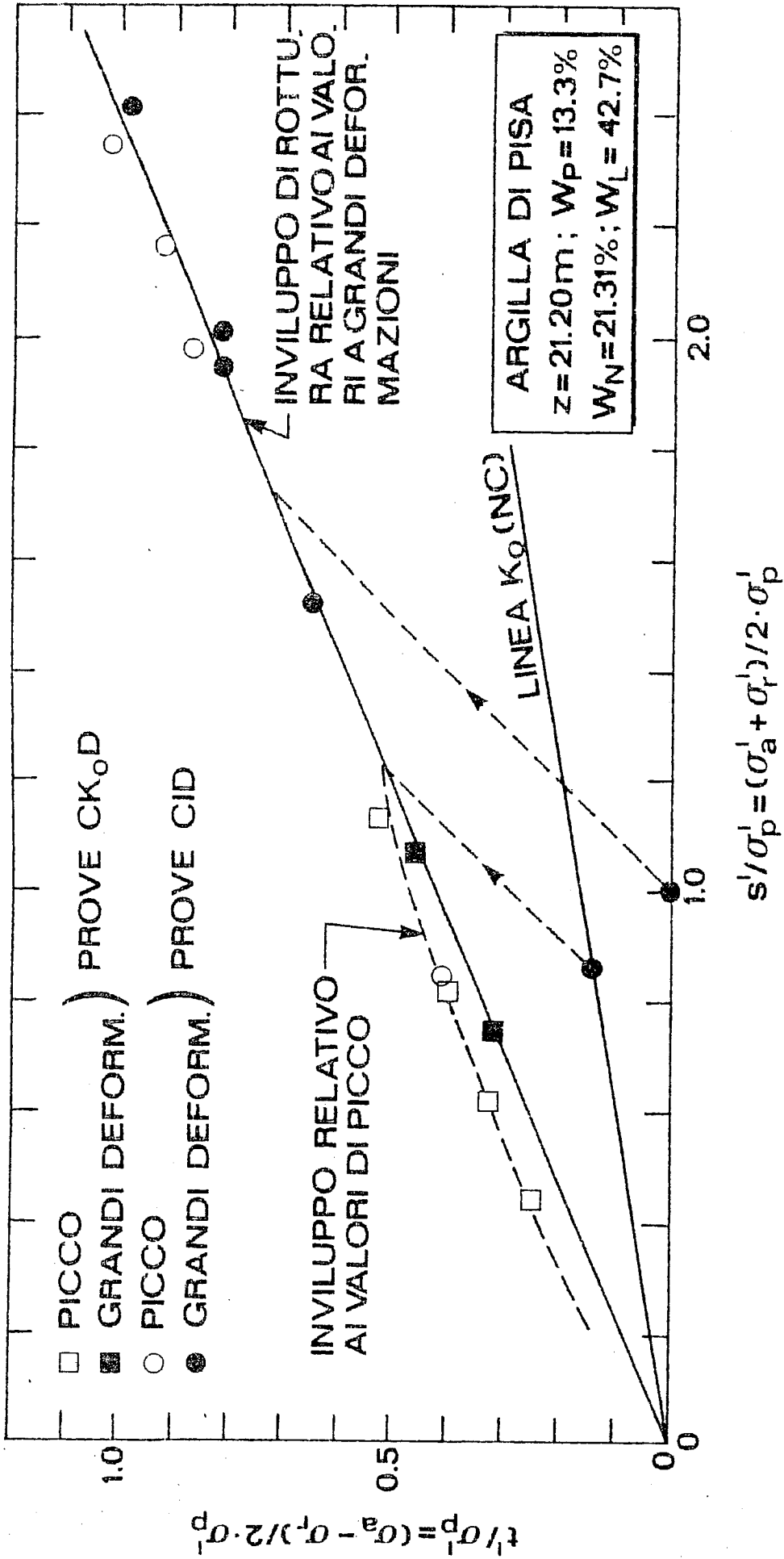


ESEMPIO PROVA CID (OC – NC)



$c' \cong 41 \text{ kPa} \quad \alpha \cong 24.7^\circ \quad (\text{OC})$

$c' \cong 0 \text{ kPa} \quad \alpha \cong 29.8^\circ \quad (\text{NC})$



ANGOLO DI RESISTENZA AL TAGLIO RESIDUO

Valori di ϕ'_r per $\sigma'_v = 100 \text{ kPa}$

