

STRESS CELL REDUCTION PROGRAM  
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 CSIRO Division of Geomechanics.  
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## GENERAL INFORMATION

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 INSTRUMENT TYPE :Thin-wall Cell  
 INSTRUMENT LOCATION :Test  
 NORTHING : 1.00 (METRIC)  
 EASTING : 1.00 (METRIC)  
 R.L. : 1.00 (METRIC)  
 DATE OF INSTALLATION:28/04/03  
 DATE OF OVERCORING :29/04/03  
 SETTING DEPTH : OVERCORE HOLE DEPTH = 44.59 METRES  
 LENGTH OF PILOT HOLE = 0.67 METRES  
 DEPTH TO INSTRUMENT GAUGES = 44.85 METRES

## INPUT DATA

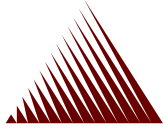
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 BOREHOLE DESCRIPTION :  
 BEARING = 82.00 DEGREES (EAST FROM NORTH POSITIVE)  
 DIP = 1.00 DEGREES (DIP FROM HORIZONTAL, POSITIVE DOWN)  
 ROCK PROPERTIES : (DETERMINED FROM BIAXIAL TEST)  
 POISSONS RATIO = 0.32  
 ELASTIC MODULUS = 28.19 GPa

## K FACTORS

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 K1= 1.113 K2= 1.218 K3= 1.074 K4= 0.968

## STRAIN MEASUREMENTS :

-STRAIN IS THE CHANGE AT THE STRAIN GAUGE DUE TO OVERCORING  
 TENSILE STRAIN IS POSITIVE  
 -ALPHA IS THE ANGLE IN DEGREES DESCRIBING THE POSITION OF THE  
 MID-POINT OF THE GAUGE ON THE CIRCUMFERENCE OF THE BOREHOLE.  
 (LOOKING INTO THE HOLE, CLOCKWISE FROM NORTH OR UP)  
 -BETA IS THE ANGLE IN DEGREES BETWEEN THE DIRECTION OF GAUGE  
 AND THE GENERATRIX OF BOREHOLE PASSING THROUGH THE MID-POINT OF  
 THE GAUGE AND DIRECTED AWAY FROM BOREHOLE MOUTH, CLOCKWISE FROM  
 AXIS OF INSTRUMENT IF LOOKING FROM OUTSIDE OF BOREHOLE



MICROSTRAIN	ALPHA	BETA
309.00	302.90	0.00
167.00	280.00	90.00
239.00	280.00	45.00
232.00	143.60	45.00
307.00	143.60	135.00
195.00	160.00	90.00
306.00	62.90	0.00
227.00	40.00	90.00
184.00	40.00	45.00

OUTPUT RESULTS : RUN NUMBER 3

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STANDARD DEVIATION OF DIFFERENCES IS 2.12 ON 1 DEGREES OF FREEDOM  
 GOODNESS OF FIT =1.00  
 CORRELATION COEFFICIENT =1.00

THE STRESSES IN THE ROCK ARE COMPUTED BY THE MULTIPLE LINEAR  
 REGRESSION METHOD WHICH OUTPUTS VARIOUS STATISTICAL DATA AND  
 BEST FITTING VALUES OF THE STRESS COMPONENTS. THE MAGNITUDE  
 AND DIRECTION OF PRINCIPAL STRESSES CAN BE DETERMINED FROM  
 THESE STRESS COMPONENTS

STRESS COMPONENTS IN REFERENCE SYSTEM

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NORMAL NORTH-SOUTH 4.45 MPA  
 STANDARD ERROR 0.02 MPA

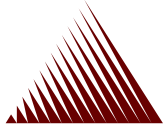
NORMAL EAST-WEST 11.04 MPA  
 STANDARD ERROR 0.05 MPA

NORMAL VERTICAL 3.90 MPA  
 STANDARD ERROR 0.02 MPA

SHEAR N-S / E-W 1.40 MPA  
 STANDARD ERROR 0.02 MPA

SHEAR E-W / VERT -0.61 MPA  
 STANDARD ERROR 0.03 MPA

SHEAR VERT / N-S -0.26 MPA  
 STANDARD ERROR 0.01 MPA



NOTE :THE STANDARD ERROR IS THE STANDARD DEVIATION OF THE NORMAL AND SHEAR STRESS COMPONENTS. CONFIDENCE LIMITS FOR THE STRESS COMPONENTS ARE OBTAINED BY USING THE STUDENTS T DISTRIBUTION FOR THE DESIRED PROBABILITY. THE STANDARD ERROR TAKES NO ACCOUNT OF THE POSSIBLE ERROR IN THE STRESS COMPONENTS DUE TO INACCURATE READINGS OF THE STRAIN GAUGES.

