

## COMBUSTIBLE DANGER TO MONGOLIAN GHER

Dambyn Khishigbaatar, Kausilgazin Sultaninkarin  
(Fire-fighting department, State police department,  
Ulaanbaatar, Mongolia)

### ABSTRACT

Origin of the mongolian gher and fire protection methodology.

### INTRODUCTION

The shelters and residences of our ancestors which suited for extremely harsh weather conditions and for different /geographical/ landscapes such as gobi desert, mountainous regions and steppe lands had been built using natural materials which were within reach and they dwelled in them for hundreds and thousands of years. Since immemorial periods of time, the cone-shaped dwellings of nomadic people and of hunters were made of wooden materials and of bones of various beasts and were covered by hides, skins and rinds of trees. Since the time they enabled to make wooden lattice frames they could build their shelters on the ground surface and especially during the winter they covered up by some layers of hides, skins and felts warmly. The felt was begun made of animal wool even 3000 years ago. The main parts of mongolian gher are (toono) cupola, (uni) poles, (khanas) grates or lattice, floor, ropes and strings, lining and poles, (khas) grates or lattice, floor, ropes and strings, lining and covering, frame felt, inner laying or lower and upper felt coverings, bottom part covering and curtains were made of wood, cloths and felt. So they always threatened by danger of combustibility. The roominess of the gher depends on the diameter of cupola, holes on the cupola for poles and number of grates. Now in our country every gher has 4 or 5 grates or khanas. Roominess of gher depending on (khanas) grates shown in TABLE I:

Table 1. Roominess of gher depending on (khanas) grates

Number of khanas	diameter of gher	height of gher	area square m	roominess cubic m
4	4.9	1.95	18.9	42.7
5	6.1	2.5	19.3	36.8
6	7.3	2.94	42.0	144.4
8	9.6	3.88	72.6	331.5
10	12.3	4.97	119.0	689.0
12	14.0	5.9	165.0	1132.0

In the suburban of the cities, towns and large settlements, people used to erect wooden fences around their ghers. In this way some fences form long streets which built mainly by very dry wooden materials.

## EXPERIMENTAL

Of the over 260 thousand families who live in traditional mongolian ghers nearly 40 thousand are in the capital city of Ulaanbaatar. In our country more than 250 families suffer fire damages every year and of the 50 death cases above 90 percent of them were little boys and girls. On the whole 2.5 million tugriks worth of private property was devastated some essential parts of gher for example coarse cotton cloth and wooden materials are inflammable at 180 and 250 degrees of Celsius above zero, respectively and candles, matches and unextinguished cigarettes are very dangerous to any cloths. Before a decade one fire-damaged family had suffered 18640 tugriks worth of material losses but today this loss increased up to 28000 tugriks and this kind of increasing tendency will be continued for the future. Therefore it is important to take certain measures to prevent from fire damages of ghers. As the families have been more applying modern electric durables in their every day life we are responsible to follow strictly the fire-protection instruction but we could not.

The main reasons which cause fire damages to ghers are follows:

- 1 60 percent of fire damages is result of careless activity of little boys and girls.
- 2 18.2 percent is due to misuse of electric durables/leaving them without switching off and because of unsuitable wires/
3. 5.8 percent as on account of improper handling fireplaces and stoves.
- 4 4 percent is owing to careless measures to inflammable materials.
- 5 12.2 percent is for the other reasons.

