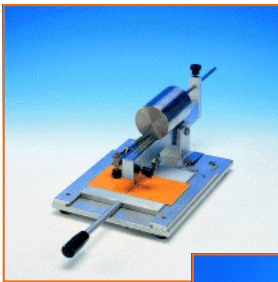


# Elcometer 3000 Clemen Unit



Elcometer 3000  
Clemen Unit



## At a glance

- Available as either a manual or motorised version.
- Variable load adjustment and interchangeable scratch tool.
- Used to evaluate resistance to scratching.

## Can be used in accordance with:

BS 3900 E2	BS 3900 E5
BS EN 13523-12	ISO 1518

## Elcometer 3000 Clemen Unit

Designed to evaluate resistance to scratching. A tool fitted with a hemispherical ball of 1mm diameter (standard) is lowered gradually onto the surface of the sample and moved 6cm.

Depending on the purpose of the test and the load applied, varying degrees of penetration of the tool into the coating are observed, from a superficial trace to total destruction.

The Elcometer 3000 is available in two versions; the original Manual Clemen Unit and the Motorised Clemen Unit. See also the Elcometer 1535 Multifunction Scratching Tool.

## Elcometer 3000/1 Manual Clemen Unit;

The tool is positioned on the sample, which is fixed on a sliding platform and moved manually. Load variable from 0 to 2000g.

## Elcometer 3000/3 Motorised Clemen Unit;

The motorised motion brings the tool gently in contact with the sample, whatever the load, variable from 0 to 5000g, and moves it across the coating, with automatic start and stop. The contact of the tool with the metallic substrate is indicated by a lamp and voltmeter.

## Hardness Testers

Improved mechanical resistance is part of many quality requirements. One important criteria for assessing this feature is hardness.

Depending on the requirements there are various methods for testing hardness. Some are dedicated to characterise coatings and others are more suitable for testing bulk materials such as metals, plastics, rubber or elastomers.

Elcometer manufacture and supply a wide range of instrumentation designed for the hardness tests most frequently used in the industry – these include pendulum, scratching, indentation or rebound measuring methods.

Model	Description	Part Number		
		UK 240V	EUR 220V	US 110V
Elcometer 3000/1	Elcometer 3000 Manual Clemen Unit	K0003000M001		
Elcometer 3000/3	Elcometer 3000 Motorised Electric Clemen Unit	K0003000M003		K0US3000M003
Accessories	Adjustment Kit to test from 5 to 20mm	KT003000N015		
	Luminous microscope - x30	KT007210M001		
	Magnifier – x10	KT001546N002		
	1mm Ball Tool in Tungsten Carbide	KT003000P021		
	2mm Cutting Tool in Tungsten Carbide	KT003000N001		
	VW Cutting Tool	KT003000N013		
	1cm <sup>2</sup> Rubber Tool for Drying Time	KT003000N002		
Packing List	Elcometer 3000/1 Clemen Unit or Elcometer 3000/3 Motorised Clemen Unit, 4 x 1000g weight (Elcometer 3000/3 models only), 1mm (0.04") Ball Tool & Operating Instructions			

Алматы (7273)495-231  
Ангарск (3955)60-70-56  
Архангельск (8182)63-90-72  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
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Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Коломна (4966)23-41-49  
Кострома (4942)77-07-48  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Курган (3522)50-90-47  
Липецк (4742)52-20-81

Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
Новокузнецк (3843)20-46-81  
Новосибирск (383)227-86-73  
Ноябрьск (3496)41-32-12  
Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16  
Петрозаводск (8142)55-98-37  
Псков (8112)59-10-37  
Пермь (342)205-81-47

Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692)22-31-93  
Саранск (8342)22-96-24  
Симферополь (3652)67-13-56  
Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Сургут (3462)77-98-35  
Сыктывкар (8212)25-95-17  
Тамбов (4752)50-40-97  
Тверь (4822)63-31-35

Тольятти (8482)63-91-07  
Томск (3822)98-41-53  
Тула (4872)33-79-87  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Улан-Удэ (3012)59-97-51  
Уфа (347)229-48-12  
Хабаровск (4212)92-98-04  
Чебоксары (8352)28-53-07  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Чита (3022)38-34-83  
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## Elcometer 3120 Shore Durometer

The Elcometer 3120 range of durometers is widely used to test the hardness of soft materials.