ANALYSIS OF VARIANCE TABLE FOR MULTIPLE REGRESSION

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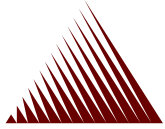
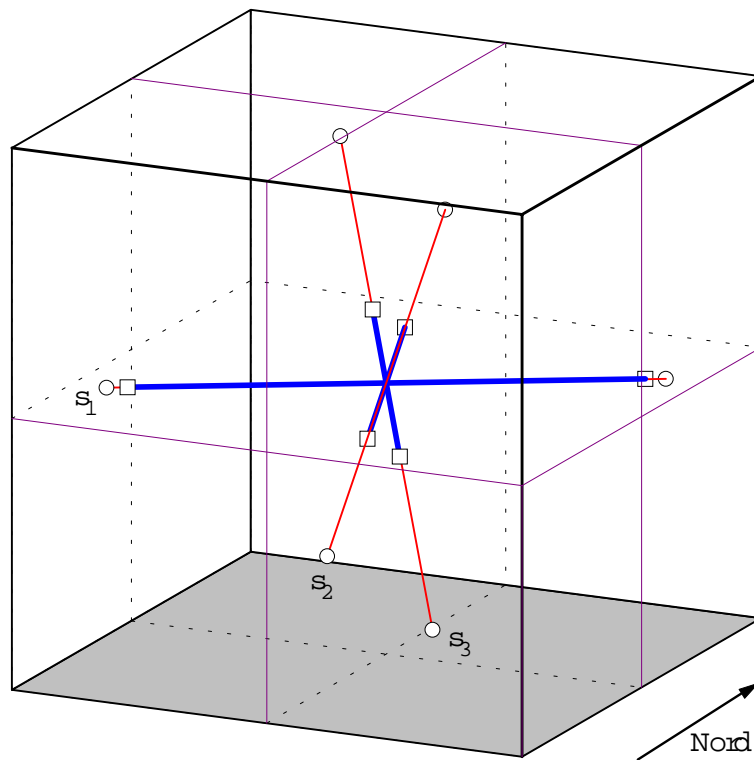
SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F-TEST
REGRESSION	102635.50	6	17105.92	
DEVIATION	4.51	1	4.51	3796.3720
TOTAL VARIATION	102640.00	7		

PRINCIPAL STRESSES DIP BEARING

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11.38	4.9	258.4
3.80	70.3	2.2
4.21	19.1	166.7

NOTE : (1)THE PRINCIPAL STRESS IS IN MEGAPASCALS  
(2)THE DIP IS THE ANGLE IN DEGREES POSITIVE DOWN FROM THE HORIZONTAL  
(3)THE BEARING IS THE ANGLE IN DEGREES POSITIVE CLOCKWISE FROM NORTH