Fire damages which are owing to misuse of electric durables are follows: the electricity was installed improperly; using unstandardized heaters; different types of cables were applied for electrification; overloading on mains; and leaving electrical devices without turning them off: in some gher regions cable lines were not maintained properly and used them for extremely long period of time; power points and switches were not safety fitted and protected reasonably; fuses were not selected appropriately; tapping of current from an electrical pole or main through too many branch circuits; or using too many distributors; electrical cables used among ghers and wooden houses are like a drying string and cloths were hung up on them. All these above-mentioned careless actions created favorable conditions for fire damages. Considering all these problems we came to the conclusion that the carelessness and improvident activity of little boys and girls were the main reason of outbreak of fire damages. As we know, children whom left and locked in their home without any parent's care tried to spend their time pleasantly and played with everything such as matches, paper and the others which were within their reach and hide-and-seek and they gleamed in the dark places for example, under beds and between furniture and so on. The result of this many children lost their life in fire and were burnt down and some of them were disabled forever. Last decade witnessed(that) of the whole fire damage were broken out in Ulaanbaatar. 25.9 percent from 4 to 12 a.m and 48.7 percent from 1 to 6 p.m otherwise 95.1 percent were coincided with working hours. The fire damages have a seasonal character. Every year from September till May there were most fires because of domestic heating and children were left at home and nobody looked them after. During these dry months sun radiation is high and velocity of the wind reaches 10-25 m/sec. In some fences many ghers which built very closely to each other burnt out. Unfortunately this case is not

rare.

If we decrease fire damages by 10 percent the material losses will fall down by 10 thousand tugriks every year.

The fire damages of the gher were in the overwhelming majority of fires of our country. Therefore we have to take into consideration the combustibility features of gher and prevention and protection measures. There occur difficulties to take operative measures to extinguishing gher fires because of gher burn out and collapse within seconds and the fire spread quickly. So Mongolian fire-protection organizations have been making researches on fire damages of gher since 1984. The experiments show that a gher burns out completely within 5 minutes and the temperature inside the (firing) burning gher goes up to 950 C and it can destroy all dry inflammable material like wool, paper, cloths, fefts and the others which may find in its vicinity within 5 meters. By the result of study, the first 5 minute. But fire break the material losses go up by 1200-2000 tugriks in every minute. But beginning from the 6-th the losses will soar by 3600-4000 tugriks. At the same time, the lack of sufficient information system, the fire announcement takes 5 or 10 minutes in average. This means complete catastrophe of the gher. After receiving information the fire-fighters will arrive at the fire place in 5 minutes of they drive 50 km per hour speed. If in the time when the other gher is just collapsing down and the fences with wooden houses burning out heavily.

We have been taking measures for extinguishing fire within possibly short time and with a minimal losses and for eliminating the fire spread in its initial period after gher even catches a fire.

In some areas of Ulaanbaatar, in other towns as well gher were centralized we are making efforts to establish small fire brigades with 3 km of service distance and an adequate information network. Besides, for the improvement of dealing with gher fire protection and creating security against fire the main parts gher and some furniture should be steeped in or with fire-withstanding detergents or chemicals.

## RESULTS AND DISCUSSIONS

During the against mongolian gher fire the experts of mongolian fire-protection organizations observed and revealed that the gher curtains soaked in solution which contains incombustible chemical were limited catching fire on blame of candles and matches. It was a significant achievement in this field. But two types of chemicals diamine sulphate and ammonium which were solved solutions were not suitable for hygienic requirements of people and they have somewhat poisonous effects to human health, there are difficulties to introduce them into practice. So we are continuing our research on finding out alternative or substituting substances.

The following tasks and targets were put forward bringing to a stop of fire damage of gher.

1. Main component parts such as curtains, lining and the others of the gher must be made of fire withstanding materials depending on its peculiarities.
2. With a view to create fire security condition we have determine the distance reasonably between gher protecting from whirled fire damages.
3. Certain devices for instance fire alarm. fuse-breaks should be installed

on mains and on electric durables.

4. Researches and experiments should be successfully done for selecting solutions which contains fire-withstanding chemicals in which main parts of gher will be soaked. The vital aspect is that the chemicals must be met hygienic requirements and will not be harmful to human body.

I feel so much obliged to express my grateful thanks to you ,to esteemed ladies and gentlemen for your attention.

Your disinterested advice and kind businesslike assistance for accomplishing our targets and overcoming difficulties faced us will highly appreciated by us or by our fire-fighting organizations.

#### REFERENCES

1. D.Maidar, Building in Mongolia, State Press, 1972, 12
2. Statistics facts of Fire-Fighting Department SPD of Mongolia
3. N.I.Zenkov, Building materials and combustible danger, Academic Press (1074), 123