A round point indents the material under a fixed force spring and the hardness is displayed on the dial in Shore Hardness Units.

The instrument can be used either hand-held or fitted to an optional stand for increased repeatability.

*Note: The Elcometer 3120 range of Shore Durometers encompasses a number of hardness values. Please refer to the table below.*



### STANDARDS:

ASTM D 2240, BS 7442-3.2, DIN 53505, FIAT 50411, ISO 868, ISO 7267-2, NF T51-123, NF T 51-174

### Technical Specification

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Part Number		Description	Certificate
Without Certificate	With Certificate		
K0003120M001	K0003120M015	Elcometer 3120 Shore Durometer A	○
K0003120M008	-	Elcometer 3120 Shore Durometer A with Max indicator	
-	K0003120M025	Elcometer 3120 Shore Durometer A with Max indicator and 10N weight	○
K0003120M005	K0003120M018	Elcometer 3120 Shore Durometer D	○
K0003120M009	-	Elcometer 3120 Shore Durometer D with Max indicator	
Dimensions		50 x 50 x 110mm (1.9 x 1.9 x 4.3")	
Weight		300g (10.58oz)	
Packing List	Elcometer Shore Durometer and operating instructions.		

### Accessories

Part Number	Description
KT003120N002	Test Stand BS 61 II with 10N Load for Shore A, B & O
KT003120N005	Test Stand BS 61 II with 50N Load & Control Ring for Shore D, C & DO

### Material Relative Hardness Range

←	Soft	Medium	Hard	→
Shore A ASTM D2240, DIN 53505, ISO 868, ISO 7267-2				
Shore D ASTM D2240, DIN 53505, ISO 868, ISO 7267-2				

## Elcometer 3080 Pencil Hardness Tester

This is a simple and effective technique to evaluate the hardness of many coatings.

The pencil lead, prepared beforehand by using the special pencil sharpener and rubbing it on fine abrasive paper (400 grade), is maintained at an angle of 45° and pushed with uniform pressure on to the sample, leaving either a superficial trace or causing destruction down to the substrate.

The Elcometer 3080 Pencil Hardness Tester is supplied complete with stand and a series of 14 pencils, ranging from 6B to 6H hardness values.

**STANDARDS:**

ASTM D 3363, ECCA T4, EN 13523-4, ISO 15184:2012, JIS K 5600-5-4

### Technical Specification

Part Number	Description
<b>K0003080M203</b>	Elcometer 3080 6B to 6H Pencil Hardness Tester with Stand
Dimensions	330 x 280 x 330mm (13 x 11 x 13")
Weight	1kg (2.2lb)
Packing List	Elcometer 3080 Pencil Hardness Tester, Pencil set - (14 pencils, grades 6B - 6H), x 2 pencil sharpeners, abrasive paper block, storage stand and operating instructions

### Accessories

Part Number	Description	Part Number	Description
<b>T99923042-1</b>	12 Hardness Pencils (6B)	<b>T99923042-8</b>	12 Hardness Pencils (F)
<b>T99923042-2</b>	12 Hardness Pencils (5B)	<b>T99923042-9</b>	12 Hardness Pencils (H)
<b>T99923042-3</b>	12 Hardness Pencils (4B)	<b>T99923042-10</b>	12 Hardness Pencils (2H)
<b>T99923042-4</b>	12 Hardness Pencils (3B)	<b>T99923042-11</b>	12 Hardness Pencils (3H)
<b>T99923042-5</b>	12 Hardness Pencils (2B)	<b>T99923042-12</b>	12 Hardness Pencils (4H)
<b>T99923042-6</b>	12 Hardness Pencils (B)	<b>T99923042-13</b>	12 Hardness Pencils (5H)
<b>T99923042-7</b>	12 Hardness Pencils (HB)	<b>T99923042-14</b>	12 Hardness Pencils (6H)
<b>T99923039</b>	Set of 14 Pencils (6B to 6H)		
<b>T501190451</b>	Pencil Sharpener (6H to 2B)		
<b>T501190452</b>	Pencil Sharpener (3B to 6B)		