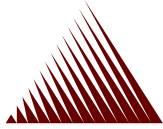
Spannungs-Diagramm

$$s_1 = 11,38 \text{ MPa}$$

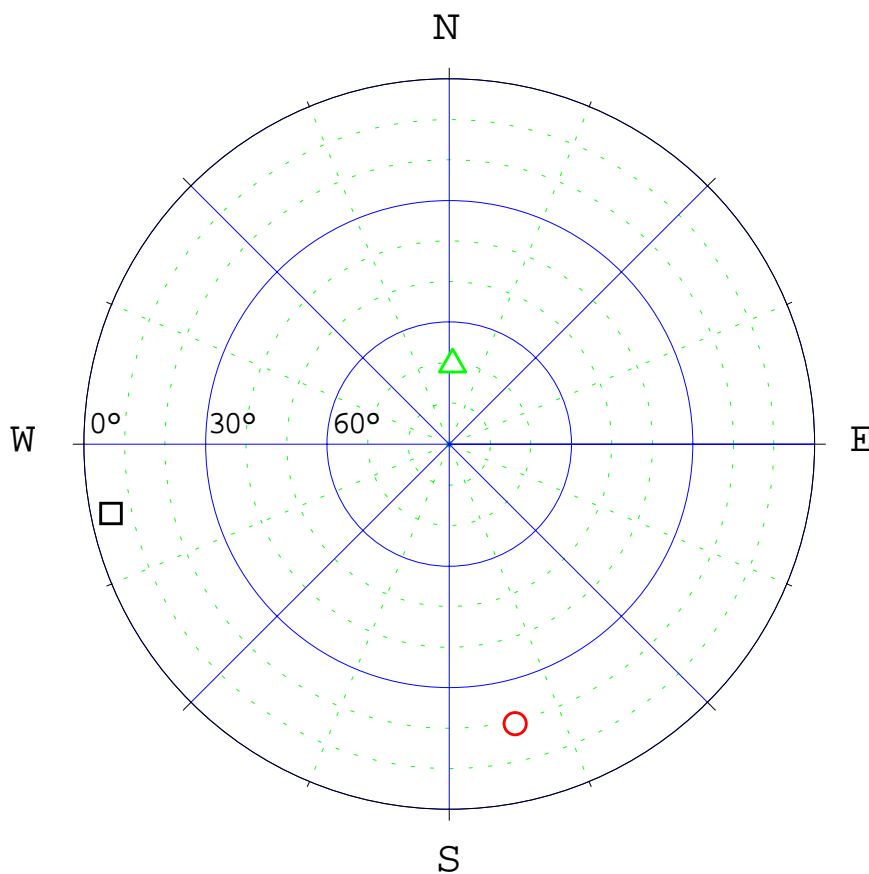
$$s_2 = 4,21 \text{ MPa}$$

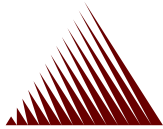
$$s_3 = 3,8 \text{ MPa}$$

$$\text{Kantenlänge} = 12 \text{ MPa}$$

