

## Fire Research & Investigation Unit

# Heads Up



### BACKGROUND

Wheat bags (also known as wheat packs or heat bags) are fabric bags filled with buckwheat or other grains. They are available in a variety of shapes and sizes, including cuddly toys and hot water bottles. They are also manufactured by handicraft enthusiasts and often sold at local markets and fairs. Wheat bags are promoted for their therapeutic value as non-invasive pain relief for muscle strain, arthritis and sports-related injuries. The bags are heated in either a microwave or conventional oven and are intended for external use by placing the bag on parts of the body where pain is occurring.



### FIRE RISK

There have been frequent examples of fires where people have overheated their wheat bags, or wrapped them in towels or placed them under bedding to warm beds (which is not what they are designed for). In many cases, this has led to smouldering or flaming fires. Heated wheat bags have been blamed for 31 fires in New South Wales, injuring 11 people and causing one death from smoke inhalation after a wheat bag in a bed caught fire.



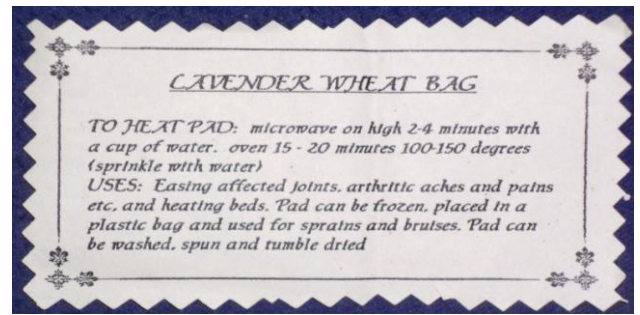
*Results of an overheated wheat bag which was inadvertently heated in a microwave oven for 20 minutes*

Statistics from the Accident Compensation Corporation (ACC) indicate that, since 2007, 172 New Zealanders have made claims for burns in which wheat bags were involved.

When manufacturers' instructions are followed, these products should heat and cool safely. However, they can ignite if overheated or if the microwave turntable fails or is obstructed. They can also create a fire risk when the wheat bag is used to warm up a bed or is covered with blankets. The bag may begin to self-heat. As the heat is unable to dissipate, smouldering occurs, leading to the bedding catching fire.

Continual heating of the wheat bag causes the contents of the bag to dry out, making it more likely to overheat to ignition point. When heating it in a microwave, users should place a cup or bowl of water in with the wheat bag to reduce this risk.

While users of wheat bags need to exercise caution, statistically most wheat bag fires involve elderly people and children. Often the manufacturer's instructions are only enclosed with the packaging, and there are no heating instructions attached to the product itself. Once the packaging is disposed of, there is no information to indicate how long to safely warm the product. Many commercial wheat bags suggest no more than 4 minutes.



*Typical warning instructions printed on paper and sold with the bag*

### TESTING DETAILS

Under test conditions, a commercially available wheat bag was repeatedly heated and cooled to simulate a bag being reheated by a user. The temperatures were recorded up until the point that a smouldering fire occurred. The results are shown on the right.

These results highlight the increased fire risk if the bag is not completely cooled before reheating and also demonstrates that a prolonged heating time may result in a fire.

#### Wheat Bag Tests by NZ Fire Service

Start	Temperature	19.8°C
1.0 min		48.0°C
3.0 min		88.7°C
6.0 min		121.4°C
9.0 min		164.2°C
11.0 min		180.1.°C*

**\* Bag smouldering and fire started**

### LESSONS LEARNED AND RECOMMENDATIONS

#### Tips for staying safe when using wheat bags:

- Buy bags with clear heating instructions and follow the manufacturer's instructions.
- Only use a wheat bag for direct application to the body.
- Ensure the wheat bag rotates freely in the microwave turntable.
- Add a cup of water when heating the wheat bag in a microwave. The water provides hot moisture which the bag can absorb and prevents the wheat from overheating.
- Discard the bag if there is evidence of problems, e.g. discolouration or charring.
- Use a hot water bottle instead of a wheat bag in confined spaces that can trap heat, such as under blankets or in bedding.
- Don't leave the microwave unattended while heating.
- Only store the bag when it has cooled completely (this can take 2 hours). Leave it to cool in a safe place on a non-combustible surface, e.g. the kitchen sink.

### FURTHER INFORMATION

If you smell burning, your wheat bag must be thrown away. Wheat will dry out over time and start to emit a cooked or burnt smell. This is letting you know that it is time to replace your wheat bag. Carefully remove the bag from the heat source and place it on a non-combustible surface, such as a sink or kitchen bench. Let the wheat bag completely cool, then throw it away.

### INFORMATION SOURCES

<http://m.consumeraffairs.govt.nz/for-consumers/goods/product-safety/wheat-bags>  
<http://www.productsafety.gov.au/content/index.phtml/itemId/1000231>



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