## Elcometer 501 Pencil Hardness Tester

The pencil hardness test, also referred to as the Wolff-Wilborn test, uses the varying hardness values of graphite pencils to evaluate a coating's hardness.

The Elcometer 501 has been designed to ensure that the cylindrical pencil lead is maintained at a constant angle of 45° and exerts a force of 7.5N (1.68lbF).

The pencil lead, prepared beforehand using the special sharpener and abrasive paper, is inserted into the Elcometer 501 and pushed over the smooth, flat coated surface.

The lowest hardness value of the pencil which marks the coating determines the coating's hardness rating.



### STANDARDS:

ASTM D 3363, ECCA T4, EN 13523-4, ISO 15184:2012, JIS K 5600-5-4

### Technical Specification

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Part Number	Description	Certificate
<b>H501-----1</b>	Elcometer 501 Pencil Hardness Tester	○
Dimensions (with Pencils)	130 x 130 x 50mm (5 x 5 x 2")	
Weight	2.1kg (4lb)	
Packing List	Elcometer 501 Pencil Hardness Tester, pencil set (14 pencils, grades 6B - 6H), positioning block, 2 x pencil sharpeners, abrasive paper block, carry case and operating instructions	

### Accessories

Part Number	Description	Part Number	Description
<b>T99923042-1</b>	12 Hardness Pencils (6B)	<b>T99923042-8</b>	12 Hardness Pencils (F)
<b>T99923042-2</b>	12 Hardness Pencils (5B)	<b>T99923042-9</b>	12 Hardness Pencils (H)
<b>T99923042-3</b>	12 Hardness Pencils (4B)	<b>T99923042-10</b>	12 Hardness Pencils (2H)
<b>T99923042-4</b>	12 Hardness Pencils (3B)	<b>T99923042-11</b>	12 Hardness Pencils (3H)
<b>T99923042-5</b>	12 Hardness Pencils (2B)	<b>T99923042-12</b>	12 Hardness Pencils (4H)
<b>T99923042-6</b>	12 Hardness Pencils (B)	<b>T99923042-13</b>	12 Hardness Pencils (5H)
<b>T99923042-7</b>	12 Hardness Pencils (HB)	<b>T99923042-14</b>	12 Hardness Pencils (6H)
<b>T99923039</b>	Set of 14 Pencils (6B to 6H)		
<b>T501190451</b>	Pencil Sharpener (6H to 2B)		
<b>T501190452</b>	Pencil Sharpener (3B to 6B)		



## Elcometer 3092 Sclerometer Hardness Tester

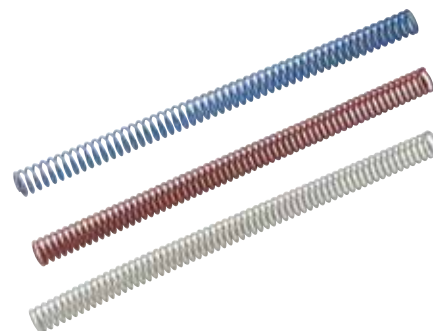
The Elcometer 3092 tests the hardness of a coating by moving a Tungsten Carbide Tip over the coating with predetermined force.