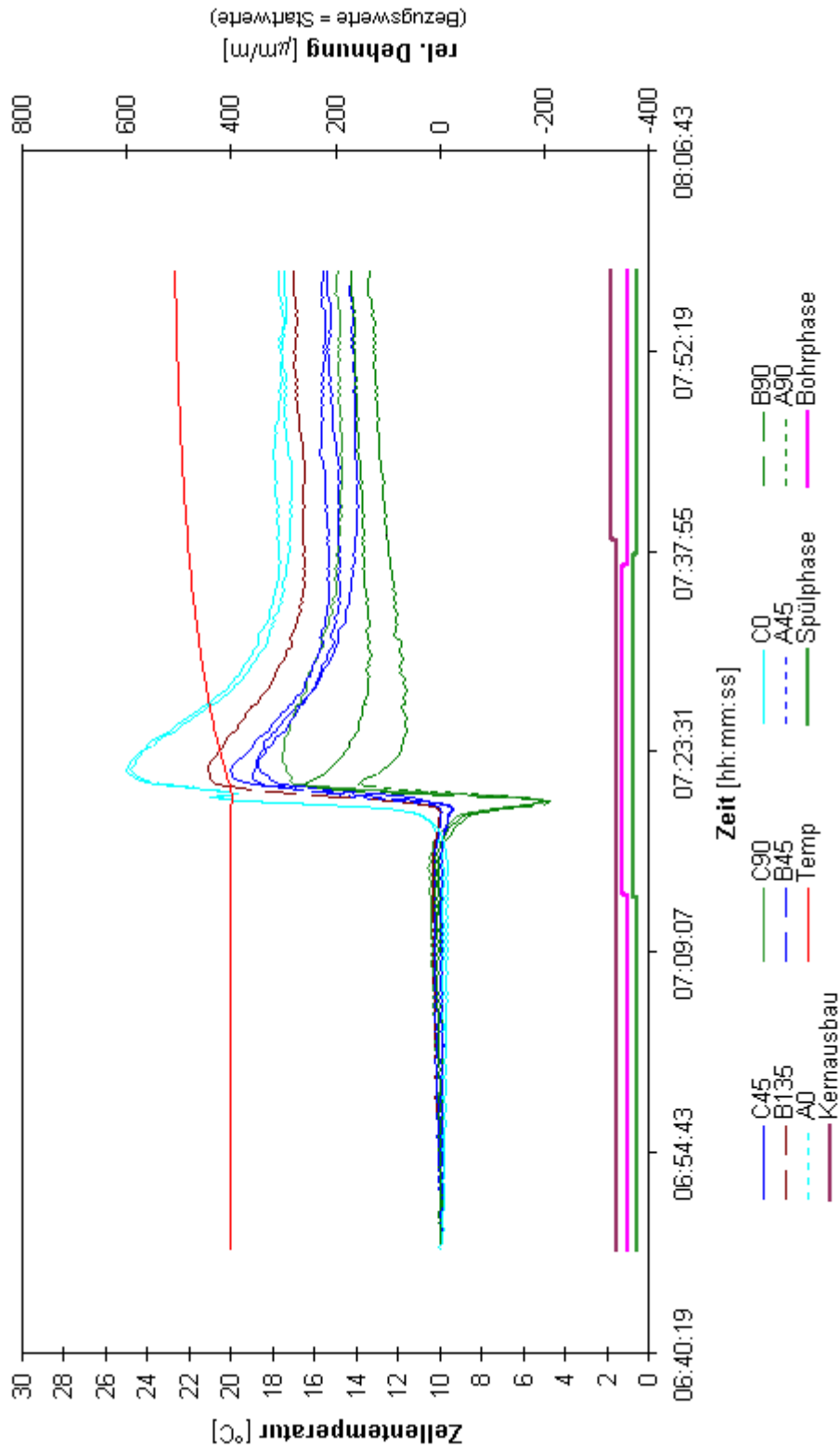
**Lagenkugel- Diagramm**

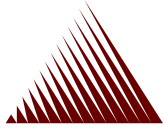
(Projektion in die untere Halbkugel)

—□—  $s_1 = 11,38 \text{ MPa}$ —○—  $s_2 = 4,21 \text{ MPa}$ —△—  $s_3 = 3,8 \text{ MPa}$