The body of the instrument contains a cursor fitted with a screw lock and a round tip, compressed by one of the four springs corresponding to the four printed scales:

- *Grey spring:* 0-3N (0.671lbF)
- *Red spring:* 0-10N (2.248lbF)
- *Blue spring:* 0-20N (4.49lbF)
- *Green spring:* 0-30N (6.74lbF)

The spring force can be set by the "collar"; compressing the spring increases the force with which the tip is pushed on to the surface of the test piece. By making short, straight movements while gradually increasing the load, the user can observe the force at which the tip leaves a mark or destroys the coating.

Each Elcometer 3092 is supplied in a case with a 0.75mm (0.03") diameter tungsten carbide tip and 3 springs (grey, red and blue). An optional green spring of 0 - 30N is also available.



### STANDARDS:

AS 3894.4, EN 438-2, ISO 4586-2

### Technical Specification

Part Number	Description
<b>K0003092M201</b>	Elcometer 3092 Sclerometer Hardness Testers - 3 ranges
Dimensions	165 x 24 x 16mm (6.5 x 1 x 0.6")
Weight	370g (13oz)
Packing List	Elcometer 3092 Sclerometer, tool with 0.75mm (0.03") diameter tungsten carbide tip, 3 springs (grey, red and blue), carry case and operating instructions

### Accessories

Part Number	Description
<b>KT003092P001</b>	0.5mm (0.02") Tungsten Carbide Tip
<b>KT003092P002</b>	0.75mm (0.03") Tungsten Carbide Tip
<b>KT003092P003</b>	1.0mm (0.04") Tungsten Carbide Tip
<b>KT003092P008</b>	90° Diamond Point Cone, 90µm (3.54mils) Radius - ISO Type
<b>KT003092P004</b>	Grey Spring 0 - 3N (0 - 0.67lbF)
<b>KT003092P005</b>	Red Spring 0 - 10N (0 - 2.248lbF)
<b>KT003092P006</b>	Blue Spring 0 - 20N (0 - 4.49lbF)
<b>KT003092P007</b>	Green Spring 0 - 30N (0 - 6.74lbF)

## Elcometer 3025 Scratch/Shear Tester

The Elcometer 3025 is a motorised device to test the resistance of many materials to scratching, shearing, gouging, marring, scraping and engraving. This portable instrument tests materials up to 12.7mm (½") thick by 101mm (4") square or round.

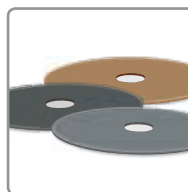
The height of the scale beam is adjusted by the user to match the thickness of the sample. The tool, a conical diamond tip, is then placed on the sample and the instrument is activated by the user with the On/Off switch.

The tip leaves a trace mark and the extent of this, in relation to the load used, indicates the degree of coating or material hardness. The turntable rotates at a constant 5rpm to ensure repeatability and reproducibility of tests. By changing the load on the tool, from 0 - 1000g (0 - 2.2lb), the sample's scratch resistance can be evaluated.

### Sample Cutter

The Sample Cutter cuts precise 106mm (4.2") circular samples with a 6.35mm (0.25") centre hole to prepare specimens for use with the Taber® Abrasers.

An easy counter-clockwise cutting motion allows the user to cut a variety of materials. Optional pads allowing cutting thicknesses of 0.03mm (0.001"), 4.74mm (0.187") and 6.35mm (0.25") are available.



**STANDARDS:**  
EN 438-2, ISO 4586-2

### Technical Specification

Part Number			Description
UK 240V	EUR 220V	US 110V	
K0UK3025M001	K0003025M001	K0US3025M001	Elcometer 3025 Scratch/Shear Tester
Dimensions	445 x 190 x 150mm (17 x 7.8 x 6")		
Weight	6.8kg (14.9lb)		
Packing List	Elcometer 3025 and operating instructions		

### Accessories

Part Number	Description
<b>ST985000</b>	Sample Cutter
<b>ST131569</b>	Sample Cutter Upper Pad – 4.74mm (0.187")
<b>ST131570</b>	Sample Cutter Upper Pad – 6.36mm (0.250")
<b>KT003025P007</b>	Magnifier (x10)

## Elcometer 3095 Buchholz Hardness Tester

Measuring a coating's hardness using the indentation method, the Elcometer 3095 Buchholz Hardness Tester consists of a bevelled disc indenting tool which is fitted into a stainless steel block exerting a constant test load of 500g (17.6oz).

The gauge is placed on to the coating and then removed after 30 seconds. The length of any subsequent indentation in the coating is measured using the graduated microscope.

The result is expressed as units of Buchholz Indentation Resistance using the scale provided.


**STANDARDS:**

 BS 3900-E9, DIN 53153, **ISO 2815**, NF T30-052

### Measure of Buchholz Hardness

Indentation Length mm	Indentation Resistance	Indentation Depth		Minimum coating thickness for which a measurement is valid	
		µm	mils	µm	mils
0.8	125	5	0.2	15	0.59
0.85	118	6	0.24	20	0.79
0.9	111	7	0.28	20	0.79
0.95	105	7	0.28	20	0.79
1.0	100	8	0.31	20	0.79
1.05	95	9	0.35	20	0.79
1.1	91	10	0.39	20	0.79
1.15	87	11	0.43	25	1
1.2	83	12	0.47	25	1
1.3	77	14	0.55	25	1
1.4	71	16	0.63	30	1.18
1.5	67	18	0.71	30	1.18
1.6	63	21	0.83	35	1.38
1.7	59	24	0.94	35	1.38

**Elcometer 3095 Buchholz Hardness Tester**

## Technical Specification

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Part Number	Description	Certificate
K0003095M001	Elcometer 3095 Buchholz Hardness Tester	○
Dimensions	360 x 310 x 120mm (14.2 x 12.2 x 4.7")	
Weight	2.9kg (6.4lb)	
Packing List	Elcometer 3095 Buchholz Hardness Tester, indentation tool with bevelled disc and two locating pins, pin adjusting shim, x20 illuminated microscope, indentation locator template, hexagonal wrench, plastic carry case and operating instructions	

## Accessories

Part Number	Description
KT003095P001	Spare Pin Supports (x2)
KT003095P002	Bevelled Hardened Steel Disc Indenter



## Elcometer 3101 Barcol Impressor Hardness Tester

These easy to use hardness testers are ideal for testing the hardness of soft metals, plastics, glass fibre and leather.

Making sure the indenter point is perpendicular to the surface being tested, the instrument is placed on to the sample and a light pressure is exerted against the instrument driving the spring-loaded indenter point into the material. The hardness reading is instantly indicated on the dial.

There are three models in the range:

Elcometer 3101/1 Model 934-1: for soft metals such as aluminium and its alloys, brass, copper, and some of the harder plastics and glass fibre. This unit meets ASTM Standard D2583.

Elcometer 3101/2 Model 935: for softer plastics and very soft metals.

Elcometer 3101/3 Model 936: for extremely soft materials such as lead, linoleum and leather.

To ensure the Barcol Hardness Tester is in calibration, a number of Standard Test Discs are available. Please select the appropriate Test Disc from the list of Accessories below to supplement the disc supplied.

All results are recorded in Barcol Units (BU).



**STANDARDS:**

AS 3894.4, ASTM B 648, ASTM D 2583, NF P38-501

**Elcometer 3101 Barcol Impressor Hardness Tester**

## Technical Specification

Part Number	Description
K0003101M001 <sup>a</sup>	Elcometer 3101/1 Barcol Hardness Tester Type 934/1 at 25-150 Brinell Hardness
K0003101M002 <sup>b</sup>	Elcometer 3101/2 Barcol Hardness Tester Type 935 at 50-100 Rockwell
K0003101M003 <sup>c</sup>	Elcometer 3101/3 Barcol Hardness Tester Type 936
Dimensions	152 x 106 x 50mm (6 x 4 x 2")
Weight	900g (2lb)
Packing List	Elcometer 3101, adjusting spanner, 2 x indenting points, appropriate standard test disc and operating instructions