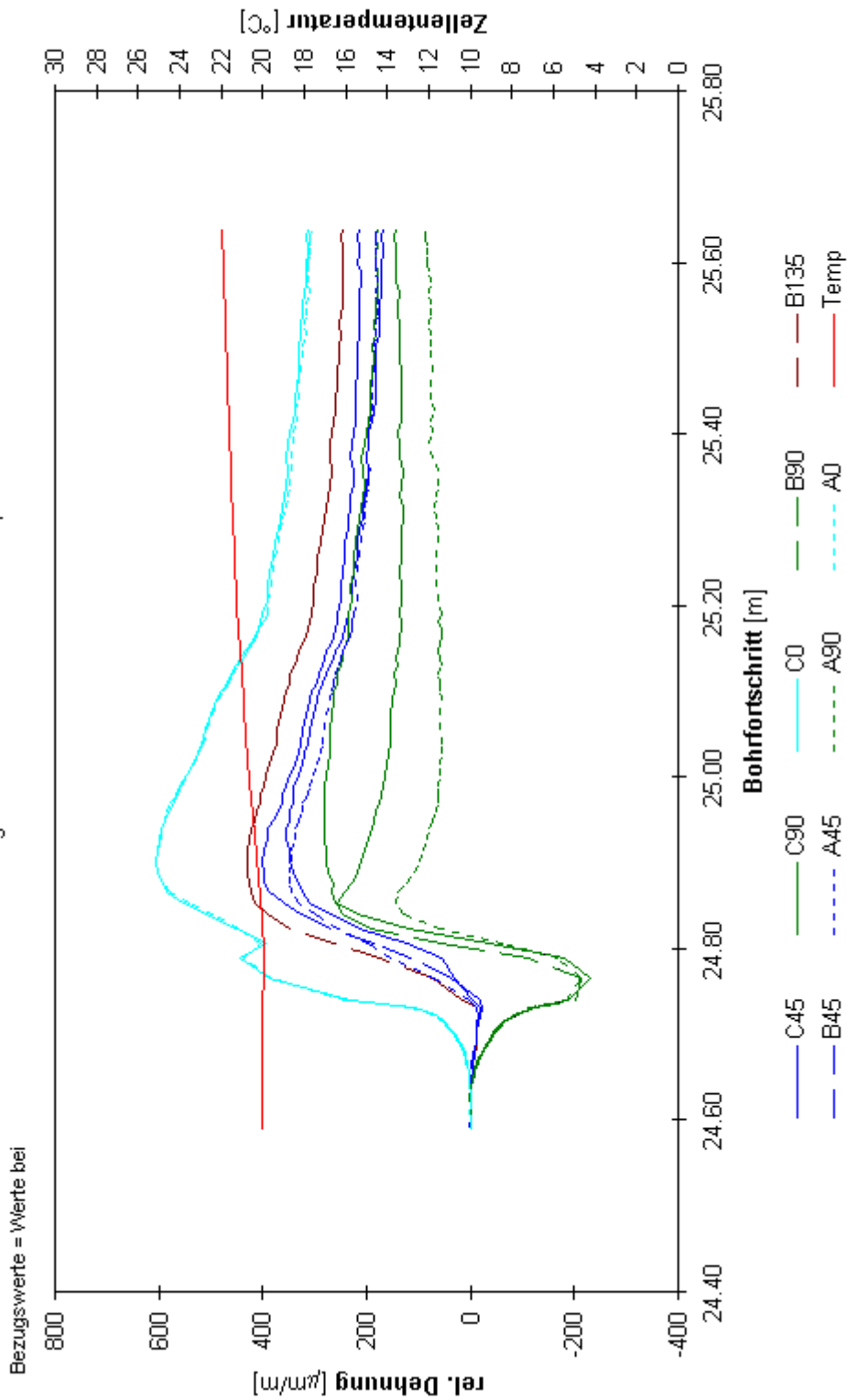
Zeitabhängiger Dehnungsverlauf Zelle: 4884

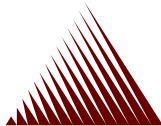




**Bohrfortschrittsabhängiger Dehnungsverlauf Zelle: 4884**

Lage der Meßwertaufnahme: 44,85 m





Verlauf der relativen Dehnungen als Funktion des radial wirkenden Drucks												
Druck [MPa]	Umfang [ $\mu\text{m/m}$ ]	Axial [ $\mu\text{m/m}$ ]	C45 [ $\mu\text{m/m}$ ]	C90 [ $\mu\text{m/m}$ ]	C0 [ $\mu\text{m/m}$ ]	B90 [ $\mu\text{m/m}$ ]	B135 [ $\mu\text{m/m}$ ]	B45 [ $\mu\text{m/m}$ ]	A45 [ $\mu\text{m/m}$ ]	A90 [ $\mu\text{m/m}$ ]	A0 [ $\mu\text{m/m}$ ]	
0.0	0	0	0	0	0	0	0	0	0	0	0	
0.5	-38	12	-14	-38	11	-39	-9	-16	-13	-37	13	
1.0	-82	24	-32	-86	24	-83	-22	-35	-26	-77	24	
1.5	-127	36	-52	-139	37	-127	-36	-55	-39	-114	34	
2.0	-170	47	-70	-189	50	-169	-50	-70	-52	-153	44	
2.5	-212	59	-88	-237	62	-209	-65	-85	-65	-189	55	
3.0	-260	73	-108	-295	79	-255	-80	-101	-77	-230	67	
2.5	-225	62	-95	-262	68	-220	-67	-92	-64	-193	56	
2.0	-186	48	-79	-223	53	-181	-54	-81	-51	-154	43	
1.5	-145	35	-64	-178	39	-141	-40	-68	-39	-116	31	
1.0	-100	20	-45	-127	22	-96	-27	-52	-27	-76	17	
0.5	-50	5	-26	-71	5	-48	-16	-33	-13	-32	4	
0.0	2	-11	-4	-6	-12	3	-3	-8	0	10	-9	