## Accessories

Part Number	Description
KT003101P001	Spare Indenter Point for Elcometer 3101/1 and Elcometer 3101/2
KT003101P006	Spare Indenter Point for Elcometer 3101/3
KT003101P202	Standard Test Disc 934-1; (x1) 87 - 89 BU
KT003101P002	Certified Test Disc 934-1; (x5) 87 - 89 BU
KT003101P203	Standard Test Disc 934-1; (x1) 43 - 48 BU
KT003101P003	Certified Test Disc 934-1; (x5) 43 - 48 BU
KT003101P204	Standard Test Disc 935; (x1) 87 - 89 BU
KT003101P004	Certified Test Disc 935; (x5) 87 - 89 BU
KT003101P205	Standard Test Disc 936; (x1) 43 - 48 BU
KT003101P005	Certified Test Disc 936; (x5) 43 - 48 BU

<sup>a</sup> Supplied with Standard Test Disc 934-1; 43 - 48 BU, Standard Test Disc 934-1; 87 - 89 BU<sup>b</sup> Supplied with Standard Test Disc 935; 87 - 89 BU<sup>c</sup> Supplied with Standard Test Disc 936; 43 - 48 BU

## Elcometer 1537 ISO Scratching Tool

The Elcometer 1537 ISO Scratching Tool is a simple but effective instrument which is used to scratch the surface of samples in preparation for adhesion, salt spray and corrosion tests.

The tool is held horizontally and pulled across the sample to produce the scratch.

The Elcometer 1537 has a tungsten carbide blade which is set to give a 90° cutting angle with a 75° cutting edge.

Certificate of Conformity available upon request.

**STANDARDS:**

BS 7479, EN 22063, ISO 2063, ISO 7253, ISO 9227, NF A91-124

### Technical Specification

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Part Number	Description	Certificate
K0001537M001	Elcometer 1537 ISO Scratching Tool	o
Dimensions	200 x 45 x 20mm (7.8 x 1.7 x 0.8")	
Weight	100g (3.5oz)	
Packing List	Elcometer 1537 ISO Scratching Tool, operating instructions	

## Elcometer 1538 DIN Scratching Tool

The Elcometer 1538 has interchangeable carbide cutters for the preparation of specimens to be used for corrosion testing. Supplied complete with a 0.5mm (0.02") or 1mm (0.04") cutter.

An adjustment device to ensure accurate setting of the blade is available as an optional accessory.



### STANDARD:

DIN 53167, BS EN ISO 4628-8:2012,  
DIN EN ISO 4628-8:2012

### Technical Specification

Part Number	Description
K0001538M201	Elcometer 1538 DIN Scratching Tool with 1mm (0.04") Cutter - CASS Test
K0001538M202	Elcometer 1538 DIN Scratching Tool with 0.5mm (0.02") Cutter - Salt Spray Test
K0001538M004	Elcometer 1538 DIN Scratching Tool with 0.5mm (0.02") Cutter - Renault Version
K0001538M005	Elcometer 1538 DIN Scratching Tool with 1mm (0.04") Cutter - Renault Version
Weight	113g (4oz)
Packing List	Elcometer 1538 DIN Scratching Tool, hexagonal wrench, cutter & storage case

### Accessories

KT001538N002	Spare 0.5mm (0.02") Cutter	KT001538N001	Spare 1mm (0.04") Cutter
KT001538M103	Blade Adjustment Device		

Алматы (7273)495-231  
Ангарск (3955)60-70-56  
Архангельск (8182)63-90-72  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Благовещенск (4162)22-76-07  
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Владикавказ (8672)28-90-48  
Владимир (4922)49-43-18  
Волгоград (844)278-03-48  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
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Иваново (4932)77-34-06  
Ижевск (3412)26-03-58  
Иркутск (395)279-98-46  
Казань (843)206-01-48  
Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Коломна (4966)23-41-49  
Кострома (4942)77-07-48  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Курган (3522)50-90-47  
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