Triaxialzellennr.: 4884

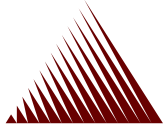
Mittelwert aus Umfangaufnehmer:

-262

Mittelwert aus Axialaufnehmer:

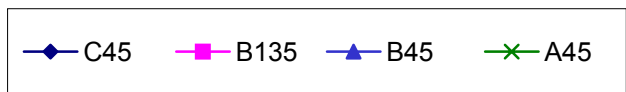
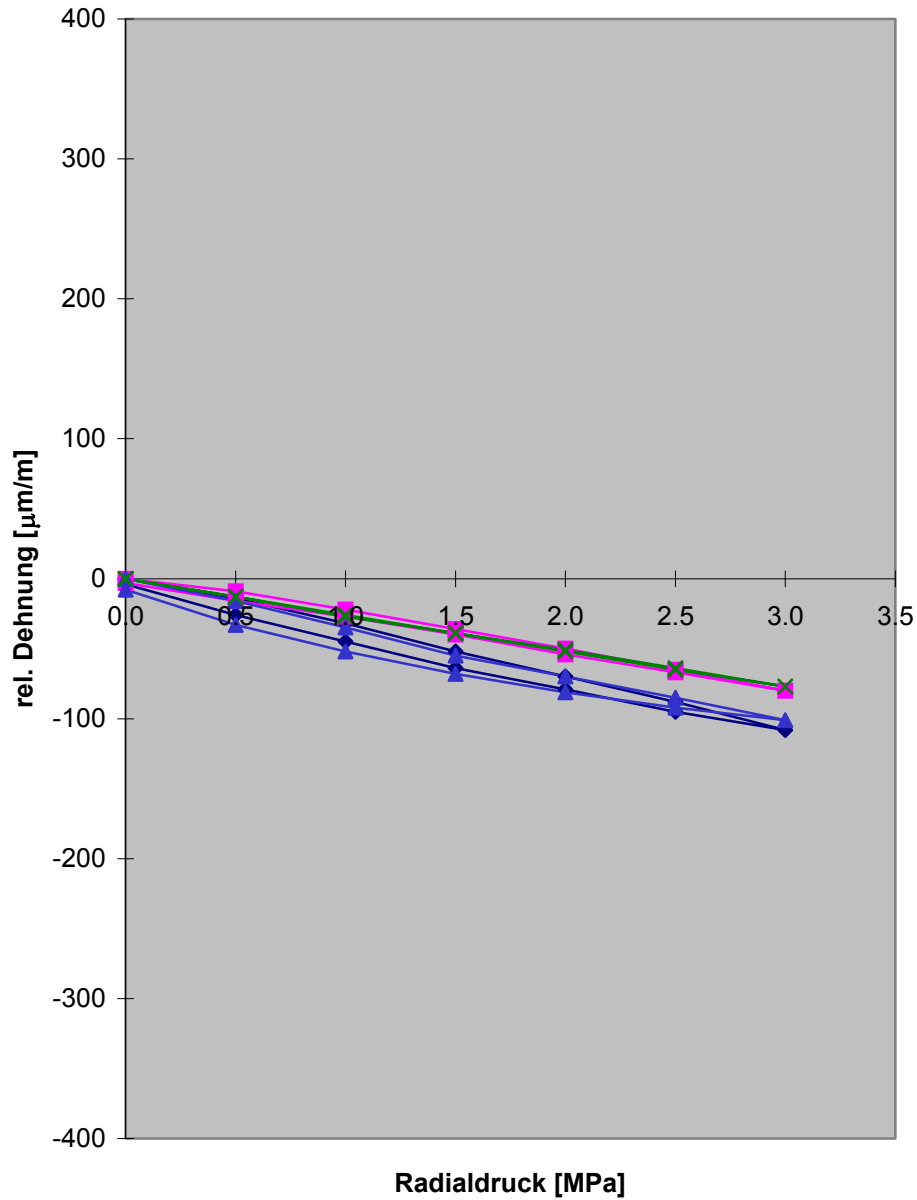
84

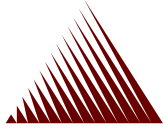




**Biaxialversuch Zelle:**

4884





**Biaxialversuch Zelle:**

4884

